Wagga Wagga Lithium-Ion Battery Recycling Facility

Environmental Impact Statement

Calibre Metals Pty Ltd

17 March 2025

Project name		Wagga LIB Recycling Plant					
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Declaration

Project	**Project name**	**Wagga Wagga Lithium-Ion Battery Recycling Facility**	
	Application no	SSD-67983064	
	Project location	Lot 91 DP1299517 Building 107, 61 Edison Road, East Wagga Wagga NSW 2650	
Proponent	Applicant name:	Calibre Metals Pty Ltd	
	Applicant address:	30 Mallee Road, Springvale NSW 2650	
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	Organisation	GHD Pty Ltd	
Declaration	The undersigned declares that this EIS: – has been prepared in accordance with Schedule 2 and Part 10 of the Environmental Planning and Assessment Regulation 2021; – contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates; – does not contain information that is false or misleading; – addresses the Planning Secretary's environmental assessment requirements (SEARs) for the project; – identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments; – has been prepared having regard to the Department's *State Significant infrastructure Guidelines – Preparing an Environmental Impact Statement*; – contains a simple and easy to understand summary of the project as a whole, having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development; – contains a consolidated description of the project in a single chapter of the EIS; – contains an accurate summary of the findings of any community engagement; and – contains an accurate summary of the detailed technical assessment of the impacts of the project as a whole.		
	Signature		
	Date	17/03/2025	

Executive summary

ES1 Introduction

Calibre Metals Pty Ltd (ACN 666 059 801) (Calibre Metals) is seeking approval to construct and operate a lithium ion battery (LIB) recycling facility. The LIB recycling facility is proposed at Building 107, 61 Edison Road, Wagga Wagga NSW 2650. The Wagga Wagga LIB recycling facility includes installation of a fully automated battery recycling machine, positioned wholly within an existing approved industrial building that is currently under construction, within an existing approved industrial estate. The LIB recycling facility will have capacity to process up to 3,000 tonnes per annum (tpa) of waste LIB, to recover a range of critical minerals and other products such as metal and plastic.

Calibre Metals have identified that there is a need and demand for recycling facilities for waste LIB in Australia, with just one LIB recycling facility currently operational, in Melbourne Victoria, and less than ten per cent of used LIB currently being recycled in Australia. Ninety per cent of used LIB in Australia are currently being sent to landfill.

This Environmental Impact Statement (EIS) has been prepared under Division 4.7 of the *Environmental Planning and Assessment Act 1979 (EP&A Act),* in accordance with the NSW Secretary's Environmental Assessment Requirements (SEARs), dated 26 March 2024, the State Significant Assessment Guidelines (DPIE, 2022) and the requirements of Section 190 and 192 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation).

The objectives of the project are to:

– Establish a LIB recycling industry in NSW
– Reduce the number of LIB ending up in landfill
– Capture the critical minerals found in LIB (lithium, copper, nickel, manganese and graphite), as well as metal and plastic so that they can be reused and are not lost to landfill
– Operate a LIB recycling facility in NSW, using best available technology, to maximise recovery efficiencies and minimise waste
– Develop a dedicated LIB recycling industry in Australia, by establishing an outlet for LIB in NSW
– Develop the circular economy for LIB in Australia
– Develop a facility which is acceptable to the local community
– Generate skilled jobs in a regional area in the circular economy sector.

The project represents an opportunity to establish a LIB recycling industry in NSW to account for the significant shortfall in waste LIB recycling rates in Australia.

ES2 Project description

Project Overview

The Wagga Wagga LIB recycling facility will be the first lithium ion battery recycling facility in NSW. The project will process up to 3,000 tpa of waste-LIB and produce a variety of recycled products including copper metal, aluminium metal, stainless steel, polypropylene and black mass powder (containing Nickel, Cobalt and Lithium).

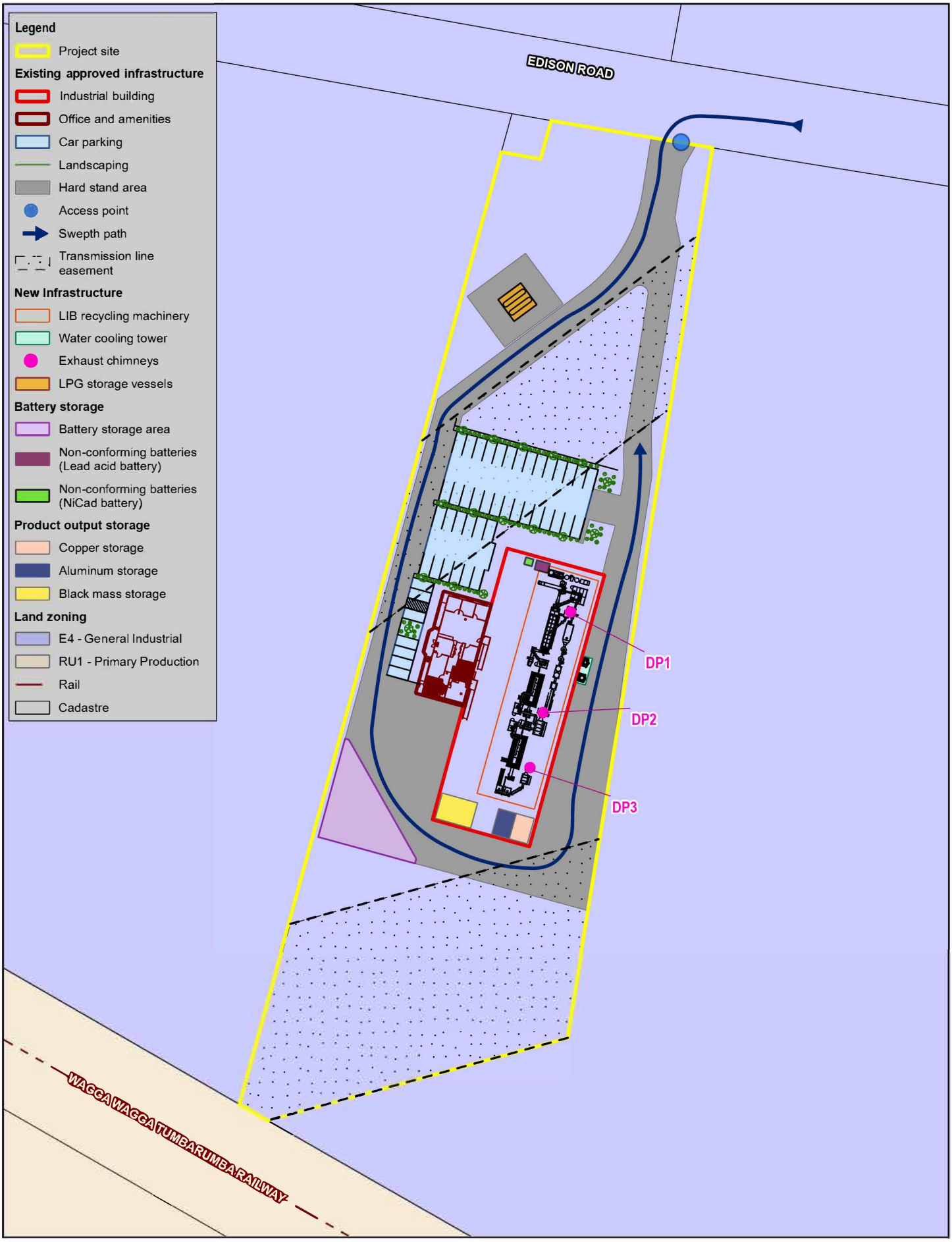
Key components of the project include:

– A fit out of an existing approved industrial building, that is currently under construction, with a fully automated recycling machine that will comprise of the following components:
  - Shredder
  - Dryer and heat exchanger
  - Air separators
  - Drum magnet
  - Water cooling
  - Scrubber towers
  - Condensers
  - Primary and secondary rotary screens
  - Catalytic combustion system
  - Hammer mill
  - Baghouses
  - Turbo mill
  - Rotary vibrating sieve
  - Air separation tables.
– The battery recycling machine will require minor external changes to the approved industrial building to include three exhaust chimneys for the baghouses, an evaporative water cooling tower and two Liquid Petroleum Gas (LPG) storage vessels.
– Storage of a maximum of 52.8 tonne of unprocessed LIB in specialised storage containers on an existing hardstand area external to the building for up to five days, prior to processing.
– Installation of two 7.5 Kilolitre (KL) or three tonne storage vessels for liquid petroleum gas (LPG) including a buffer area.

Calibre Metals will be leasing the existing approved industrial building and site for the project and there is no clearing or ground disturbance proposed as part of the project. Infrastructure that was approved by Wagga Wagga City Council under (DA22_0534) for the Stage 1 – Flip Screen Industrial Estate, is currently being constructed and will be utilised as part of the project, including:

– An industrial building complete with an office complex
– Site access will be utilised via existing local roads, Edison Road and Tasman Road, that connect into the Sturt Highway
– Hardstand access throughout the site and on site parking provisions for up 47 light vehicles, and up to four trucks will be utilised for operations
– Landscaping
– The following utilities and connections already exist to the site:
  - Electricity
  - Telecommunications
  - Potable water supply
  - Stormwater drainage
  - Sewer connection
  - Trade waste connection
  - Lighting
  - Fencing.

See Figure ES.1 for the project layout.



Paper Size ISO A4

0 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility
EIS

Site locality and layout

Project No. **12622054**
Revision No. **0**
Date **14/03/2025**

FIGURE ES-1

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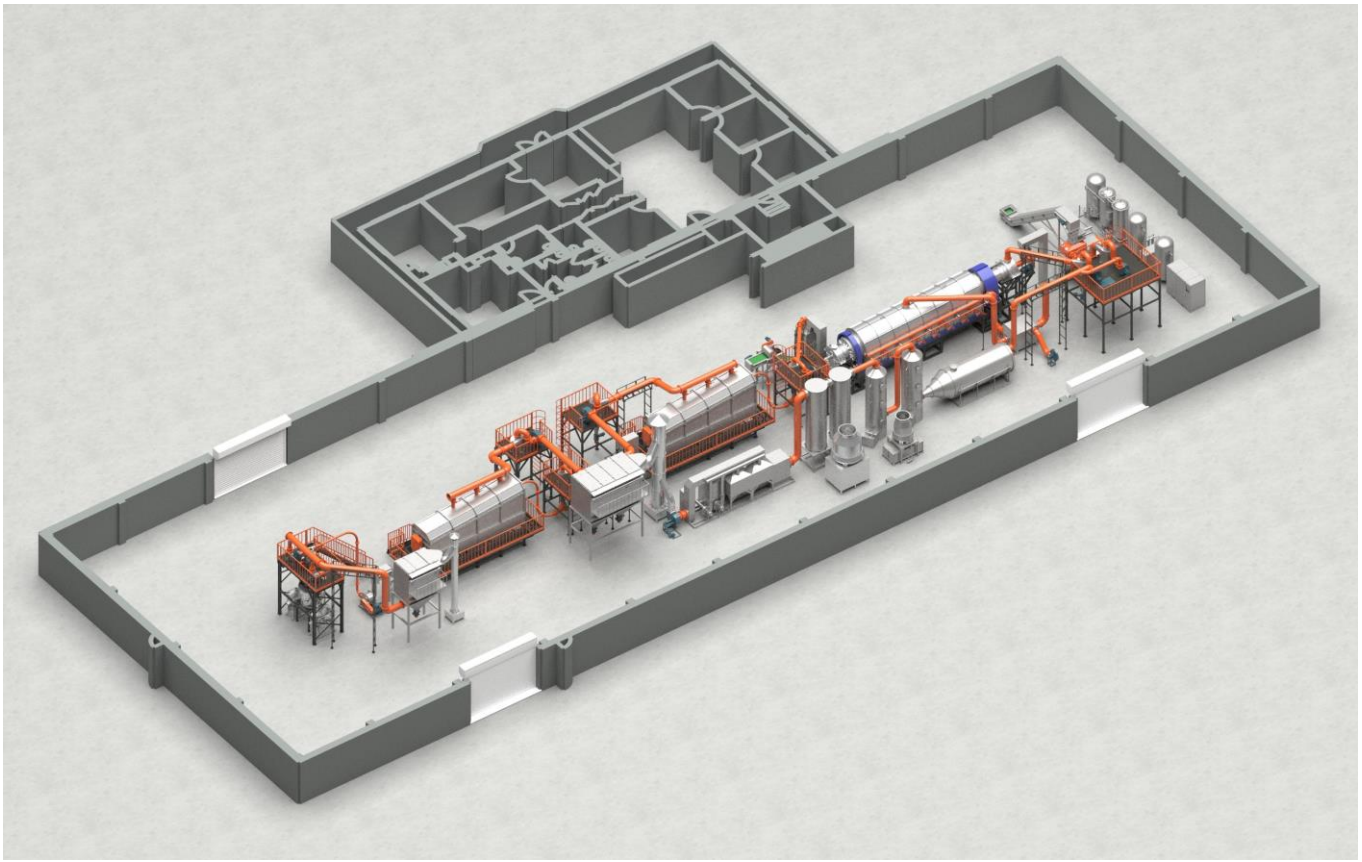
Print date: 14 Mar 2025 - 13:58

Data source: General topo - NSWSS 2023, Aerial imagery - Created by: rvillalon

Project design

The project will incorporate the following design (shown in Figure ES.2):

– Installation of a fully automated and enclosed LIB recycling machine, positioned entirely within an existing approved industrial building (currently under construction)
– Provision of a dedicated storage area on an established hardstand area, external to the industrial building, for short term (up five days) storage of incoming waste LIB prior to processing
– Installation of an evaporative water cooling tower, external to the industrial building on existing pavement
– Installation of three exhaust chimneys
– Installation of two LPG storage vessels.



ES.2 Project design

Project operations

The LIB recycling facility will receive and process up to 3,000 tpa of waste LIB, and will accept all types of LIB including:

– Handheld LIB – from mobile phones, laptops and power tools
– Electrical vehicles – from cars, buses, scooters, golf carts and marine
– Energy storage – including household and commercial.

Once the waste LIB are received on site they will be unloaded and stored in their storage containers external to the building in a dedicated storage area, where the LIB will be stored for a maximum of five days prior to undergoing the discharge process.

An automated battery recycling machine has been selected to maximise safety, efficiency and product recovery, while minimising air emissions and waste generation. It's anticipated that more than 90 per cent of the LIB waste recycled will be recovered. Recovered products include copper, nickel manganese, and graphite as well as plastics and metals. It's intended that recycled products are sold in Australia as the domestic LIB industry develops; in the absence of domestic purchasers the recycled products will be sold to manufacturers overseas in South Korea, the US and Europe.

ES3 Strategic Context

Need for the project

The key objective of the project is to establish a circular LIB industry in industry in Australia to account for the current significant gap in Australia's LIB value-chain. The global demand for batteries is increasing and is largely driven by the imperative to reduce climate change through the broader renewable energy transition, energy storage systems, and electrification of mobility. LIB is also widely used in electronic goods, electric vehicles, commercial and household energy storage. As such the demand for LIB Is rapidly increasing globally and in Australia. Waste LIB recycling facilities can recover up to 90 per cent of battery component for alternate reuse or the production of new LIB instead of disposals at landfills. However, Australia currently only has one LIB recycling facility located in Melbourne, Victoria.

On a state level there is currently no LIB recycling facilities that exist within NSW and no battery recycling specific strategic plan is in place. However, recently the *Future Transport Strategy 2056* has acknowledged the need for adequate supporting infrastructure to account for uptake of electric vehicles and the significant obligations of future transport to minimise its resource footprint. Crucially, this includes projects that maximise recycling opportunities and providing opportunities to source recycled products in their procurement of goods and services,

The NSW governments *20-Year Economic Vision for Regional NSW* advocates the competitive advantage of regional NSW in the provision of circular economy services noting that critical minerals and recycling and waste management as emerging sectors that will drive long-term economic growth in regional NSW.

As such the project will be instrumental to the establishment of a recycling LIB services in Australia to support the increasingly LIB-enabled industries in Australia with the electrification of transport the broader energy transition. The project will not only improve the circularity of the LIB value chain in Australia but also enable sustainable procurement practices and limited resources footprint in Australia, changing industries through the provision high quality recycled LIB products.

Alternatives considered

Project alternatives considered are divided into two main types:

– Alternate project locations
– Alternate process technologies.

A "do nothing" approach was also considered during the options selection process. If the project was not constructed and operated, the previously mentioned objectives would not be achieved and a significant step towards a circular LIB industry would not be realised. As such the do -nothing options is not preferred.

Wagga Wagga was selected as the preferred location for the project due to:

– Strong transport links to the major east coast population centres
– The presence of a mature recycling sector in the region
– The skilled labour available locally
– The ability to secure an existing established industrial building, to allow for a "fit out", decreasing the impact and scale of the development.

ES4 Statutory Context

The project has been declared State Significant Development (SSD) in accordance with Section 4.36(2) of the EP&A Act and clause 23, Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). As the primary purpose of the project is resource recovery, the development is best characterised as a resource recovery facility, in accordance with the definitions in the *Standard Instrument (Principal Local Environmental Plan) 2006* (Standard Instrument).

Development for the purpose of waste or resource management facilities are permitted consent on any land in a prescribed zone in accordance with Division 23 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP). The project site is zoned E4 General Industrial under the Wagga Local Environmental Plan (Wagga Wagga LEP) 2010 which is specified as a prescribed zone.

Part 8 of the EP&A Regulation describes the requirements for an EIS. Section 190 outlines the required form for an EIS, while Section 192 outlines the required content. This EIS has been prepared in accordance with the form and content requirements of the EP&A Regulation. These requirements and where they are addressed in the EIS are outlined in Appendix D.

All applicable NSW and Commonwealth legislation has been considered during the preparation of this EIS.

ES5 Consultation

Stakeholder and community consultation was carried out prior to and during preparation of the EIS and the consultation activities which will continue during the assessment and development of the project.

Stakeholder is identified as those who are interested or may be affected the LIB recycling project and these include:

– Landowners
– Wider community
– Government and technical stakeholders.

Stakeholder members were consulted utilising a range of methods, including phone calls, emails, letter drop box and a website. These were supported by community feedback mechanisms, including a project-specific phone number and email address.

The general sentiment on the project from engagement activities was neutral to broad support. The support was associated with the need for LIB safe recycling opportunities. Issues raised by stakeholders largely focused on battery waste and fire risks.

Key stakeholders will continue to be consulted with during the environmental impact assessment/approvals phase, and if approved, during construction and operation.

ES6 Assessment of impacts

Air quality

The AQIA was undertaken for the project to estimate risk and health impacts on the surrounding environment and nearby sensitive receptors. The existing environment was characterised based on a review of the background air quality, climate and meteorology, and sensitive receptors in the area surrounding the site.

A detailed operational air quality assessment was undertaken in accordance with the NSW Environment Protection Authorities (EPA's) *Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2022).*

Emissions to air during operation of the plant include Nitrogen Dioxide (NO2), total Fluoride, Total Suspended Particles (TSP), Volatile Organic Compounds (VOCs), type 1 and type 2 substances. Emissions from the facility were found to be below the Protection of the Environment Operations (POEO) Clean Air Regulation limits for all pollutants.

The findings of the dispersion modelling are summarised below:

– No cumulative exceedance of the annual TSP criteria was predicted for one-year averaging period in the modelled year at any sensitive receptor
– Compliance was predicted for annual dust deposition concentration against NSW Approved Methods criteria at any sensitive receptor
– No cumulative exceedances of the 24-hour PM_{10} or $PM_{2.5}$ criteria were predicted for any 24-hour period within the modelled year at all sensitive receptors
– Compliance was predicted for one hour and annual NO_2 concentrations against NSW Approved Methods criteria at sensitive receptor locations
– Compliance was predicted for 24-hour total fluoride concentrations against NSW Approved Methods criteria at sensitive receptor locations
– Compliance with the 1-hour 99.9th percentile concentrations of VOCs, including highest ranked compounds of Benzene, Acetaldehyde, and Formaldehyde was predicted against the NSW Approved Methods criteria at and beyond the site boundary

– Compliance with the 99.9th percentile concentrations of type 1 and type 2 substances, including highest ranked metals of Nickel, Cobalt and Cadmium, was predicted against the NSW Approved Methods and WA guideline assessment criterion at and beyond the site boundary.

The project includes a number of air pollution controls to minimise emissions as far as reasonably practicable including dust removal, combustion of pollutants, scrubbers to remove hydrogen fluoride and an oxidiser to remove VOCs.

Noise and vibration

This Noise and Vibration Impact Assessment (NVIA) has been prepared as part of the EIS for the project. A total of 422 noise sensitive receivers were identified and categorised into two Noise Catchment Areas (NCAs) with consideration the noise environment of the study area. The identified receivers have classified by receiver type including, residential, educational, hotel, active recreation, commercial and industrial buildings. Construction Noise Management Levels (NMLs) and operational Project Noise Trigger Levels (PNTLs) for the identified NCAs were developed in accordance with the relevant guidelines using long term unattended background noise monitoring within each NCA.

Worst-case noise levels have been predicted to sensitive receivers in the study area for each stage of construction and noise levels during construction are predicted to meet the noise management levels at all sensitive receivers during the proposed hours. Additionally, no significant vibration impacts are anticipated due to the absence of vibration-intensive works and the large distance to the nearest structures.

Noise levels for the operational equipment for the project were provided by Calibre Metals. Internal noise sources were modelled to calculate the internal reverberant level of the building and the incident levels at the building facades and roof.

Predicted operational noise levels at sensitive receivers are expected to meet the project noise trigger levels, including the project amenity noise criterion. As such, cumulative noise from surrounding industry would be below the recommended amenity noise level.

During operation, the transport of incoming and outcoming LIB waste or products is anticipated to generate up to a maximum of two heavy vehicle movements per day.

Based on the existing road volumes, and the expected traffic generation from the project, the additional traffic generated during the construction and operational phases of the project would result in a negligible increase in road traffic noise levels along Sturt Highway. As no residential dwellings are located on Edison Road and Tasman Road and the assumed existing high number of heavy vehicles on this route, no impacts are anticipated due to traffic generation from the project during construction or operation.

Traffic and transport

A Transport Impact Assessment (TIA) has been prepared as part of the EIS for the project. The project is located on Edison Road, East Wagga Wagga and the site is accessed via Edison Road, Tasman Road and Sturt Highway.

Traffic data for the key roads in proximity to the subject site has been provided by Transport for NSW (TfNSW). Analysis of the traffic survey data indicate that:

– The AM peak hour was recorded between 8am and 9am, with 314 eastbound vehicles and 507 westbound vehicles
– The PM peak hour was recorded between 4pm and 5pm, with 491 eastbound vehicles and 433 westbound vehicles
– Vehicles are predominantly westbound on the Sturt Highway in the AM peak and are approximately equal in the PM peak.

The intersection of Sturt Highway / Tasman Road / Eunony Bridge Road has been assessed using SIDRA software and indicates that the intersection of interest currently operates with a good level of service (LoS) during peak periods of road network activity.

A mid-block capacity analysis has also been undertaken for the key roads in proximity to the subject site and indicates that the key access roads in the vicinity of the subject site are operating well within their mid-block capacities during peak periods of road network operation.

It is anticipated that during the construction of the project, up to (approximately) 16 workers will be required. Additionally, up to 16 semi-trailer loads are expected to be delivered to the site across the nine-week construction program, at an average of less than two heavy vehicles per week. Following the delivery of all construction equipment, construction vehicle activity will fall to a single movement per day of a Franna Crane, plus the occasional small delivery truck or van.

During operation the project is expected to generate approximately to generate up to 18 trips in a single peak hour and 10 heavy vehicle trips per day. The additional 18 vehicles per hour associated with the construction and operation of the project is expected to have a negligible impact on the operation of the road network and fall within typical daily fluctuations on the Sturt Highway and Tasman Road.

Hazard and risk and fire incident management

A hazard and risk assessment has been prepared through a preliminary risk screening and Preliminary Hazard Analysis (PHA) in accordance with the *State Environmental Planning Policy (Resilience and Hazards) 2021* (*SEPP (Resilience and Hazards)*), to determine if the proposed LIB recycling facility is 'potentially hazardous or offensive'.

The results of the preliminary risk screening indicate that the screening thresholds for dangerous goods storage and transport movements were not exceeded by any of the dangerous goods proposed to be stored. As a result, the project is not deemed a 'potentially hazardous industry'.

Over the lifecycle of the project, and with safeguards, the project is not expected to release a significant quantity of pollutant emissions and is not considered to be an 'offensive industry'.

Based on the hazard identification process, one hazard scenario (a release of LPG) was determined to have potential for off-site impacts and a PHA was completed. The outcome of the PHA determined that the risk arising from the Liquid Petroleum Gas (LPG) storage area does not exceed the fatality or injury risk criteria specified in Hazardous Industry Planning Advisory Paper four (HIPAP 4).

The PHA demonstrates that the project could be designed, constructed and operated in a manner that will meet relevant regulations, standards and policies.

The LIB recycling facility has a site-wide fire management system that includes fire hydrants, fire hose reels and spill management kits. A chemical spill response procedure and the fire response procedure within overarching Emergency Response Plan will be prepared for the site.

Waste

The project involves processing up to 3,000 tonnes per annum (tpa) of waste-LIB and produce a variety of recycled products including copper metal, aluminium metal, stainless steel, polypropylene and black mass powder (containing Nickel, Cobalt and Lithium).

The incoming waste LIB will be transported to the site by suppliers using heavy vehicles and as LIB are classified as Class 9 Dangerous Goods, all transport will be in accordance with applicable dangerous good codes and waste tracking requirements and regulations. The LIB will be received in their original hard plastic casing and stored in a specialised non-conductive container.

For construction and operation, appropriate bins would be provided for plastics, timber, scrap steel and general building waste. All waste will be removed from site by appropriately licenced contractors.

Social

A social impact assessment was prepared by GHD as required by the NSW Department of Planning and Environment's (DPE) *Social Impact Assessment Guideline for State Significant Projects* (2023).

The SIA identifies key social benefits, including employment opportunities during both construction and operation, with the potential for local and Indigenous businesses to participate. The project is expected to provide economic benefits for the Wagga Wagga region, reinforcing its strategic role in NSW's green economy. Additionally, it will contribute to the region's reputation as a leader in environmental sustainability.

Key social impacts may arise from perceived risks and hazards related to the facility's construction and operation, which could affect the wellbeing of local residents and stakeholders. These impacts are expected to be minor due to the site's industrial location and the small number of residential properties nearby

Glossary and abbreviations

Abbreviation	Term
ABN	Australian business number
ABS	Australian Bureau of Statistics
ACHAR	Aboriginal Cultural Heritage Assessment Report
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
AQIA	Air Quality Impact Assessment
AQMS	Air quality monitoring stations
AR	Assessment report
AVTG	Assessing Vibration: A Technical Guideline
AWS	Automatic Weather Station
BCS	Biodiversity, Conservation and Science Group
BDAR	Biodiversity Development Assessment Report
BoM	Bureau of Meteorology
BMP	Biodiversity management Plan
CEMP	Construction Environment Management Plan
CO_2	carbon dioxide
CP	Communication Plan
CS	Construction Scenarios
DA	Development Assessment
DCCEEW	Department of Climate Change Energy, the Environment and Water
DCP	Development Control Plan
DG	Dangerous Goods
DP	Discharge Point
DPHI	Department of Planning Housing and Industry
DPIE	Department of Planning, Industry and the Environment.
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
ESD	Ecological Sustainable development
ESPR	Enirgi Power Storage Recycling
FM Act	Fisheries Management Act 1994
FRIA	Flood Impact and Risk Assessment
FTE	Full Time Employment

Abbreviation	Term
GHD	GHD Pty Ltd
GMV	Gross Vehicles Mass
GRP	Gross Regional Profile
Heritage Act	*Heritage Act 1977*
HF	hydrogen fluoride
Hz	Hertz
IAMQ	Institute of Air Quality Management
IWTS	Integrated Waste Tracking Solution
KL	Kilolitre
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
LIB	Lithium Ion Battery
LoS	Level of Service
LPG	Liquid Petroleum Gas
LSPS	Local Strategic Planning Statement
MNES	Matters of National Environmental Significance
NBS	National Battery Strategy
NCA	noise catchment areas
NEPC	National Environment Protection Council
NFPA	USA National Fire Protection Association
NMLs	Noise Management Levels
NO_2	Nitrogen Dioxide
NPfI	Noise Policy for Industry
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
OEMP	Operation Environment Management Plan
OLM	Ozone Limiting Method
PCU	Passenger Car Unit
PCT	Plant Community Type
PHA	Preliminary Hazard Assessment
PHAST	Process Hazard Analysis Software Tool
PIRMP	Pollution Incidence Response Management Plan
PLC	programmable logic controller
PMST	Protected Matters Search Tool
PNTLs	Project Noise Trigger Levels
POEO Act	*Protection of the Environment Operations Act 1997*
PPE	Personal protective equipment
RAVs	Restricted Access Vehicle
RBLs	Rating Background Noise Levels
RCO	regenerative catalytic oxidiser

Abbreviation	Term
REDS	Regional economic development strategy
RJP	Regional Job Precinct
SAP	Special Activation Precinct
SEARS	Secretary's Environmental Assessment Requirements
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SIA	Social Impact Assessment
SOC	State of Change
SSD	State Significant Development
SSI	State Significant Infrastructure
SWMP	Soil and Water Management Plan
TfNSW	Transport for NSW
TIA	Transport Impact Assessment
tpa	Tonnes per annum
TSP	Total Solid Particles
ULAB	Used Lead Acid Battery
UN	United Nations
VCR	Volume Capacity Ratio
VOCs	Volatile organic compounds
VPA	Voluntary Planning Agreement
WA EPA	Western Australia Environmental Protection Authority
Wh/kg	Watt-hour per kilogram
Council	Wagga Wagga City Council

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Appendices

1. Introduction

This section provides an overview of the Wagga Wagga lithium ion battery recycling facility project. It also provides an overview of the local context of the project within its locality, identifies the proponent and outlines the structure and purpose of the Environmental Impact Statement.

1.1 Overview

Calibre Metals Pty Ltd (Calibre Metals) propose to establish and operate a lithium ion battery (LIB) recycling facility (the project) at Building 107, 61 Edison Road, Wagga Wagga NSW 2650. The Wagga Wagga LIB Recycling Facility will involve outfitting an existing industrial building with a fully automated battery recycling machine to process up to 3,000 tonnes per annum (tpa) of LIB, to recover a range of critical minerals.

Calibre Metals have identified that there is a need and demand for recycling facilities for LIB in Australia, with just one LIB recycling facility currently operational, in Melbourne Victoria, and less than ten per cent of used LIB currently being recycled in Australia. Ninety per cent of used LIB in Australia are currently being sent to landfill.

Key components of the project include:

– Outfitting an existing industrial building in an established industrial estate
– Receiving and storing waste LIB for processing
– Recycling waste LIB, to recover critical minerals including; lithium, copper, manganese and graphite, as well as metal and plastic
– Transporting recycled LIB products.

1.2 Proponent details

Calibre Metals Pty Ltd ACN 666 059 801 is the owner and proponent for the project, and is located at: 30 Mallee Road, Springvale NSW 2650. Calibre Metals are an Australian owned and operated company, comprising of a team that are highly skilled and experienced in battery recycling operations. The Calibre Metals team have a strong history of managing and operating Used Lead Acid Battery (ULAB) recycling facilities in Melbourne, Sydney, Wagga Wagga (Bomen) and Perth.

1.3 Project objectives

The objectives of the project are to:

– Establish a LIB recycling industry in NSW
– Reduce the number of LIB ending up in landfill
– Capture the critical minerals found in LIB (lithium, copper, nickel, manganese and graphite), as well as metal and plastic so that they can be reused and are not lost to landfill
– Operate a LIB recycling facility in NSW, using best available technology, to maximise recovery efficiencies and minimise waste
– Develop a dedicated LIB recycling industry in Australia, by establishing an outlet for LIB in NSW
– Develop the circular economy for LIB in Australia
– Develop a facility which is acceptable to the local community
– Generate skilled jobs in a regional area in the circular economy sector.

The project provides an avenue to recover critical minerals plastics and metal for sale and reuse in LIB manufacturing, which is a growing industry with constantly increasing demand. The project will improve the circularity of the LIB value chain in Australia and enable sustainable procurement practices, limiting the resources footprint for Australian industries through the provision high quality recycled LIB products. The project will also generate skilled jobs in a regional area in the circular economy sector which has been identified as a future growth industry for regional NSW.

1.4 Project area

The project is located on Lot 91 DP1299517 (formerly Lot 9 DP846835 prior to subdivision), at Building 107, 61 Edison Road, East Wagga Wagga. The project site is zoned E4 – General Industrial under the *Wagga Wagga Local Environmental Plan 2010* (Wagga Wagga LEP), located within an approved industrial area of approximately 1.5 hectares via Edison Road, East Wagga Wagga, in the Wagga Wagga City Local Government Area (LGA). The project area and local setting is provided in Figure 1-1.

The project site is situated on pre-disturbed land that was historically owned by Wagga Wagga City Council (Council) and was used for stockpiling materials and leased out for grazing livestock. The land was sold by Council to Flip Screen, who applied for and obtained Council approval for the Stage 1 Flip Screen Industrial Estate (DA22_0534) in 2023.

The approved Stage 1 Flip Screen Industrial Estate development consists of seven new industrial buildings, access, internal roads, carparking, utilities and services connections as per DA22-0534. For the purposes of this project, Calibre Metals will lease one of the newly constructed industrial buildings (Building 107) within the industrial estate, from Flip Screen Australia Pty Ltd (Flip Screen). Calibre Metals will be the first tenant in this new building and are seeking approval for the use of the site as a LIB recycling facility. Further detail on related development is provided in section 1.7.

1.5 Suitability of the site

Section 4.15(1)c of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) requires consideration of the suitability of the site for the proposed development. Key considerations include whether the development fits into the locality and if the site features are amenable to the proposed development. The site is located on the fringe of a flood area where the site would be inundated to less than 0.3m in a 1% Annual Exceedance Probability (AEP) event. The design of the existing industrial building and industrial estate (approved DA22-0534) was completed in collaboration with Council and the building floor adopted the lesser of the 5% AEP + 500mm or the 1% AEP flood levels as detailed in the Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan (WMA, 2021). The Stage 1 Flip Screen Industrial Estate site plans for the development are included in Appendix A - A-1. The Statement of Environmental Effects (SEE) prepared by SKM on behalf of Flip Screen and the Notices of Determination are provided in Appendix F - F-1 and F-2.

The site and surrounding locality don't present any significant ecological, physical, social or technological constraints, given the proposed development will be in a modern, purpose-built industrial building, in an industrial estate. The proposed development is ideally suited to this location.

1.6 Purpose of this document

This Environmental Impact Statement (EIS) has been prepared by GHD Pty Ltd (GHD) on behalf of Calibre Metals to address the Secretary's Environmental Assessment Requirements (SEARs) as issued by the Department of Planning Housing and Industry (DPHI) for the project. This EIS provides an assessment of the potential impacts that may arise from the construction and operation of the project, and recommends management measures to avoid, mitigate, or manage identified impacts. This EIS has been prepared having regards to the *State Significant Development guidelines – preparing an environmental impact statement* (DPIE, 2022).

Table 1.1 provides a summary of each chapter of the main volume of the EIS.

Table 1.1 Structure of the EIS

Chapter No.	Chapter name	Content
1	Introduction	Provides an overview of the project, the proponent, location outlines the purpose and structure of the EIS.
2	Strategic context	Describes the national, state, regional and local context of the project and outlines alternatives considered during development of the project.
3	Project description	Provides a detailed description of the project. Includes a description of the project area, the physical layout and design, uses and activities, and timing (phases and sequencing) of the project.

Chapter No.	Chapter name	Content
4	Statutory context	Describes the applicable environmental legislation and policy.
5	Community engagement	Describes the consultation that has been undertaken prior to and during the environmental assessment process, and what further consultation is proposed during the exhibition of the EIS.
6	Assessment and mitigation of impacts	Assesses the key environmental impacts associated with the project and provides management measures to avoid or minimise these impacts.
7	Environmental management	Outlines the proposed environmental management system that we be put in place during the construction and operation of the project.
8	Project justification and conclusion	A review of the project against the principles of Ecologically Sustainable Development and objects of the EP&A Act.
9	References	References of all documentation and online resources used in the preparation of the EIS.

The EIS addresses the SEARs which are attached in full in Appendix B and are also referenced throughout this EIS where relevant.

1.7 Related development

The project site, located at 61 Edison Road, East Wagga Wagga, underwent a development application process in 2022 to 2023. The Council granted consent to DA22/0534 on 3 March 2023. The development application was for the two-stage development of Flip Screen Industrial Estate. Stage 1 was for the construction of seven industrial buildings, including building 107 that Calibre Metals are leasing for the LIB recycling facility.

Each of the industrial buildings are surrounded by hardstand area and established access. Each building also has all required supporting amenities and facilities, including office space, toilets, access, parking, stormwater connection, town water, sewer, trade waste connection, electricity and telecommunications to accommodate industrial businesses. Stage 1 is currently under construction and Building 107 is due for completion in early 2025. Stage 2 is for a subdivision on two adjacent lots of industrially zoned land, at a future date.

The Stage 1 - Flip Screen Industrial Estate development application and SEE has addressed all required considerations in relation to biodiversity, historic heritage, and aboriginal heritage. This will be referenced in relevant sections throughout this EIS.

1.8 Scope and limitations

This report has been prepared by GHD for Calibre Metals and may only be used and relied on by Calibre Metals for the purpose agreed between GHD and Calibre Metals as set out in section 1.6 of this report.

GHD otherwise disclaims responsibility to any person other than Calibre Metals arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report. The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

Paper Size ISO A4

0 200 400 600 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility
EIS

Regional location

Project No. **12622054**
Revision No. **0**
Date **16/10/2024**

FIGURE 1-1

\\ghdnet\ghd\AU\Wagga Wagga\Projects\23\12622054\GIS\Maps\Deliverables\EIS.aprx
Print date: 16 Oct 2024 - 10:13

Data source: General topo - NSWSS 2023; Aerial imagery & inset basemap - World Street Map (Night): Vicmap, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS;Nearmap WMS
Server: . Created by: rvillalon

2. Strategic context

This section describes the need for the project and the alternatives that were considered as part of the project's development. The section also provides an analysis of the project in relation to corporate policy, as well as global, national, state, regional and local strategic contexts.

2.1 Need for the project

2.1.1 Managing waste LIB

The demand for and use of LIB is rapidly increasing in Australia, with LIB used in a vast array of electronic goods electrical vehicles and commercial and household energy storage. Waste LIB can be recycled to recover up to 90 per cent of the batteries components for alternative reuse or for production of new LIB. Despite this the majority of waste LIB in Australia are currently being disposed of to landfill. There is currently only one LIB recycler in Australia, located in Melbourne, Victoria. This existing recycler has reported recycling rates of 1,300 tpa in 2022, and 800 tpa of LIB for the 2023/2024 financial year.

A study commissioned by the Commonwealth Department of Environment in 2016 estimated the amount of LIB for recycling in Australia. The study called *Waste lithium ion battery projections* (Randell Environmental Consulting 2016), reported data on best, high and low estimates, as shown below in Table 2.1.

Table 2.1 Waste LIB projections (Randell, 2016)

Tonnes / Year	2022	2023	2024	2025	2026	2027	2028	2029	2030
Best	7,745	9,045	10,562	12,905	16,591	20,183	24,943	30,412	37,358
High	8,013	9,518	11,304	13,998	18,165	22,410	28,086	34,898	43,736
Low	7,482	8,588	9,857	11,884	15,145	18,166	22,139	26,462	31,830

In recent years the increase in use of LIB powered devices, such as e-bikes, e-scooters and power tools has surged above what may have been envisaged in 2016. Furthermore, the uptake of electric vehicles has increased, with the Tesla Model Y being sixth and Tessla Model 3 fourteenth in the top selling vehicles in Australia in 2023. Thus, the projections established by Randell (2016) may underestimate the size of the current and future market for LIB. The demand for LIB recycling and circular economy solutions are only expected to grow given the transition to renewables and associated energy storage requirements at both the industrial and household scale. Australia's limited capacity for mineral refining provides additional impetus to the establishment of a circular LIB industry in Australia making use of recycled LIB products in Australia.

The need to increase recycling rates for waste LIB is well acknowledged in the *National Battery Strategy* (Department of Industry, Science and Resources, 2023) which notes that recycling rates for waste LIB site at less than 10 per cent compared to 95 per cent of lead-acid batteries that are currently being recycled. Indeed, using the "best" estimate from Randell, there was 10,562 tons of waste LIB projected for 2024. Accounting for the one existing recycler in Victoria, there was an excess of 9,000 tons of LIB waste destined for landfill.

A leading problem with the battery value chain is the lack of attention to the disposal and recovery of batteries. Unprofessional or illegal disposal of battery would have the potential to cause sever toxic pollution. LIB when sent to landfill poses a significant fire hazard if improperly managed. It's an established principle across Australian federal government to divert waste from landfill to the greatest extent possible and to improve the quality and utility of recycled products. Furthermore, the establishment of circularity into Australia's LIB value chain is required for industry development and maturity and is expected to achieve environmental outcomes and resources efficiency while creating additional jobs and adding value to the economy.

The project proposes to remove 3,000 tons of LIB from landfill per annum and recover the critical minerals. Furthermore, the project is critical to establishing a circular LIB industry in Australia to account for the current significant gap in Australia's LIB value-chain.

2.1.2 Supporting industry change

The global demand for batteries is increasing and is largely driven by the imperative to reduce climate change through the broader renewable energy transition, energy storage systems, and electrification of mobility. It is expected on a global scale the demand for LIB is expected to grow by 33 per cent annually by 2030 (McKinsey, 2023). Almost 60 per cent of today's lithium is mined for battery-related applications, a figure that could reach 95 per cent by 2030 (McKinsey, 2023). Most of the high-grade deposits are mainly limited to Argentina, Australia, Chile, and China. With technological shifts toward more lithium-heavy batteries, lithium mining will need to increase significantly. Although battery growth would confer environmental and social benefits, to avoid shortages, there would need to be a steady supply of materials and equipment. As such, there needs to be a focus on improving the circular battery value chain and recovering the critical minerals contained therein especially where mineral refining capabilities in Australia are currently limited.

Australia has the potential to be a renewable energy superpower. Australia is well positioned to offer minerals and manufacturing to a wide range of battery chemistries across the value chain. Lithium-ion, sodium-ion, vanadium flow batteries and others, present opportunities for Australia and can support the transition to a net zero emissions economy (DISR, 2023).

Domestically, batteries will have a critical role for Australia's transition to net zero emissions. Australia can play a role to advance secure, resilient, and sustainable global supply chains. This could be achieved by supporting the development of a domestic battery manufacturing ecosystem. The battery industry currently adds $1.3 billion value and 6,000 jobs to Australia's economy (FBICRC 2022). The industry has now reached a critical stage where the government would be seeking the development of LIB recycling especially with the expected increase of electric vehicles (ABRI, 2023). The state and territories in Australia have set higher targets for renewable energy uptake, as such batteries would be an important part of the transition for renewables.

The project will be instrumental to the establishment of a recycling LIB services in Australia to support the increasingly LIB-enabled industries in Australia with the electrification of transport the broader energy transition. The project will not only improve the circularity of the LIB value chain in Australia but also enable the sustainable procurement practices and limited resources footprint in Australia changing industries through the provision high quality recycled LIB products.

2.1.3 Supporting regional development

NSW currently hosts numerous battery minerals energy storage, research, and several local battery manufacturers. Battery projects are boosted by the NSW Government's $250 million Renewable Manufacturing Plan and reported in the accelerated NSW Electricity Infrastructure Roadmap.

There are currently no LIB recycling facilities that exist within NSW and no battery recycling specific strategic plan is in place. However, recently the *Future Transport Strategy 2056* has acknowledged the need for adequate supporting infrastructure to account for uptake of electric vehicles and the significant obligations of future transport to minimise its resource footprint. Crucially this includes the design of projects that maximise recycling opportunities and providing opportunities to source recycled products in their procurement of goods and services. The project will supply high quality recycled LIB products that can be used in future transport projects to limit their resource footprint.

Furthermore, the NSW Environment Protection Authority (EPA) has collaborated with B Cycle, the national stewardship scheme for batteries, to establish drop off points in all community recycling centers and major retail outlets for battery recycling. The battery stewardship scheme is a national battery network to increase the recovery of batteries and to raise awareness of battery safety, storage, and disposal.

The NSW Government is committed to protecting the state's strong history of recycling and is working with local Councils and industry to respond to these challenges. In March 2018, the NSW Government endorsed the development of a circular economy policy for NSW. This policy will build on NSW's strong track record in waste avoidance and resource recovery. In 2018, the Australian government developed the National Waste Policy that support circular economy principles, as such the NSW government created the NSW Waste Less, Recycle More initiative. One of the initiatives by the NSW government funds $10 million for grants to improve recycling of solar panels and battery systems.

The NSW governments *20-Year Economic Vision for Regional NSW* advocates the competitive advantage of regional NSW in the provision of circular economy services noting that critical minerals and recycling and waste management as emerging sectors that will drive long-term economic growth in regional NSW. Regional NSW can leverage low-cost land and proximity to renewable energy zones to provide significant advantages in the establishment of critical mineral recovery throughout regional NSW.

The project thus serves to further develop and establish a waste LIB recycling services in regional NSW where its competitive advantage can be fully realised. The project will also contribute to regional development objectives through the development of key growth industries in regional NSW.

2.2 Consistency with strategies, plans, policies and guidelines

Table 2.2 Consistency with government plans, policies and guidelines

Policy	Objective	Project alignment
Global context		
Battery 2030 Resilient, sustainable and circular	The Global Battery Alliance is a public private collaboration platform founded in 2017 to establish a sustainable battery value chain by 2030. Batteries are a major tool to decarbonise industries and reduce greenhouse gas emission. As such the demand for batteries is increasing for battery operated applications following the shift for more sustainable methods. Battery 2030 urges companies to leverage technological advances to contribute to the goal of creating a closed loop, domestic supply chain that involves the collection, recycling, reuse or repair of used LIB.	The project is consistent with this global strategy of creating a circular battery value chain. As there is currently only one LIB recycling facility in Australia, the addition of another LIB recycling facility will enhance Australia's capability in a closed loop supply chain. The project also intends to utilise a more advanced technology that maximises the recovery of crucial mineral, by improving the separation process steps to produce purer and cleaner products, all while minimising waste.
National context		
National Battery Strategy (Department of Industry, Science and Resources (DISR), 2023)	The National Battery Strategy (NBS) is a plan to support the globally competitive Australian battery industries. The NBS identifies opportunities for the Australia to expand in the global market. It supports the battery industry while understanding the long-term opportunities for the battery industry require recycling for a circular economy. Currently LIB is not being recycled at scale globally due to a lack of waste stock to feed recycling. The plan notes the need to increase recycling rates for LIB in Australia which sit at under 10 per cent compared to 95 per cent of lead-acid batteries that are currently being recycled. However, with the shift towards more battery-based technologies will increase the need for appropriate recycling facilities. This is especially prevalent given Australia's limited mineral refining capabilities making the use of recycled LIB products more relevant. The strategy supports the establishment of circularity in Australia's battery industry to improve environmental outcomes and resources efficiency while creating additional jobs and adding value to the economy.	As there is currently only one LIB plant in Australia, this project is consistent with the strategy to ensure a circular economy for the battery value chain, especially with the projected increase supply and demand for LIB. The project will utilise new technology to maximise the potential for reuse and produce as minimal waste as possible. Assuming that the project removes an additional 3,000 tons of waste LIB from landfill per annum, that equates to improving the recycling rates of LIB by an additional 30 per cent using 2024 estimates of waste LIB.
National Waste Policy 2018 (Department of Climate Change Energy, the Environment and Water (DCCEEW), 2018).	The National Waste Policy set a framework for action by the government, business sector and waste and resource energy industries. The aim of this policy is to identify the need for better resource efficient systems and to maximise the value of all material used. It also encourages businesses to embrace innovative technology for new opportunities. Specifically, the policy aims to promote industry capacity through the identification of opportunities to improve diversion from landfill and improve the quality of recycled content. The management of material flows is intended to provide benefits to human health, the environment and the economy.	The role of this project is to provide a LIB waste plant that will recycle resources and limit the waste produced. The project will utilise new technology to maximise the potential for reuse and produce as minimal waste as possible. Specifically, the project identifies and addressing a gap in Australia's management of waste LIB and will make significant innovations in diversity a large proportion of waste LIB that was destined for landfill. The project is envisioned to provide environmental and economic benefits in providing recycled LIB products to a growing LIB enabled industry in Australia while providing environmental benefits in limiting landfill bound waste.

Policy	Objective	Project alignment
National Waste Policy Action Plan 2019 (DCCEEW, 2019)	The National Waste Policy Action Plan presents targets and actions to implement the National Waste Policy 2018. Several targets relate specifically to the project. Target 3 aim for an 80 per cent average resource recovery rate from all waste streams. Specific actions relating to this scheme include the development of a common approach to restrict the disposal of priority products in landfills with lithium-ion batteries being the priority. Target 4 aims of the increased use of recycled content by government and industry. With the burgeoning number of industries enables by lithium-ion batteries the demand for recycled products is expected to increase particularly across transport.	The project aligns with action plan and contributes to resource recovery by salvaging materials from waste LIB for reuse. The project is aligned with key targets in the National Waste Policy Actions plan in eliminating priority products from landfills and providing recycled LIB products to be used in government and industries to mitigate their resource footprint.
State context		
NSW Waste and Sustainable Material Strategy 2041	The NSW Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027 aims to reduce waste and change how the NSW economy produces, consumes and recycles products and materials. It sets out a vision for transitioning to a circular economy over the next 20 years. Specific targets for 2030 include: – Reduce total waste generated by 10 per cent per person by 2030 – Have an 80 per cent average recovery rate from all waste streams by 2030.	As the use of LIB expands across different sectors (particularly Transport with the increasing use of electric vehicles) it's expected the need to divert waste LIB from personal and industry will become increasingly important. This project directly aligns with the strategy by reducing waste to landfill and creating a circular economy for LIB through collection, recycling and supplying battery manufacturers with recycled critical minerals and metals.
NSW Circular Economy Policy Statement (NSW Environment Protection Authority (EPA), 2019)	The circular economy policy statement is about changing the way we produce, assemble, sell and use products to minimise waste and to reduce our environmental impact. A number of principles are to provide a common language for circular economy to be implemented in industry and government decision making and strategy. – Sustainable management of all resources – Valuing resource productivity – Design out waste and pollution – Maintain the value of products and materials – Innovate new solutions for resource efficiency – Create new circular economy jobs – Foster behaviour change through education and engagement.	The project is consistent with the objectives of the policy statement. The project will contribute to the recycling rate and fulfil one of the gaps in the circular economy. Moreover, the project promotes the sustainable management of resources in maintaining the value of products and materials which are becoming increasingly important in the energy and transport transition. Furthermore, the project will create circular economy jobs and contribute to the establishment of a waste LIB recycling industry in Australia.

Policy	Objective	Project alignment
20-Year Economic Vision for Regional NSW (NSW Government, 2021)	This plan identifies Critical Minerals as well as Recycling and Waste Management as emerging sectors and future industries that will deliver jobs and long-term economic prosperity across regional NSW. With the "NSW Government investigating in opportunities to grow regional NSW's circular economy". The 20-year economic vision identified the following as 'future industries' capable for support the long-term development and prosperity of regional NSW: – *"Recycling and waste management, growing the circular economy in regional NSW, leveraging the availability of lower cost land and a rapidly changing global waste management system"* – *"Critical minerals, technological change is driving global demand for critical minerals, and as demand grows there are significant economic opportunities for NSW"*	This project directly aligns with the vision by managing the LIB waste and recycling the LIB to recover critical minerals. The project also supports the long-term prosperity of regional NSW through the establishment of new circular economy opportunities in regional NSW.
Future Transport Strategy 2056	The Future Transport Strategy 2056 provides a 40-year vision to guide transport investment and development in the long-term. The strategy sets out six guiding principles to guide planning and investment broadly aimed at developing new technologies and innovation to support a resilient and adaptive transport network. A critical element of the strategy is the support for transport powered by alternative fuels with low- and zero-emission LIB electric fuel cells being prominent amongst them. The plan notes the accelerating uptake of EVs in particular and the need for adequate supporting infrastructure to accommodate and promote this growth. Additionally, the plan notes significant opportunities and obligations to avoid or minimise the resource footprint associated with future transport innovations. This necessarily includes the design or projects that that maximise recycling opportunities. Circular economy is promoted as comprises valuable decision making under the plan; in particular the plan advocates the enhancement of links to circular economy objectives in the procurement of goods and services for Transport.	The project aims to cater for the future challenges of the burgeoning use of low- and zero-emission LIB and electric fuel cells in NSW transport. The project involves managing and recycling this LIB waste from electrical vehicles to accommodate for this growth in electric vehicle uptake. The project supports the maximising of recycling opportunities to minimise the resource footprint associated with the electric vehicle industry through the provision of recycled LIB products consistent with circular economy objectives in the procurement of goods and services for Transport for NSW (TfNSW).

Policy	Objective	Project alignment
Regional and local context		
Riverina Murray Regional Plan 2041	This plans identified priorities for the local governments in the Riverina Murray region. “The regional plan recognises waste as an economic resource that supports a net zero emissions future. The Wagga Wagga SAP and the Albury RJP are examples of strategic precinct planning that promote and provide opportunity for circular economy projects to establish to minimise waste and maximise the use of materials.” The plan identifies several strategic to support Circular Economy in the region, these strategies include: – Identifying waste infrastructure required to support new industry specialisations, including renewable energy generation.	The project will contribute to reducing waste from LIB. The use of innovative technology would recover as much material as possible for reuse. The project supports new industry specialisation as LIB becomes more prominent in the use of electric vehicles and renewable energy storage.
Eastern Riverina Regional Economic Development Strategy – 2023 Update (Department of Regional NSW)	Regional economic development strategy (REDS) support and implement the *20-year economic vision for regional NSW* to create smaller economic with strong economic links. The REDS put forward a number of strategies to development the Eastern Riverina according with it natural social and infrastructure assets. These include: – Leverage the region's strategic location by developing the transport and logistics and manufacturing sectors – Upskill the workforce and drive innovation and entrepreneurialism. The REDS identifies Electricity, gas, water and waste services as engine industries in the region which drive consistent economic development to be supported.	The project will contribute to the development of engine industries in the Eastern Riverina and provide jobs that are crucial in upskilling the workforce. The project drives innovation in the region through the establishment of waste LIB recycling industry which is novel to Australia.
Wagga Wagga Local Strategic Planning Statement (LSPS) 2040	The LSPS is framework that supports the regional vision for key industries and sectors. Under principle 3, the plan advocates for circular opportunities, reduce waste an promote green options. The plan seeks to “*Promote circular economy opportunities through collaboration and innovation with business and industry*”	The project provides the opportunity for a circular economy for the battery value chain. It will also support the projected transition for greener energy options. The project will also generate employment opportunities for the community in Wagga Wagga.

2.3 Key features of the site

2.3.1 Regional Overview

The project is located within the Riverina region in south-western NSW extending from the foothills of the Snowy Mountains in the north west, through to the Murrumbidgee River catchment area and the inland plains of Hay and Carrathool. The Riverina is primarily agricultural and has a population of approximately 172,000. The dominant industries in the region are agriculture, forestry, and fishing, employing about 10,000 people. Healthcare and social assistance is the second largest employer with about 9,600 employees in the region. A strong education base within the Riverina consists of Charles Sturt University, TAFE NSW, the Royal Australian Air Force Base Forest Hill and Kapooka Army Base.

The Riverina is known for two major areas of food production which rely on the Murrumbidgee Irrigation Area and Coleambally Irrigation Area, both sourcing water from the Murrumbidgee River and located to the west of the site. Land use in the region is mostly agricultural, particularly dry land grazing for cattle and sheep. The Riverina is the largest citrus growing region in Australia and produces the largest supply of orange juice. Other produce grown in the Riverina include rice, cotton, wine, hazelnuts, walnuts and almonds.

The region's economic assets include, (but are not limited to) the major freight routes of the Hume, Newell, Sturt and Cobb highways, important freight railway lines, Wagga Wagga Special Activation Precinct (SAP) and Albury Regional Job Precinct (RJP). Wagga Wagga is the largest regional town in the Riverina region and home to more than 67,000 people and the central hub for much of the region's east. Wagga Wagga also provides commercial, health, education, civic and social services to a catchment of about 190,000 people.

2.3.2 Site conditions and local context

The project is located at Building 107, 61 Edison Road, East Wagga Wagga (Lot 91 DP1299517) within the Flip Screen Industrial Estate, an area of approximately 1.5 hectares via Edison Road, East Wagga Wagga, in the Wagga Wagga City LGA. The project site is situated on pre-disturbed land that is currently undergoing construction of the new industrial building, internal roads and carparking, approved by Council (DA22_0534). Prior to purchase by Flip Screen, the site was owned by Council and used for the stockpiling of materials and leased for livestock grazing. Since approval of the Stage 1 Flip Screen Industrial Estate, earthworks for the development has taken place refer to Figure 2-1. The topography of the project site is relatively flat with no watercourse or drainage lines traversing the site. The Murrumbidgee River is located approximately 1.6 kilometres north of the project site.

The following sensitive receivers have been identified in proximity to the project site:

– Wagga and District Kart Racing Club approximately 380 metres northeast of the site
– Commercial and industrial services immediately east of the site
– Residences located around one kilometre east of the site on Matilda Crescent, Governor's Hill and less than one kilometre south west of the site on Mitchell Road, Lake Albert.

The Wagga Wagga – Tumbarumba railway line is located on the southern boundary of the project site, and a Transgrid power easement is located along the western extent of the site.

Figure 2-1 Existing site conditions

2.4 Alternatives to the project

2.4.1 Site selection

A number of different locations for the proposed LIB recycling facility were considered. Locations in both Melbourne and Wodonga in Victoria, as well as Brisbane in Queensland were assessed as possible options but were ultimately discounted based on the overall benefits of transport links to the major east coast population centres provided by the preferred location of Wagga Wagga NSW.

Constructing a new industrial building for the project was also considered, however this would result in an increase in the scale of the development incorporating the need to undertake earthworks and ground disturbance. Retrofitting an existing industrial building within an industrial estate was preferred to minimise impacts.

2.4.2 Recycling technology

Calibre Metals undertook a review of current technology for LIB recycling used in Australia and internationally. The review determined that the key difference between older technology, used in both Australia and internationally, does not address the organic electrolyte. This leaves the electrolyte in the processed lithium material, which results in ongoing evaporation of the electrolyte in the workplace, during shipment or transport and at the customer interface. As a result, odour is present and there is a reduction in product purity. Market research indicates that recycled material containing the electrolyte may not be accepted in the future.

2.4.3 Preferred option

Sourcing the best available modern technology for this facility, has been of highest priority, to improve the separation process steps to produce cleaner, more pure products, to maximise the recovery of critical minerals. The result is a process that also generates minimal waste. From an operational standpoint the chosen technology also requires very limited down time for maintenance with most processes being automated. The technology chosen is currently being utilised in various locations around the globe, including the USA, Spain, Turkey, Italy, Malta, Hungary, South Korea, Malaysia, Singapore, and Ireland.

Wagga Wagga was selected as the preferred location for the project due to:

– Strong transport links to the major east coast population centres
– The presence of a mature recycling sector in the region
– The skilled labour available locally
– The ability to secure an existing established industrial building, to allow for a “fit out”, decreasing the impact and scale of the development.

2.4.4 Do nothing

The do-nothing option is not considered viable as it would not allow the project objectives to be achieved.

3. Project description

This section provides a description of the project's construction and operational features. These details form the basis for the environmental impact assessments undertaken.

3.1 Project overview

The Wagga Wagga Lithium Battery (LIB) Recycling Facility (the project) will be the first lithium battery recycling facility in NSW. The project will process up to 3,000 tonnes per annum (tpa) of waste-LIB and produce a variety of recycled products including copper metal, aluminium metal, stainless steel, polypropylene and black mass powder (containing Nickel, Cobalt and Lithium). The project will involve the fit out of an existing approved industrial building that is currently under construction; as such, access management, pavement, parking, as well as utilities including power, water, and sewer have already been assessed and constructed as per a previous development consent, approved by Council (DA22_0534).

A summary of the key project elements is provided in Table 3.1.

Table 3.1 Project summary

Project element	Summary	Reference
Project footprint	Recycling facility located at Building 107, Lot 91 of DP1299517, 61 Edison Road Wagga Wagga NSW.	Section 3.2
Automated battery recycling machine	Fit out of an industrial building with a fully automated LIB recycling machine to process up to 3,000 tpa of waste LIB. The battery recycling machine comprises of the following: – Shredder – Dryer and heat exchanger – Air separators – Drum magnet – Water cooling – Scrubber towers – Condensers – Primary and secondary rotary screens – Catalytic combustion system – Hammer mill – Baghouses – Turbo mill – Rotary vibrating sieve – Air separation tables. The battery recycling machine will require minor external changes to the industrial building to include three exhaust chimneys for the baghouses, an evaporative water cooling tower and two Liquid Petroleum Gas (LPG) storage vessels.	Section 3
Storage of LIB	Storage of a maximum of 52.8 tonne of unprocessed LIB in specialised storage containers on an existing hardstand area external to the building for up to five days, prior to processing.	Section 3.3
Products	The following saleable products would be produced from the recycling process: – Black mass (including Lithium, Manganese and graphite) – Copper – Aluminium – Fluorspar – Stainless steel – Plastic.	Section 3.3

Project element	Summary	Reference
Utilities	Installation of two 7.5 Kilolitre (KL) or three tonne storage vessels for liquid petroleum gas (LPG) including buffer area.	Section 3.3
Ancillary Infrastructure	Nil.	Section 3.3
Employment	– Up to 16 FTE personnel will be employed during construction. – Up to 22 FTE personnel will be employed during operations.	Section 3.4
Construction duration	Nine weeks	Section 3.5
Hours of operation	– Construction phase – Monday to Saturday 7am to 6pm. – Operation phase – Monday to Saturday 7am to 6pm.	Section 3.4
Traffic and Access	– Access to the site via existing local roads, Edison Road and Tasman Road, that connect into the Sturt Highway. – 2 heavy vehicle movements per day expected during operation. – Up to 22 light vehicle movements per day for staff movements during operation. – Process machinery delivered in around 16 semi trailer loads delivered to site across the 9 week construction program. – Estimated 32 light vehicle movements per day for the construction workforce.	Section 3.5
Capital expenditure	$1,500,000	-
Project lifespan	40 years	Section 3.4 Section 3.5

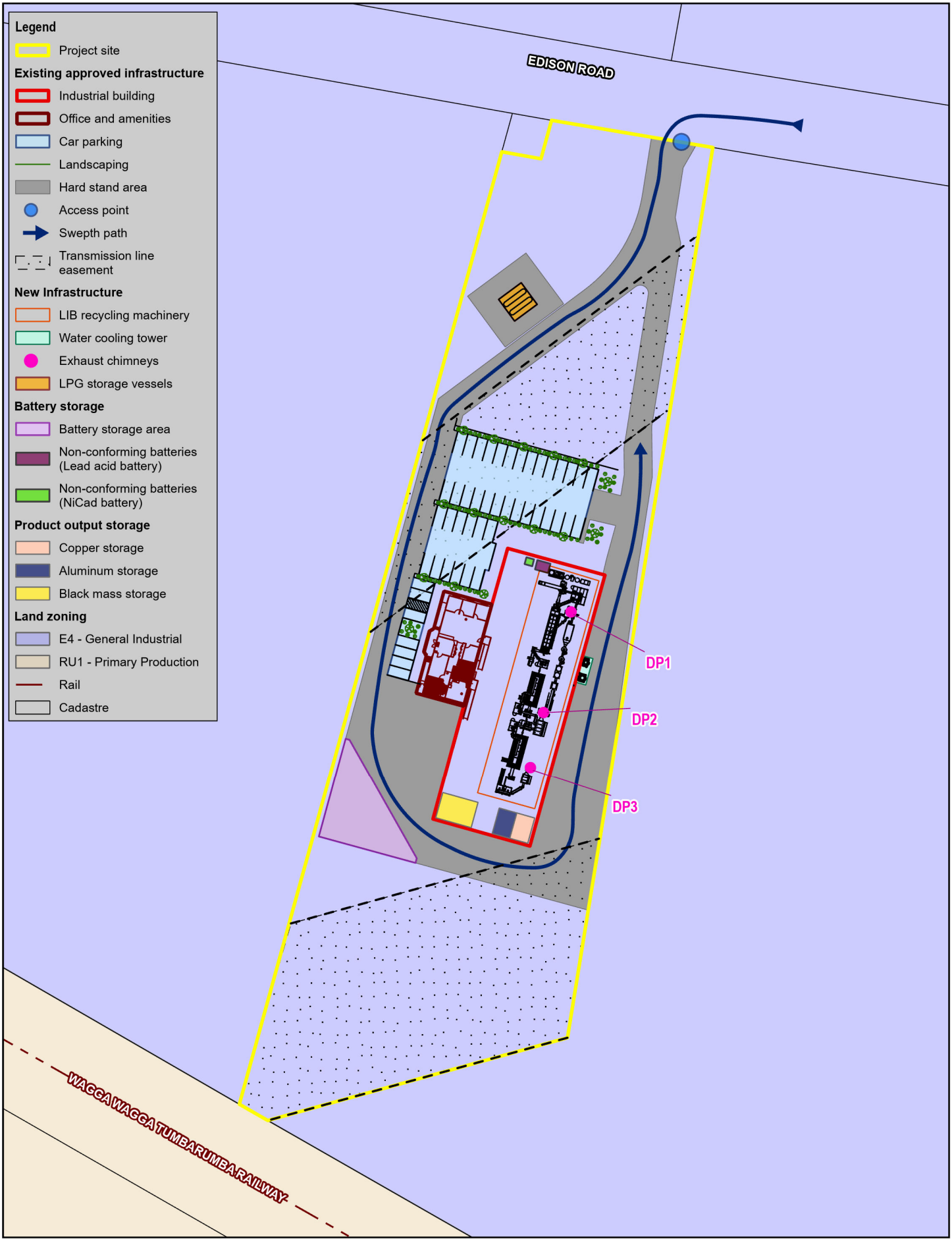
Calibre Metals are leasing the industrial building and site for the project and no earthworks are proposed as part of the project, with all LIB recycling facility elements being installed on existing hardstand. Existing infrastructure that was approved under (DA22_0534) and will be utilised as part of the project is detailed in Table 3.2 and shown in plans located in Appendix A - A-1.

Table 3.2 Existing approved infrastructure

Approved element	Description
Industrial building	An industrial building complete with an office complex.
Access	Existing site access will be utilised via existing local roads, Edison Road and Tasman Road, that connect into the Sturt Highway.
Hardstand and parking	Existing hardstand access throughout the site and on site parking provisions for up 47 light vehicles, and up to four trucks will be utilised for operations.
Utilities	The following utilities and connections already exist to the site: – Electricity – Telecommunications – Potable water supply – Stormwater drainage – Sewer connection – Trade waste connection – Lighting – Fencing.
Landscaping	Landscaping installed.

3.2 Project site

The site is located within the Wagga Wagga City Council LGA and the land is zoned E4 General Industrial under the Wagga Wagga LEP, 2010. The project is located on Lot 91 DP1299517, within the Flip Screen Industrial Estate, in an existing approved industrial building that is currently under construction, as shown in Figure 3-1. At the time that the Flip Screen Industrial Estate DA was submitted the land was identified as Lot 9 DP846835, upon approval by Council the subdivision resulted in the land subject to this State Significant Development (SSD) application being allocated the current Lot and DP number.



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0 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

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Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility
EIS

Site locality and layout

Project No. **12622054**
Revision No. **0**
Date **14/03/2025**

FIGURE 3-1

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Data source: General topo - NSWSS 2023; Aerial imagery - . Created by: rvillalon

3.3 Design and layout

3.3.1 Overview

Calibre Metals LIB recycling facility would involve fit out of an existing approved industrial building in an established industrial estate that are currently under construction in East Wagga Wagga, NSW. The LIB recycling facility will receive and process up to 3,000 tpa of waste LIB, and incorporate the following plant and infrastructure:

– Installation of a fully automated and enclosed LIB recycling machine, positioned entirely within an existing industrial building
– Provision of a dedicated storage area on an established hardstand area, external to the industrial building, for short term storage of incoming waste LIB prior to processing
– Installation of an evaporative water cooling tower, external to the industrial building on existing pavement
– Installation of three exhaust chimneys
– Installation of two LPG storage vessels.

The LIB recycling equipment selected by Calibre Metals for the facility has been installed and operated in other LIB recycling facilities around the world. A review of emissions sampling was undertaken of a similar operating facility in China, as provided by the technology partner, Henan Zhengyang Machinery Equipment Co Ltd. Sampling included $PM_{2.5}$, PM_{10}, NOx, SO_2, HF and VOCs including speciation, and provided Calibre Metals with confirmation of achievable operating efficiencies. The project will make use of existing access arrangements to the site and internal access throughout the site, on-site parking, stormwater collection system, water and sewer, as already approved and constructed under development consent (DA 22_0534). The site layout is shown in Figure 3-1 and the layout of the LIB recycling process within the industrial building is shown on Figure 3-2. Site plans for the project and for the existing approved Flip Screen Industrial Estate are provided in Appendix A - A-1, and site plans for this project are provided in Appendix A - A-2

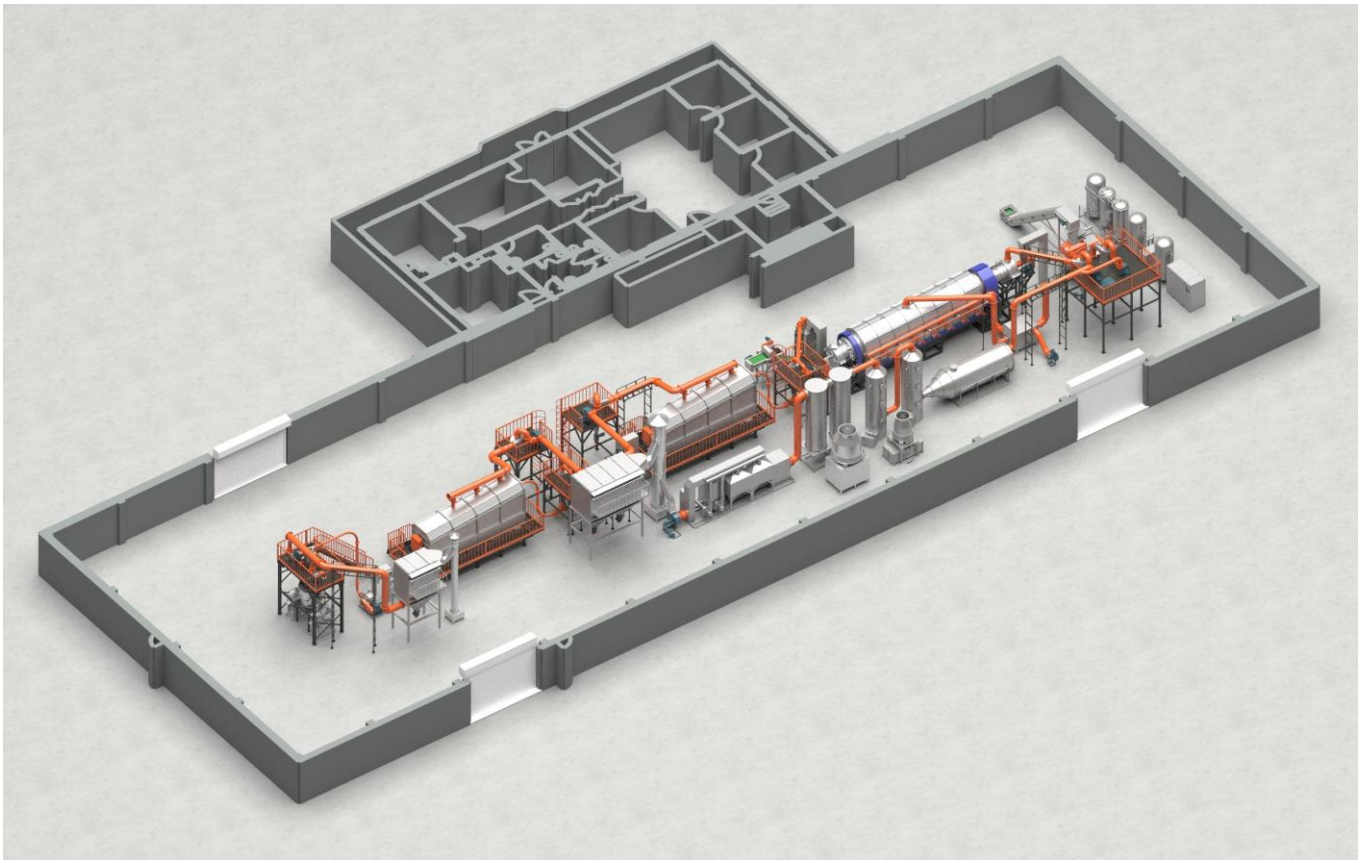


Figure 3-2 Internal LIB recycling facility layout

3.3.2 LIB collection, storage, sorting and discharge

Collection

The LIB recycling facility will receive and process up to 3,000 tpa of waste LIB, and will accept all types of LIB including:

– Handheld LIB – from mobile phones, laptops and power tools
– Electrical vehicles – from cars, buses, scooters, golf carts and marine
– Energy storage – including household and commercial.

LIB are typically considered post consumer waste and as such batteries will be collected from end of life locations such as waste facilities, recycling facilities, scrap metal collectors and car dealerships. LIB may be collected from locations Australia wide, though expect the majority of collection to come from the most populated parts of Australia including NSW, Victoria and Queensland.

LIB will be transported to the site by suppliers using heavy vehicles. As LIB are classified as Class 9 Dangerous Goods, all transport will be in accordance with applicable dangerous good codes and waste tracking requirements and regulations.

The Australian National Transport Commission require LIB to be certified to UN38.3 prior to transport. LIB must have safeguards built in to withstand the physical and environmental conditions encountered, not only during their use, but throughout their lifetime. UN38.3 is the United Nations (UN) standard that LIB must meet to receive certification for safe transport. The responsibility to ensure that batteries meet the UN standard falls upon the manufacturer and seller. In accordance with Australian Dangerous Goods Code, 2022, edition 7.8, Special Provision 377, Lithium ion cells and batteries transported for recycling are not subject to the requirements of UN38.3.

Calibre Metals will comply with the requirements for Australian Dangerous Goods Code, 2022, edition 7.8. LIB destined for recycling are to comply with Packing instruction P909, which in general specifies:

– PG II performance packaging required
– Electrically non-conductive or lined
– Prevention of short circuits and excessive movement.

Calibre Metals will transport and receive LIB in their original hard plastic casing, that is in the same state they were originally transported to and within Australia as new LIB products. LIB that aren't able to be safely transported will not be collected or accepted.

A specialised container that is non-conductive, will be used to transport used LIB (refer to Figure 3-3).

Figure 3-3 An example of UN certified containers used for LIB transport

The containers will be unloaded from the delivery truck by forklift and stored until processing.

Storage

Once LIB are received on site they will be unloaded and stored in their storage containers external to the building in a dedicated storage area as shown in Figure 3-1 where the LIB will be stored for a up to five days prior to undergoing the discharge process.

There is currently no dedicated standard or guidelines for the storage of waste LIB. The USA National Fire Protection Association standard "*NFPA 855, standard for the installation of stationary energy storage systems, 2023*" provides guidance for charged and operating batteries, which Calibre Metals have adopted for development of the storage plan for the waste LIB.

NFPA 855 (2023) (79) specifies a minimum 0.9 metre separation distance is required between groups or modules and other modules and walls, with each module having a maximum allowable energy storage capacity of 50 kWh.

LIB have a reference energy density 170 Watt-hour per kilogram (Wh/kg). A discharged battery has a retained State of Charge (SOC) of 30 per cent. Thus, 1,000 kilograms (kg) of waste LIB has an energy content of 51 kWh/tonne. Calibre Metals would store two containers, one on top of the other, with each container holding up to 400 kg of waste LIB. The two containers will have no more than 800 kg of batteries or 40.8 kWh. So, using the NFPA 855 standard, each stack of two containers will be separated by a minimum of 0.9 metres.

The proposed storage layout pattern is provided in Figure 3-4, with each group of two containers (1.0 metre x 1.2 metre x two containers high) separated from its nearest neighbour by 1.0 metre in any direction. The overall dimensions of the storage area is shown on site plans in Appendix A - A-2 .

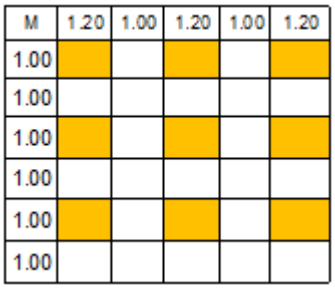


Figure 3-4 LIB container storage layout pattern (yellow block = container, white block = empty space)

Table 3.3 shows the maximum storage capacity of the designated area on site, which is far greater than the proposed nominated storage amount.

Table 3.3 Maximum storage capacity of the designated storage area and nominated storage to be held on site

Type	Maximum storage capacity	Nominated storage amount to be held on site
Number of bins	132	50
Mass of a bin	400 kg	N/A
Mass of storage	52.8 tonnes	20 tonnes

This dedicated storage area will be separated from combustible vegetation by a three metre buffer, as per the NFPA 855 standard. In addition, the containers will be stored upon an existing hardstand paved pad. Liquid Petroleum Gas (LPG) class 2.1, flammable gas storage will also be required on site as a heating fuel and stored in two 7.5 KL storage vessels in a compliant location as shown in Figure 3-1.

Battery sorting and discharge

Unprocessed LIB are transferred from storage for sorting within the factory building via forklift. Once at the sorting station, the LIB will be sorted by hand, according to battery chemistry (Lithium-Nickel-Cobalt, Lithium-Iron-Phosphate, Nickel-Metal-Hydride, non- LIB).

Sorted batteries will be stored in designated containers according to chemistry. Suppliers of waste LIB will undertake their own quality checks, however should any non conforming batteries (i.e. non LIB) be received on site, they will temporarily be stored in a designated non-conforming battery area, as shown on Figure 3-3.

Non conforming batteries would either be returned to the supplier or sent to an approved recycler such as Enirgi Power Storage Recycling, Wagga Wagga for lead acid batteries, or Envirostream, Laverton North for Alkaline batteries, for processing.

The LIB will then be dismantled down to the individual battery cell level. Plastic casings and circuit boards will be collected for sale and further processing by other providers. Any non-LIB will be sent for recycling by others. The Lithium cells will then be discharged in a saltwater solution, within the factory building. Dedicated containers will be filled with town water and have the appropriate amount of salt added. This salt water will be continually reused in this process step and not require disposal.

Discharged LIB will be removed from the brine solution, drained, then processed by the automated battery recycling machine. Discharged batteries would be stored for up to 72 hours prior to final processing.

3.3.3 LIB recycling technology

An automated battery recycling machine has been selected to maximise safety, efficiency and product recovery, while minimising air emissions and waste generation. The proposed technology allows for greater than 90 per cent recovery of the battery products. The automated battery recycling machine also reduces downtime with the majority of the maintenance processes also being automated. The process machinery is shown in Figure 3-5 and the layout of the process machinery inside the industrial building shown in Figure 3-6.

Automated battery recycling machine process

The automated battery recycling machine consists of a multi-step process integrated into a single machine, and this is summarised in Table 3.4.

Table 3.4 Battery recycling process

Process	Description
Feeding	Whole LIB are manually fed onto a feeding conveyor by a trained operator. At this stage the batteries cells are whole and remain contained in their original packaging. This eliminates the risk of exposure to metal dusts and the organic electrolyte. The feed conveyor is completely enclosed to eliminate the risk of falling objects or entanglement in moving equipment.
Shredding under N_2 atmosphere	The purpose of the shredding process is to crush the cells into pieces 20 millimetre to 40 millimetre (mm) in size. This exposes the internal components of the battery to enable recovery of the individual components and removal of the organic electrolyte at the next stage of the process. The risks of short circuiting and subsequent combustion of the organic electrolyte is eliminated by two steps. 1. Discharging the LIB in saline solution 2. The shredding process is conducted under a nitrogen atmosphere. The nitrogen atmosphere eliminates the presence of oxygen, thus eliminating the risk of fire. The nitrogen used in the process in generated on site by a nitrogen pressure swing adsorption generator, which eliminates the need for delivery of nitrogen gas bottles. The crushed batteries exit the shredder via a bucket elevator. The bucket elevator moves the shredded material to the dryer, and both the shredder and bucket elevator are connected to the extraction system. Negative pressure ensures any suspended dust and volatile organic compounds (VOCs) are extracted to the collecting cyclone and contained. Dust will settle in the cyclone collector and the VOC gasses pass onto the post combustion chamber.
Dryer	Crushed batteries enter a rotating continuous dryer to evaporate off the organic electrolyte. A dual chamber rotary dryer is utilised to maintain separation between burner off-gases and process gases. The furnace is heated by eight individual 116kilowat (kW) (100,000 kcal/hr) burners. The outer surface of the inner drum of the dryer is heated by the gas burners. The heated drum conducts heat to the crushed battery material inside which causes the organic electrolyte material to evaporate. The evaporated electrolyte is then drafted from the sealed inner drum to the gas handling section of the plant. The dryers' burners are controlled by the plant programmable logic controller (PLC) to maintain the dryer at the target temperature. The burner off-gases exit the top of the dryer burner chamber and pass into a heat exchanger. The heat in the burner off-gases is recovered in the heat exchanger and used to pre-heat the burner combustion air. After heat recovery the burner off-gases are discharge to atmosphere (this will be discharge point one (DP1).

Process	Description
Zig-zag air separator	Dry process material exits the rotary dryer into a bucket elevator. The bucket elevator discharges the material into a zig-zag air separator. This stage of the process is designed to separate heavy material from lighter material. The zig-zag air separator promotes the lighter material (dust, copper, aluminium) to exit from the top and heavy material (stainless steel casings, plastics) to fall to the base. The lighter material is extracted by a draft fan and contained within a pipe. The heavy material exits onto an incline conveyor belt and reports to the drum magnet.
Drum magnet	Heavy material exiting the bottom of the zig-zag air separator falls onto an inclined conveyor belt. The material passes beneath a drum magnet before discharging into a collection bin. Any magnetic material, namely the steel shells from the battery cases, are picked up by the rotating magnet and diverted to the steel recovery bin. Material that is not magnetic reports to the inclined conveyor discharge bin. This material consists of the plastic chips from any hard cased batteries, such as laptop batteries.
Primary screening	The light material that exited the top of the zig-zag air separator is drafted by pipe to a collector cyclone then passes through a blower and is sent to the primary rotating screen. At this stage of the process the material consists of aluminium and copper granules plus the mixed metal dust (or black mass). The purpose of the primary screen is to separate the black mass powder from the copper and aluminium granules. This is achieved by using the particle size difference of the materials. The black mass is a fine powder, and the aluminium and copper granules are considerably larger. The primary screen recovers approximately 90 per cent percent of the contained black mass. The black mass is collected in two ways from the primary screen. Black mass that passes through the screen either settles on the floor of the primary screen hopper and is removed by screw conveyor. Black mass that does not settle and remiains suspended is drafted from the primary screen and directed to a collection cyclone. The discharge from the collection cyclone joins with the screw conveyor. Black mass is discharged into a sealed bulk bag by rotary valve. Black mass that does not settle in the collection cyclone continues on to the baghouse system.
Hammer mill	Oversized material exiting the primary screen, predominantly aluminium and copper granules plus remaining black mass, report to a bucket elevator that directs the material into a hammer mill. The hammer mill is used to reduce the particle size of the copper and aluminium, to less than three millimetres, to enable increased recovery of the black mass. Material exits the hammer mill and is blown into the secondary rotating screen.
Secondary screening	The milled material from the hammer mill is screened in the secondary rotating screen to recover the remaining black mass. The screen aperture will allow the black mass to pass through the screen but retain the aluminium and copper granules. The process used to collect the black mass is identical to the process used in the primary screen. The oversize material, aluminium and copper granules, exit the secondary screen and fall onto an enclosed inclined conveyor. The conveyor moves the material into the turbo mill.
Turbo mill	Oversized material exiting the secondary screen, predominantly aluminium and copper granules, report to an enclosed inclined conveyor belt which discharges the material into the turbo mill. The turbo mill is used as the third size reduction step to further reduce the particle size of the copper and aluminium, to enable recovery of the residual black mass as well as improved separation and thus recovery of copper from aluminium. Material is drafted from the turbo mill to a cyclone collection system.
Rotary sieve	Material drafted from the turbo mill to the cyclone collection system discharges from the cyclone into a two deck rotary sieve. The purpose of the two deck rotary sieve is to separate the material into three size fractions. Material that is collected on the first deck (largest particle size) is discharged to the coarse air separation table. Material that is collected on the second deck (medium particle size) is discharged to the fine air separation table. Material that passes through both decks is discharged to the final black mass collection point, resulting in 99 per cent collection efficiency for black mass.
Air separation tables	The rotary sieve divides the aluminium and copper into two distinct size fractions, coarse and fine. This sieving step improves the separation of the copper from the aluminium by ensuring that larger particle size aluminium does not act like smaller particle sized copper. Restricting the size distribution improves the density separation process on the air separation table, to enable production of high purity copper and aluminium.

Process	Description
Gas cleaning	Process gases, containing the evaporated electrolyte, exit the inner section of the dryer and are drafted to the gas cleaning section. The purpose of the gas cleaning section is to remove volatile organics as well as fluoride (as hydrogen fluoride (HF)). Upon exiting the dryer the gases pass through the cyclone collection station to remove entrained solids and then pass into the post combustion chamber. The post combustion chamber uses a single 465kW (400,000 kcal/hr) burner to destroy the organic electrolyte into carbon dioxide (CO_2) and water. After the organic electrolyte is destroyed, the gases pass into the base of two caustic scrubbers in series. The fluoride (as HF) contained in the gas stream is removed by reaction with calcium hydroxide to produce calcium fluoride solid, known as fluorspar, which is collected and sold to battery manufacturers. The gas is introduced into the base of the first scrubber and rises to the top of the scrubber where it exits from the first scrubber into the base of the second scrubber. The gas rises again in the second scrubber and exits from the top of the scrubber. Caustic liquor is pumped to the top of each scrubber and sprayed over the packing material. The packed scrubbers utilise ceramic pall rings as the packing to increase gas liquid mass transfer to remove the fluoride from the gas stream. The gas exiting the second scrubber is saturated with moisture. To lower the moisture content of the gas, two condensers in series are used. Cooled water, from an evaporative water-cooling tower, is pumped inside the condensers within enclosed pipework, to cool the passing gas. As the gas cools, water condenses from the air and is collected. The collected water is reused in the scrubbing towers. Gas exiting the condensers passes to the final gas cleaning step, the regenerative catalytic oxidiser (RCO). Here an electric heater is used along with a catalyst to further remove VOCs from the gas stream. The cleaned gas exits the RCO and is discharged to atmosphere via the second discharge point (DP2) stack.
Dust collection	Due to the fine particle size of the black mass powder there is the potential to generate dust. To minimise dust generation a number of controls are utilised, specifically: – Dust is contained with original battery packaging until processed – Plant is contained within an enclosed factory building – Enclosed process equipment is used – Dusty material is transported within enclosed pipework – Ventilation of process equipment to dedicated baghouses. All potential dust generating process steps are enclosed and drafted to a cyclone collector, to remove majority of entrained solids, then on to one of two baghouse cells. The baghouse cells are a reverse pulse jet baghouse. All potential dust generating process steps such as shredder, dryer, mills, screens and transfer conveyors are enclosed. In addition, each of these unit operations are drafted to a cyclone collector, which removes the majority of entrained solids (dust) from the air stream. After the cyclone collector the air stream reports to one of two baghouse cells to filter the fine entrained solids from the air stream. The discharge from baghouse cell number one is combined with the cleaned process gas stream and is discharged to atmosphere via the second discharge point (DP2). The discharge from baghouse cell number two is discharged to atmosphere via the third discharge point (DP3) stack.

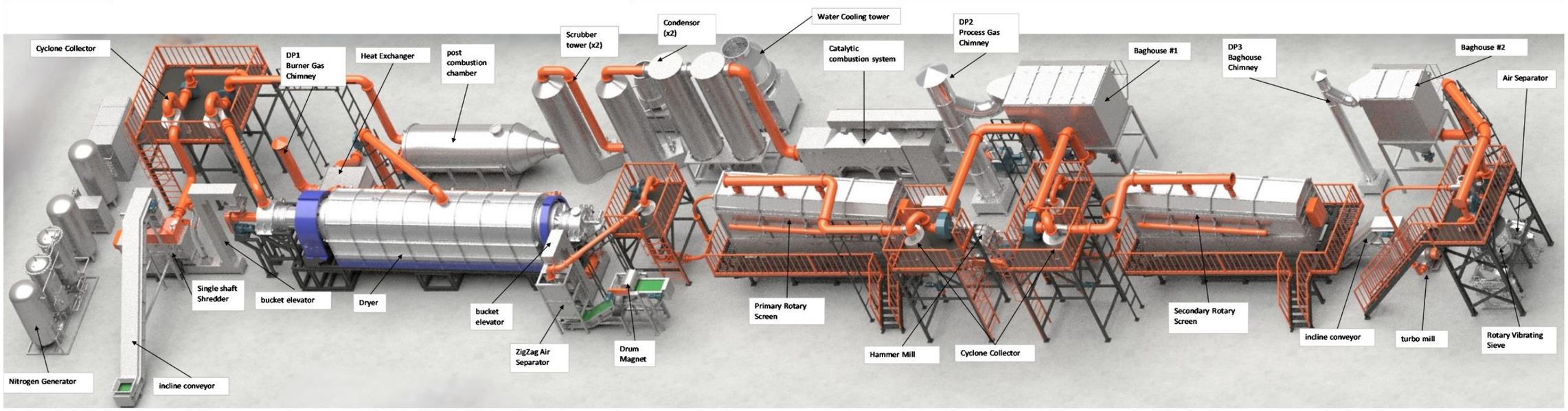


Figure 3-5 Automated battery recycling machine

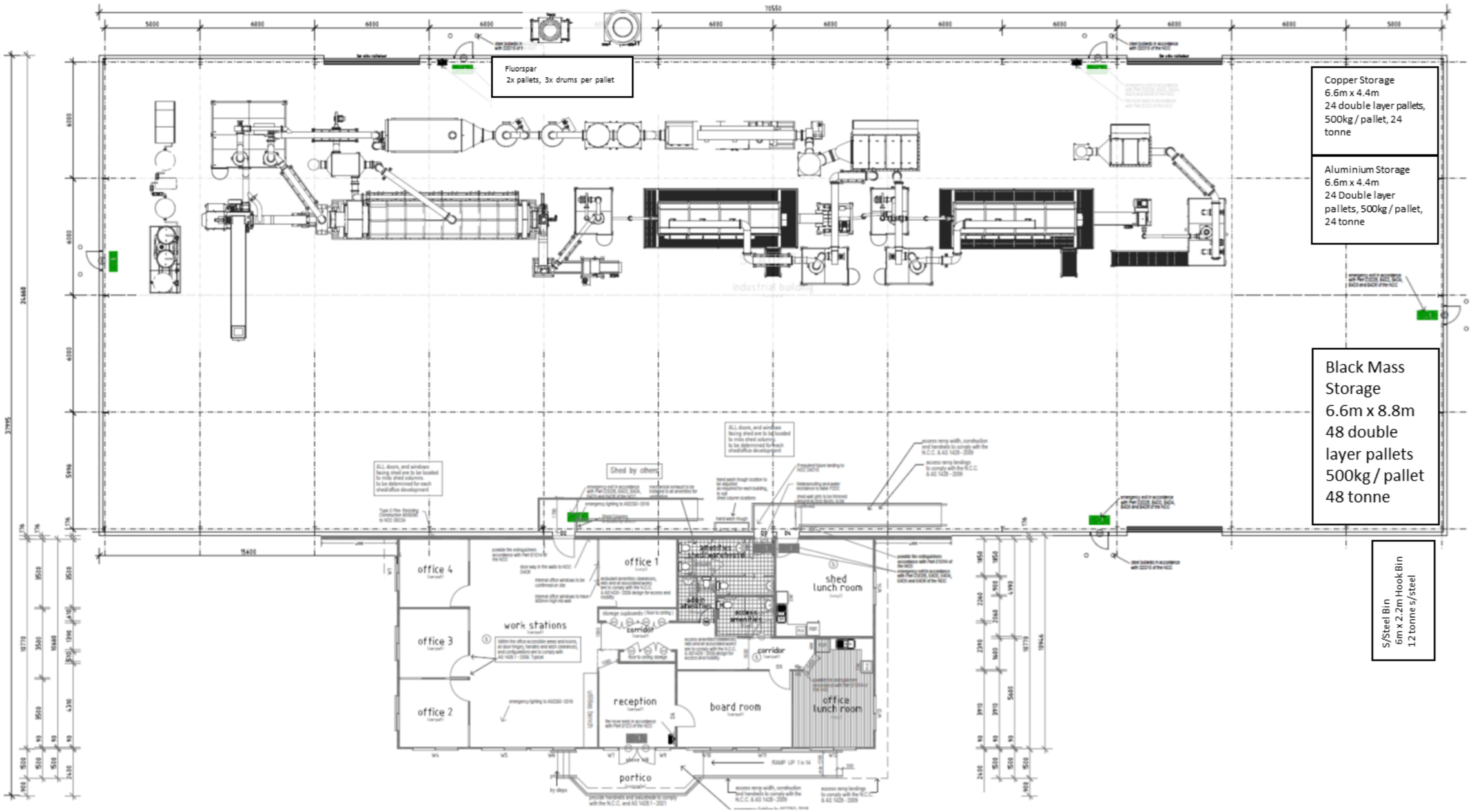


Figure 3-6 *Layout of process machinery*

3.3.4 Product outputs

The project will process up to 3,000 tonnes of LIB annually. It's anticipated that more than 90 per cent of the LIB waste recycled via the process described in section 3.3.3 will be recovered. Recovered products include copper, nickel manganese, and graphite as well as other plastics and metals. It's intended that recycled products are sold in Australia as the domestic LIB industry develops; in the absence of domestic purchasers the recycled products will be sold to manufacturers overseas in South Korea, the US and Europe. The projected volume of recycled products associated with the processing of 3,000 tonnes of LIB is provided in Figure 3-5.

Table 3.5 Product outputs

Output product	Volume (tonne per annum)
Black Mass (lithium, manganese, graphite)	1,430
Copper	430
Aluminium	200
Stainless steel	550
Plastic casings	50
Fluorspar	16

3.3.5 Ancillary infrastructure

As detailed in Table 3.2 ancillary infrastructure is already provided at the site as part of the approved development consent (DA 22_0534). Access to the site via Edison Road, internal roads and on site parking are already established. Landscaping, lighting and fencing have already been established under the existing approved DA.

Existing utilities connected to the site include electricity, potable water, stormwater system, sewer, trade waste connection, telecommunications. Installation of two 7.5 KL LPG vessels will be provided as part of the project.

3.4 Construction

3.4.1 Construction program

It is anticipated that construction would commence in Q3 of 2025. All construction will be completed in a single phase, and it is expected that construction would take approximately nine weeks to complete. Construction activities for the project involves the fit-out of an existing industrial building, the construction of the project will involve:

- Delivery of plant processing equipment in standard shipping containers (16 x 40-foot containers). Containers will be stored on hardstand surfaces at the site perimeter.
- Plant processing equipment will be unloaded from the shipping containers using a forklift, and empty containers will be returned.
- A Franna crane will be used to lift the plant processing equipment into the building.
- Plant processing equipment will be assembled inside the building and lifted into final position by the Franna crane.
- Testing and commissioning of the battery recycling machine.

An indicative construction schedule is provided in Table 3.6.

Table 3.6 Indicative construction schedule

Stage	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Delivery of plant and processing equipment (in containers)									
Installation of plant and processing equipment inside factory building									
Mechanical, electrical and gas connection of equipment									
Dry commissioning and first fill of reagent stores									
Full commissioning									

3.4.2 Work hours

As detailed in Table 3.7, construction would be undertaken Monday to Friday 7am to 6pm, and Saturdays 7am to 6pm. There would be no construction activities scheduled for Sundays or public holidays. There may be a need for out of hours deliveries from time to time.

Table 3.7 Construction hours

Day	Hours
Monday	7am to 6pm
Tuesday	7am to 6pm
Wednesday	7am to 6pm
Thursday	7am to 6pm
Friday	7am to 6pm
Saturday	7am to 6pm
Sunday	Nil
Public Holiday	Nil

3.4.3 Work force

A team of approximately 16 personnel would be required for construction, as shown in Table 3.8.

Table 3.8 Construction personnel

Construction personnel	Number
Project Manager	1
Chemical Engineer	1
Mechanical Supervisor	1
Mechanical Fitter	4
Electricians	2
Gas Fitter / Plumber	2
Labourers	4
Crane Operator	1

3.4.4 Traffic and access

The site is accessible via Edison Road, Tasman Road and Sturt Highway. Edison Road is a 50 kilometre per hour sealed road with a single lane in each direction. The existing site entrance is designed to accommodate articulated vehicles and will be used for construction purposes; the surrounding road network is designed and regularly subject to conveying heavy vehicles to service the East Wagga industrial area.

Delivery of equipment to site is estimated to take 16 x 40-foot shipping containers and as such require 16 semi-trailer vehicles. Following the delivery of all construction equipment, construction vehicle activity will fall to a single movement per day of a Franna Crane, plus the occasional small delivery truck or van.

Off-site traffic will not require management due to the low number of construction vehicles required and the non-thoroughfare of Edison Road from which the project site is accessed. All heavy vehicles will park on site thereby limiting any need for vehicles to park on Edison Road. The driveway at the project site measures 106 metres and can accommodate four semi-trailers in single file.

The project site has 45 dedicated parking spaces and two additional accessible parking spaces; it is anticipated that existing parking availability will accommodate the sixteen-construction staff and vehicles, and laydown areas will be located on hardstand areas external to the building as shown in Figure 3-7 below. The project site will have no pedestrian activity as only authorised personnel will be permitted to be onsite.

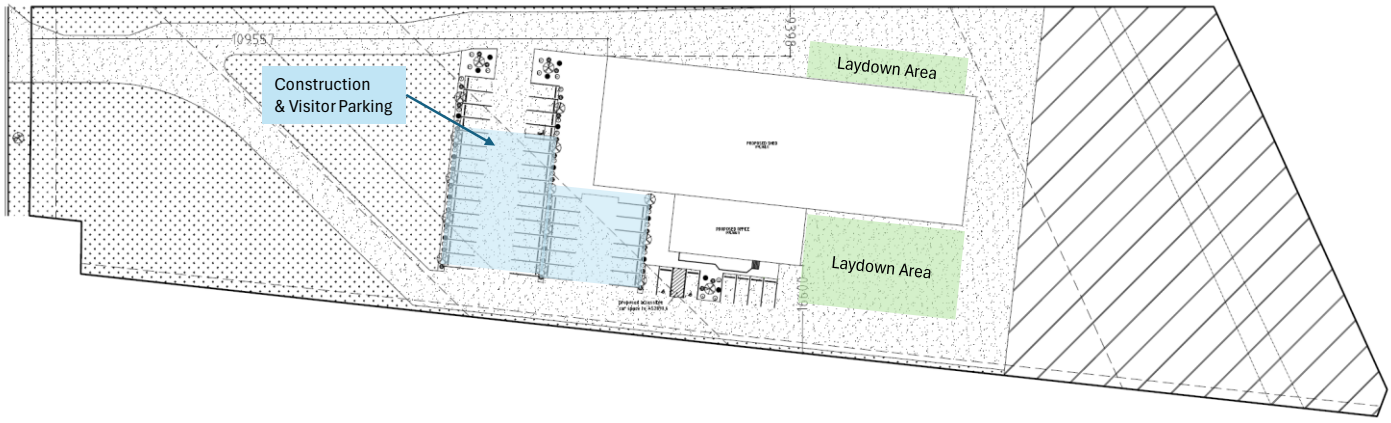


Figure 3-7 Construction parking and laydown areas

3.4.5 Construction equipment and materials

An indicative list of mobile equipment required for construction of the project is provided in Table 3.9, numbers of equipment will be confirmed as project planning progresses. Other handheld tools such as welders, impact wrenches and drills will also be used to install the process plant.

Table 3.9 Indicative construction equipment

Mobile Equipment
Light vehicles
Vans
Rigid trucks
Single articulated vehicle (prime mover and trailer)
20 tonne Franna Crane
Forklift

The process equipment will arrive at site, on a scheduled basis, contained within shipping containers. The shipping containers will be placed on the site's external pavement and a forklift truck with be used to remove equipment from the shipping containers. Equipment will be lifted into place by use of a Franna crane.

3.4.6 Waste

Indicative waste streams and volumes from the construction process are primarily recyclable are detailed in Table 3.10.

Table 3.10 Indicative construction waste streams and quantities

Type of waste	Waste classification	Volume (approx.)
Scrap Steel	Recyclable	1 tonne
Plastic film/wrapping	Recyclable	50 kg
Plastic strapping	Recyclable	50 kg
Timber / pallets	Recyclable	1 tonne
Carboard	Recyclable	100 kg
General rubbish (gloves, ear plugs)	General waste	100 kg
Food Waste	Green waste	150 kg

3.5 Operation

3.5.1 Overview of LIB recycling facility operation

Operation of the LIB recycling facility will commence in 2025, with waste LIB being received from end of use locations around Australia for processing at the facility. The facility will have a throughput capacity of 3,000 tpa of waste LIB. The recycling process will produce a range of recovered products include:

– Black mass (Lithium, Manganese and Graphite)
– Copper
– Aluminium
– Stainless steel
– Plastic.

Recycled products will be sold in Australia as the domestic LIB industry develops, as well as to LIB manufacturers overseas in South Korea, the US and Europe. The project will generate ten heavy vehicle movements per week once operational and would operate six days per week (Monday to Saturday).

3.5.2 Operational work hours and work force

The project will operate six days per week, Monday to Saturday, in shift patterns as detailed in Table 3.11.

Table 3.11 Operating personnel and shifts

Operating shift	Staff numbers
Day Shift Operators Monday to Saturday, 7am to 6pm	16
Administrative Staff Monday to Friday, 8am to 4.30pm	4
Maintenance Monday to Saturday, 8am to 4.30pm	2

3.5.3 Traffic and access

Surrounding road network

The existing site is accessed by Edison Road, Tasman Road and the Sturt Highway. Edison Road is a 50 kilometres per hour sealed road with a single lane in each direction. It is an east-west local road which provides direct access to the site. It is a new road built specifically for the new industrial estate subdivision in which the project site is located. The road joins Tasman Road at a T-intersection. Edison Road is not a through road and as such traffic on Edison Road will be solely related to the occupants of the industrial estate.

Tasman Road is a north south road approximately 1.5 kilometres in length. The road provides connection between Edison Road and the Sturt Highway. Tasman Road is an 80 kilometres per hour zone from Edison Road to the Copland Street intersection, after which the speed limit reduces to 60 kilometres per hour up to the end of Tasman Road at the Sturt Highway intersection, which is a roundabout.

The Sturt Highway (A20) is a major state arterial road, which connects the Hume Motorway (M31) to Adelaide, South Australia to the south and Sydney, New South Wales in the northeast.

Heavy vehicle traffic generation

The operation phase of the project will involve the transport of any incoming LIB waste for processing and recycling as well as the transport of any outgoing products as detailed in Table 3.12. The transport of incoming and outcoming LIB waste or products is anticipated to generate up to a maximum of two heavy vehicle movements per day; projected vehicles movements on a daily, weekly and annual basis in summarised in Table 3.12. The expected increase in heavy vehicle traffic is extremely low and is likely to have a negligible impact on the local road network.

Table 3.12 Heavy vehicle traffic generation, based on a 25 tonne load on a single truck

Period of time	Inputs		Outputs		Total vehicle movements
	Total number of vehicles	Vehicle movements (in and out)	Total number of vehicles	Vehicle movements (in and out)	
Yearly	123	245	131	262	507
Weekly[1]	2.4	5	2.6	5	10
Daily[2]	0.4	0.8	0.4	0.9	1.7

Notes: 1. Based on a 50-week operating year distributed evenly
2. Based on a 6-day operating week distributed evenly

Light vehicle traffic generation

It is anticipated that 22 staff will be arriving and departing the project site during operation on any of the days as per the operating shifts detailed in Table 3.11. Given that each staff member travels to and from the site each day alone, and by private vehicle, the maximum number of vehicle movements per day would be 44 movements. This is not considered to be a large increase in light vehicle movements on the existing road network and is anticipated to have negligible impact.

Traffic flow around site

Vehicles will access the project site via the entrance on Edison Road and will use an internal road that encompasses the main factory building enabling vehicles to travel and exit the project site in an anti-clockwise direction. Internal road accommodates the largest size heavy vehicle that Calibre Metals propose to use for construction and operation of the project, a semi-trailer, and traffic flow around site and the swept path is provided in Figure 3-8 and site plans located in Appendix A - A-2.

On site parking

As described in section 3.3 the project site incorporates a total of 47 carparking spaces, comprising of 45 regular spaces, and two accessible spaces, as shown in Figure 3-8. For operational purposes this is more than double the number of spaces required to accommodate 22 employees each day.

Figure 3-8 Traffic flow around the site

3.5.4 Key safety and environmental management features

Operational controls

During operation, a number of engineering controls will be implemented to minimise exposure to any hazardous chemicals. These controls are listed below:

- Operating equipment is situated in an enclosed building.
- Operating equipment is enclosed to contain dust within the equipment.
- Operating equipment is drafted to cyclones and the baghouse to contain, remove and capture dust.
- A scrubber system to contain and remove HF gas.
- Housekeeping will be routinely conducted in work areas, and all surfaces will be maintained as free as practicable of dust accumulation.
- HEPA vacuum units are to be utilised for housekeeping tasks.
- Routine inspections will ensure adherence to site procedures and policies.
- Routine maintenance regime implemented to ensure equipment is operated efficient and effectively.
- Office and Amenities area is separated from process area.

Personal protective equipment

Personal protective equipment (PPE) will be used to minimise any risk stemming from dust exposure within the recycling facility. Operators will be required to wear the following mandatory PPE:

- Enclosed footwear with steel capped toes
- Long sleeve shirt and long pants, or overalls
- Hi-vis vest/shirt
- Safety glasses
- Safety hard hat
- Hearing protection.

Initially, the use of a respiratory, or dust mask, will be mandatory until lapel monitoring demonstrates that the air quality is of a suitable level to negate the need for respiratory protection, based on Safe Work Australia *Worksafe exposure standards for airborne contaminants* (January 2024). At this stage, due to the engineering controls applied to the operating equipment, it is envisaged that the air quality in the factory will be of a suitable level that respiratory protection is not required, however staff may still use respiratory equipment if they chose.

Fire and spill management

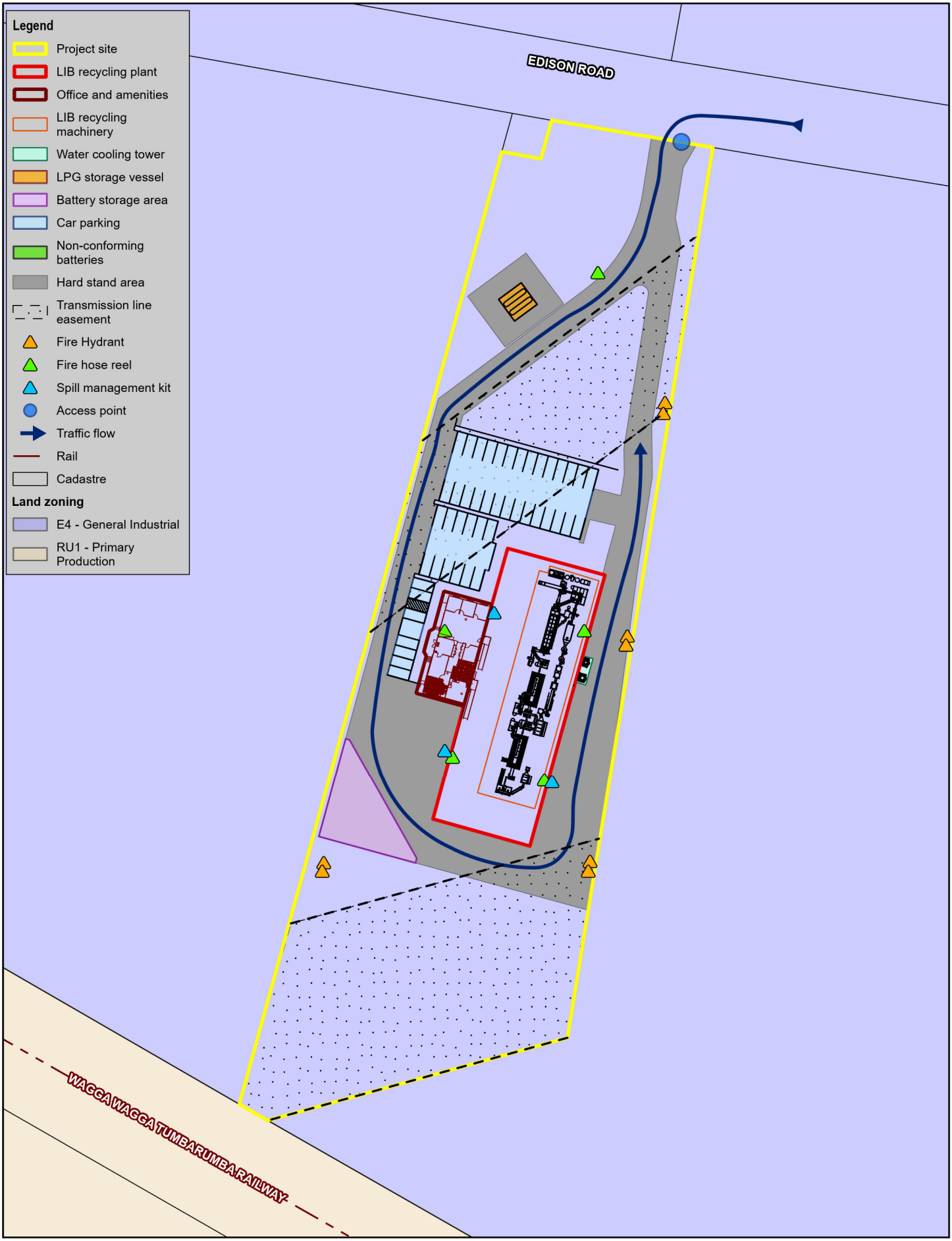
Staff will complete and maintain formal accredited fire management training, and the following fire management system equipment will be installed on site including:

- Smoke detectors
- CCTV with remote activation
- Three fire hose reels within the building housing the processing machinery, one fire hose reel in the office area and one fire hose reel near the LPG storage vessel, providing sufficient hose coverage to the entire facility
- Fire hydrants located external to the building providing sufficient hose coverage for the whole facility
- Fire extinguishers will be located throughout the building.

Spill kits will also be installed throughout the site and staff trained in their use. The locations of fire and spill equipment is shown on Figure 3-9.

3.6 Decommissioning

As the site will be leased by Calibre Metals, decommissioning the project at the end of its life will involve removal of all the plant processing equipment from within the building, removal of the LPG vessels and vacating the industrial building.



Paper Size ISO A4

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility
EIS

Emergency Equipment

Project No. **12622054**
Revision No. **0**
Date **14/03/2025**

FIGURE 3-9

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Data source: General topo - NSWSS 2023; Aerial imagery - . Created by: rvillalon

4. Statutory Context

This section provides a summary of the assessment and approval requirements for the project under relevant legislation. The approval pathway is summarised, and relevant planning instruments and legislation are considered.

4.1 Introduction

This section outlines the relevant statutory requirements for the project. It identifies:

- The legal pathway under which approval is sought, why the pathway applies, and who the consent authority is
- Relevant state approvals (outlining approvals that are not required for approved SSD and approvals that are required and that should be substantially consistent with approved SSD)
- Mandatory matters for consideration, including relevant state and local environmental planning instruments that have been considered in relation to the project
- Relevant federal approvals.

Table 4.1 provides a summary of the statutory requirements of the project with reference to relevant legislation and environmental planning instruments. Further details on how the project complies with relevant legislation, including a statutory compliance table, is provided in Table 4.1 and Appendix D.

Table 4.1 Summary of statutory requirements

Category	Comment / requirement
Power to grant approval	The EP&A Act is the principal legislation regulating development in NSW. It establishes a regime for the making of development applications, assessment of their environmental impacts, and the determination of those applications. Section 4.36(2) of the EP&A Act provides that a State environmental planning policy may declare any development, or any class or description of development, to be SSD. The project is deemed SSD in accordance with Clause 23 in Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP). The project would be a waste facility that has the capacity to store or dispose of solid or liquid waste classified under the Australian Dangerous Goods Code and handles more than1,000 tonnes per year. The project will involve recycling of 3,000 tonnes per annum of LIB and lithium is a class 9 dangerous good and the project is therefore declared SSD for the purposes in section 4.36 of the EP&A Act. The Minister for Planning or the Independent Planning Commission (pursuant to Part 2.2 of the Planning Systems SEPP) is the consent authority in accordance with Section 4.5(a) of the EP&A Act.
Permissibility	The project is characterised as development for the purpose of waste or resource management facilities are permitted consent on any land in a prescribed zone in accordance with Division 23 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP). The project site is zoned E4 General Industrial under the Wagga Wagga LEP, 2010 which is specified as a prescribed zone. The project is permissible with consent in Zone E4 and consistent with the objectives of the zone.
Other approvals - Approval and legislation that does not apply to SSD	An authorisation under certain other legislation, identified in section of the EP&A Act, is not required for approved SSD including: – A permit under sections 201, 205 or 219 of the *Fisheries Management Act 1994* (FM Act) – An approval under Part 4, or an excavation permit under section 139 of the *Heritage Act 1977* (Heritage Act) – An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act) – A bushfire safety authority under section 100B of the *Rural Fires Act 1997* (RF Act)

Category	Comment / requirement
	– A water use approval under section 89, a water management work approval under section 90, or an activity approval (other than aquifer interference approvals) under section 91 of the *Water Management Act 2000.* None of these approvals would be applicable to the project if it were not approved SSD as outlined in section 6.
Other approvals – Approvals and legislation that must be applied consistently to SSD	Any authorisations under certain legislation, identified in section 4.42 of the EP&A Act, cannot be refused if it is necessary for carrying out an approved SSD project and is to be substantially consistent with the SSD approval. In relation to the project, these authorisations will include: – The project is a scheduled activity listed in Schedule 1 of the *Protection of the Environment Operations Act 1997 Act* (POEO Act) and would require an environment protection licence under this schedule. Further detail is provided in section 4.4.
Pre-conditions to exercising the power to grant approval	A consent authority must be satisfied that the land is suitable with any existing contamination for the development to be carried out in accordance with Chapter 4 of the Hazards and Resilience SEPP. The project involves the fit-out of a newly constructed industrial warehouse with no known contamination that would restrict the carrying out of the development.as discussed in section 6.8.1.
Mandatory matters for consideration	The following statutory pre-conditions are relevant to the application for approval of the project: – Section 1.3 of EP&A Act provides the objects, which are guiding principles that need to be considered by planning authorities when making decisions under the EP&A Act. Consideration of the objects of the EP&A Act is provided in section 8.2). – A Biodiversity Development Assessment Report (BDAR) waiver has been prepared to accompany the EIS as the project is restricted to the fit-out of a newly constructed industrial warehouse as described in section 6.8.6. – The EIS has reviewed relevant environmental plannings instruments to determine their applicability (refer to Appendix D).
EPBC Act approvals	The project would not result in a significant impact on any Matters of National Environmental Significance (MNES) under the Commonwealth EPBC Act. A referral under the EPBC Act is not required for the project.

4.2 Power to grant approval

4.2.1 Environmental Planning and Assessment Act 1979

The key legislation in NSW regulating the use of land is the EP&A Act and *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). The EP&A Act institutes a system for environmental planning and assessment, including approvals and environmental impact assessment requirements for proposed developments.

The project has been declared State Significant Development (SSD) in accordance with Section 4.36(2) of the EP&A Act and clause 23, Schedule 1 of the Planning Systems SEPP.

The Minister for Planning or the Independent Planning Commission (pursuant to Part 2.2 of the Planning Systems SEPP) is the consent authority in accordance with Section 4.5(a) of the EP&A Act.

4.2.2 Environmental Planning and Assessment Regulation 2021

Part 8 of the EP&A Regulation describes the requirements for an EIS. Section 190 outlines the required form for an EIS, while Section 192 outlines the required content. This EIS has been prepared in accordance with the form and content requirements of the EP&A Regulation. These requirements and where they are addressed in the EIS are outlined in Appendix D.

4.3 Permissibility

The project involves development for the purpose of recovering lithium, and other valuable resources, from LIB waste using a dedicated automated recycling process.

As the primary purpose of the project is resource recovery, the development is best characterised as a resource recovery facility, in accordance with the definitions in the *Standard Instrument (Principal Local Environmental Plan) 2006* (Standard Instrument). Under the Standard Instrument a resource recovery facility is a type of waste or resource management facility.

Development for the purpose of waste or resource management facilities are permitted with consent on any land in a prescribed zone in accordance with Division 23 of Transport and Infrastructure SEPP

The project site is zoned E4 General Industrial under the Wagga Wagga LEP 2010 which is specified as a prescribed zone.

The project is permissible with consent under the Wagga Wagga LEP and consistent with the objectives of the zone, as detailed in Table 4.2.

Table 4.2 Project compatibility with E4 zone objectives

Zone objective	Comment
To provide a range of industrial, warehouse, logistics and related land uses.	The proposed land use to recover resources from lithium ion battery waste is an industrial activity suitable for use at the site.
To ensure the efficient and viable use of land for industrial uses.	The project represents the first LIB recycling facility in NSW and represents a viable use of the land.
To minimise any adverse effect of industry on other land uses.	The project is in keeping with the intended use of the zone which is for industrial development which is located away from sensitive receivers.
To encourage employment opportunities.	The project will facilitate employment opportunities during both the construction phase and ongoing operations of the facility as described in section 3 on land which is currently vacant and not providing any employment opportunities.
To enable limited non-industrial land uses that provide facilities and services to meet the needs of businesses and workers.	Not applicable to the project.

4.4 Approvals

4.4.1 Approvals not required for an approved SSD

Under section 4.41 of the EP&A Act, certain other approvals are integrated into the SSD approval process and are not required to be separately obtained for the project. Such approvals are listed in Table 4.3. Although approvals are not required under the legislation in Table 4.3 the objectives of the legislation have been considered during preparation of the EIS.

Table 4.3 Approvals that would not be required for the LIB recycling facility (approved SSD)

Legislation	Purpose/description	Relevance to project
Fisheries Management Act 1994 (FM Act)	The objectives of the FM Act are to conserve, develop and share the fisheries resources of NSW for the benefit of present and future generations. Part 7 of the FM Act outlines a number of permits required for works within fisheries areas, including dredging or reclamation works (section 201), marine vegetation in protected areas (section 205) and fish passages (section 219).	Not applicable. The project would not impact any fisheries resources.
Heritage Act 1977 (Heritage Act)	The Heritage Act is concerned with all aspects of the conservation of heritage places and items, with items of state significance listed on the State Heritage Register. Part 4 of the Heritage Act states that approval must be obtained for works that have the potential to interfere with an item on the State Heritage Register or that is subject to an Interim Heritage Order.	No known non-Aboriginal heritage items are located within the site.
National Parks and Wildlife Act 1974 (NPW Act)	The NPW Act provides for the protection of Aboriginal objects and places in NSW. Section 86 of the NPW Act states it is an offence to harm an Aboriginal object, defined as destroying, defacing, damaging or moving an object from the land. Section 87 states a defence to the harm or destruction of an Aboriginal object is the authorisation of an Aboriginal Heritage Impact Permit (AHIP) issued under section 90 of NPW Act.	No known Aboriginal heritage items are located within the site. Further consideration of the NPW Act is provided in section 6.8.3 and Appendix D.
Rural Fires Act 1997 (RF Act)	The objectives of the RF Act are to provide for the prevention, mitigation, and suppression of bush and other fires; for the co-ordination of bush firefighting and bush fire prevention; for the protection of persons from injury or death, and property from damage, arising from fires; and for the protection of infrastructure and environmental, economic, cultural, agricultural, and community assets from damage arising from fires. A bush fire safety authority must be obtained before developing in bush fire prone land under section 100B of the RF Act.	Not applicable. The project does not require a bushfire safety authority under the RF Act.
Water Management Act 2000 (WM Act)	The WM Act provides for the sustainable and integrated use and management of water resources in NSW. The WM Act controls the extraction of water, its use, and the carrying out of activities on or near water sources. Part 3 of the WM Act outlines the approval requirements for water use (section 89), management works approvals (section 90), and activity approvals other than aquifer interference (section 91). These approvals include two activity types, controlled activity approvals and aquifer interference approvals. A controlled activity approval allows the holder to carry out a specific controlled activity on waterfront land, defined as land within 40 metres of a river, lake, estuary, or shoreline. The project would not involve a water use approval or involve any water management works under the WM Act. No works are being carried out within 40 metres of a water body, as such, a controlled activity approval is not required.	Not applicable. The project would not affect water resources or require a controlled activity approval.

4.4.2 Approvals required and that should be consistent with approved SSD

Under section 4.42 of the EP&A, certain other approvals are still required for SSD that is authorised by a development consent but must be substantially consistent with the SDD approvals. Such approvals are outlined in Table 4.4.

Table 4.4 Approvals that would be required for the project

Legislation	Purpose/description	Relevance to project
FM Act	Part 7 of the FM Act outlines a number of permits required for works within fisheries areas including aquaculture.	Not applicable. The project is not located within a fisheries area and would not require an aquaculture permit under section 144 of the FM Act.
Coal Mine Subsidence Compensation Act 2017 (CMSC Act)	The object of the CMSC Act is to provide for a fair, efficient, and sustainable compensation framework for dealing with the impacts of coal mine subsidence. Certain development within mine subsidence districts require approval.	Not applicable. The project is not located within a mine subsidence district; therefore the project does not require approval.
Mining Act 1992	The Mining Act 1992 facilitates the discovery and development of mineral resources in NSW, having regard to the need to encourage ecologically sustainable development. Mining leases are issued under Part 5 of the Act.	Not applicable. The project would not include mining for mineral resources or any activity which would require a lease under the Act.
Petroleum (Onshore) Act 1991	The Petroleum (Onshore) Act 1991 facilitates the discovery and development of petroleum resources in NSW, having regard to the need to encourage ecologically sustainable development.	Not applicable. The project would not include any activity which would develop any petroleum resources which would require a production lease.
Protection of the Environment Operations Act 1997 (POEO Act)	The objectives of the POEO Act are to protect, restore and enhance the quality of the environment, in recognition of the need to maintain ecologically sustainable development. The POEO Act provides for an integrated system of licensing and contains a core list of activities requiring an Environment Protection Licence (EPL) from the NSW EPA. These activities are called 'scheduled activities' and are listed in Schedule 1 of the POEO Act.	The project will require an EPL. The project includes a scheduled activity 34 Resource Recovery listed under Schedule 1 of the POEO Act, therefore an EPL would be required for the project under section 48 of the POEO Act.
Roads Act 1993 (Roads Act)	The Roads Act provides for the classification of roads and requirements for carrying out road works within NSW. Section 138 requires consent from the relevant consent authority to be obtained prior to any works which occur in, on or over a public road.	Not applicable. The project does not require any additional works in, on or over public roads.
Pipelines Act 1967	The *Pipelines Act 1967* outlines the licensing application requirements for pipelines in NSW. A licence is required under section 11 to commence, or continue, the construction of a pipeline, alter or reconstruct a pipeline or operate a pipeline.	Not applicable. The project would not include construction of a pipeline that would require a pipelines licence.

4.4.3 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act* (EPBC Act) provides a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as matters of national environmental significance (MNES).

Consideration of the need for an environmental approval from the Minister for the Environment under Part 3 of the EPBC Act is triggered by the following:

– Potential impacts on MNES including:
  - world heritage properties
  - national heritage places
  - wetlands of international importance (listed under the Ramsar Convention)
  - listed threatened species and ecological communities
  - migratory species protected under international agreements
  - Commonwealth marine areas
  - Great Barrier Reef Marine Park
  - nuclear actions (including uranium mines)
  - a water resource, in relation to coal seam gas development and large coal mining development
– Actions carried out by the Australian Government
– Actions on Commonwealth land or which may have impacts on Commonwealth land.

Part 9 of the EPBC Act provides that an action that has, would have or is likely to have a significant impact on MNES may not be undertaken without prior approval from the Commonwealth Environment Minister. Approval under the EPBC Act is also required for actions carried out by Commonwealth agencies or impacting on Commonwealth land.

A search using the Protected Matters Search Tool (PMST) with a 10 kilometre buffer from the project was undertaken on 7 May 2024. Based on the review of MNES in proximity to the project, a referral under the EPBC Act is not considered necessary as the project is unlikely to have a significant impact on protected matters.

4.4.4 Native Title Act 1993

Under the Native Title Act, the valid grant of a freehold estate on or before 23 December 1996 is known as a ‘previous exclusive possession act’. This means that native title has been extinguished over the area and native title claimants cannot include this land in their applications. The project would be located on freehold land, therefore not subject to native title.

5. Community engagement

This chapter details the community and stakeholder consultation for the project, key issues raised and how they have been addressed in the EIS.

5.1 Introduction

This chapter describes the stakeholder and community consultation process carried out prior to and during preparation of the EIS and the consultation activities which will continue during the assessment and development of the project. It includes issues raised and identifies where, if applicable, the project has been amended in response to those issues. Table 5.1 details the SEARs in relation to project consultation.

Table 5.1 Community and stakeholder engagement SEARs

Requirements	Where addressed
Community and stakeholder engagement –	
a community and stakeholder engagement strategy consistent with the Department's Undertaking Engagement Guidelines for State Significant Projects for all stages of the development, including (but not limited to):	Section 5
– details of how issues raised, and feedback provided during engagement activities (see Consultation section below for list of stakeholders) have been considered and responded to in the development. Where amendments have not been made to address an issue, a short explanation should be provided.	Section 5.2 and 5.3
– details of the proposed approach to future community and stakeholder engagement based on the results of consultation.	Section 5.4, 5.5 and 5.6

5.2 Consultation approach and strategy

In response to SEARs, Calibre Metals is required to consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. Consultation for the LIB recycling facility follows the DPHI guidelines for SSD and is consistent with DPHI's *Undertaking Engagement Guidelines for State Significant Projects*. GHD's Engagement Team developed an engagement approach (see Figure 5-1) to guide consultation activities throughout the project, ensuring stakeholders and the community were informed and had opportunities to provide feedback during key stages.

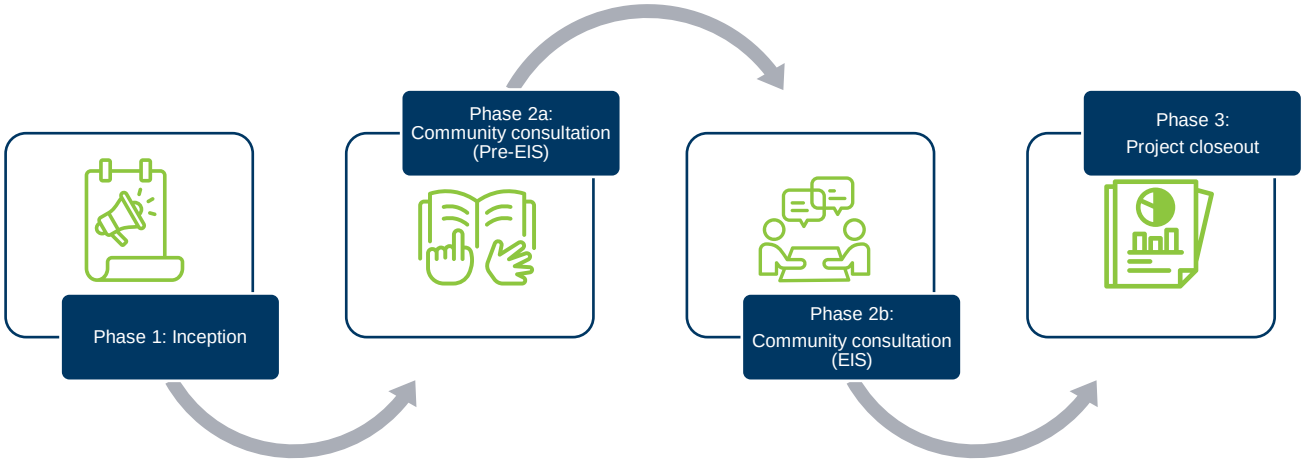


Figure 5-1 Engagement approach

The engagement approach outlined in Figure 5-1 is further expanded upon in Table 5.2.

Table 5.2 Detailed approach to engagement

Phase	Details
Phase 1 – Inception	During this phase, the GHD engagement team developed the overall engagement strategy to guide how stakeholders and the community would be consulted throughout the project.
Phase 2a – Community consultation (Pre-EIS)	This phase involved preparing and delivering notification letters (letterbox drop), engaging with relevant stakeholders, and providing updates on the Calibre Metals website. These activities ensured stakeholders were informed about the upcoming EIS process and had an opportunity to provide input.
Phase 2b – Community consultation (EIS)	This phase involves the EIS being exhibited publicly for at least 28 days, providing stakeholders and the community with an opportunity to review the document and submit formal feedback. The public exhibition period will be promoted through notifications and updates on the Calibre Metals and DPHI' websites.
Phase 3 – Project closeout	This phase will focus on summarising the feedback that was provided during phase 2b – Community consultation (EIS). It will be considered in the decision-making process and inform the final EIS.

This strategy includes a combination of stakeholder meetings, public notifications, and online updates. It has been designed to keep stakeholders informed and gather feedback to shape the development of the project and the EIS. Feedback from stakeholders during the Pre-EIS Community Consultation (Phase 2a) has been incorporated where appropriate. For issues raised that could not be addressed through project amendments, responses will be documented and provided during the EIS Public Exhibition phase, along with explanations as required by the SEARs.

5.3 Engagement undertaken to date

Prior to drafting the EIS, a range of engagement activities were carried out to inform key stakeholders and the local community and to gather feedback on the project. These activities are summarised below in sections 5.3.1 and 5.3.2, including how issues raised have been considered and responded to.

5.3.1 Engagement meetings

Meetings were an essential part of the engagement process during the Pre-EIS Community Consultation phase. These meetings provided opportunities for the project team to present information regarding the LIB recycling facility to key stakeholders and gather early feedback. These interactions allowed for detailed discussions with Government agencies and local authorities to seek feedback and discuss regulatory requirements early in the project's development.

Table 5.3 identifies meetings undertaken to engage key stakeholders, provide information about the project, and collect input.

Table 5.3 Pre-EIS engagement meetings

Engagement Activity	Dates	Details	Comments provided	Response/outcome
Meeting with NSW EPA	Wednesday 2 August 2023	Discussed lithium-ion battery classification and approval pathway.	No comments provided.	Feedback helped inform the EIS approach to regulatory approvals.
Meeting with DPHI	Friday 25 August 2023	Provided project overview and discussed SSD requirements.	Regulatory requirements and approval pathways were highlighted.	Feedback incorporated into the EIS process to align with SSD regulations.
Meeting with Council – First Meeting	Thursday 21 September 2023	Presented the project and discussed potential economic benefits.	Positive feedback on potential economic benefits for the region. Discussed rationale for the preferred project site, including in relation to the Bomen Special Activation Precinct (SAP). Incompatible timing and block sizes in the SAP.	Feedback included in the socio-economic impact section of the EIS.
Meeting with Council– Second Meeting	Thursday 5 October 2023	Discussed SSD approval pathway and received council feedback.	Discussed the SSD approval process.	Feedback addressed and incorporated into the project development schedule.
Meeting with DPHI and NSW EPA	Wednesday 21 February 2024	Discussed Scoping report.	No comments provided.	Feedback helped inform the EIS Scoping Report.
Consultation with Biodiversity, Conservation and Science Group (BCS), Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Friday 15 March 2024	Discussed the project, existing biodiversity assessments and approvals for the Flip Screen Industrial Estate and biodiversity assessment requirements for the project.	No comments raised.	Feedback helped to inform preparation of a Biodiversity Development Assessment Report (BDAR) waiver.
Meeting with the Department Primary Industries (DPI) and Regional Development	Wednesday 8 May 2024	Provided overview of the project.	No comments raised	N/A
Meeting with DPHI	Wednesday 19 June 2024	Discussed SEARs.	No comments raised.	Feedback helped to inform EIS preparation and development.
Correspondence with the Minister for Climate Change, Energy, Environment, and Heritage.	Monday 2 July 2024	Calibre Metals introduced itself as a Wagga Wagga-based lithium-ion battery recycling business, highlighting its SSD application and efforts to establish safe handling and recycling networks.	Lithium battery waste in landfills and the need for safe recycling solutions.	Calibre Metals seeks to collaborate with government on sustainable recycling efforts.

Engagement Activity	Dates	Details	Comments provided	Response/outcome
Correspondence with the Government of South Australia – Green Industries SA.	Tuesday 6 August 2024	Green Industries SA acknowledged Calibre Metals' lithium-ion battery recycling plans and the lodged development application. They recognised the need for safe handling and recycling networks, especially for large format batteries.	Battery waste, fire risks, and limited recycling pathways for larger lithium-ion batteries.	Green Industries SA expressed interest in future project updates, particularly around end-markets for recovered materials.
Meeting with Wagga Wagga State Member of Parliament.	Wednesday 28 August 2024	Discussed the project and detailed the process, location and background of proponents.	No issues raised.	N/A
Correspondence with the Minister for Climate Change, Energy, Environment, and Heritage.	Thursday 29 August 2024	The Minister acknowledged Calibre Metals' letter on lithium-ion battery recycling, highlighting the challenges of battery disposal, fire risks, and the need for a circular economy. The Minister invited Calibre Metals' input on upcoming reforms and noted that the NSW EPA would reach out for further discussions.	End-of-life battery management, disposal risks, and environmental impacts.	The NSW Government supports Calibre Metals' recycling efforts and will engage further, facilitated by the NSW EPA.
Correspondence DPHI and Heritage NSW	Wednesday 31 July 2024	Sought clarification on SEARs for Aboriginal Cultural Heritage Assessment Report (ACHAR).	GHD advised that there will be no clearing or ground disturbance proposed as part of the project, request consideration of due diligence approach to Aboriginal heritage assessment, including consultation with the Local Aboriginal Lands Council (LALC) in lieu of an ACHAR.	Response received 29 August 2024, from Heritage NSW providing concurrence to GHD's proposed approach to Aboriginal heritage assessment.
Consultation with Wagga Wagga LALC	Friday 20 September 2024 Monday 23 September 2024 Thursday 10 October 2024 Friday 11 October 2024	Multiple attempts to contact via email and phone calls.	No response received.	Future efforts to engage with LALC will continue during the EIS public exhibition phase.
Landowner engagement	Ongoing	Providing an overview of the project and working out leasing arrangements.	No queries or matters have been raised.	Consultation to date has been positive.

5.3.2 Engagement tools

A variety of communication tools were employed to reach a wider audience and provide clear, accessible information about the project. These tools helped inform the local community and stakeholders about the project's purpose and the EIS process, while also providing avenues for feedback. These tools are described in in Table 5.4.

Table 5.4 Pre EIS engagement tools

Engagement Activity	Dates	Details	Comments provided	Response/outcome
Website update	Saturday 14 September 2024	A dedicated project page was created on the Calibre Metals website, providing regular updates about the Wagga Wagga Lithium-Ion Battery Recycling Facility project. This page outlines the project's objectives, its environmental benefits, and progress updates. It also includes a section for stakeholders to submit inquiries or feedback directly through the website.	No issues raised through the website.	The website continues to serve as a key information source for the community, allowing stakeholders to access updates and provide feedback at any time.
Letterbox Drop	Wednesday 18 September 2024	A letter informing nearby local residents and businesses about the project and EIS process. Also provided contact information to direct any project related enquiries.	One response was received from a stakeholder seeking information about hours of operation and potential noise impacts. No other responses were received.	The project team clarified that operations will be Monday to Saturday, 7am to 6pm, excluding public holidays. A noise assessment is being prepared as part of the EIS. No project amendments were made due to compliance with local regulations.

These activities were carried out to inform the development of the project during the Pre-EIS Community Consultation phase. Any feedback that did not result in changes to the project was responded to with explanations to the stakeholders involved.

5.4 Stakeholder engagement during EIS preparation

During the preparation of the EIS, stakeholder engagement remained focused on providing regular project updates and gathering feedback to inform the EIS content. In line with the SEARs, the project team has documented how feedback was integrated into the project and how issues raised were addressed.

Engagement activities during this phase included meetings with government agencies, consultations with Council, and regular updates via letterbox drop, and the project website (outlined in section 5.2). Feedback that could not be accommodated was documented with explanations, and efforts will continue during the next phases of the project.

5.5 Public exhibition of the EIS

In accordance with the SEARs, the public exhibition of the EIS will provide an opportunity for stakeholders and the broader community to review the EIS and submit their feedback. This period will allow formal input to be gathered, and responses to submissions will be provided, as required.

The EIS will be exhibited publicly for at least 28 days. During this period, stakeholders will be able to review the document and submit formal comments. The project team will promote the exhibition through the project website and DPHI Major Projects website.

5.6 Stakeholder engagement during future project stages

As part of the future engagement strategy, regular updates will be provided through the project website. Continued efforts will also be made to engage with stakeholders. A dedicated contact will be available throughout the construction and operational phases to handle inquiries and provide updates. Feedback provided during this stage will be recorded and responded to in line with the SEARs, including explanations where amendments are not made to address issues. This engagement will focus on maintaining communication and addressing any concerns raised as the project progresses.

6. Impact Assessment and mitigation

This chapter summarises the key potential impacts associated with construction and operation of the project and provides details on how these impacts will be managed and mitigated.

6.1 Air quality and odour

6.1.1 Overview

An Air Quality Impact Assessment (AQIA) has been prepared for the project (Appendix G). This section describes they key elements of the technical study, including the air quality considerations that relate to the construction and operation of the LIB recycling facility, potential impacts associated with the project, and provides details on how these impacts will be mitigated. The SEARs relating to air quality and odour are outlined in Table 6.1.

Table 6.1 SEARs for air quality

Requirements	Where addressed
Air Quality and Odour –	
a quantitative assessment of the potential air quality, dust and odour impacts of the development (construction and operation) on surrounding landowners, businesses and sensitive receptors, in accordance with relevant Environment Protection Authority guidelines, including:	Appendix G and section 6.1
– details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to buildings	Section 6.1.4
– details of proposed mitigation, management and monitoring measures.	Section 6.1.5

6.1.2 Methodology

6.1.2.1 Construction

The construction air quality impact assessment approach focuses on identifying activities that could impact off-site air quality if not properly managed, allowing for the development of appropriate mitigation measures to be included in the project design and environmental management plans.

For this assessment, the Institute of Air Quality Management (IAMQ) Guidance on the Assessment of Dust from Demolition and Construction (2024), developed by the IAMQ in the UK, has been used (Table 6.2).

Table 6.2 Construction assessment methodology (IAQM, 2024)

Step	Description
Step 1	Screen the requirement for a more detailed assessment.
Step 2A	Assess the scale and nature of the works, which determines the potential dust emission magnitude for each of the four activities (demolition, earthworks, construction and track-out).
Step 2B	Assess the sensitivity of the area to dust soiling effects, human health effects and ecological effects.
Step 2C	Assess the risk of dust impacts based on the dust emission magnitude and receptor sensitivity.
Step 3	Determine the site-specific mitigation.
Step 4	Examine the residual effects and determine whether or not these are significant.
Step 5	Prepare the dust assessment report.

6.1.2.2 Operation

The operational assessment includes identification of all likely sources of air pollution and quantification of potential impacts, taking into account emission frequency and proximity of sensitive receptors. A detailed air quality assessment was undertaken in accordance with guidance outlined in the NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2022) (the Approved Methods).

Based on information provided by Calibre Metals and the emissions report of the LIB recycling technology provided, the pollutants of interest that would be emitted during operation of the LIB recycling facility were identified to include:

- Airborne particulate matter ('particulates'), including particulate matter with diameter smaller than 2.5 microns ($PM_{2.5}$)
- Nitrogen dioxide ($NO_{2)}$
- Volatile Organic Compounds (VOCs)
- Type 1 and type 2 substances
- Total fluoride.

It is noted that Calibre Metals regular operating hours are from 7am to 6pm, Monday to Friday. For the purposes of this assessment, the modelling has conservatively assumed continuous operation of the LIB recycling facility throughout the full day, with pollutants being emitted at all times. This reflects a very conservative operating scenario, which is unlikely to ever happen.

6.1.2.3 Government Plans, Policies and guidelines

The relevant legislation and government guidance for the air quality assessment of the project are as follows. It should be noted that in the absence of specific criteria for certain metallic emissions in NSW, the relevant criteria established by the Western Australia Environmental Protection Authority (WA EPA) have been adopted.

- *NSW Protection of the Environment Operations Act 1997* (POEO Act)
- NSW Protection of the Environment Operations (Clean Air) Regulation 2022 (POEO Clean Air Regulation)
- NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2022)(the Approved Methods)
- National Environment Protection Council (NEPC) National Environment Protection (Ambient Air Quality) Measure 2021 (the Air NEPM)
- National Environmental Protection (Air Toxics) Measure 2011 (cth)
- Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2024)(IAQM guidance)
- Guideline for Air Emissions - Western Australia's Environmental Protection Authority (WA EPA).

6.1.2.4 Assessment criteria

Assessment criteria for the project was predominately taken from the Approved Methods. The adopted air quality impact assessment criteria are summarised in Table 6.3. Pollutants in the table below are consistent with expected emissions from construction and operation of the project including construction dust (TSP, and PM_{10}) and exhaust emissions ($PM_{2.5}$, NO_2, VOCs, type 1and type 2 substances and total fluoride). Additionally, stacks of the LIB recycling facility emit type I and type II substances consisting of different metals, a summary of the emission criteria for this project is shown in Table 6.4. For cobalt and selenium, where criteria do not exist in NSW, the WA guidance was applied.

Table 6.3 Air quality assessment criteria for gaseous pollutants

Pollutant	Averaging period	Criteria
Airborne particulate matter and common gaseous pollutants		
TSP[1]	Annual	90 µg/m^3
PM_{10}[2]	24 hours	50 µg/m^3
	Annual	25 µg/m^3
$PM_{2.5}$[3]	24 hours	25 µg/m^3
	Annual	8 µg/m^3
NO_2	1 hour	164 µg/m^3
	Annual	31 µg/m^3
CO	1 hour	30 mg/m^3
	8 hours	10 mg/m^3
Hydrogen fluoride	90 days	0.5 µg/m^3
	30 days	0.84 µg/m^3
	7 days	1.7 µg/m^3
	24 hours	2.9 µg/m^3
Lead (Pb)	Annual	0.5 µg/m^3

Notes: 1. TSP = Total Suspended Particulates
2. PM_{10} = particulate matter with diameter smaller than 10 microns
3. $PM_{2.5}$ = particulate matter with diameter smaller than 2.5 microns

Table 6.4 Air quality assessment criteria for metals

Substance Symbol	Substance Name	Averaging Period (hours)	Criteria (µg/m^3)[1]	Source of Assessment Criteria
As	Arsenic and compounds	1	0.09	NSW guideline
Be	Beryllium and beryllium compounds	1	0.004	NSW guideline
Cd	Cadmium and cadmium compounds	1	0.018	NSW guideline
Cr	Chromium VI compounds	1	0.09	NSW guideline
Cr	Chromium (III) compounds	1	9	NSW guideline
Ni	Nickel and nickel compounds	1	0.18	NSW guideline
Mn	Manganese and compounds	1	18	NSW guideline
Hg	Mercury organic	1	0.18	NSW guideline
Hg	Mercury inorganic	1	1.8	NSW guideline
Sb	Antimony and compounds	1	9	NSW guideline
Co	Cobalt	24	0.092	WA guideline
Se	Selenium	1	0.92	WA guideline
Sn	Tin	NA	NA	NA
V	Vanadium	24	0.92	WA guideline

Note: 1. mg/m^3: Gas volumes are expressed at 25°C and at an absolute pressure of 1 atmosphere (101.325 kPa).

6.1.2.5 Modelling Method

A review of the surrounding terrain, air emission sources and distance to nearby receptors was undertaken to inform the choice of dispersion model used for this assessment. Given the terrain features to the north and west of the site and importance of modelling of calm conditions which typically result in worst case dispersion, CALPUFF was identified to be the most appropriate dispersion modelling software to use for the project.

CALPUFF modelling steps include:

– Gathering meteorological data, geophysical data and model parameters
– CALMET processes this information to generate detailed 3D meteorological field
– Source emissions data (refer to Appendix B-1 of the AQIA located in Appendix G) and environmental variables are input into CALPUFF
– CALPUFF performs dispersions modelling to predict ground– level pollutant concentrations and depositions.

6.1.2.6 POEO Clean Air Regulation

The POEO Clean Air Regulation outlines air quality standards of concentration that apply to general and specific activities and plant for both scheduled and non-scheduled premises. Standards of concentration relevant to the project have been provided in Table 6.5 and were sourced from the general activities and plant (Group 6) category. Emissions to air from relevant project operation must comply with these emission limits.

Table 6.5 Relevant standards of concentration

Air impurity	Plant	Standard of concentration (Dry, 273 K, 101.3 kPa)
General standards of concentration (group 6)		
Solid Particles (total)	Any crushing, grinding, separating or materials handling activity	20 mg/m^3
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent	Any activity or plant, except boilers, gas turbines and stationary reciprocating internal combustion engines listed below	350 mg/m^3
Fluorine (F2) and any compound containing fluorine, as total fluoride (HF equivalent)	Any activity or plant, other than the manufacture of aluminium from alumina	50 mg/m^3
Volatile organic compounds (VOCs), as n-propane equivalent	Any activity or plant involving combustion	40 mg/m^3
Type 1 substances and Type 2 substances (in aggregate)	Any activity or plant	1 mg/m^3

6.1.3 Existing environment

6.1.3.1 Background air quality

The NSW DCCEEW operates air quality monitoring stations (AQMS) in many locations across NSW. The nearest station to the project is the Wagga Wagga North AQMS which is located approximately 6.5 kilometres northeast of the site. This station was commissioned in 2011 and measures $PM_{2.5}$ and PM_{10}.

Given the significance of NO_2 in this study and to incorporate existing air quality data for a comprehensive cumulative assessment, NO_2 concentrations recorded by the Wagga Wagga North AQMS and the Bargo have been used for the cumulative analysis. Specifically, data collected after September 30, 2022, is from the Wagga Wagga North AQMS, while data prior to this date is from the Bargo AQMS. Considering the urban and industrial zoning of the land surrounding Bargo AQMS, this station provides a conservative estimation of air pollutants levels, ensuring that the assessment considers potentially higher baseline concentrations typical of more developed areas.

A summary of the ambient air quality data recorded at AQMS is provided in Table 6.6.

Table 6.6 Summary of available background air quality recorded by the DCCEEW Wagga Wagga North AQMS and Bargo AQMS

Pollutant	Averaging Period	Recorded background concentration by year				
		2019	2020	2021	2022	2023
PM_{10} ($\mu g/m^3$)	24 hours maximum	251.7	295.3	69.1	46.8	62.5
	Maximum 24 hour (below assessment criteria)	49.9	48.9	49.4	46.8	47.7
	Annual average	35.3	23.2	17.7	13.1	17.4
	Data availability	95%	98%	98%	99%	96%
$PM_{2.5}$ ($\mu g/m^3$)	24 hours maximum	239.6	559.5	25.4	27.1	19.2
	Maximum 24 hour (below assessment criteria)	45.5	34.6	25.4	27.1	19.2
	Annual average	11.3	10.7	6.3	5.3	6.6
	Data availability	95%	98%	96%	99%	97%
NO ($\mu g/m^3$)	1 hour maximum	/	/	/	28.1	92.5
	Annual average	/	/	0.6	1.1	3.4
	Data availability	0%	0%	25%	56%	82%
NO_2 ($\mu g/m^3$)	1 hour maximum	/	/	/	41.0	80.0
	Annual average	/	/	5.9	3.7	5.8
	Data availability	0%	0%	25%	56%	82%
Ozone ($\mu g/m^3$)	1 hour maximum	/	/	117.7	115.6	130.5
	1 hour average	/	/	51.2	42.2	41.7
	4 hours maximum	/	/	109.1	104.9	100.6
	4 hours average	/	/	50.4	41.3	15.3
	24 hours maximum	/	77.0	74.9	72.8	107.0
	24 hours average	/	51.0	42.3	42.0	41.9
	Data Availability	0%	14%	58%	58%	82%

6.1.3.2 Facilities reporting to the NPI

The National Pollutant Inventory (NPI), operated under the *National Environment Protection (National Pollutant Inventory) Measure 1998*, provides publicly available information about emissions of 93 pollutants throughout Australia. Facilities that exceed prescribed threshold values are required to report their emissions to the NPI on a yearly basis.

Surrounding facilities located within five kilometres of the site include:

– The Wagga Wagga Airport (located approximately four kilometres southwest of the site)
– The Wagga Wagga Concrete (located approximately three kilometres northeast of the site).

6.1.3.3 Climate and Meteorology

The local climate and meteorology (weather) within the study area is of critical importance when assessing the potential for air quality impacts at sensitive receptors.

The nearest automatic weather station (AWS) to the project area is the Bureau of Meteorology (BoM) Wagga Wagga AMO AWS, which is approximately 4.6 kilometres west of the site. This station was commissioned in 1989 and measures wind speed, wind direction, temperature, relative humidity and cloud.

Wind

The average wind rose over the period 2019-2023 was generated from information obtained from BoM (see Appendix A-2-3 of the AQIA located in Appendix G). The following features are observed:

– The predominant annual average wind direction is from the east.
– The average wind speed measured was 3.6 metres per second.
– Calm conditions (wind speeds less than 0.5 metres per second) occurred 4.4 per cent of the time.
– The winds from the west occur throughout the year.
– Summer has a slightly higher average wind speed than the other seasons.
– Winter has the highest proportion of calm conditions.

Temperature

Monthly mean temperature statistics for data measured at the BoM Wagga Wagga North AWS for the period 2019 through 2023 were reviewed. The 50th percentile monthly maximum and minimum temperatures range from 30/18 ^{o}C (January) and 14/2.9 ^{o}C (August).

Rainfall

Monthly rainfall statistics for data measured at BoM Wagga Wagga AMO AWS for the period 2019 through 2023 was reviewed. The statistics shown include average monthly rainfall amount (mm) and average number of days per month where rainfall is greater than 0.25 millimetres.

The data indicate that the most number of rain days occurred, on average over the three year data period are in October and November. The maximum average rainfall occurred in October with 56.5 millimetres.

Atmospheric stability

Stability classes calculated from the measurements at the BoM Wagga Wagga AMO AWS from 2019-2023 are reviewed. The distribution on the AWS shows that class D (neutral) conditions occur most frequently (22 per cent of the observations), and Class A (very unstable) occur the least frequently (<1 per cent).

6.1.3.4 Sensitive receivers

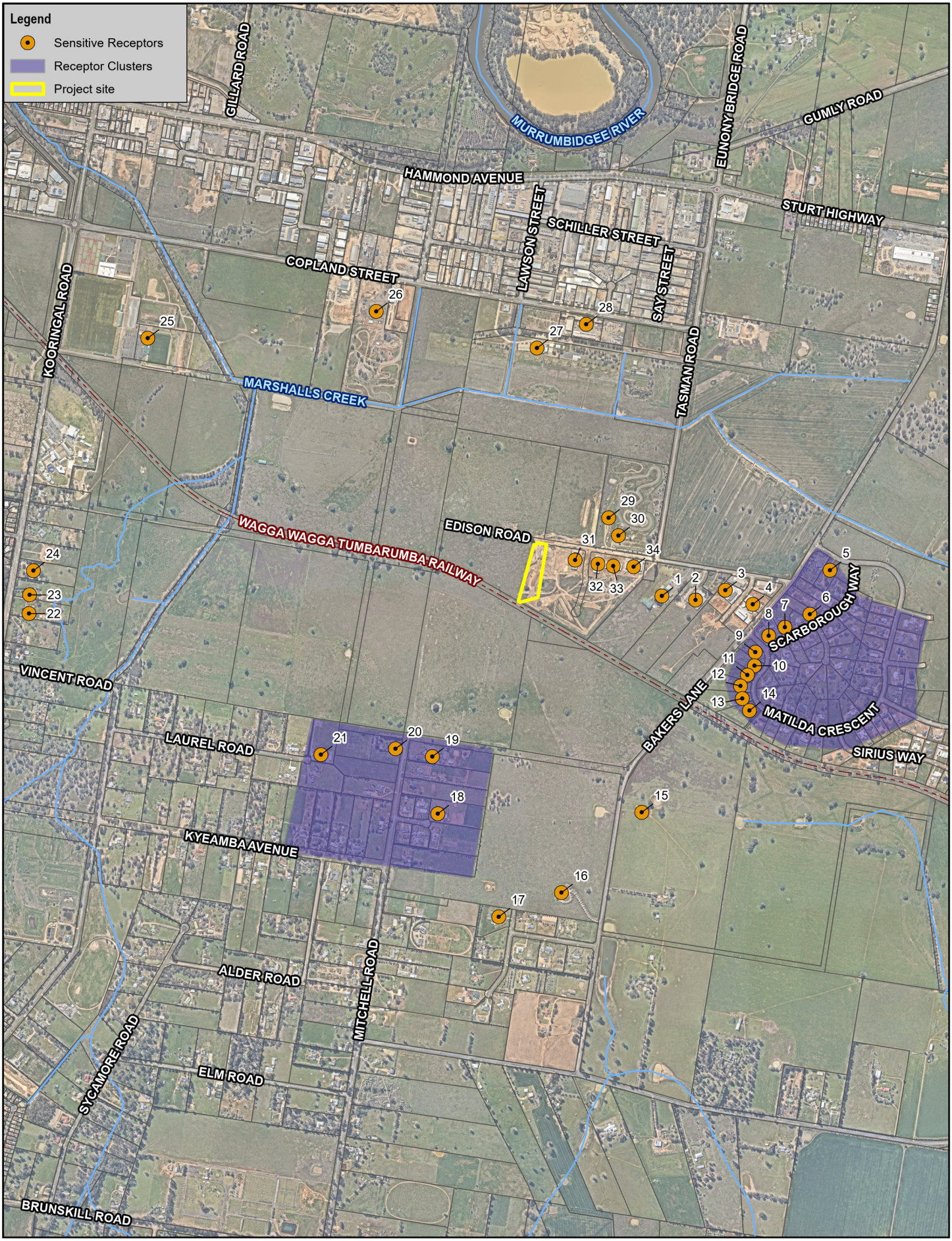
The nearest sensitive receptors in each direction have been reviewed. A total of 34 receptors have been identified within two kilometres of the site (refer to Table 6.7 and Figure 6-1).

Two receptor clusters have been identified based on their similar characteristics. Within each cluster, the receptor with the highest predicted air quality impact has been selected to represent the worst-case scenario for that cluster. This approach ensures a conservative assessment of the potential impacts associated with the project.

Table 6.7 Sensitive receptors within two kilometres of the project site

ID	Receptor type	Address	Distance and direction from the project site
R01	Commercial	59 Edison Road, East Wagga Wagga NSW 2650	550 m E
R02	Commercial	6 Dangar Place, East Wagga Wagga NSW 2650	700 m E
R03	Commercial	4 Dangar Place, East Wagga Wagga NSW 2650	810 m E
R04	Commercial	3 Dangar Place, East Wagga Wagga NSW 2650	950 m E
R05	Residential	4 Matilda Crescent, Gumly Gumly NSW 2652	1250 m E
R06	Residential	10 Scarborough Way, Gumly Gumly NSW 2652	1180 m SE
R07	Residential	14 Scarborough Way, Gumly Gumly NSW 2652	1100 m SE
R08	Residential	16 Scarborough Way, Gumly Gumly NSW 2652	1020 m SE
R09	Residential	49 Matilda Crescent, Gumly Gumly NSW 2652	1000 m SE
R10	Residential	47 Matilda Crescent, Gumly Gumly NSW 2652	1020 m SE
R11	Residential	45 Matilda Crescent, Gumly Gumly NSW 2652	1010 m SE
R12	Residential	43 Matilda Crescent, Gumly Gumly NSW 2652	1000 m SE

ID	Receptor type	Address	Distance and direction from the project site
R13	Residential	41 Matilda Crescent, Gumly Gumly NSW 2652	1040 m SE
R14	Residential	39 Matilda Crescent, Gumly Gumly NSW 2652	1090 m SE
R15	Residential	Bakers Lane, Lake Albert NSW 2650	1500 m SE
R16	Residential	26 Dandaloo Road, Lake Albert NSW 2650	1380 m S
R17	Residential	58 Manuka Road, Lake Albert NSW 2650	1470 m S
R18	Residential	4 Tamarind Place, Lake Albert NSW 2650	1110 m S
R19	Residential	1A Mitchell Road, Lake Albert NSW 2650	890 m SW
R20	Residential	2 Mitchell Road, Lake Albert NSW 2650	950 m SW
R21	Residential	15 Laurel Road, East Wagga Wagga NSW 2650	1180 m SW
R22	Residential	521 Kooringal Road, East Wagga Wagga NSW 2650	2130 m W
R23	Residential	519 Kooringal Road, East Wagga Wagga NSW 2650	2130 m W
R24	Residential	517 Kooringal Road, East Wagga Wagga NSW 2650	2100 m W
R25	Parks and Recreational Areas	154 Copland Street, East Wagga Wagga NSW 2650	1900 m NW
R26	Commercial	254 Copland Street, East Wagga Wagga NSW 2650	1270 m NW
R27	Commercial	320 Copland Street, East Wagga Wagga NSW 2650	930 m N
R28	Commercial	340 Copland Street, East Wagga Wagga NSW 2650	1060 m N
R29	Commercial	156 Tasman Road, East Wagga Wagga NSW 2650	390 m NE
R30	Commercial	Edison Road, East Wagga Wagga NSW 2650	380 m NE
R31	Industrial	95 Edison Road, East Wagga Wagga NSW 2650	170 m E
R32	Industrial	95 Edison Road, East Wagga Wagga NSW 2650	270 m E
R33	Industrial	43 Edison Road, East Wagga Wagga NSW 2650	340 m E
R34	Industrial	51 Edison Road, East Wagga Wagga NSW 2650	420 m E



Paper Size ISO A4

0 100 200 300 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility
EIS

Project No. **12622054**
Revision No. **0**
Date **12/11/2024**

Site Locality and Sensitive Receivers

FIGURE 6.1

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Print date: 12 Nov 2024 - 15:15

Data source: Project site boundary, Sensitive receptors, Project site boundary - GHD- 20240924. General topo - NSWSS 2023; Aerial imagery - NearMap - 2024.. Created by: rvillalon

6.1.4 Potential Impacts

6.1.4.1 Construction

The key emissions to air from the construction of the proposed construction were identified upon review of the construction methodology. No earthwork and demolition work is required for the project. Furthermore, given that all roads will be sealed, significant dust emissions from trucks accessing the site are not anticipated. However, to remain conservative, a minimal amount of track-out dust is assumed as part of the truck movements. Therefore, low levels of dust emissions (TSP and PM_{10}) are expected during construction stage, primarily from:

– Construction – dust emissions from movement and installation of plant processing equipment
– Track-out – wheel generated dust from truck delivery supplies to the construction area.

Minor vehicle exhaust emissions are expected throughout the construction period; however, sources will be discontinuous, transient, and mobile, and therefore the air quality risk associated with vehicle emissions during construction is low.

A risk-based approach in accordance with IAQM guidance was adopted to assess potential particulate matter impacts during the construction of the project. The IAQM guidance recommends that a detailed risk assessment be undertaken where there is a human receptor within 250 metres or an ecological receptor within 50 metres of the construction footprint, or where there is a human or ecological receptor within 50 metres of any haulage routes up to 250 metres from the site entrance. Given there are human receptors within 250 metres of the construction footprint, a detailed risk assessment has been undertaken.

Dust emission magnitude and receptor sensitivity

The construction program has been divided into two activity groups that have potential to cause dust emissions. These activities are construction and track-out. The risk identified during all construction activities was Low Risk for dust soiling, human health and ecological (refer to Table 6.8).

Table 6.8 Risk matrix for dust impacts during construction

Impact	Risk			
	Demolition	Earthworks	Construction	Track-out
Dust soiling	NA	NA	Low	Low
Human health	NA	NA	Low	Low
Ecological	NA	NA	Low	Low

6.1.4.2 Operation

Discharge of air to the atmosphere from the recycling process are managed through advanced gas cleaning systems and dust collection methods, ensuring environmental safety and regulatory compliance. The recovered materials will be distributed for further use in various industries.

Discharge points details are described in Table 6.9. Annual discharge volumes to the atmosphere are estimated at:

– NO_2
– VOCs
– Total Fluoride (HF equivalent)
– Total Solid Particles (TSP) from which PM_{10} and $PM_{2.5}$ are derived
– Type 1 substances and Type 2 substances (in aggregate).

No emission of pollutants such as sulphurous compounds that have the potential to cause odour issues are anticipated as part of the project operation, therefore odour impacts have not been further assessed.

Table 6.9 Summary of discharge point characteristics

Discharge Point	Stack Height (m)	Volumetric Flow (Am3/h)	Stack Exit Diameter (m)	Stack Exit Temp (degC)	Exit Velocity Am/s	Moisture %
DP1 – Gas Burner chimney	9	2,600	0.40000	100	5.7	15%
DP2 – Process Gas chimney & Baghouse #1	9	41,500	0.80000	60	22.9	5%
DP3 – Baghouse #2 chimney	9	13,500	0.40000	40	29.8	2%

A review of emissions sampling was undertaken of a similar operating facility in China, as provided by the technology partner, Henan Zhengyang Machinery Equipment Co Ltd. Sampling included $PM_{2.5}$, PM_{10}, NOx, SO_2, HF and VOCs including speciation.

To conservatively assess potential impacts on nearby sensitive receptors, maximum provided emission rates have been used in the assessment. The estimated emission rates for type 1 and type 2 metals have been utilised in the assessment for accurate predictions. The emissions modelled in this project are presented in Table 6.10, while the emissions of type 1 and type 2 metals of DP1 and DP2 are shown in Table 6.11 and Table 6.12, respectively. Additionally, POEO Clean Air Regulation 2022 Group 6 limits are provided in Table 6.10, demonstrating full compliance.

A review of the DPHI Major Projects website was completed to understand future sources of air pollutants which may contribute to cumulative impacts with the project. A review of the DPHI's Major Projects website was completed to understand future sources of air pollutants which may contribute to cumulative impacts with the project. New state significant infrastructure projects, that is both SSD and State Significant Infrastructure (SSI), with potential for air emissions are summarised in Table 6.16 State significant projects with determinations dated more than three years ago are not included, as it is assumed that emissions from these projects are already accounted for in the ambient air quality monitoring conducted by the DCCEEW. All of these projects are over 4.5 kilometres from the project site and most identified emissions are during the construction phase only. Cumulative impacts are not anticipated.

Table 6.10 Proposed operational air pollutant emissions

Air pollutant	Emission concentration (mg/Nm^3)	Volumetric flow rate (Nm^3/h)	Emission rate (g/s)	POEO Clean Air Regulation 2022 Group 6 Limits (mg/m3)
DP1 – Gas Burner Chimney				
NOx (as NO_2)	150	1,600	0.06667	350
DP2 – Process Gas Chimney & Baghouse #1				
NOx (as NO_2)	100	33,250	0.92361	350
Total fluoride (HF equivalent)	5	33,250	0.04618	50
Volatile organic compounds (VOCs)	20	33,250	0.18472	40
Solid Particles (total)	20	33,250	0.18472	20
Type 1 substances and Type 2 substances (in aggregate)	1	33,250	0.00924	1
DP3 – Baghouse #2 Chimney				
Solid Particles (total)	20	11,600	0.06444	20
Type 1 substances and Type 2 substances (in aggregate)	1	11,600	0.00322	1

Table 6.11 Modelled emissions of Type 1 and Type 2 substances for DP2

DP2 – Process Gas Chimney Principal Toxic Pollutants	Emission (mg/Nm^3)	Volumetric Flow (Nm^3/h)	Emission Rate (g/s)	Type
Sb	1.40E-05	33,250	1.29E-07	1
As	3.49E-05	33,250	3.22E-07	1
Cd	2.45E-04	33,250	2.26E-06	1
Pb	1.40E-03	33,250	1.29E-05	1
Hg	6.99E-06	33,250	6.46E-08	1
Be	3.49E-05	33,250	3.22E-07	2
Cr	8.69E-05	33,250	8.03E-07	2
Co	6.86E-03	33,250	6.33E-05	2
Mn	3.01E-02	33,250	2.78E-04	2
Ni	2.25E-02	33,250	2.08E-04	2
Se	1.40E-05	33,250	1.29E-07	2
Sn	6.99E-06	33,250	6.46E-08	2
V	6.98E-05	33,250	6.44E-07	2

Table 6.12 Modelled emissions of Type 1 and Type 2 substances for DP3

DP3 – Baghouse Chimney Principal Toxic Pollutants	Emission (mg/Nm^3)	Volumetric Flow (Nm^3/h)	Emission Rate (g/s)	Type
Sb	4.01E-05	11,600	1.29E-07	1
As	1.00E-04	11,600	3.22E-07	1
Cd	7.01E-04	11,600	2.26E-06	1
Pb	4.01E-03	11,600	1.29E-05	1
Hg	2.00E-05	11,600	6.46E-08	1
Be	1.00E-04	11,600	3.22E-07	2
Cr	2.49E-04	11,600	8.03E-07	2
Co	3.43E-04	11,600	1.11E-06	2
Mn	3.27E-03	11,600	1.05E-05	2
Ni	1.01E-03	11,600	3.25E-06	2
Se	4.01E-05	11,600	1.29E-07	2
Sn	2.00E-05	11,600	6.46E-08	2
V	2.00E-04	11,600	6.44E-07	2

The air pollutant model predictions are presented as tabulated results providing ground level concentrations at each sensitive receptor and as contour plots to illustrate the predicted pattern of dispersion and allow interpretation of the model predictions at any point of the sampling grid. The model results for each species were presented as appropriate averaging periods and percentiles to align with their respective assessment criteria. The predicted model results were compared against the adopted assessment criteria to determine regulatory compliance.

6.1.4.3 Predicted pollutant impacts

Predicated pollutant impacts

The top 5 background PM_{10} and $PM_{2.5}$ concentration are shown in Table 6.13. Predicted incremental and cumulative particulate concentrations are presented in Table 6.14 and contour dispersion plots of incremental annual TSP and 24-hour PM_{10} and $PM_{2.5}$ are shown in Figure 6-2 and Figure 6-3. Due to the absence of specific PM_{10} and $PM_{2.5}$ data in the emission inventory, the assessment is carried out conservatively for the following parameters:

– Particulate matter, including PM_{10} and $PM_{2.5}$ – it is assumed that 100 per cent of the particulate matter emission is $PM_{2.5}$
– On this basis, total particulate emissions are equal to PM_{10} emissions, which are equal to $PM_{2.5}$ emissions.

R12 is identified as the highest and representative for the receptor cluster R05 – R14, where R18 serves as the highest and most representative for the receptor cluster R18 – R21.

Table 6.13 Top 5 background PM_{10} and $PM_{2.5}$ in 2022

Unit: µg/m³	TSP	PM_{10}	$PM_{2.5}$
Maximum	93.6	46.8	22.4
Average	26.0	13.0	5.2
Rank 1	93.6	46.8	22.4
Rank 2	89.2	44.6	18.4
Rank 3	79.2	39.6	17.3
Rank 4	78.4	39.2	15.6
Rank 5	78.2	39.1	15.2

Table 6.14 Predicted particulate concentrations (proposed operation)

Receptors	Predicted particulate concentration (µg/m³)									
	Incremental					Cumulative with DCCEEW AQMS				
	TSP	PM_{10}		$PM_{2.5}$		TSP	PM_{10}		$PM_{2.5}$	
	Annual	24-hour max	Annual	24-hour max	Annual	Annual	24-hour max	Annual	24-hour max	Annual
Criteria	**90**	**50**	**25**	**25**	**8**	**90**	**50**	**25**	**25**	**8**
R01	0.2	2.3	0.2	2.3	0.2	26.2	46.9	13.2	22.4	5.4
R02	0.1	1.5	0.1	1.5	0.1	26.2	46.9	13.2	22.4	5.4
R03	0.1	1.2	0.1	1.2	0.1	26.1	46.9	13.1	22.4	5.3
R04	0.1	0.9	0.1	0.9	0.1	26.1	46.8	13.1	22.4	5.3
R05	0.1	0.6	0.1	0.6	0.1	26.1	46.8	13.1	22.4	5.3
R06	0.1	0.6	0.1	0.6	0.1	26.1	46.8	13.1	22.4	5.3
R07	0.1	0.6	0.1	0.6	0.1	26.1	46.8	13.1	22.4	5.3
R08	0.1	0.7	0.1	0.7	0.1	26.1	46.8	13.1	22.4	5.3
R09	0.1	0.8	0.1	0.8	0.1	26.1	46.8	13.1	22.4	5.3
R10	0.1	0.9	0.1	0.9	0.1	26.1	46.8	13.1	22.4	5.3
R11	0.1	1.0	0.1	1.0	0.1	26.1	46.8	13.1	22.4	5.3
R12	0.1	1.1	0.1	1.1	0.1	26.1	46.8	13.1	22.4	5.3
R13	0.1	1.1	0.1	1.1	0.1	26.1	46.8	13.1	22.4	5.3
R14	0.1	1.0	0.1	1.0	0.1	26.1	46.8	13.1	22.4	5.3

Receptors	Predicted particulate concentration (µg/m^3)									
	Incremental					Cumulative with DCCEEW AQMS				
	TSP	PM_{10}		$PM_{2.5}$		TSP	PM_{10}		$PM_{2.5}$	
	Annual	24-hour max	Annual	24-hour max	Annual	Annual	24-hour max	Annual	24-hour max	Annual
R15	0.0	1.0	0.0	1.0	0.0	26.1	46.8	13.1	22.4	5.3
R16	0.0	0.7	0.0	0.7	0.0	26.1	46.8	13.0	22.4	5.3
R17	0.0	0.5	0.0	0.5	0.0	26.1	46.8	13.0	22.4	5.3
R18	0.0	0.6	0.0	0.6	0.0	26.1	46.8	13.0	22.4	5.3
R19	0.0	0.6	0.0	0.6	0.0	26.1	46.8	13.1	22.4	5.3
R20	0.0	0.5	0.0	0.5	0.0	26.1	46.8	13.1	22.4	5.3
R21	0.1	0.5	0.1	0.5	0.1	26.1	46.8	13.1	22.4	5.3
R22	0.1	0.8	0.1	0.8	0.1	26.2	46.8	13.2	22.4	5.4
R23	0.1	0.9	0.1	0.9	0.1	26.2	46.8	13.2	22.4	5.4
R24	0.2	0.9	0.2	0.9	0.2	26.2	46.8	13.2	22.5	5.4
R25	0.1	0.7	0.1	0.7	0.1	26.1	47.2	13.1	22.6	5.3
R26	0.0	0.6	0.0	0.6	0.0	26.1	46.8	13.1	22.5	5.3
R27	0.0	0.8	0.0	0.8	0.0	26.1	47.1	13.1	22.4	5.3
R28	0.0	0.5	0.0	0.5	0.0	26.1	47.0	13.1	22.4	5.3
R29	0.2	3.1	0.2	3.1	0.2	26.3	47.1	13.2	22.4	5.5
R30	0.3	3.0	0.3	3.0	0.3	26.3	47.2	13.3	22.4	5.5
R31	0.8	7.4	0.8	7.4	0.8	26.8	48.1	13.8	22.4	6.0
R32	0.6	5.9	0.6	5.9	0.6	26.6	47.6	13.6	22.4	5.8
R33	0.5	4.3	0.5	4.3	0.5	26.5	47.3	13.5	22.4	5.7
R34	0.4	3.1	0.4	3.1	0.4	26.4	47.1	13.4	22.4	5.6

Dust deposition impacts

Deposition impacts are assessed against a maximum increase of 2 g/m^2/month and a maximum total of 4 g/m^2/month. Deposition of TSP for each sensitive receptor has been assessed, converted to align with these criteria. No contour dispersion plot has been provided as the predicted levels are so low (less than two per cent at any receptor) compared to the criteria. The assessment indicates no exceedances of the criteria at sensitive receptor locations. The maximum predicted concentration within the modelled area is 0.47 g/m²/month, which is well within the acceptable limits, confirming a compliant level of dust deposition.

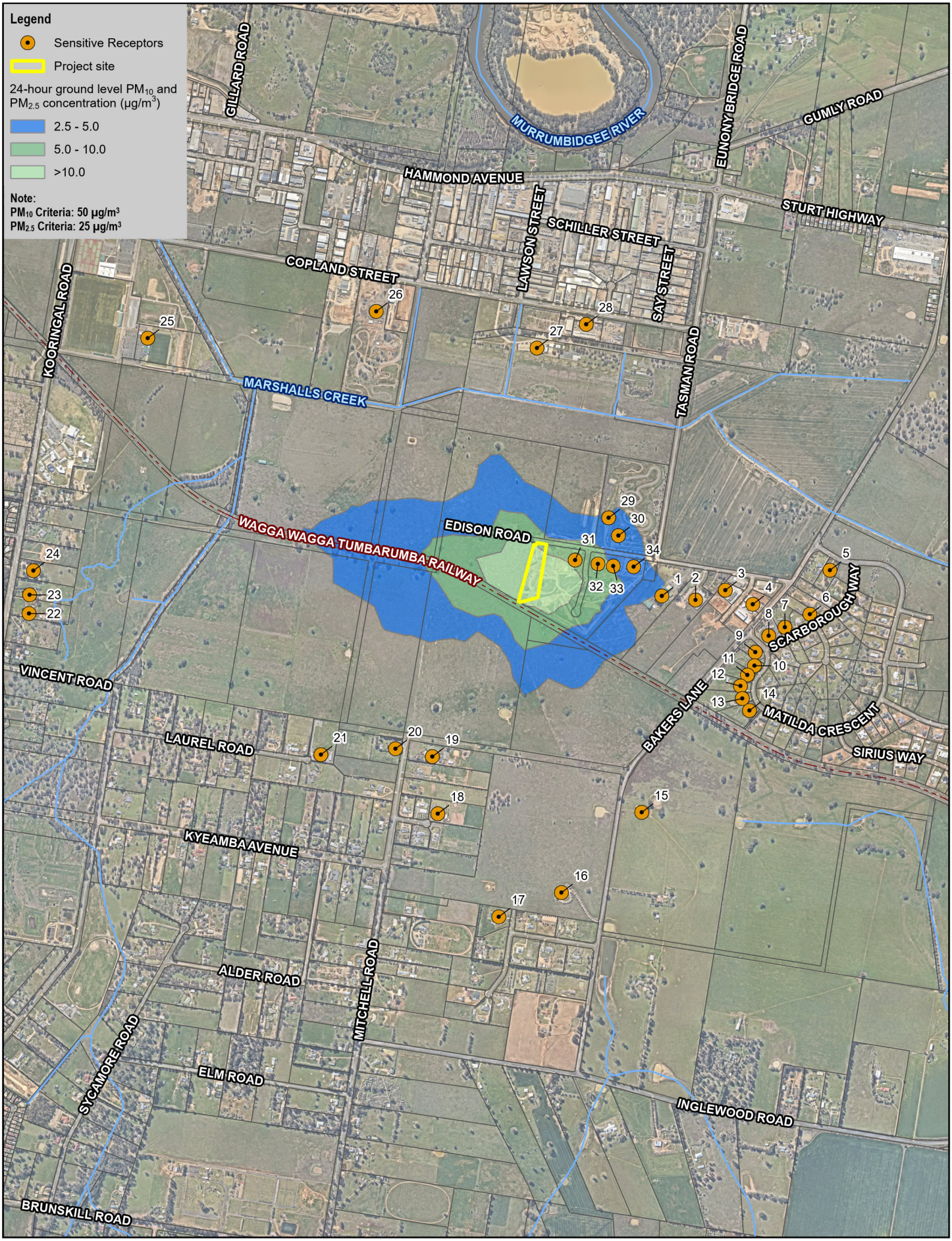
Further detail is provided in Appendix G.

NO_2 impacts

The cumulative NO_2 concentrations were calculated using Ozone Limiting Method (OLM), which assumes that all the available ozone in the atmosphere will react with NO_2 in the plume until either all the O_3 or all the NO is used up. The assessment results indicate that no exceedances of the established criteria were predicted at sensitive receptor locations.

Hydrogen Fluoride impacts

As the criteria applies at the nearest existing or likely future off-site sensitive receptor, no exceedances of criteria were predicted at sensitive receptor locations.



Paper Size ISO A4

0 100 200 300 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility EIS

Predicted incremental 24-hour PM_{10} and $PM_{2.5}$ concentration for proposed operation (µg/m³, 100th percentile)

Project No. **12622054**
Revision No. **0**
Date **12/11/2024**

FIGURE 6.2

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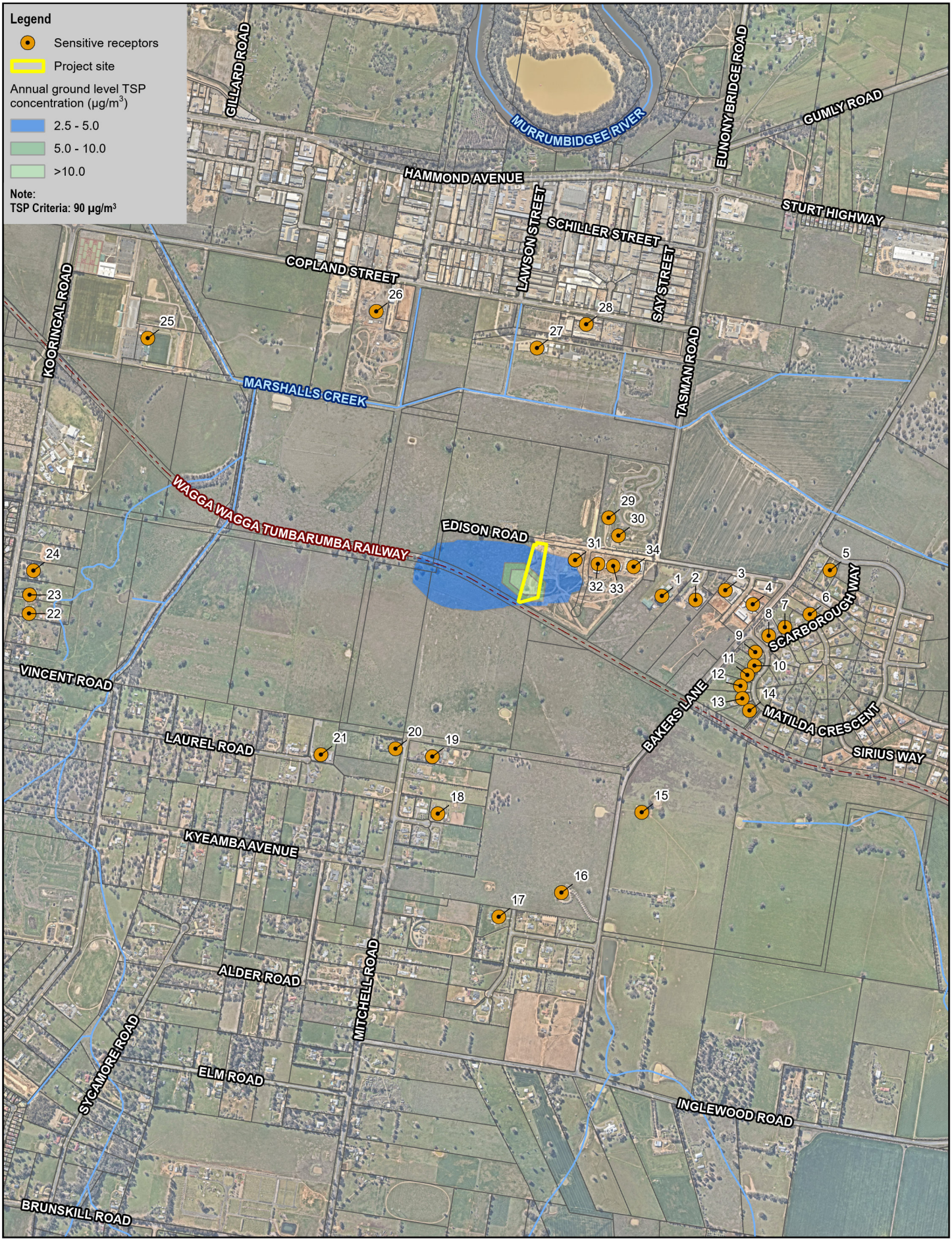
Print date: 12 Nov 2024 - 15:16

Data source: TSP 24hour Contour, Project site boundary, Sensitive receptors - GHD- 20240924, Aerial imagery - NearMap - 2024.. Created by: rvillalon



Paper Size ISO A4

0 100 200 300 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility EIS

Predicted incremental annual TSP concentration for proposed operation (µg/m³, 100th percentile)

Project No. **12622054**
Revision No. **0**
Date **12/11/2024**

FIGURE 6.3

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Print date: 12 Nov 2024 - 15:17

Data source: TSP annual concentration contour, Project site boundary, Sensitive receptors- GHD- 20240924, Aerial imagery - NearMap - 2024. Created by: rvillalon

VOC impacts

A review of sampling data of a like facility was undertaken to determine the top three ranked VOCs in comparison to their individual criteria and were found to be Benzene, Acetaldehyde, and Formaldehyde.

Due to the impact assessment criteria applying at and beyond the boundary of site, the maximum predicted grid values of these compounds compare with the criteria (Appendix G).

Benzene is the VOC predicted to be closest to the criteria however the maximum predicted 99.9th percentile concentration on the modelling domain of 10.4 µg/m^3 is below the criteria of 29 µg/m^3. This indicates that there are no exceedances for all VOCs at and beyond site boundary.

Type 1 and Type 2

The top six ranked metals have been identified and analysed to serve as representative indicators for Type 1 and Type 2 substances. This categorisation is based on the compliance risk ratio, which is determined by dividing the emission rates of these metals by the established criteria. The maximum concentrations of each metal and their criteria is shown in Table 6.15

Table 6.15 Top 6 predicted metals maximum concentrations in type 1 and type 2 substances (99.9 percentile)

Pollutants	Averaging period	Max predicted value(µg/m3)	Criteria (µg/m3)	Percentage of criteria (%)	Source of assessment criteria
Ni	1 hour	0.09	**0.18**	48.2%	NSW Guideline
Co	24 hours	0.02	**0.092**	21.6%	WA Guideline
Mn	1 hour	0.12	**18**	0.7%	NSW Guideline
Pb	Annual	0.003	**0.5**	0.5%	NSW Guideline
Be	1 hour	0.0003	**0.004**	8.1%	NSW Guideline
Cd	1 hour	0.0023	**0.018**	12.6%	NSW Guideline

Further detail on the operational impacts is provided in Appendix G.

6.1.4.4 Cumulative impacts

State significant projects

A review of the DPHI Major Projects website was completed to understand future sources of air pollutants which may contribute to cumulative impacts with the project. New state significant projects (both SSD and State SI projects), with potential for air emissions are summarised in Table 6.16 State significant projects with determinations dated more than three years ago are not included, as it is assumed that emissions from these projects are already accounted for in the ambient air quality monitoring conducted by the DCCEEW. All of these projects are over 4.5 kilometres from the project site and most identified emissions are during the construction phase only. Cumulative impacts are not anticipated.

Table 6.16 Summary of nearby state significant projects with emissions to air

Name of project	Proximity to the project	Project status	Description of project	Expected air emissions
Inland Rail – Albury to Illabo	~4.5 km northwest	Assessment	This project is to build a 1700 km freight rail corridor between Melbourne and Brisbane.	Dust, exhaust fumes, wind-blown rubbish and potential odour impacts from construction.
EnergyConnect	~7 km southwest	Determination (02/09/2022)	Development of a new transmission line connecting Buronga Substation and Wagga Wagga Substation, and construction of the new Dinawan Substation.	Dust, exhaust fumes and wind-blown rubbish from construction.

Name of project	Proximity to the project	Project status	Description of project	Expected air emissions
Belhaven Battery Energy Storage System	~7.2 km southwest	Prepare EIS	Construction and operation of a Battery Energy Storage System including transmission connection and associated infrastructure.	Dust, exhaust fumes and wind-blown rubbish from construction.
Teys Australia Abattoir – MOD 12 – New Plate Freezer & Switch Room	~7.2 km north	Determination (24/10/2022)	Construction of a new plate freezer/store, a new switch room and temporary workshop.	Construction equipment may emit particles and generate dust emissions.
Mod 1 – Uranquinty Compressor Station	~6.8 km north	Prepare Mod Report	Construction and operation of a compressor station at Uranquinty.	Dust, exhaust fumes and wind-blown rubbish from construction. Combustion emissions from operation.

6.1.5 Mitigation and management measures

Key emission controls associated with the project are designed to ensure that all emissions remain below the limits set by the POEO Clean Air Regulation and to minimise emissions as much as reasonably possible. These controls include:

– Cyclone collection station: To remove entrained solids from gases before further treatment
– Post combustion Chamber: To destroy the organic electrolyte, converting it into CO_2 and water
– Caustic scrubbers: To remove HF from the gas stream by reacting it with calcium hydroxide, producing calcium fluoride, which is collected and sold
– Regenerative Catalytic Oxidiser (RCO): To further remove VOCs from the gas stream using a catalyst and electric heater
– Enclosed process equipment: All potential dust-generating steps, such as shredding, drying, milling and screening, are conducted within enclosed systems to prevent dust escape
– Baghouse: To minimise dust by filtering fine entrained solids from the air stream
– Cyclone collector: To remove the majority of entrained solids (dust) from the air stream.

Mitigation measures proposed to avoid or minimise potential air quality during construction and operation of the project are listed in Table 6.17. These measures would be included in the issue-specific environmental management sub-plans for the LIB recycling facility.

Table 6.17 Air Quality and odour mitigation measures

Impact/Aspect	ID	Mitigation Measure	Timing
Construction dust	AQ1	Avoid dry sweeping of large areas.	Construction
Construction dust	AQ2	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Construction
Construction dust	AQ3	Record all inspections of haul routes and any subsequent action in a site log book.	Construction
Plant emissions	AQ4	Obtain and comply with an Environmental Protection Licence (EPL).	Operation
Plant emissions	AQ5	Develop and implement an Air Quality Management Plan prior to commencement of operations.	Operation
Plant emissions	AQ6	Plant and equipment should be maintained in good condition to minimise air emissions that may cause nuisance.	Operation
Plant emissions	AQ7	All stacks are to be sampled upon commissioning. Sampling results are to be compared with emission inventory provided by client and POEO emission limits.	Operation

6.2 Noise and vibration

6.2.1 Overview

A Noise and Vibration Impact Assessment (NVIA) has been prepared for the project and is located in Appendix H. This section summarises the noise and vibration considerations that relate to the construction and operation of the LIB recycling facility, outlines potential impacts associated with the project, and describes how these impacts will be mitigated. The SEARs that relate to noise and vibration are outlined in Table 6.18.

Table 6.18 SEARs for noise and vibration

Requirements	Where addressed
Noise and Vibration –	
a quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards which includes: – the identification of impacts associated with construction, operation and traffic generation at noise affected sensitive receivers, including the provision of operational noise contours and a detailed sleep disturbance assessment	Appendix H and section 6.2.4
– details of noise monitoring survey, background noise levels, noise source inventory and 'worst case' noise emission scenarios	Sections 6.2.3 and 6.2.4
– consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area	Sections 6.2.3 and 6.2.4
– a cumulative impact assessment inclusive of impacts from other developments	Section 6.2.4
– details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of these measures and details of any proposed compliance monitoring programs.	Section 6.2.5

6.2.2 Methodology

6.2.2.1 Government plans, policies and guidelines:

– Interim Construction Noise Guideline (ICNG) (DECC, 2009)
– Noise Policy for Industry (NPfI) (EPA, 2017)
– NSW Road Noise Policy (RNP) (DECCW, 2011)
– Assessing Vibration: A Technical Guideline (DEC, 2006)
– British Standard (BS) BS6472-1: Guide to Evaluation of Human Exposure to Vibration in Buildings *(1 Hz to 80 Hz)* (British Standards, 1992)
– BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 – Guide to damage (British Standards, 1993).

6.2.2.2 Desktop assessment

Noise and vibration modelling was undertaken to estimate the potential noise and vibration impacts associated with the construction and operation of the project. The assessment included:

– Review of information provided by the proponent detailing the proposed construction staging and equipment and operational activities
– Review the study area to identify noise sensitive receivers and key noise catchment areas (NCAs)
– Assessment of the potential for construction noise and vibration impacts
– Assessment of the potential operational noise and road traffic noise impacts
– Provided recommendations for reasonable and feasible management and mitigation measures to adequately manage the identified noise and vibration impacts.

6.2.2.3 Field survey

Noise monitoring was undertaken from Thursday 4 September 2024 until Monday 16 September 2024 at two residential locations to quantify and characterise the existing ambient noise environment across the study area.

6.2.2.4 Construction assessment criteria

Noise management levels

The ICNG provides recommended construction noise management levels (NMLs), which represent a noise level that, if exceeded, would require management measures including:

– Reasonable and feasible work practices
– Contact with the residences to inform them of the nature or works to be carried out, the expected noise levels and durations and contact details.

The management measures are aimed at reducing noise impacts at the residential receivers. The noise affected construction noise management levels during recommended standard hours are not intended as a noise limit but rather a level where noise management is required.

The determination of the NML is dependent on the time of day and the existing rating background level (RBL) at the residential receiver locations. This is explained in further detail in Table 6.19, including a description of each relevant NML. Noise management levels are also provided for other sensitive land uses in the ICNG and are reproduced in Table 6.20.

Table 6.19 Residential construction noise management levels

Time of day	Noise management level, $L_{Aeq(15\ min)}$	Application notes
Recommended standard hours	Noise affected: RBL + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise: – Where the predicted or measured $L_{Aeq(15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. – The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected: 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: – Times identified by the community when they are less sensitive to noise (such as before and after school, or mid-morning or mid-afternoon for works near residences) – If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside standard hours	Noise affected: RBL + 5 dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable measures have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.

Table 6.20 Noise management levels at non-residential sensitive land uses

Land use	Noise management level $L_{Aeq(15min)}$, dBA
Classrooms at schools and other educational institutions	Internal noise level of 45
Active recreation area	External noise level of 60
Industrial premises	External noise level of 75
Commercial premises	External noise level of 70

Construction noise management levels

The noise management levels during construction at sensitive receivers in each NCA are summarised in Table 6.21. Note should be made that all works are proposed to be undertaken during standard hours only, no sleep disturbance impacts are expected and the outside of standard hours NMLs have been provided for reference only.

Table 6.21 Construction noise management levels

Receiver category	NCA	Construction Noise Management Levels, $L_{Aeq(15min)}$, dBA				
		Standard construction hours		Outside standard construction hours		
		Noise affected	Highly noise affected	Day	Evening	Night
Residential	NCA01	45	75	40	39	35
	NCA02	45	75	40	35	35
Classrooms at schools and other educational institutions		External noise level of 55 (when in use)[1]				
Active recreation area		External noise level of 65 (when in use)				
Industrial premises		75 (when in use)				
Commercial premises		70 (when in use)				

Note: 1. Based on 10 dB attenuation through an open window to achieve an internal noise level of 45 dBA.

6.2.2.5 Construction assessment method

Noise modelling was undertaken using SoundPLAN version 9.1. SoundPLAN is a computer program for the calculation, assessment and prognosis of noise exposure. SoundPLAN calculates environmental noise propagation according to *ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors'*. General parameters used in the model are listed in Table 6.22

Table 6.22 Construction noise modelling parameters

Input / assumption	Description
Prediction algorithm	ISO 9613-2
Weather conditions	Based on an average temperature of 10 °C and an average humidity of 70 per cent.
Meteorological conditions	A moderate temperature inversion or downwind meteorological conditions is considered in the ISO 9613-2 prediction algorithm.
Model inputs	
Topography	5 m intervals based on the Digital Elevation Model of Australia derived from LiDAR.
Order of reflection	No reflection was considered in the noise predictions.
Buildings	Buildings in the surrounding area were obtained from a Microsoft building dataset and heights were sampled from LiDAR point cloud data.
Receiver height	1.5 m above floor height (e.g. 1.5 m for ground floor and 4.5 m for first floor).
Ground absorption	0.75 assuming a mix of 75 per cent soft and 25 per cent hard ground for all areas.

Noise level data has been obtained from the Australian Standard *AS2436 – Guide to noise and vibration control on construction, demolition and maintenance sites* and *Construction Noise and Vibration Guideline (Public Transport Infrastructure)* (TfNSW, 2023). Table 6.23 presents the construction equipment proposed for each construction scenario.

Table 6.23 Construction equipment and assumed sound power levels

Plant description	Sound power level	Source
Light vehicles	106	AS2436
Forklifts	106	AS2436
Welder	105	AS2436
Rigid truck	107	AS2436
Franna Crane (20 tonne)	98	CNVG
Articulated truck	107	AS2436
Hand tools	102	AS2436

It should be noted that no vibration intensive equipment is proposed for construction

Based on the construction staging outlined above in Table 3.6, three construction scenarios have been developed. These construction scenarios are presented below in Table 6.24 and have been modelled to determine the potential construction noise impacts on the surrounding residential receivers.

Table 6.24 Construction scenarios

Stage	Scenario ID	Equipment modelled	Typical modelled activity SWL[1]
Delivery of plant and processing equipment in containers	CS01	Light vehicles, forklifts, rigid truck, franna crane, articulated truck	113
Installation of plant and processing equipment inside factory building	CS02	Light vehicles, forklifts, welder, franna crane, hand tools	111
Testing and commissioning	CS03	Light vehicles, forklifts, hand tools	110

6.2.2.6 Operational assessment criteria

Noise Policy for Industry (EPA 2017)

The Noise Policy for Industry (NPfI) provides guidance on the assessment of operational noise impacts. The guideline includes both intrusiveness and project amenity noise levels that are designed to protect receivers from noise significantly louder than the background level, and to limit the total noise level from industry near a receiver.

The NPfI Project Noise Trigger Levels (PNTLs) provide an objective for assessing a project and are not mandatory limits required by legislation. The project noise trigger levels assist the regulatory authorities to establish licensing conditions.

The intrusiveness noise level controls the relative audibility of operational noise compared to the background level at residential receivers. The amenity noise level limits the total level of extraneous noise for all receiver types. Both levels are calculated and the lower of the two in each time period is set as the project noise trigger level. The intrusiveness noise level is assessed over a 15-minute period however the amenity noise level is assessed over the day, evening, or night-time period. For the purposes of assessment to standardise the approach the NPfI recommends that the $L_{Aeq(15min)} = L_{Aeq(period)} + 3$ dBA unless an alternative approach can be justified.

Intrusiveness noise level

The intrusiveness noise level is determined by a 5 dB addition to the measured or adopted RBLs with a minimum intrusiveness noise level of 40 dBA for the daytime period and 35 dBA for the evening and nighttime periods. The NPfI recommends that the intrusiveness noise level for the evening and night time period should not exceed the daytime period. The intrusiveness noise levels are only applicable to residential receivers. Table 6.25 provides the project intrusiveness noise levels in each NCA for each time of day.

Table 6.25 NCA project intrusiveness noise levels

NCA	Time of day	RBL	Intrusiveness noise level
NCA01	Day	35	40
	Evening	34	39
	Night	30	35
NCA02	Day	35	40
	Evening	30	35
	Night	30	35

Project amenity noise level

The recommended amenity noise level applies to all industrial noise in the area which when combined should remain below the recommended amenity noise level. The recommended amenity noise level represents the total industrial noise at a receiver location and a project Amenity Noise Level is set at 5 dBA below the recommended amenity noise level.

Table 6.26 provides the project amenity noise levels for each time of the day. All residential receivers have been classed as rural residential receivers.

Table 6.26 NCA project amenity noise levels

Receiver Type	Time of day	Amenity noise level, $L_{Aeq(period)}$, dBA	Project amenity noise level, $L_{Aeq\ (period)}$, dBA
Rural residential (NCA01 and NCA02)	Day	50	48
	Evening	45	43
	Night	40	38
School classroom	Noisiest 1 hr	35 (internal)	33 (internal)
Active recreation	When in use	55	53
Commercial	When in use	65	63
Industrial	When in use	70	68

Summary of project noise trigger levels – residential receivers

The PNTLs reflect the most stringent noise level requirements from the intrusiveness and project amenity noise level. Daytime, evening, and night-time PNTLs should aim to be achieved as project works may span across a full day. For each NCA, the project noise trigger levels are provided in Table 6.27 and Table 6.28.

Table 6.27 Project noise trigger levels – residential noise receivers

NCA	Time of day	Intrusiveness noise level, $L_{Aeq\ (15\ min)}$ dBA	Project amenity noise level[1], $L_{Aeq\ (15\ min)}$ dBA	Project noise trigger level, $L_{Aeq\ (15\ min)}$ dBA
NCA01	Day	40	48	40
	Evening	39	43	39
	Night	35	38	35
NCA02	Day	40	48	40
	Evening	35	43	35
	Night	35	38	35

Note: 1. A +3 dB factor has been used to adjust amenity noise levels from $L_{Aeq(period)}$ to $L_{Aeq(15\ min)}$

Table 6.28 Project noise trigger levels – non-residential noise receivers

Receiver type	Time of day	Project noise trigger level, $L_{Aeq\ (15\ min)}$ dBA
Educational	Noisiest 1 hr	33 (internal) 43 (external)[1]
Hotel	When in use	40[2]
Active recreation	When in use	53
Commercial	When in use	63
Industrial	When in use	68

Notes: 1. Assuming a reduction of 10 dB is achieved through an open window
2. The daytime PNTL for residential receivers has been adopted for hotels.

Modifying factor corrections

The NPfI requires that corrections for annoying characteristics are applied if the noise level at the receiver contains tonal, intermittent, or low frequency characteristics, which have the potential to increase annoyance. Modifying factor corrections are applied to the noise level at the receiver before comparison to the PNTLs. The modifying factor adjustments are detailed in Table 6.29.

Table 6.30 provides the relevant threshold levels for the low frequency noise assessment.

Table 6.29 NPfI modifying factor corrections

Factor	Assessment / measurement	When to apply	Correction[1,2]
Tonal noise	One-third octave or narrow band analysis	Level of one-third octave band exceeds the level of the adjacent bands on both sides by: – 5 dB or more if the centre frequency of the band containing the tone is in the range of 500 to 10,000 Hz – 8 dB or more if the centre frequency of the band containing the tone is in the range 160 to 400 Hz – 15 dB or more if the centre frequency of the band containing the tone is in the range 25 to 125 Hz.	5 dBA[2]
Low frequency noise	Measurement of C-weighted and A-weighted level	Measure/assess C and A weighted Leq,T levels over same time period. Correction to be applied if the difference between the two levels is 15 dB or more and: – Where any of the one-third octave noise levels in Table C2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2 dBA positive adjustment to measured/predicted A-weighted levels for the evening/night period. – Where any of the one-third octave noise levels in Table C2 are exceeded by more than 5 dBA and cannot be mitigated, a 5 dBA positive adjustment to measured/predicted A-weighted noise levels applies for the evening/night period and a dBA positive adjustment for the daytime period.	2 or 5 dBA[2]
Intermittent noise	Subjectively assessed	When the night-time noise level drops to that of the background noise level with a noticeable change in noise level of at least 5 dBA.	5 dBA

Notes: 1.Where two or more modifying factors are present the maximum correction is limited to 10 dBA.
2.Where a source emits a tonal and low-frequency noise, only one 5 dB correction should be applied if the tone is in the low frequency range.

Table 6.30 One third octave $L_{Zeq,15min}$ threshold level

Hz/dBZ	One third octave $L_{Zeq,15min}$ threshold level								
Freq (Hz)	25	31.5	40	50	63	80	100	125	160
dBZ	69	61	54	50	50	48	48	46	44

Sleep disturbance screening assessment criteria

The NPfI provides guidance for assessing sleep disturbance due to short-term maximum noise events. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages. To assess the potential for disturbance during nighttime hours of operation for the proposed stabling facility (first light to 7am) the NPfI recommends the following as a screening criterion:

– $L_{Aeq,15mi}$ 40 dBA or the prevailing RBL plus 5 dB, whichever is greater, and/or
– L_{AFmax} 52 dBA or the prevailing RBL plus 15 dB, whichever is greater.

Given the rural residential nature of surrounding receivers, and the expected absence of existing maximum noise level events in the area, the minimum screening criteria of L_{AFmax} 52 dBA has been adopted for all NCAs and receivers.

Road noise assessment criteria

The *Road Noise Policy* (RNP) (DECCW, 2011) provides road traffic noise criteria for residential land uses affected by additional traffic on the public road network.

Section 3.4.1 of the RNP states that any increase in the total noise level at existing residences and other sensitive land uses affected by traffic generation on existing roads should be limited to 2 dBA above current levels. Where road traffic noise levels are predicted to increase by more than 2 dBA and the controlling noise criteria (Table 6.31) is also exceeded, feasible and reasonable mitigation and management measures will be considered to minimise impacts. An exceedance of the RNP criteria requires both of the following criteria to be triggered:

– Where a greater than 2.0 dBA increase in road traffic noise levels has been predicted
– An exceedance of the relevant road criteria at a residential receiver.

Table 6.31 RNP controlling noise criteria for additional traffic on public roads

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

6.2.2.7 Operational assessment method

Noise modelling was undertaken using SoundPLAN version 9.1. SoundPLAN is a computer program for the calculation, assessment and prognosis of noise exposure. SoundPLAN calculates environmental noise propagation according to *ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors'*. General parameters used in the model are listed in Table 6.32.

Table 6.32 Operational noise modelling parameters

Input / assumption	Description
Prediction algorithm	ISO 9613-2
Weather conditions	Based on an average temperature of 10 °C and an average humidity of 70%
Meteorological conditions	A moderate temperature inversion or downwind meteorological conditions is considered in the ISO 9613-2 prediction algorithm.
Model inputs	
Topography	5 metre intervals based on the Digital Elevation Model of Australia derived from LiDAR
Order of reflection	1 order of reflection was considered in the noise predictions
Buildings	Buildings in the surrounding area were obtained from a Microsoft building dataset and heights were sampled from LiDAR point cloud data.

Input / assumption	Description
Receiver height	1.5 m above floor height (e.g. 1.5 m for ground floor and 4.5 m for first floor)
Ground absorption	0.75 assuming a mix of 75% soft and 25% hard ground for all areas.

6.2.3 Existing environment

6.2.3.1 Sensitive receivers

Noise and vibration sensitive receivers are defined based on the type of occupancy and the activities performed in the land use. Sensitive noise and vibration receivers could include:

– Residential dwellings.
– Classrooms.
– Hospitals.
– Places of worship.
– Passive and active recreational areas such as parks, sporting fields, golf courses. Note that these recreational areas are only considered sensitive when they are in use or occupied.
– Hotels, motels, caretaker's quarters, holiday accommodation and permanent resident caravan parks.

Within the study area residential, educational, industrial, commercial, hotel and active recreational receivers have been identified. The nearest residential receivers to the site are located on Matilda Crescent, approximately one kilometre to the east. The study area has been divided into two Noise Catchment Area (NCAs) with similar noise environments. NCA1 is representative of the residential receivers to the east of the project site, and NCA2 is representative of the residential receivers to the south of the project site.

6.2.3.2 Existing Noise environment

Noise monitoring was undertaken from Thursday 4 September 2024 until Monday 16 September 2024 at two residential locations to quantify and characterise the existing ambient noise environment across the study area. The long-term noise monitoring program was undertaken in accordance with the *Approved methods for measurement and analysis of environmental noise* (EPA, 2022) and rating background noise levels (RBLs) were calculated in accordance with the NPfI. The noise monitoring locations are shown on Figure 6-4 and the unattended noise monitoring results are presented in Table 6.33.

Table 6.33 Unattended noise monitoring results

Location	Address	Rating Background Level[1] $L_{A90(Period)}$, dBA			Ambient noise descriptors[1] $L_{Aeq(period)}$, dBA		
		Day	Evening	Night	Day	Evening	Night
M1	1 Mitchell Road, Wagga Wagga	35	34	30	54	43	45
M2	41 Matilda Crescent, Governors Hill	35 (33)[2]	30 (29)[2]	30 (22)[2]	52	43	41

Notes: 1. The *Noise Policy for Industry (NPfI)* (EPA, 2017) defines day, evening and night-time periods as:
- Day: 7am to 6pm Monday to Saturday and 8am to 6pm Sunday
- Evening: 6pm to 10pm
- Night: 10pm to 7am Monday to Saturday and 10pm to 8am Sunday.
Where the measured background level is above the minimum RBL provided in Table 2.1 of the NPfI, the minimum RBL is adopted in accordance with the NPfI

Paper Size ANSI A

0 0.5 1 km

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

GHD

Calibre Metals
Wagga Wagga Lithium Ion Battery Recycling Facility EIS

Noise sensitive receivers and noise monitoring locations

Project No. **12622054**
Revision No. **-**
Date. **05/11/2024**

FIGURE 6-4

Document Path: \\ghdnet\ghd\AU\Wagga Wagga\Projects\23\12622054\Tech\Noise\04_GIS\WaggaLIB.qgz

Print Date:

Data Source: Nearmap

Created By: Rosy Browell

6.2.3.3 Meteorological conditions

Wind effect

The Noise Policy for Industry (NPfI) recommends consideration of wind effects if they are “significant”. The NPfI defines “significant” as the presence of source-to-receiver wind speed (measured at 10 metres above ground level) of three metres per second or less, occurring for 30 per cent of the time in any assessment period and season.

A thorough review of the vector components of hourly wind data from 2016 to 2022 was undertaken for data from the BoM Wagga Wagga AMO (number 072150). The BoM observations are approximately 4.5 kilometres west of the site.

The analysis identified that significant wind effects were not found to be a feature of the area, as per the NPfI.

The wind roses (2016 to 2022) for wind speeds less than 3 metres per second in each NPfI assessment period and for each season. Appendix G provides a summary of the prevailing wind conditions that are relevant to the assessment.

Temperature inversions

Temperature inversions typically occur during the night-time period in the winter months and have the potential to also increase noise levels from ground operations. As per the NPfI, temperature inversions are to be assessed when they are found to occur for 30 per cent of the time or greater during the winter months. Stability categories have been determined using the Turner Scheme, as described in Fact Sheet D1 of the NPfI.

Table 6.34 provides the percentage breakdown of stability categories present at the Wagga Wagga AMO weather station between 2016 and 2022. The categories are split into the day and night periods and by season. Temperature inversions occur during stability categories E, F and G, corresponding to weak, moderate and strong inversions respectively. For the purposes of noise assessments, only moderate and strong inversions are considered significant.

The sum total of F and G inversions are greater than 30 per cent during each season therefore the project area is considered to be significantly affected by inversions warranting consideration in the noise assessment.

Table 6.34 Night time stability category percentages – Wagga Wagga AMO 2016 to 2022

Classes	Summer	Autumn	Winter	Spring
E	34%	29%	28%	29%
F	26%	32%	31%	26%
G	11%	16%	16%	11%
F and G	**37%**	**48%**	**47%**	**37%**

Atmospheric conditions

Temperature and humidity affect how sound is absorbed by the atmosphere. With a fixed temperature at 15 ºC, a decrease in relative humidity from 80 to 20 per cent can decrease the sound level at a listener standing 800 metres from the noise source by 3 dB (at 1000 Hz). Fixing the relative humidity at 80 per cent, an increase in temperature from 15 ºC to 30 ºC can decrease the sound level 800 metres from the noise source by 3 dB (at 1000 Hz).

Adopting an average temperature of 10 °C and average humidity of 70 per cent is generally representative of the atmospheric conditions for environmental noise propagation and is considered appropriate for the purposes of this assessment.

6.2.4 Potential Impacts

6.2.4.1 Construction noise

The construction noise levels are predicted to comply with the NMLs at all receivers in the study area for both standard construction hours and outside of standard hours work during the day period. A summary of the highest predicted construction noise levels for each receiver type is shown in Table 6.35. An overview of the predicted construction noise levels at all sensitive receivers is included in Appendix C of the NVIA located in Appendix H. As a worst-case approach was used, the construction noise levels are likely to be lower than the presented noise levels.

Table 6.35 Summary of predicted construction noise levels

Receiver ID	Receiver type		NML (dBA)	Highest predicted noise level ($L_{Aeq(15min)}$, dBA)		
				CS1	CS2	CS3
R273	Residential	NCA1	40	39	38	37
R077	Residential	NCA2	40	38	37	36
R067	Hotel		40	28	26	25
R415	Education		55	30	29	28
R148	Active Recreation		65	50	44	43
R289	Commercial		70	28	26	25
R164	Industrial		75	59	56	55

6.2.4.2 Operational noise

Noise modelling results indicate compliance at all sensitive receivers during the operation of the project. The residential receivers with the highest predicted noise levels from both NCAs are presented in Table 6.36 showing the highest predicted noise levels are 34 dBA at R273 (1 Mitchell Rd, Lake Albert) and R077 (49 Matilda Crescent, Gumly Gumly). The partial contribution of sources at the aforementioned residential receivers indicate that the chimney sources are the primary contributors, with the open roller door on the western façade also being a significant contributor at R273 (see Figure 6-5), situated south west of the project site.

The highest predicted noise level at each non-residential receiver type is shown in Table 6.37 and predicted operational noise levels at all sensitive receivers is included in Appendix H.

Table 6.36 Highest predicted residential noise levels

RID	Address	NCA	Project Noise Trigger Level $L_{Aeq(15min)}$, dBA	Predicted $L_{Aeq(15\ min)}$ noise levels, dBA	Compliance
R273	1 Mitchell Road, Lake Albert	NCA1	40	34	Yes
R077	49 Matilda Crescent, Gumly Gumly	NCA2		34	Yes
R082	45 Matilda Crescent, Gumly Gumly	NCA2		33	Yes
R078	47 Matilda Crescent, Gumly Gumly	NCA2		33	Yes
R083	41 Matilda Crescent, Gumly Gumly	NCA2		33	Yes
R085	43 Matilda Crescent, Gumly Gumly	NCA2		32	Yes
R280	11 Mitchell Road, Lake Albert	NCA1		31	Yes
R347	15 Laurel Road, Lake Albert	NCA1		31	Yes
R303	Somerset, 2 Mitchell Road, Lake Albert	NCA1		31	Yes
R066	17 Scarborough Way, Gumly Gumly	NCA2		30	Yes

Table 6.37 Highest predicted non-residential noise levels

RID	Address	Type	Project Noise Trigger Level $L_{Aeq(15min)}$, dBA	Predicted $L_{Aeq(15\ min)}$ noise levels, dBA	Compliance
R415	Wagga Wagga Christian College, 401 Kooringal Road, Kooringal	Education	43	25	Yes
R067	Seven Inn, 3935 Sturt Highway, Gumly Gumly	Hotel	40[2]	23	Yes
R147	Wagga & District Kart Racing Club, 56 Tasman Road, East Wagga Wagga	Active recreation	53	39	Yes
R289	Wagga Bike Tyres, 238 Hammond Avenue, East Wagga Wagga	Commercial	63	21	Yes
R164	91/DP1299517	Industrial	68	49	Yes

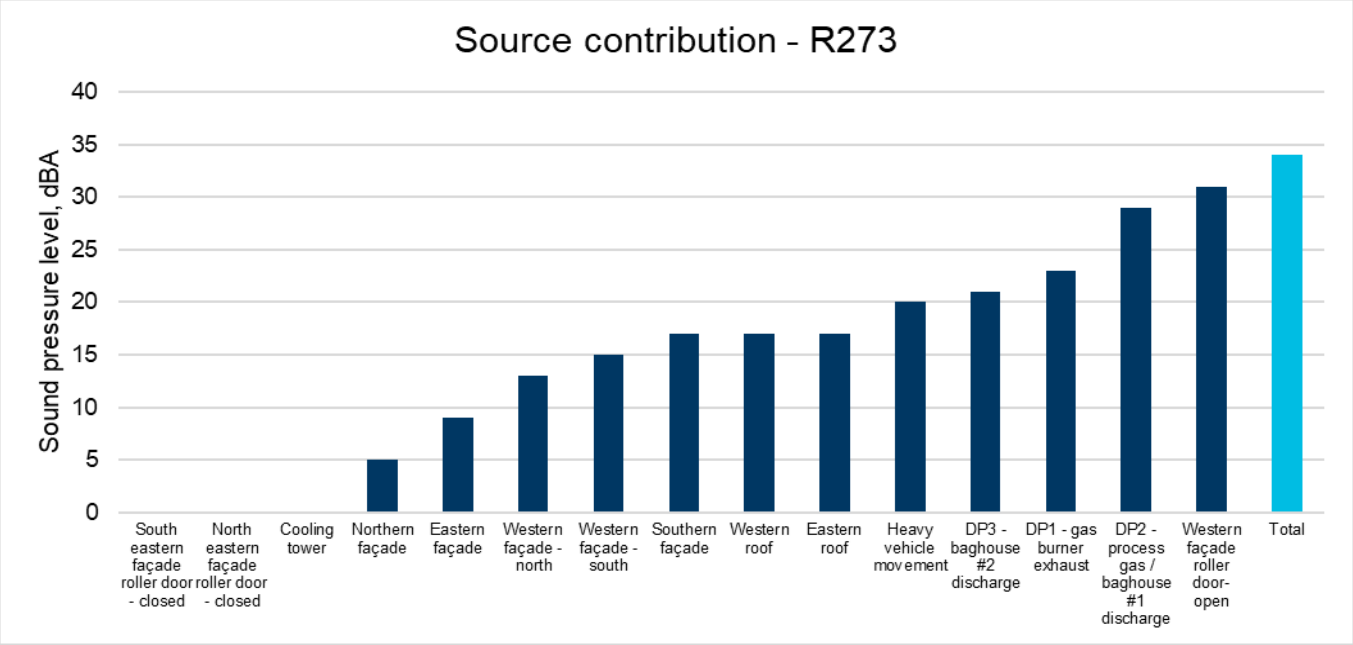


Figure 6-5 Source Contribution R273

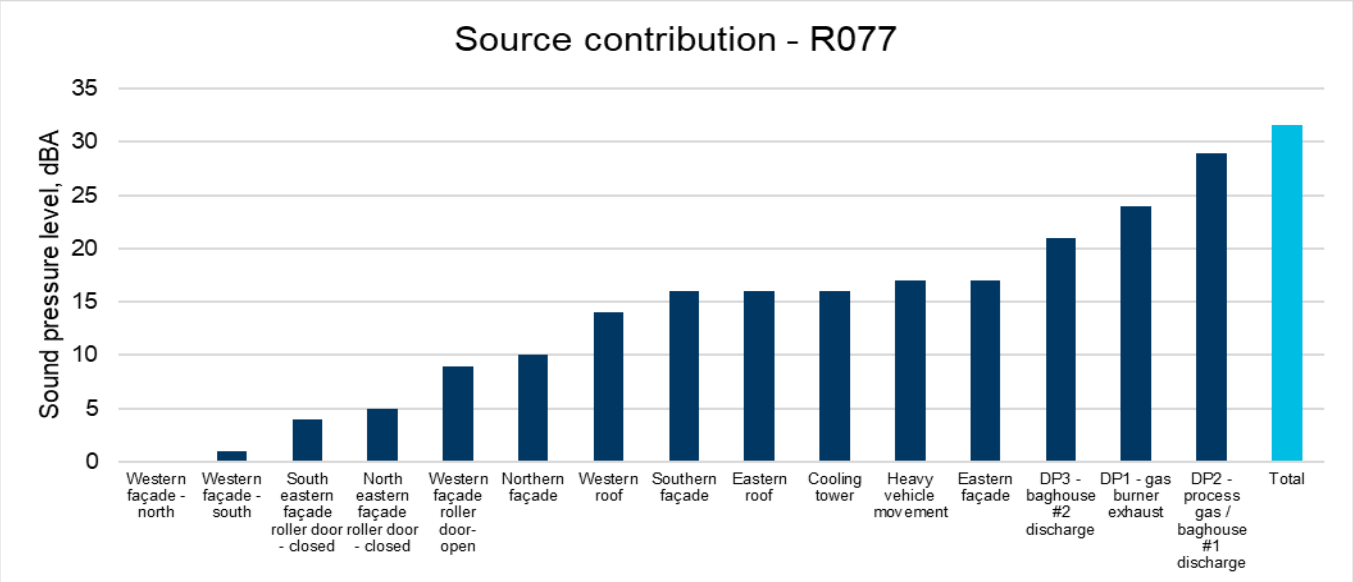


Figure 6-6 Source Contribution R077

An analysis of annoying noise characteristics was undertaken at the representative receivers and no tonal or low frequency characteristics were found at the residential receivers.

6.2.4.3 Road noise

The site is accessible via Edison Road, Tasman Road and Sturt Highway. Edison Road is a 50 kilometres per hour sealed road with a single lane in each direction. The existing site entrance is designed to accommodate articulated vehicles and will be used for the project purposes. The surrounding road network is designed and regularly subject to conveying heavy vehicles to service the East Wagga industrial area.

During construction, delivery of equipment to site is estimated to take 16 x 40-foot shipping containers and as such require 16 semi-trailer vehicles, which is a small number of vehicles when compared to existing as described in section 6.3.3.3. Following the delivery of all construction equipment, construction vehicle activity will reduce to a single movement per day of a Franna crane, plus the occasional small delivery truck or van.

The operation phase of the project will involve the transport of any incoming LIB waste for processing and recycling as well as the transport of any outgoing products. The transport of incoming and outcoming LIB waste or products is anticipated to generate up to a maximum of two heavy vehicle movements per day. The expected increase in heavy vehicle traffic is extremely low and is likely to have a negligible impact on the local road network.

Based on the existing road volumes, and the expected traffic generation from the project, the additional traffic generated during the construction and operational phases of the project would result in a negligible increase in road traffic noise levels along Sturt Highway.

As no residential dwellings are located on Edison Road and Tasman Road and the assumed existing high number of heavy vehicles on this route, no impacts are anticipated due to traffic generation from the project during construction or operation.

6.2.4.4 Cumulative impacts

A review of NSW state significant projects showed no other projects, existing or proposed that have the potential to generate cumulative impacts for sensitive receivers within the study area.

The project is located on Lot 107 within the Flip Screen Industrial Estate where other noise generating industry may accommodate the adjacent lots and contribute to the cumulative noise level of the area. However, it is unknown how many noise generating sites would be situated within the industrial estate and the potential noise level arising from these sites. As the project is proposed to operate only during daytime hours, the risk of cumulative noise impacts on residential receivers is reduced. The operational noise levels are predicted to comply with the more stringent project intrusiveness criteria during the proposed operating hours and as such cumulative impacts are not anticipated from the project.

6.2.5 Mitigation and management measures

Mitigation measures proposed to avoid or minimise potential air quality during construction and operation of the project are listed in Table 6.38. These measures would be included in the issue-specific environmental management sub-plans for the LIB recycling facility.

As no exceedances of the project noise trigger levels are predicted for operation, no additional mitigation is required.

Table 6.38 Noise and vibration mitigation measures

Impact/Aspect	ID	Measure	Timing
Site inductions	NV1	All employees, contractors and subcontractors are to receive an environmental induction. The induction should include: – All relevant project specific and standard noise mitigation measures – Relevant licence and approval conditions – Permissible hours of work – Location of nearest sensitive receivers – Construction employee parking areas – Designated loading/unloading areas and procedures – Site opening/closing times (including deliveries) – Environmental incident procedures.	Construction
Behavioural practices	NV2	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.	Construction / Operation
Implement community consultation measures	NV3	Contact will be established with the local residents and the construction program and progress communicated on a regular basis, particularly when noisy activities are planned. Affected receivers will be notified of the intended work, its duration and times of occurrence. This may include a local community update letters for specific construction activities and a project info line.	Construction
Implement complaints management measures	NV4	Complaints will be managed in accordance with the procedure outlined below. Signage at each site will clearly and visibly provide a contact number and name to receive complaints and enquiries about construction. In this instance the response would be to: – Verbally respond to complainant – Provide a written response within seven calendar days if the complaint cannot be resolved verbally – Log the complaint, and any actions taken with regards to the complaint within a complaints register – Undertake monitoring at the complainant's residence(s) – Investigate the nature and reasons of the impact – Investigate and implement further mitigation measures to minimise the impact.	Construction
Construction hours and scheduling	NV5	Comply with the recommended standard construction hours outlined by the ICNG, unless out of hours work has been approved. No truck movements before 7am or after 6pm. For any work that would take place outside of normal construction hours: – Undertake an assessment of the potential noise impacts associated with the proposed activities and outline specific mitigation measures – Residents potentially affected by such activities will be notified at least five days before hand – Minimise consecutive night activities in the same locality and provide periods of quiet if activities occur for extended periods during the night – Conduct activities in a manner that eliminates or minimises the need for audible warning alarms.	Construction
Equipment selection	NV6	Use quieter construction methods where reasonable and feasible.	Construction

Impact/Aspect	ID	Measure	Timing
Use and siting of plant	NV7	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers.	Construction / Operation
Maintain equipment	NV8	Regularly inspect and maintain equipment to ensure it is in good working order. Equipment must not be unless it is in good operating condition. For machines with enclosures, check that doors and door seals are in good working order and that the doors close properly against the seals. Return any hired equipment that is causing noise that is not typical for the equipment – the increased noise may indicate the need for repair.	Construction / Operation
Plan worksites and activities to minimise noise	NV9	Plan traffic flow, parking and loading unloading areas to minimise reversing movements within the site.	Construction / Operation
Minimise disturbance arising from delivery of goods to construction sites	NV10	Loading and unloading of materials/deliveries is to occur during standard construction hours. Contractors are to avoid dropping materials from height where practicable, during loading and unloading. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.	Construction / Operation

6.3 Traffic and transport

6.3.1 Overview

This section describes the traffic and transport considerations that relate to the construction and operation of the LIB recycling facility, outlines potential impacts associated with the project, and provides details on how these impacts will be mitigated. The SEARS related to traffic and transport are outlined in Table 6.39.

Table 6.39 SEARs for traffic and transport

Requirements	Where addressed
Traffic and Transport –	
a quantitative traffic impact assessment (TIA) prepared in accordance with relevant Roads and Maritime Services and Austroads guidelines, that includes:	Section 6.3
– the development to be addressed in two (2) distinct stages as follows: • Establishment phase – the transport of materials and equipment/components for the establishment of the facility and ancillary infrastructure, the movement and parking of construction related vehicles, including personal vehicles, during the construction period • Operational phase – the traffic generation due to the operation, maintenance and servicing of the various elements of the project	Section 6.3.4
– details of all daily and peak traffic volumes likely to be generated during all key stages of establishment and operation, including a description of key access / haul routes, vehicle types and potential queuing impacts	Section 6.3.4
– an assessment of the predicted impacts of this traffic on road safety and the capacity of the local and regional road and rail networks, including consideration of cumulative traffic impacts on existing performance levels of nearby intersections (including the intersections of Tasman Road / Bakers Lane with the Sturt Highway), using a calibrated SIDRA (or similar) traffic model plans demonstrating how all vehicles likely to be generated during establishment and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network	Sections 6.3.3 and 6.3.4 and Appendix F
– plans demonstrating how all vehicles likely to be generated during establishment and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network	Section 6.3.4 and Appendix A - A-1 and A-2
– details and plans of the proposed internal road network, loading docks, pedestrian and cycling facilities and on-site parking in accordance with the relevant Australian Standards	Section 6.3.4 and Appendix A - A-1 and A-2
– details of the largest vehicle anticipated to access and move within the site, including swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site and at key intersections	Sections 3.5.3, 6.3.3, 6.3.4. Appendix F and Appendix A - A-1 and A-2
– a Construction Transport Management Plan and Driver Code of Conduct to outline measures to manage traffic related issues generated by the development.	Section 6.3.5

6.3.2 Methodology

This scope of the TIA included:

– An assessment of the surrounding road network base on a desktop review utilising the following data sources:
  - Guide to Road Design Part 3: Geometric Design (Austroads, 2021)
  - Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads, 2021)
  - Guide to Traffic Management Part 6: Interchanges, Intersections and Crossing Management (Austroads, 2020)
  - Guide to Traffic Generating Developments (Roads and Maritime Services, 2000)
  - Roads and Maritime Services Traffic Modelling Guidelines (2013)

A review of the assessments for the Stage 1 Flip Screen Industrial Estate was undertaken, including:

– Traffic Impact Assessment (TIA) prepared by Intersect Traffic (2022) for the Stage 1 Flip Screen Industrial Estate was also completed (refer to Appendix 5 of the Stage 1 Flip Screen Industrial Estate Appendix F - F-1).
– The vehicle swept path analysis (refer to Appendix A - A-1 and A-2)

The following assumptions were made in preparation of the TIA:

– The assessment of the surrounding road network was based on a desktop review.
– The existing traffic volumes along Sturt Highway and Tasman Road were determined based on data provided by Transport for New South Wales (TfNSW).
– A one-way mid-block capacity of 1,200 passengers per car per hour per lane (pc/h/lane) applies to the arterial roads in proximity to the subject site, including Sturt Highway.
– A one-way mid-block capacity of 900 pc/h/lane applies to the other roads in proximity to the subject site, including Tasman Road.
– SIDRA intersection analysis for the intersection of Sturt Highway / Tasman Road and Eunony Bridge Road was undertaken based on its existing geometry and the traffic data provided by TfNSW.
– A mid-block analysis assesses the volume capacity ratio (VCR) of a road and measures its operation and congestion.

6.3.3 Existing environment

6.3.3.1 Key roads

The project is located on Edison Road, East Wagga Wagga. The site is accessed via Edison Road, Tasman Road and Sturt Highway, as detailed in section 3.4.4.

The existing road network providing access to the project is shown in Figure 6-7. Details of the key roads are provided below in Table 6.40.

Table 6.40 Roads and key attributes in the project area

Road	Key attribute
Edison Road	A 50 km/hr sealed road with a single lane in each direction. It is an east-west local road that provides direct access to the site. It is a new road built specifically for the new Flip Screen industrial estate subdivision in which the project site is located. The road joins Tasman Road at a T-intersection to the east of the subject site. Edison Road (to the west of Tasman Road) operates as a cul-de-sac, and as such, traffic on this section of Edison Road will be associated with employees and visitors of the industrial estate.
Tasman Road	A north-south local road, approximately 1.5 km in length, that provides a connection between Edison Road and the Sturt Highway. Tasman Road is an 80 km/hr zone from Edison Road to the Copland Street intersection, after which the speed limit is reduced to 60 km/hr up to the northern end of Tasman Road at the roundabout with Sturt Highway.
Sturt Highway (A20)	Provides a sub-arterial link between the Hume Highway (M31) and Buronga in NSW, extending through to Adelaide in South Australia. The Sturt Highway (Hammond Avenue within proximity of site) provides an undivided carriageway with a single lane in each direction and dedicated turn lanes provided in each direction on approach to the roundabout at Tasman Road/Eunony Bridge Road intersection.

The layout of the intersection of the intersection of Sturt Highway, Tasman Road and Eunony Bridge Road is displayed in Figure 6-7.

Figure 6-7 Sturt Highway/Tasman Road intersection layout

6.3.3.2 Active and public transport

There are no footpaths or bike paths on the roads in proximity to the project site. The 965-bus service, Forest Hill to Wagga Wagga, operates on the Sturt Highway in proximity to the subject site. The 965 bus service typically operates with a two hour frequency on weekdays and weekends.

6.3.3.3 Current volumes

Traffic data for the key roads in proximity to the subject site has been provided by TfNSW. The daily average traffic counts recorded between 23 October 2019 and 29 October 2019 on Sturt Highway west of Tasman Road are provided in Table 6.41 and Figure 6-8.

Table 6.41 Daily average traffic counts

Date Range	Location	Weekly average, including weekends (vehicles per day)	Weekday Average (vehicles per day)
23 October to 29 October 2019	Eastbound-Hammond Avenue-East Wagga Wagga-West of Tasman Road	5,146	5,503
	Westbound-Hammond Avenue-East Wagga Wagga-West of Tasman Road	5,219	5,638

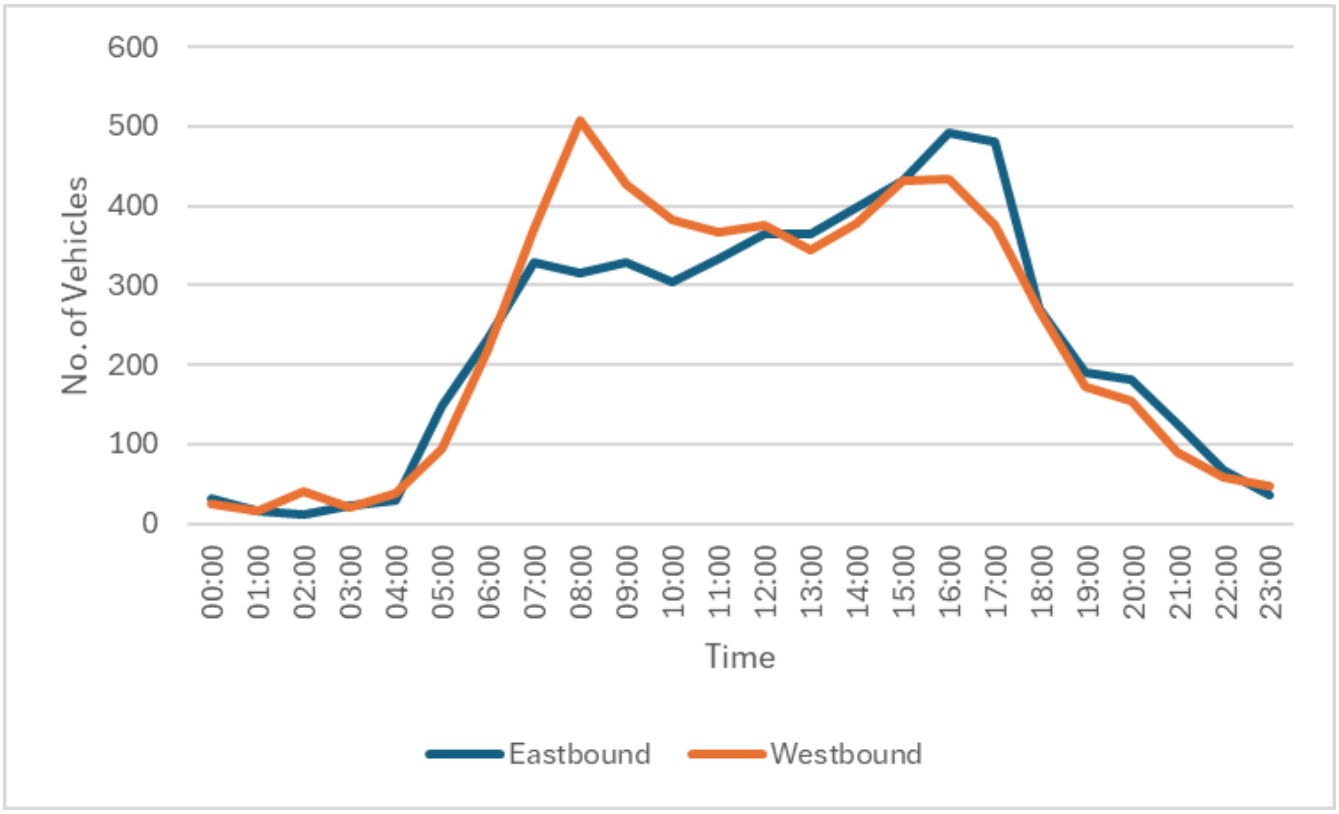


Figure 6-8 Average weekday profile on Sturt Highway west of Tasman Road

Analysis of the traffic survey data shown in Table 6.41 and Figure 6-8 indicates that:

– The AM peak hour was recorded between 8am and 9am, with 314 eastbound vehicles and 507 westbound vehicles.
– The PM peak hour was recorded between 4pm and 5pm, with 491 eastbound vehicles and 433 westbound vehicles.
– Vehicles are predominantly westbound on the Sturt Highway in the AM peak and are approximately equal in the PM peak.

An intersection count of Sturt Highway, Tasman Road and Eunony Bridge Road was undertaken in March 2024 for the following peak periods of road network activity.

– AM peak period: 6am to 10am
– PM peak period: 3pm to 7pm.

A review of the traffic data indicated that

– The morning traffic peak hour occurs between 7.45am to 8.45am
– The afternoon traffic peak hour occurs between 4.30pm to 5.30pm.

The 2024 peak hour traffic volumes at the intersection of Sturt Highway, Tasman Road and Eunony Bridge Road are displayed in Figure 6-9.

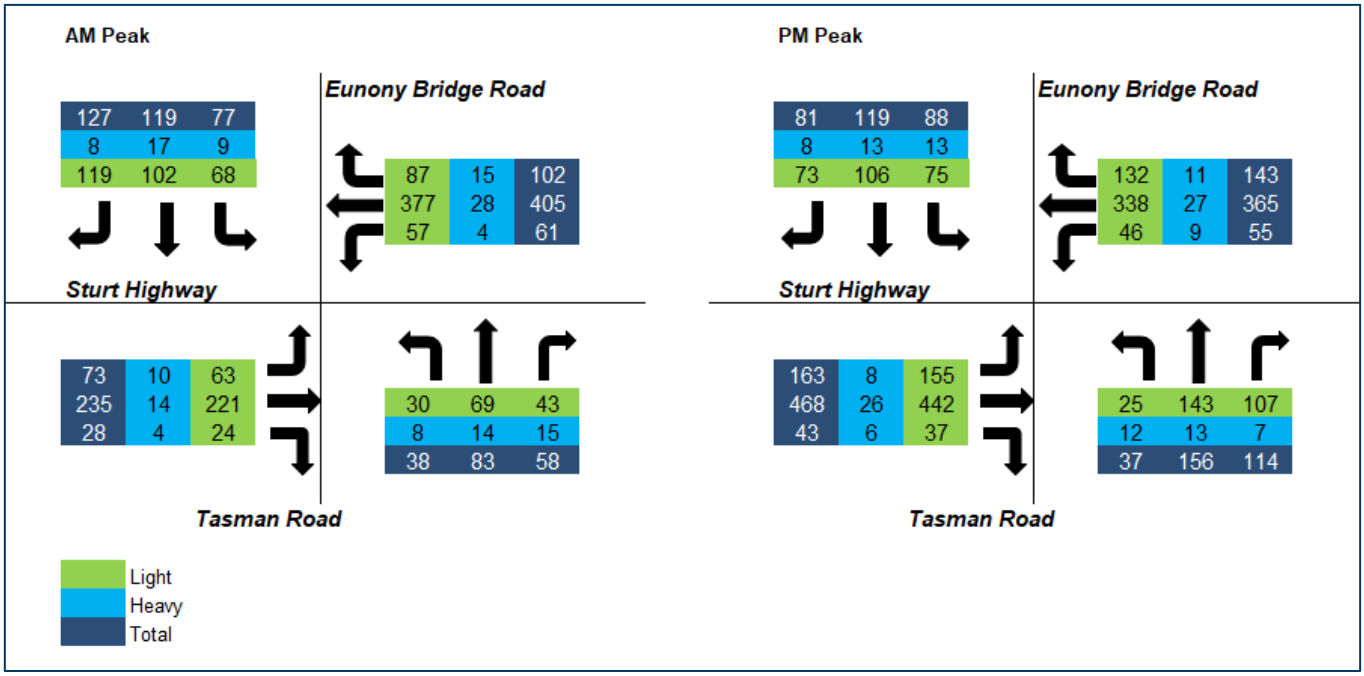


Figure 6-9 Peak hour traffic volumes

The data in Figure 6-9 indicates that:

– Sturt Highway accommodates approximately 330 to 570 veh/h/lane in the AM peak and 480 to 670 veh/h/lane in the PM peak.
– Tasman Road accommodates approximately 180 to 200 veh/h/lane in the AM peak and 220 to 310 veh/h/lane in the PM peak.

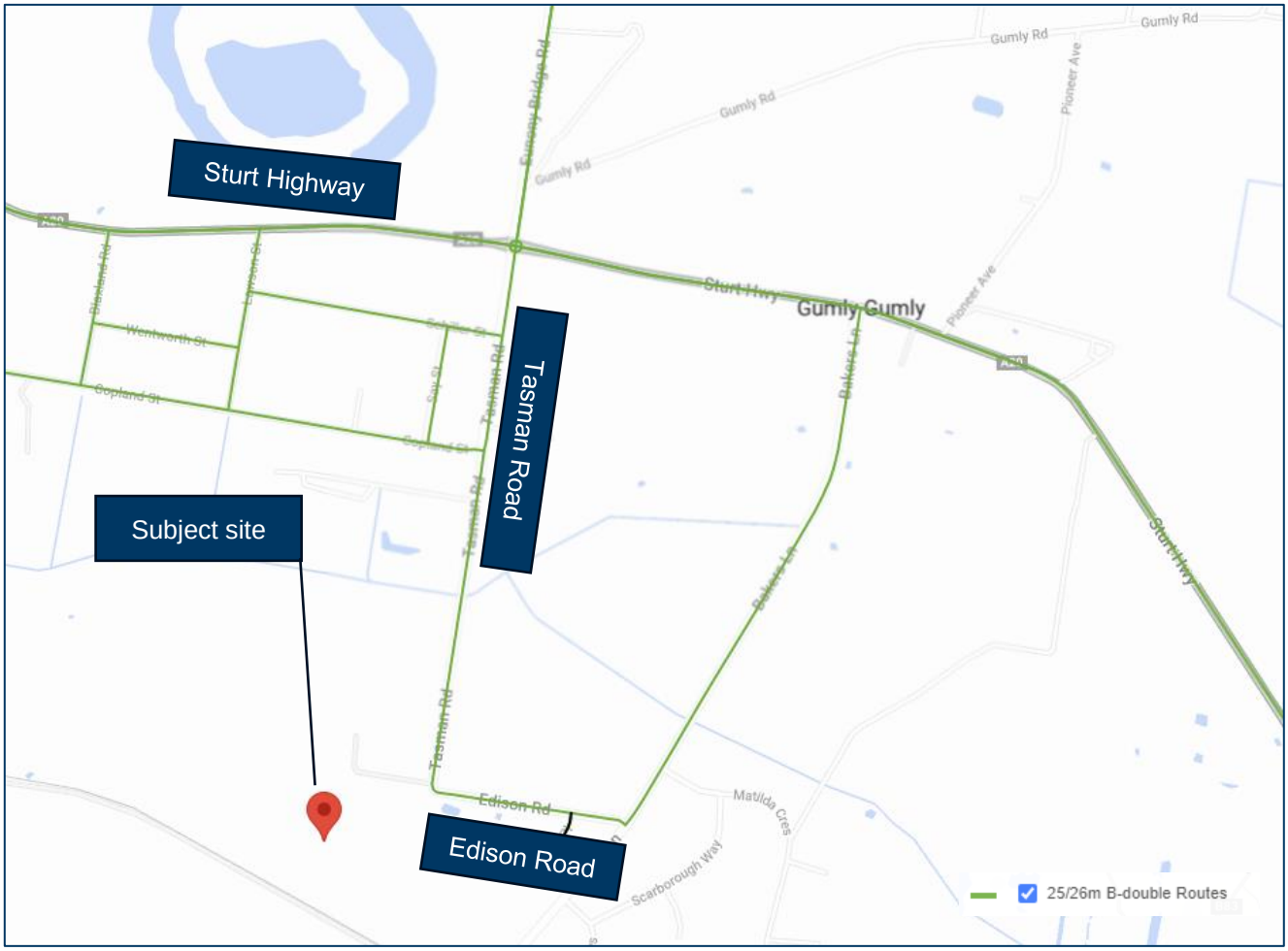
6.3.3.4 Heavy vehicle routes

As detailed in Section 3.4, the largest vehicle expected to access the subject site during construction and operation is a semi-trailer with characteristics of the vehicles included in Table 6.42. The driveway at the site is 106 metres long, sufficient to queue a minimum of four semi-trailers in a single file and this is consistent with the swept path analysis (refer to Appendix A - A-1 and A-2) and the TIA (Intersect Traffic, 2022) (refer to Appendix 5 of the SEE (SKM, 2022) in Appendix F - F-1) prepared for the completed for the Stage 1 Flip Screen Industrial Estate. Thus, daily construction heavy vehicle movements can be accommodated on site with consideration given to peak heavy vehicle movements as outlined in section 6.3.4.

Table 6.42 Construction and operation vehicle size

Mobile Equipment	Description
Rigid trucks	– Courier truck / delivery – 8x to 12x pallet trucks – Delivering small parts and materials from local suppliers during construction
Single articulated vehicle (prime mover and trailer)	– Standard single semitrailer (construction) • Delivering 40 ft shipping containers containing process equipment • one 40 ft container per truck – Standard single semitrailer (operation) • Delivering up to 25 tonne waste LIB

Outputs from the TfNSW Restricted Access Vehicle (RAV) map indicate that the key roads in Wagga Wagga that are proposed to provide access/egress to and from the subject site are authorised to accommodate vehicles up to the size of a 26-metre B-double truck (refer to Figure 6-10).



Source: TfNSW modified by GHD

Figure 6-10 26 metre B-double roads

6.3.3.5 Intersection performance

The intersection of Sturt Highway / Tasman Road / Eunony Bridge Road has been assessed using SIDRA software.

The criteria for evaluating the operational performance of intersections are provided by the Guide to Traffic Generating Developments (TfNSW, 2002) and reproduced in Table 6.43 The operational performance assessment of intersections is based on 'Level of Service' (LoS), a quantitative measure that relates to the average delay experienced by vehicles.

Typically, a LoS D or better is considered to be an acceptable level of operation.

Table 6.43 Level of Service (LoS) criteria for intersections

Level of Service	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident Study required

Level of Service	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
E	57 to 70	At capacity, at signals, incidents will cause excessive delays. Roundabouts require other control modes	At capacity, requires other control mode
F	> 70	Over Capacity Unstable operation	Over Capacity Unstable operation

The layout of the intersection of interest, as modelled in SIDRA, is displayed in Figure 6-11.

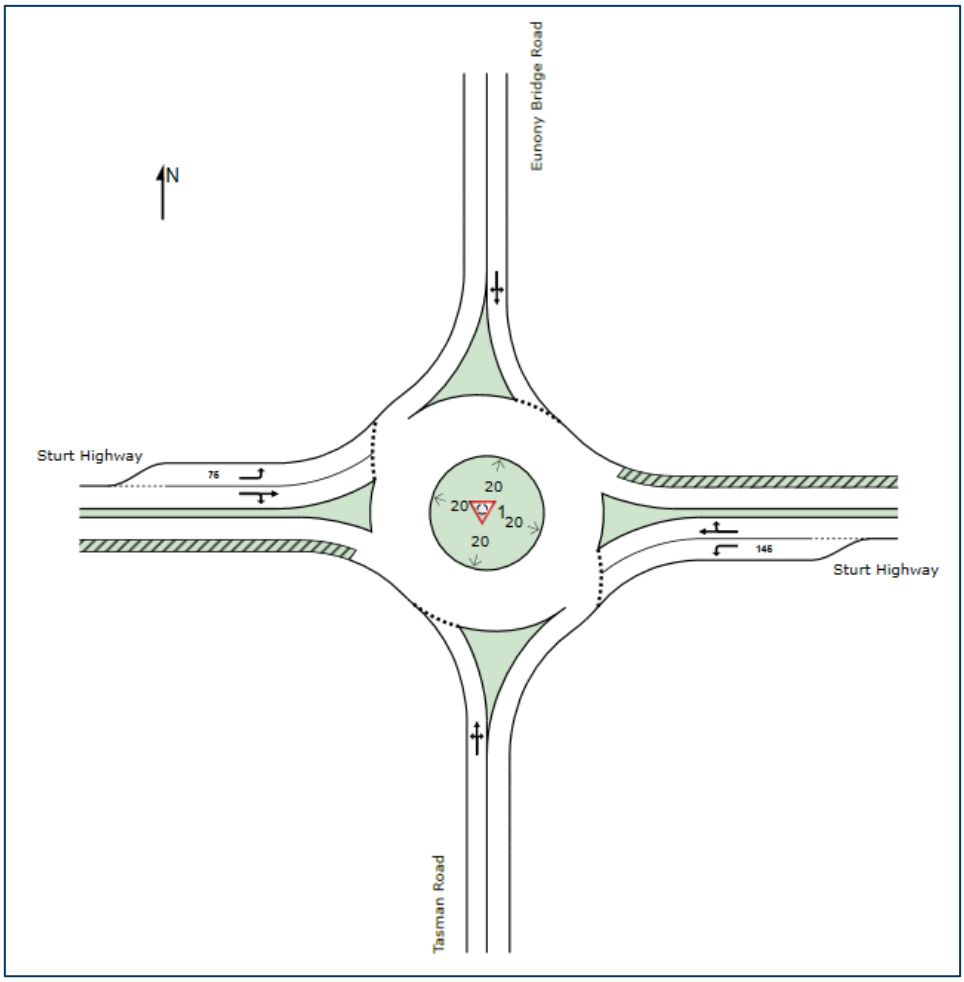


Figure 6-11 SIDRA intersection layout

The SIDRA outputs accounting for the 2024 traffic volumes in Figure 6-9, and the road geometry in Figure 6-11 are presented in Table 6.44.

Table 6.44 2024 SIDRA outputs

Intersection Leg	AM Peak			PM Peak		
	Ave delay (sec)	LOS	95th % queue (m)	Ave delay (sec)	LOS	95th % queue (m)
Tasman Road	11.7	A	16	12.0	A	27
Sturt Highway - east	6.8	A	25	6.9	A	25
Eunony Bridge Road	8.7	A	19	12.1	A	28
Sturt Highway - west	5.9	A	10	7.1	A	27
Total	7.7	A	-	8.7	A	-

The data in Table 6.44 indicates that the intersection of interest operates with a good LoS during peak periods of road network activity.

6.3.3.6 Mid-block analysis

A mid-block capacity analysis has been undertaken for the key roads in proximity to the subject site in accordance with the following assumptions:

– A one-way mid-block capacity of 1,200 passengers per car per hour per lane (pc/h/lane) applies to Sturt Highway.
– A one-way mid-block capacity of 900 pc/h/lane applies to Tasman Road and Eunony Bridge Road.
– A passenger car unit (PCU) of two has been applied to heavy vehicles.

The outputs of the mid-block analysis accounting for the 2024 traffic volumes, displayed in Figure 6-9, are presented in Table 6.45.

Table 6.45 Mid-block analysis (2024)

Road Name	Direction	Carriageway capacity *	Existing traffic		VCR (2024)	
		(pcu / direction)	AM Peak (pcu)	PM Peak (pcu)	AM Peak	PM Peak
Sturt Highway-West	Eastbound	1200	364	714	0.303	0.595
	Westbound	1200	614	530	0.512	0.442
Sturt Highway-East	Eastbound	1200	408	716	0.340	0.597
	Westbound	1200	615	610	0.513	0.508
Eunony Bridge Road	Southbound	900	357	322	0.397	0.358
	Northbound	900	297	530	0.330	0.589
Tasman Road	Southbound	900	233	245	0.259	0.272
	Northbound	900	216	339	0.240	0.377

The data in Table 6.45 indicates that the key access roads in the vicinity of the subject site are operating well within their mid-block capacities during peak periods of road network operation.

6.3.4 Potential Impacts

6.3.4.1 Construction volumes

It is anticipated that during the construction of the project, up to (approximately) 16 workers will be required. For the purposes of analysis, it has been assumed that:

– 16 workers will access the site in the morning and egress the site in the afternoon.
– Each construction worker will drive themselves to and from work, i.e. there will be no car sharing.

Additionally, up to 16 semi-trailer loads are expected to be delivered to the site across the nine-week construction program, at an average of less than two heavy vehicles per week. Following the delivery of all construction equipment, construction vehicle activity will fall to a single movement per day of a Franna Crane, plus the occasional small delivery truck or van.

Based on the above information, during construction, it is unlikely that more than one heavy vehicle will access/egress the subject site within a single hour.

The construction of the project is expected to generate up to 18 trips in a single peak hour, as follows:

– AM peak
  - 16 inbound light vehicle trips
  - One inbound and one outbound heavy vehicle trip

– PM peak
  - 16 outbound light vehicle trips
  - One inbound and one outbound heavy vehicle trip.

6.3.4.2 Operation volumes

As detailed in section 3.5, during operation:

– The project will be staffed six days per week, Monday to Saturday, in shift patterns.
– Up to 22 staff will be employed.
– There is an offset between the work shift of the 16-day shift operators (7am to 6pm) and the six administrative/maintenance staff (8am to 4.30pm).
– The project will generate approximately ten heavy vehicle trips per week and two heavy vehicles per day.

Based on the above information, during operation, it is unlikely that more than one heavy vehicle will access/egress the subject site within a single hour.

The operation of the project is also expected to generate up to 18 trips in a single peak hour, as follows:

– AM peak
  - 16 inbound light vehicle trips.
  - One inbound and one outbound heavy vehicle trip
– PM peak
  - 16 outbound light vehicle trips.
  - One inbound and one outbound heavy vehicle trip.

6.3.4.3 Impact to the road network

The data in section 6.3.3 indicates that the roads in proximity to the subject site operate with a good level of service with minimal delays experienced by road users. An additional 18 vehicles per hour associated with the construction and operation of the project is expected to have a negligible impact on the operation of the road network and fall within typical daily fluctuations on the Sturt Highway and Tasman Road.

6.3.4.4 Impact to public transport and active transport

There are no walking and cycling facilities in proximity to the subject site. A single bus service (with a two-hourly frequency) operates on the Sturt Highway in general proximity to the subject site. Therefore, the project is expected to have a negligible impact on the operation of active transport and public transport facilities.

6.3.4.5 Impact to parking

On-street parking is not permitted on Edison Road or Tasman Road. As detailed in section 3.5.3, the project site incorporates a total of 47 car parking spaces, comprising 45 regular spaces and two accessible spaces. The provision of 47 spaces will accommodate the peak parking demand associated with the operation of the project.

A designated parking area will be provided during the construction of the project for up to 16 workers. All heavy vehicles will be able to access the site manoeuvre internally and exit in a forward direction.

6.3.4.6 Operation of internal site

Loading and unloading have been catered for on site, with the maximum sized heavy vehicle to be used by Calibre Metals being a semi-trailer. Existing site accessways and driveways would be used, with all vehicles able to enter and exit the site in a forward direction (refer to Figure 3-8.

Parking has been provided in excess of the requirements of Council's DCP requirements.

Access within and around the site and parking has largely been unchanged from the previously approved DA (5891803), which is assumed to be in accordance with relevant Australian standards, with the exception of the incorporation of the incoming LIB storage area. A swept path analysis for the site was prepared for the Stage 1 Flip Screen Industrial Estate (refer to Appendix A - A-1). An updated swept path analysis has been prepared for

this project factoring in the placement of the incoming LIB storage area, using the largest vehicle that Calibre Metals require for construction and operation, a semi-trailer (refer to Appendix A - A-2). The construction and operation of the project are consistent with the vehicle sizes and movements of this swept path analysis prepared for the project.

6.3.5 Mitigation and management measures

Mitigation measures to support the construction of the project are presented in Table 6.46.

Table 6.46 Traffic mitigation measures

Impact/Aspect	ID	Measure	Timing
Traffic mitigation measures	T1	A Construction Traffic Management Plan (CTMP) will be prepared prior to the commencement of works with site induction for construction personnel being undertaken to outline the requirements of the CTMP. The aim of the CTMP is to maintain the safety of all workers and road users within the vicinity site.	Pre-construction
Pedestrian and cyclists	T2	Site access is to be restricted to authorised personnel only. Pedestrian and cycle movement surrounding the project site is anticipated to be low, however, workers will be made aware of the potential hazards and associated mitigation measures in place as outlined in the CTMP. The pedestrian travel paths are to be maintained and be free from trip hazards.	Construction
Parking	T3	A parking area will be provided onsite for construction workers.	Construction

6.4 Hazard and risk

6.4.1 Overview

A Hazard and Risk Assessment has been prepared for the project and is included in Appendix I. This section provides a summary of the Hazard and Risk Assessment, including the potential hazards and risks associated with the construction and operation of the project, and provides mitigation measures to reduce impacts associated with project. Fire incident and management was also assessed in the PHA and is described in section 6.5 of the EIS.

The SEARs related hazard and risk are outlined in Table 6.47.

Table 6.47 SEARs for hazard and risk

Requirements	Where addressed
Hazards and Risk –	
a preliminary risk screening completed in accordance with Chapter 3 of *State Environmental Planning Policy (Resilience and Hazards)* 2021 and *Applying SEPP 33* (DoP, 2011), that includes:	Section 6.4.4
– a clear indication of class, storage and handling quantities and location of all dangerous goods and hazardous materials associated with the development	Section 6.4.4
– a hazards identification of the proposed process including but not limited to the hazards that may lead to generation of flammable or toxic materials during discharge of Li-ion batteries, batteries that are insufficiently discharged and require subsequent procedures, and incorrect concentration of saline solution	Section 6.4.4
– demonstration that adequate controls are available to safeguard consequences from the identified hazards	Section 6.4.5
– demonstration that the development would comply the risk criteria as set out in *Hazardous Industry Advisory Paper No 4 – Risk Criteria for Land Use safety Planning*.	Section 6.4.4

6.4.2 Methodology

6.4.2.1 Government Plans, Policies and Guideline

The hazard and risk assessment was prepared with reference to the following plans/policies/guidelines:

– State Environmental Planning Policy (Resilience and Hazard) 2021
– NSW Department of Planning and Environment, Hazardous Industry Planning Advisory Paper No 4 – risk criteria for land use safety planning, 2011 (HIPAP 4)
– NSW Department of Planning and Environment, Hazardous Industry Planning Advisory Paper No 6 – guidelines for hazard analysis, 2011 (HIPAP 6)
– NSW Department of Planning and Environment, Multi-level risk assessment, 2011.

6.4.2.2 Desktop assessment

Risk Screening

The risk screening process typically concentrates on the storage of specific dangerous good classes that have the potential for significant offsite effects. Specifically, the assessment involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site with an indication of storage locations. The quantities of dangerous goods are then assessed against the *Applying SEPP 33* threshold quantities. If any of the *Applying SEPP 33* threshold quantities are exceeded, then a PHA is required.

Hazard Identification

The hazard identification is a desktop qualitative assessment and involves documenting possible events that could lead to a possible off-site incident. The assessment then lists potential causes of the incident, as well as identification of operational and organisational safeguards to prevent the incidents from occurring or to mitigate their impact. The hazard identification is conducted for both construction and operation of the project.

Preliminary Hazard Analysis

For development projects classified as 'potentially hazardous industry', a PHA is completed to determine the risk to people, property and the environment at the proposed location and in the presence of controls

The PHA will identify potential hazards, analyse these hazards in terms of their impact to people and the environment and their likelihood of occurrence, quantify the resultant risk to surrounding land uses and assess the risk to demonstrate that the project will not impose an unacceptable level of risk.

Applying SEPP 33 identifies three levels of PHA. If a PHA is required, a judgement of the level of risk associated with the project is determined using the results of the screening and hazard identification stages. The three levels of PHA are:

– Level 1 – if significant but not serious potential for harm is identified, a qualitative PHA is completed
– Level 2 – if medium potential for harm is identified, a semi-quantitative PHA is completed
– Level 3 – if high potential for harm is identified, a quantitative PHA is completed.

6.4.3 Existing environment

The site is located within an existing industrial area of approximately 1.5 hectares, accessible via Edison Road, East Wagga Wagga, in the Wagga Wagga City LGA. The project site is situated on pre-disturbed land that is currently undergoing construction of seven new industrial buildings, internal roads and carparking, approved by Council. All necessary services, including water, sewer, electricity and telecommunications, have been made available to the industrial estate.

The site was previously owned by the Council; and the land was used for stockpiling of materials and leased for grazing of livestock. The project site is bounded to the east by an existing industrial development, further east, about 600 metres, is the Governors Hill large lot residential development. Land to the north west is currently vacant, undeveloped land that is zoned for industrial development. To the southwest the land is used for broad acre agriculture. To the north of the site existing facilities include a go-kart facility and the Australian Clay Target shooting range.

6.4.4 Potential Impacts

6.4.4.1 Preliminary Risk Screening and Emissions

Dangerous good storage – construction

A summary of the chemicals used and/or stored on-site during construction of the project is shown in Table 6.48 and a summary of the construction thresholds are presented in Table 6.49.

Table 6.48 Construction chemicals

Chemical / product	UN #	DG class	Packing group	Indicative storage quantity	Indicative quantity (tonne)
LPG	1075	2.1	N/A	2 cylinders stored on site	0.09
Spray paint	multiple	2.1 - pressurised	N/A	Minimal amount stored on site	0.02
Acetylene (welding)	1001	2.1 - pressurised	N/A	1 ten m^3 cylinder stored on site	0.01
Oxygen (welding)	1072	5.1	N/A	1 cylinder stored on site	0.05
Paint (oil based considered worst case)	1263	3	II	Minimal amount stored on site	0.1
Solvents	multiple	3	II	Minimal amount stored on site	0.1
Epoxy resins	multiple	3	III	Minimal amount stored on site	0.1
Cleaning products	multiple	8	II	Minimal amount stored on site	0.005
Diesel (C1)	3082	9	III	Minimal amount stored on site	0.03

Chemical / product	UN #	DG class	Packing group	Indicative storage quantity	Indicative quantity (tonne)
General oils and lubricants (C2)	1791	9	III	Minimal amount stored on site	0.5
Detergent	N/A	Not classified as DG		Minimal amount stored on site	0.005

Table 6.49 Construction threshold summary

DG class	Combined storage threshold (tonnes)	Combined quantity (tonne)	Exceedance of SEPP 33 threshold
2.1 - pressurised (excluding LPG)	0.1	0.03	Pass (does not exceed)
2.1 (LPG only)	10	0.09	Pass (does not exceed)
3-II	5	0.20	Pass (does not exceed)
3-III	5	0.10	Pass (does not exceed)
5.1	5	0.05	Pass (does not exceed)
8 - II	25	0.005	Pass (does not exceed)
9 - III	None	0.53	Pass (excluded in accordance with *Applying SEPP 33*)

During construction it is assumed that minimal storage of chemicals will occur, and no stockpiling will occur (use-on-demand regime). As such, the *Applying SEPP 33* storage thresholds for construction of the project are not exceeded for any chemical.

Dangerous good storage - operation

A summary of the chemicals used and/or stored on-site during operation of the project is shown in Table 6.50. A summary of the thresholds during operation are provided in Table 6.51. Based on the Dangerous Good (DG) class, the *Applying SEPP 33* storage thresholds for operation of the project are not exceeded for any chemical.

Table 6.50 Operational chemicals

Chemical / product	UN #	DG class	Packing group	Maximum storage quantity	Quantity (tonne unless stated)
LPG	1075	2.1	N/A	2 x 7.5 kL tank	15 m^3
Nitrogen	1066	2.2	N/A	1 x pressure swing adsorption (PSA) generator	200 Nm^3/hr
LIB	3480	9	II	Receival pad	52.8
Lime, hydrated	N/A	Not classified as DG		Bulk bags	2
Lime, slurry	N/A	Not classified as DG		2 x 100 kg tanks	0.2
Salt	N/A	Not classified as DG		Bulk bags	2
Brine	N/A	Not classified as DG		24 x 500 L tanks	12
Fluorspar	N/A	Not classified as DG		Bagged powder	2.5
Black mass	N/A	Not classified as DG		Bagged powder	48
Copper metal	N/A	Not classified as DG		Granules	24
Aluminium metal	N/A	Not classified as DG		Granules	24
Stainless steel	N/A	Not classified as DG		Granules	12

Table 6.51 Operational threshold summary

DG class	Combined storage threshold	Combined quantity	Exceedance of SEPP 33 threshold
2.1 (LPG only)	16 m^3	15 m^3	Pass (does not exceed)
2.2	None	200 Nm^3/hr	Pass (excluded in accordance with *Applying SEPP 33*)
9 - II	None	53 tonnes	Pass (excluded in accordance with *Applying SEPP 33*)

Transport Movements

It is assumed that, during construction of the project, there would be low volumes of dangerous goods stored on site, with a use-on-demand regime. Therefore, the transportation volumes of chemicals during construction have been conservatively estimated and are considered minimal. Based on this, the SEPP transport movement thresholds for construction of the project are not exceeded, refer to Table 6.52.

Transport of dangerous goods during operation of the project will mainly be associated with movements of used LIB.

Table 6.52 Operational transport movement threshold summary

DG class	Transport movements threshold (annual)	Combined transport movements (annual)	Exceedance of SEPP 33 threshold
2.1	> 500	12	Pass (does not exceed)
9 - II	> 1000	720	Pass (does not exceed)

The results of the dangerous goods and transport screening indicate that the project does not exceed any of the thresholds for construction or operation. The project is not considered 'potentially hazardous' and a PHA does not need to be prepared.

The results from the air quality, and noise and vibration assessments indicate that if appropriate control measures are in place during construction and operation, the project will minimise the impact of the relevant amenity criteria. Over the lifecycle of the project, and with safeguards, the project is not expected to release a significant quantity of pollutant emissions and is not considered to be an 'offensive industry'.

6.4.4.2 Hazard Identification

The results of the hazard identification are provided in Table 6.53. The hazard identification was conducted as a desktop study and focussed specifically on both the construction and operation activities of the project.

Table 6.53 Hazard identification list

Hazard Scenario	Causes	Consequence	Identified / Recommended Safeguards	Further assessment to assess potential off-site impacts
Vehicle interactions within the project area	– Vehicle movements in vicinity of personnel	– Personal injury	– Prepare traffic management plan including standard traffic rules and signage – Implement site speed limits – Provide designated pedestrian areas for construction and operation – Driver competency	No
Natural hazards	– Flooding, earthquake, lightning, bushfire	– Personal injury – Asset Damage	– Prepare emergency management plan	No

Hazard Scenario	Causes	Consequence	Identified / Recommended Safeguards	Further assessment to assess potential off-site impacts
External fire (adjacent to site)	– Fire or explosion from adjacent land users – Embers from offsite fire	– Asset damage – Plant shut down – Personal injury	– Site fuel management – Buildings designed to appropriate codes – Fire protection systems – Housekeeping standards	No
Internal site fire	– Electrical building fire, e.g. phone charger – Hot works	– Asset damage. – Plant shut down. – Personal injury	– Prepare emergency management procedure – Construction Management Plan – Hot work permit – Fire protection systems – Buffer zones	No
Ignition of organic electrolyte	– Insufficient LIB energy discharging – LIB shredding	– Personal injury – Asset Damage	– Use of brine during discharge – Use of nitrogen during shredding	No
Ignition of flammable gas	– LIB discharge process generates hydrogen gas	– Personal injury – Asset Damage	– Ventilation – Hydrogen detection at roof level	No
Exposure to toxic gas	– Evaporated organic electrolyte during heating	– Health impacts	– Maintenance and inspection strategies – Gas extraction to scrubber tower	No
Exposure to dust	– LIB recycle process	– Health impacts – Third party complaints	– Baghouses – Maintenance and inspection strategies	No
Exposure to noise	– General construction activities – LIB recycle process	– Health impacts – Third party complaints	– Maintenance and inspection strategies	No
Flammable gas leak and ignition	– Fire or explosion following an LPG leak due to: • Failure/ damage of pipework • Failure/ damage of cylinders • Impact damage • Corrosion	– Asset damage – Personal injury	– Barriers erected around gas pipe in key areas – Pressure piping and pressure vessel design – Compliance to *AS 1940 - The storage and handling of flammable and combustible liquids* – Standard operating procedures – Maintenance and inspection strategies	Yes
Loss of containment of chemicals, including dangerous goods	– Damage to storage vessels, e.g. due to external impact – Corrosion – Wear & tear	– Environmental damage – Personal injury	– Purpose designed storage slab, including bund – Inspection and maintenance strategies – Handling procedures – Standard operating procedures – Spill kits	No

Hazard Scenario	Causes	Consequence	Identified / Recommended Safeguards	Further assessment to assess potential off-site impacts
Contact with chemicals, including dangerous goods	– Transfer and handling	– Personal injury	– Transfer and handling procedures – Standard operating procedures – PPE	No

Due to the potential for off-site impacts occurring as a result of an ignition of an LPG release, a PHA was completed.

6.4.4.3 Preliminary Hazard Analysis

It is considered that there is potential for moderately serious harm, and a Level 2 PHA is appropriate. A Level 2 PHA uses a semi-quantitative approach based on comprehensive hazard identification to demonstrate that the activity does not pose a significant risk. The PHA follows the process shown in Figure 6-12, which complies with the *Multi-level Risk Assessment Guideline*.

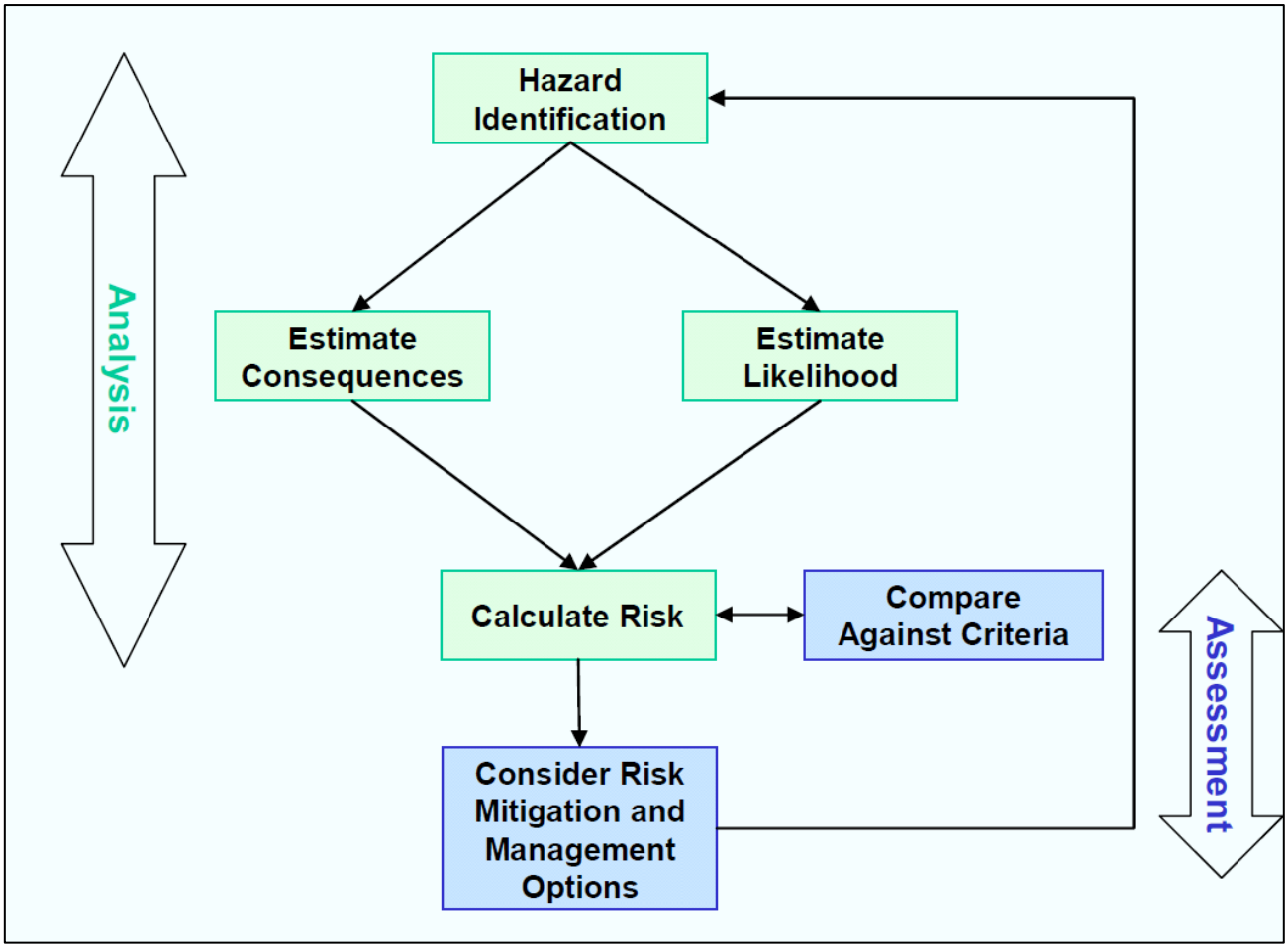


Figure 6-12 PHA process

6.4.4.4 Hazardous materials – LPG

LPG can be a mixture of butane and propane. In Australia, LPG is predominately propane. It is a colourless and odourless gas supplied in compressed liquid form. An additive (mercaptan) which has a strong odour is often used. LPG will vaporise rapidly when released into the atmosphere and is highly flammable. The density of LPG vapour is heavier than air and the vapours will settle in calm, low lying areas. The butane component of LPG has a time weighted average exposure of approximately 800 ppm.

The worst-case scenario considered is that of an ignited LPG release occurring at the bulk storage. Likely leak sources include piping connections and flanges.

6.4.4.5 Hazard Scenario

The following scenarios were identified as being worthy of further analysis:

– Catastrophic failure of the bulk LPG storage
– Connection leak (25 mm) at the bulk LPG storage.

Smaller leaks from the LPG storage and piping are also possible but will have consequences less than the hazard scenarios analysed. As such they have not been considered in this assessment.

6.4.4.6 Consequence determination

The release, dispersion and flammable effect for LPG are performed using PHAST (Process Hazard Analysis Software Tool) 8.9, a commercial software package. It should be noted that consequence modelling is not the same as risk modelling. Consequence modelling only represents the impact zone that would be affected if a release should occur.

Table 6.54 identifies the inputs used in the consequence determination.

Table 6.54 Consequence modelling inputs

Parameter	LPG (propane)
Temperature	25 °C
Storage Pressure	8.5 bar gauge
Quantity	7.5 m^3
Surface roughness	25 cm (scattered large objects)
Weather conditions	1.5/F (stable night conditions with light wind and moderate clouds) 5/D (stable night and day conditions with high wind and overcast)

A summary of the determined consequences is provided in Table 6.55 and Table 6.56. The consequences are worst case as they assume no intervention to limit the release. For the leak scenario, some level of intervention would be expected.

Table 6.55 Fire consequence summary

Release Scenario	Weather category	Maximum Distance Downwind of Release to Heat Radiation (m)		
		4.7 kW/m^2 (injury)	12.6 kW/m^2 (fatality)	23 kW/m^2 (property damage)
LPG bulk storage – connection leak with jet fire	1.5/F (night with low wind)	18	15	14
	5/D (day with high wind)	18	16	15
LPG bulk storage – catastrophic failure with fireball	1.5/F (night with low wind)	88	54	40
	5/D (day with high wind)	88	54	40

Table 6.56 Explosion consequence summary

Release Scenario	Weather category	Maximum Distance Downwind of Release to Overpressure (m)		
		0.07 bar (injury)	0.14 bar (property damage)	0.21 bar (fatality)
LPG bulk storage – connection leak with delayed explosion	1.5/F (night with low wind)	18	14	13
	5/D (day with high wind)	17	14	13
LPG bulk storage – catastrophic failure with delayed explosion	1.5/F (night with low wind)	72	46	37
	5/D (day with high wind)	76	48	38

The catastrophic failure of the LPG bulk storage has the potential for offsite impact. Both scenarios have potential to affect the on-site worker population.

6.4.4.7 Likelihood estimation

The likelihood of the worst case scenarios resulting in a fatality or injury was calculated using an event tree, Table 6.57. The assignment of the frequency and probability values has been made based on industry failure frequencies, specialist risk management judgement and the quantified consequences, as shown in Table 6.58 and Table 6.59.

Once a gas leak has occurred, for a jet fire or a delayed explosion to eventuate, the escaping gas must be ignited by an ignition source. Ignition probability is dependent on the extent of the gas leak as well as the position of the ignition source in the surrounding area. Instantaneous releases from a vessel rupture are deemed to ignite immediately.

Table 6.57 Event tree inputs

Parameter	Value	Source
LPG pressure vessel rupture frequency (per vessel per year)	2.00×10^{-06}	Failure rate and event data for use within risk assessments (UK HSE, 2017), page 25
Connection failure frequency – 25 mm (per connection per year)	5.00×10^{-06}	Failure rate and event data for use within risk assessments (UK HSE, 2017), page 45
Ignition probability for a gas release within a small plant at 0.5 kg/s	0.0019	Risk assessment data directory – Ignition probabilities (OGP, 2010)

Table 6.58 Off-site event tree for scenarios

	LPG bulk storage – connection leak with jet fire	LPG bulk storage – catastrophic failure with fireball	LPG bulk storage – connection leak with explosion	LPG bulk storage – catastrophic failure with explosion
Frequency of gas release (per annum)	5.00×10^{-06}	2.00×10^{-06}	5.00×10^{-06}	2.00×10^{-06}
Probability of ignition	0.0019	1	1	1
Frequency of fire event (per annum)	9.50×10^{-09}	2.00×10^{-06}	5.00×10^{-06}	2.00×10^{-06}
Probability of person impacted (based on consequence and on access road to rail reserve – someone on road for two hours every day)	0.083	0.083	0.083	0.083

	LPG bulk storage – connection leak with jet fire	LPG bulk storage – catastrophic failure with fireball	LPG bulk storage – connection leak with explosion	LPG bulk storage – catastrophic failure with explosion
Probability impact results in fatality (conservative assumption based on consequence)	0	1	0	1
Probability impact results in injury (conservative assumption based on consequence)	1	1	1	1
Probability impact results in property damage (conservative assumption based on consequence)	1	1	0	1
Frequency of fatality (per annum)	0.00	1.67×10^{-07}	0.00	1.67×10^{-07}
Frequency of injury (per annum)	7.92×10^{-10}	1.67×10^{-07}	4.17×10^{-07}	1.67×10^{-07}
Frequency of property damage (per annum)	7.92×10^{-10}	1.67×10^{-07}	0.00	1.67×10^{-07}

Table 6.59 On-site event tree for scenarios

	LPG bulk storage – connection leak with jet fire	LPG bulk storage – catastrophic failure with fireball	LPG bulk storage – connection leak with explosion	LPG bulk storage – catastrophic failure with explosion
Frequency of gas release (per annum)	5.00×10^{-06}	2.00×10^{-06}	5.00×10^{-06}	2.00×10^{-06}
Probability of ignition	0.0019	1	1	1
Frequency of fire/explosion event (per annum)	9.50×10^{-09}	2.00×10^{-06}	5.00×10^{-06}	2.00×10^{-06}
Probability of person impacted (based on consequence for leak - someone in LPG area four hours a day, for rupture - someone always present in building area for a 12-hour period)	0.17	0.5	0.17	0.5
Probability impact results in fatality (conservative assumption based on consequence)	1	1	1	1
Frequency of fatality (per annum)	1.58×10^{-09}	1.00×10^{-06}	8.33×10^{-07}	1.00×10^{-06}

6.4.4.8 Risk Assessment

A summary of the compliance to the relevant risk criteria from *HIPAP 4* for the cumulative risk is provided in Table 6.60. This assessment shows that the project will comply with the risk criteria.

Table 6.60 HIPAP 4 risk criteria compliance

Event	Cumulative Risk	One Injury / Fatality every X Years	HIPAP Risk Criteria	Compliance
Fire and explosion scenarios with fatality of off-site people	3.33×10^{-07}	3,000,000	5.00×10^{-05}	Complies
Fire and explosion scenarios with serious injury to off-site people	7.51×10^{-07}	1,332,000	5.00×10^{-05}	Complies
Fire and explosion scenarios with property damage off-site	3.34×10^{-07}	2,993,000	1.00×10^{-06}	Complies
Fire and explosion scenarios with fatality of on-site personnel	2.83×10^{-06}	352,700	5.00×10^{-05}	Complies

6.4.5 Mitigation and management measures

A range of hazard and risk mitigation measures will be inbuilt into the design of the project, including:

– Prepare a traffic management plan, including designated pedestrian areas for construction and operation
– Prepare an emergency management plan
– Prepare a construction management plan
– Implement appropriate maintenance and inspection strategies
– Prepare standard operating procedures
– Provide spill kits and appropriate PPE
– Design buildings and equipment to appropriate standards/codes
– Install a fire protection system as outline in section 6.5.3
– Define housekeeping standards to minimise the build-up of combustible materials on-site
– Separate the LIB storage slab from combustible vegetation by a three-metre buffer
– Install appropriate ventilation in the processing building
– Provide process gas extraction to the scrubber tower
– Include baghouses to remove dust/particulates
– Erect barriers around LPG vessel and piping in key trafficable areas
– Provide a purpose designed waste LIB storage slab, including a bund.

An additional safeguard for the identified risk scenarios to avoid or minimise potential hazard and risk during construction and operation of the project are listed in Table 6.61.

These measures would be included in the issue-specific environmental management sub-plans for the LIB recycling facility.

Table 6.61 Hazard and risk mitigation measures

Impact/Aspect	ID	Mitigation Measure	Timing
Generation of Hydrogen	H1	Install hydrogen detection at roof level in the processing building.	Construction/ Operation

Fire management is addressed in section 6.5.

6.5 Fire incident and management

6.5.1 Overview

An assessment of potential hazards and risks associated with the site has been provided in the Hazard and Risk section of this EIS (section 6.4). This section further specifically considers the potential risks associated with fire incidents that have the potential to occur onsite and identifies potential mitigation and management measures.

The SEARS related fire incident and management are outlined in Table 6.62.

Table 6.62 SEARs for fire incident and management

Requirements	Where addressed
Fire Incident and management –	
including:	
– identification of the aggregate quantities of combustible waste products to be stockpiled at any one time	Section 6.4.4
– technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including location of fire hydrants and water flow rates at the hydrant) management and containment measures	Sections 6.5.2 and 6.5.3
– details regarding the fire hydrant system and its minimum water supply capabilities appropriate to the site's largest stockpile fire load	Sections 6.5.2 and 6.5.3
– details of size and volume of stockpiles and their management and separation to minimise fire spread and facilitate emergency vehicle access	Section 6.5.2 and Appendix I
– consideration of consistency with NSW Fire & Rescue Fire Safety Guideline – Fire Safety in Waste Facilities (February 2020)	Sections 6.5.2 and 6.5.3
– detailed information relating to the proposed structures addressing relevant levels of compliance with Volume One of the National Construction Code (NCC).	Section 6.5.2 and Appendix I

6.5.2 Management procedures and responsibilities

The LIB recycling facility has a site-wide fire management system that includes fire hydrants, fire hose reels and spill management kits, as shown in Figure 3-9. These details and the relevant training requirements will be included in the chemical spill response procedure and the fire response procedure within overarching Emergency Response Plan for site. Emergency vehicle entry is via Edison Road, with suitable road access possible to all locations on site via the internal ring road. Smoke detectors will be used to detect a fire, with multi-zone activation. Six detectors will be in the processing building and three in the office building.

The details of the fire hydrant system, are:

– Full hose coverage of the entire property, including the outdoor waste LIB storage area
– A connection to town mains with backflow prevention
– A dual port fire brigade booster
– Hydrant standpipes protected by bollards where subject to mechanical damage
– External hydrant standpipes located not less than 10 metres from buildings, electrical hazards or stored combustible gas
– A flow rate of 1201 L/min at 463 kPa.

The system complies with:

– AS 2419.1:2021 Fire hydrant installations, Part 1: System design, installation and commissioning
– AS 2441:2005 Installation of fire hose reels
– The *National Construction Code* and is consistent with *Fire safety guideline: Fire safety in waste.*

In addition to the fire hydrant system, the facility also includes portable fire extinguishers in the following locations:

– The processing building (seven 9 kg F-500, lithium battery specific extinguisher)
– The kitchen area of the office building (two 4.5 kg ABE)
– The exits of the office building (two 4.5 kg ABE)
– The electrical board (one 5 kg CO_2).

Due to the nature of recycling LIBs, the combustible waste products stockpiled on site are limited to waste LIB units. There will be no storage of paper, cardboard, wood, rubber, etc. The waste LIB units will be stored on a dedicated outdoor concrete pad within their transport containers, prior to the discharge process. This dedicated storage area will be separated from combustible vegetation by a three-metre buffer.

6.5.3 Environment protection equipment

Environment protection equipment will be built into the design of the facility shown in Figure 3-9, and includes:

– Smoke detectors
– CCTV with remote activation
– Three fire hose reels within the building housing the processing machinery and one fire hose reel in the office area, providing sufficient hose coverage to the entire facility
– Fire hydrants located external to the building providing sufficient hose coverage for the whole facility
– Fire extinguishers will be located throughout the building
– Spill kits will also be installed throughout the site.

All staff will be trained in the use of environmental protection equipment.

6.5.4 Mitigation and management measures

A range of safety features and safeguards already included in the design, as detailed in section 6.4.5. No additional mitigation and safety measures are recommended.

6.6 Waste

6.6.1 Overview

This section details the management of waste associated with the construction and operation of the project. The facility is designed for recycling of waste LIB. A detailed description of the recycling process is included in section 3 of this EIS. The SEARs relating to waste management are outlined in Table 6.63.

Table 6.63 SEARs for waste management

Requirements	Where addressed
Waste management –	
including:	
– a description of each of the waste streams that would be accepted at the site including maximum daily, weekly and annual throughputs and the maximum size for stockpiles	Section 6.6.3.3
– details of the source of the waste streams to justify the need for the proposed processing capacity	Section 2.2
– a description of waste processing operations (including flow diagrams for each waste stream), including a description of the technology to be installed, resource outputs and the quality control measures that would be implemented	Sections 3.3 and 6.6.3.4
– details of how waste would be stored (including the maximum daily storage capacity of the site) and handled on site, and transported to and from the site including details of how the receipt of non-conforming waste would be dealt with	Sections 3.3 and 6.6.3.5
– detail the development's waste tracking system for incoming and outgoing waste	Sections 6.6.3.1
– detail the quality of waste produced and final dispatch locations	Sections 6.6.2 and 6.6.3.5
– details of the waste management strategy for construction and ongoing operational waste generated.	Sections 6.6.2 and 6.6.3

6.6.2 Construction waste quantities, storage and disposal

Waste generated for the construction of the project is anticipated to be relatively small, consisting of general waste such as packing materials and building waste. Table 6.64 provides a summary of the predicted types and quantities of construction waste generated by the project over the nine week construction program, and proposed management of the waste. Storage locations for waste during construction is shown in Figure 6-13.

Table 6.64 Construction waste

Waste Material	Management	Recycle / Landfill	Quantity (approx)	Waste Class
Scrap Steel	From packaging and transport will be stored in a dedicated skip bin (3 tonne). Collection will be once at the end of construction.	Recycle	1 tonne	Recyclable
Packing plastic film/wrapping	Packing plastic film/ wrapping will be stored in a dedicated bin (660 L). Collection will be once per fortnight.	Recycle	50 kg	Recyclable
Plastic strapping	Plastic strapping from transport will be stored in a dedicated bin (660 L). Collection will be once per fortnight.	Recycle	50 kg	Recyclable
Packing timber from shipping container/pallets	Packing timber and pallets will be stored in a 3 tonne skip bin. The bin will be collected once at the end of construction.	Recycle	1 tonne	Recyclable
Cardboard	Cardboard from packing will be stored in a dedicated bin (660 L). Collection will be once per fortnight.	Recycle	100 kg	Recyclable

Waste Material	Management	Recycle / Landfill	Quantity (approx)	Waste Class
General building waste (putrescible)	General waste (putrescible) will be stored in a (660 L) bin and collected fortnightly. The waste will go to Wagga Wagga Council landfill (Gregadoo Waste Management Centre).	Landfill	100 kg	General Waste
Food waste	Will be stored in a (660L) bin and collected fortnightly.	Recycle	150 kg	Green Waste

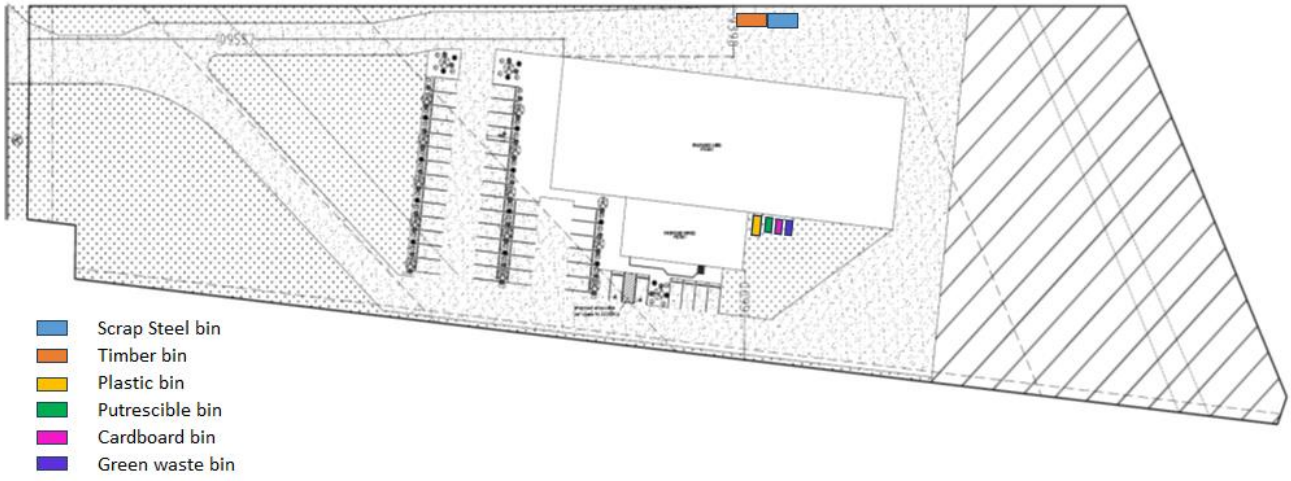


Figure 6-13 Construction waste storage locations

6.6.3 Operation waste quantities, storage and disposal

6.6.3.1 Waste tracking system

Once operational the project will receive and process up to 3,000 tpa of waste LIB, to produce a range of recovered resource outputs for sale. Calibre Metals will use the EPA's online waste tracking system, the Integrated Waste Tracking Solution (IWTS).

6.6.3.2 Transport and handling on site

Incoming LIB will be transported to the site by suppliers using heavy vehicles. Waste LIB are classified as Class 9 Dangerous Goods, and all transport will be in accordance with applicable dangerous good codes and waste tracking requirements, including Part 4 of the POEO (Waste) Regulation 2014, which includes using consignment authorization to bring waste LIB to the facility for processing, from out of state locations such as QLD and Victoria.

The incoming waste LIB will be received in their original hard plastic casing, weighed and stored in the same specialised non-conductive containers that were used during transportation to the facility. The waste LIB will be stored external to the building in a dedicated storage area, as shown on Figure 6-15. Incoming batteries will be stored for a maximum of five days prior to processing to remove any residual charge.

6.6.3.3 Incoming waste LIB quantities

The project involves processing up to 3,000 tpa of waste-LIB, as shown in Table 6.65.

Table 6.65 Maximum incoming waste LIB quantities

Maximum waste input	Approximate expected quantity of waste LIB (tonnes)
Daily	25
Weekly	75
Yearly	3,000

6.6.3.4 Resource outputs

The waste LIB are processed to produce a variety of recycled products including copper metal, aluminium metal, stainless steel, polypropylene and black mass powder (containing Nickel, Cobalt and Lithium), as shown in Table 6.66 and Figure 6-14. It's anticipated that more than 90 per cent of the LIB waste recycled via the process described in section 3.3.3 will be recovered, producing mostly saleable recovered products (critical minerals), which will be sold to battery manufacturers to produce new batteries, with only a small proportion of material requiring disposal (to land fill).

Section 3.3 describes how the LIB recycling equipment process works to produce quality resource outputs and maximise the amount of material recovered.

Table 6.66 Resource outputs

Material type	Expected Weekly Tonnage	Expected Annual Tonnage	Maximum Storage Tonnage	Collection frequency
Fluorspar (CaF_2) [1]	0.316	15.8	2.50	Monthly
Black Mass	28	1402	48	Weekly
Copper metal	8.4	418	24	Weekly
Aluminium metal	3.9	197	24	Weekly
Stainless Steel	10.8	540	12	Weekly

Note: 1. Potential for this material to be sold to battery manufacturers. However, should this not eventuate, this material will be sent to landfill with the classification of general waste.

Figure 6-14 Feedstock at the feed conveyor and the black mass powder produced by the recycling process

6.6.3.5 Operational waste quantities, storage and disposal

Table 6.67 details the predicted amount of waste generated from the operation of the project as well as the storage capacity. The waste storage locations for key waste streams are shown in Figure 6-15.

Table 6.67 Operation waste

Waste Material	Management	Recycle / Landfill	Annual tonnage	Weekly tonnage	Maximum Storage tonnage	Collection frequency	Waste Class
Fluorspar (CaF_2) [1]	This will be stored in plastic lined steel drums on a pallet. If disposed of as waste: – Material will be sampled and analysed by NATA accredited laboratory – The waste will go to Wagga Wagga City Council landfill (Gregadoo Waste Management Centre) as general waste classification.	Recycle or Landfill[1]	15.8	0.316	2.500	Monthly	General Waste
Packing plastic film/ wrapping	Stored in a dedicated (660 L) bin.	Recycle	0.25	0.005	0.050	Fortnightly	N/A
General waste	Stored in a (660 L) bin. The waste will go to Wagga Wagga City Council landfill (Gregadoo Waste Management Centre).	Landfill	2.50	0.050	0.250	Fortnightly	General Waste

Note: 1. Will only be considered a waste product, if this material is not able to be sold to battery manufacturers as a recovered resource.

Figure 6-15 Operational waste storage locations

6.6.3.6 Management of non conforming waste batteries

Non-conforming waste at Calibre Metals will only consist of batteries that are not lithium based chemistries. Generally, suppliers will undertake their own quality checks at time of acceptance/packing to identify and segregate batteries by chemistry, prior to sending the material for processing at the LIB recycling facility.

In the event that non-lithium based batteries are received at the facility, these would be segregated and stored in designated areas as shown on Figure 6-15, prior to being returned to supplier, or sent to an appropriate approved recycler for processing. Non conforming batteries may potentially include used lead acid batteries or used Nickel cadmium batteries. Any lead acid batteries would be sent on to Enirgi Power Storage Recycling (ESPR) in Bomen, and any Nickel cadmium based batteries would be sent onto Envirostream in Laverton North for processing.

The storage of non-conforming waste will be controlled to limit amount of waste held on site at any one time to quantities shown in Table 6.68.

Table 6.68 Non-conforming waste storage

Non-conforming Waste	Storage method	Maximum storage quantity
Lead acid battery	Pallet	200 kg
Nickel cadmium battery	Steel drum	50 kg

There are no testing requirements for non-conforming waste. The waste batteries are labelled, enabling identification of waste type and therefore correct separation and segregation for transport to identified appropriate third party recyclers.

6.6.4 Mitigation and management measures

Mitigation measures proposed to avoid or minimise potential impacts with regards to waste during construction, operation, and decommissioning and rehabilitation of the project are listed in Table 6.69.

Table 6.69 Waste mitigation measures

Impact/Aspect	ID	Mitigation Measure	Timing
Waste is classified and managed in accordance with regulatory requirements.	WA2	Classify waste in accordance with the Waste Classification Guidelines (NSW EPA 2014) and manage in accordance with the POEO Act and associated regulations.	Construction/ Operation

6.7 Social

A Social Impact Assessment (SIA) has been prepared for the project and is located in Appendix J. This section summarises the key aspects of the SIA, including potential social impacts associated with the construction and operation of the LIB recycling facility, and provides mitigation and management measures where needed.

The SEARs for social are provided in Table 6.70.

Table 6.70 SEARs for social

Requirements	Where addressed
Social –	
including a social impact assessment in accordance with the Department's Social Impact Assessment Guideline.	Section 6.7 and Appendix J

6.7.1 Methodology

6.7.1.1 Government Plans, Policies and Guideline

– SIA Guideline (DPE, 2023a).
– *Technical Supplement – Social Impact Assessment Guideline for State Significant Projects* – hereafter referred to as the 'SIA Technical Supplement' (DPE, 2023b).
– International Association for Impact Assessment *International Principles for Social Impact Assessment* (Vanclay et al., 2003) and *Social Impact Assessment: Guidance for assessing and managing the social impacts of projects* (Vanclay et al., 2015).

As outlined in the SIA Guideline, social impacts can involve changes to one or more of the following social values:

– **Way of life**, including how people live, how they get around, how they work, how they play, and how they interact each day
– **Community**, including composition, cohesion, character, how the community functions, resilience, and people's sense of place
– **Accessibility**, including how people access and use infrastructure, services and facilities, whether provided by a public, private or not-for-profit organisation
– **Culture**, both Aboriginal and non-Aboriginal, including shared beliefs, customs, practices, obligations, values and stories, and connections to Country, land, waterways, places and buildings
– **Health and wellbeing**, including physical and mental health especially for people vulnerable to social exclusion or substantial change, psychological stress resulting from financial or other pressures, access to open space and effects on public health
– **Surroundings**, including ecosystem services such as shade, pollution control, erosion control, public safety and security, access to and use of the natural and built environment, and aesthetic value and amenity
– **Livelihoods**, including people's capacity to sustain themselves through employment or business
– **Decision-making systems**, including the extent to which people can have a say in decisions that affect their lives, and have access to complaint, remedy and grievance mechanisms.

A social impact can be direct, indirect or cumulative, and negative or positive. It can also vary according to the individual, community, or segment of a community by whom it is experienced.

6.7.1.2 Scoping potential impacts

The potential social impacts and benefits resulting from the project have been identified by reviewing the Scoping Report (GHD, 2022), researching the social locality, and drawing from previous experience conducting social impact assessments for State significant projects in NSW (see Table 6.71).

Table 6.71 Social impact theme

Social impact theme	Description
Amenity	Impacts on visual, noise and vibration, dust and air quality due to the construction and operation of the project.
Economy, business and employment	Impacts associated with the local and regional economy, including employment opportunities and opportunities for businesses during construction and operation of the project.
Access and connectivity	Impacts on the ability and way that people move between places and interact either within the local study area, or when moving between the local study area and elsewhere due to anticipated increases in traffic volumes.

6.7.1.3 Determining the social locality

The social locality is the geographical area of social influence of an existing operation or a proposed development. For the purpose of this study, the social locality includes the people and communities most likely to experience changes to existing socio-economic conditions resulting from the proposed project. The social locality includes a local and regional study area, as outlined in Table 6.72.

Table 6.72 Social locality

Social locality study area	Definition	Relevant statistical area
Project footprint	The project footprint includes the Wagga Wagga LIB Recycling Facility project area, located on Lot 91, DP1299517, within the Flip Screen Industrial Estate, in an existing approved industrial building which is currently being constructed.	N/A
Local study area	The project is located in the suburb of East Wagga Wagga. Largely an industrial area, the closest residential area is located in the suburb of Govenors Hill about 600 metres to the east of the project site. These residents have the potential to be indirectly affected during construction and operation. Businesses in close proximity to the project area may be affected by construction activities and during operation.	Wagga Wagga – East (SA2 113031267)
Regional study area	East Wagga Wagga is located within the Wagga Wagga Local Government Area (LGA). Communities across the LGA may experience some benefits during operation of the project.	Wagga Wagga (LGA 17750)

6.7.1.4 Establishing the social baseline

The social baseline is used to inform the prediction of the potential social benefits and impacts of the project. A social baseline has been prepared for the local study area and regional study area, as shown in Table 6.73.

Table 6.73 Social baseline topics and indicators

Area	Description of topics and indicators
Project footprint	– Existing land use and tenure – Key natural features
Local study area	– Local amenity and character of the area – Select demographic and economic indicators for the suburb of East Wagga Wagga compared to Wagga Wagga LGA – Key features, including any roads, businesses, or industrial facilities
Regional study area	– Location, history, and character of the area – Community values and priorities – Economic overview – Community facilities and services – Accommodation and housing

Data to inform the social baseline has been gathered from the following sources:

– Australian Bureau of Statistics (ABS) Census, 2021
– NSW Department of Planning, Housing and Infrastructure population projections
– Economic data (e.g. economy.id)
– Local, State and Australian Government websites and publications
– Various online sources
– Information from stakeholder consultation.

6.7.1.5 Community and stakeholder engagement

Community and stakeholder engagement inputs to the SIA have been gathered through Calibre Metal's stakeholder engagement activities. Section 5 of the EIS describes these activities, stakeholders engaged, and issues and comments raised.

6.7.1.6 Description and assessment of social impacts and benefits

Following the scoping of social issues, social impacts were confirmed using a data triangulation method, whereby multiple sources of information were assessed to confirm social impacts. These data sources are summarised below:

– The project description for the EIS to understand the proposed activities that would influence social aspects.
– Baseline conditions against which the social changes/impacts were measured.
– Outcomes of the stakeholder consultation undertaken for the project to understand the existing environment and stakeholder views on potential social changes brought about by the project.
– Relevant literature including other SIAs undertaken for similar projects or for other projects in NSW and more broadly, reports about other similar facilities in Australia and overseas, community and regional plans applicable to the study area, and relevant information and documents shared by stakeholders.
– Relevant technical studies prepared for the EIS to gather technically sound evidence to identify and assess the social changes resulting from the project:
    - Noise and Vibration Impact Assessment
    - Air Quality and Odour Assessment
    - Hazard and Risk Assessment
    - Traffic Impact Assessment.

The evaluation of the identified social impacts was undertaken using a likelihood and magnitude significance rating, based on the significance criteria outlined in the SIA Guideline and Technical Supplement, and shown in Table 6.74 to Table 6.77.

Table 6.74 Defining likelihood levels of social impacts

Likelihood level	Meaning
Almost certain	Definite or almost definitely expected (e.g. has happened on similar projects)
Likely	High probability
Possible	Medium probability
Unlikely	Low probability
Very unlikely	Improbable or remote probability

Table 6.75 Dimensions of social impact magnitude

Dimensions		Details needed to enable assessment
Magnitude	Extent	Who specifically is expected to be affected (directly, indirectly, and/or cumulatively), including any vulnerable people? Which location(s) and people are affected? (e.g. near neighbours, local, regional, future generations).
	Duration	When is the social impact expected to occur? Will it be time-limited (e.g. over particular project phases) or permanent?
	Severity or scale	What is the likely scale or degree of change? (e.g. mild, moderate, severe).
	Intensity or importance	How sensitive/vulnerable (or how adaptable/resilient) are affected people to the impact, or (for positive impacts) how important is it to them? This might depend on the value they attach to the matter; whether it is rare/unique or replaceable; the extent to which it is tied to their identity; and their capacity to cope with or adapt to change
	Level of concern / interest	How concerned/interested are people? Sometimes, concerns may be disproportionate to findings from technical assessments of likelihood, duration and/or intensity.

Table 6.76 Defining magnitude levels for social impact

Magnitude level	Meaning
Transformational	Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20 per cent of a community.
Major	Substantial deterioration/improvement to something that people value highly, either lasting for an indefinite time, or affecting many people in a widespread area.
Moderate	Noticeable deterioration/improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people
Minor	Mild deterioration/improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
Minimal	Little noticeable change experienced by people in the locality.

Table 6.77 Social impact significance matrix

		Magnitude level				
		Minimal	Minor	Moderate	Major	Transformational
Likelihood Level	Almost certain	Low	Medium	High	Very high	Very high
	Likely	Low	Medium	High	High	Very high
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Very unlikely	Low	Low	Low	Medium	Medium

The risk rating then determines if mitigation or management actions are required to address the social impact. Negative social impacts with a risk rating of medium, high or very high require mitigation or management actions.

It should be noted that the degree to which community members would experience social impacts would vary based on factors such as perceptions and individual values, sensitivity to change, distance from the project, and duration people experience the impacts over. While the assessment of residual risks takes this into consideration, a risk rating for the majority of stakeholders affected by the identified potential impact has been applied. The risk rating would however be higher or lower for some stakeholders given the subjective nature of social impacts which varies based on a stakeholder's ability to adapt to impacts.

6.7.2 Existing environment

Wagga Wagga LGA is located in the Riverina region of NSW and is approximately 4,800 square kilometres (NSW Government, 2021). Most of the population is concentrated in the urban areas, the largest being central Wagga Wagga, followed by the suburbs of Kooringal and Lake Albert.

The LGA is located on the Country of the Wiradjuri people, specifically Southern Wiradjuri Country known as Ngurambang (City of Wagga Wagga, 2022). The Murrumbidgee River is a key feature of Country and part of the cultural landscape and would have been an area regularly travelled by the Wiradjuri people (City of Wagga Wagga, 2022).

The LGA has a moderately aged population with a median age of 35 years (ABS, 2022). As the regional service centre, the city is integral to the wider region, providing for industry, commerce, services, recreation, and tourism and the visitor economy (City of Wagga Wagga, 2022). While the agricultural industry supports the economy, the largest sector by employment is health care and social assistance. This underscores Wagga Wagga's role as the regional service centre (NSW Government, 2021).

A regional overview is provided in section 2.3.

6.7.2.1 Community values and priorities

Based on a review of relevant policies (section 6.7.1), the values and priorities of the Wagga Wagga LGA community can be characterised as:

- Taking pride in the area's rural roots and its status as a farming community
- Celebrating the area's unique character, heritage and contribution to the wider community
- Appreciating the natural environment and protecting natural resources such as land and water, which attract tourists to the area and support the agricultural industry
- Acting as a key driver for regional economic development in partnership with neighbouring communities and local enterprises
- Serving as a vital service hub that provides opportunities for both local residents and communities throughout the Riverina region
- Preserving and enhancing natural areas while managing sustainable growth and increasing resilience to natural hazards and land constraints
- Growing through strategic investment in sustainable infrastructure to maintain Wagga Wagga as a connected and accessible regional hub
- Providing high-quality public spaces with a vibrant urban character, offering diverse housing options to meet various needs, and promoting strong, resilient rural and village communities.

6.7.2.2 Demographic profile

Below in Table 6.78 is the key socio-economic characteristics of Wagga Wagga LGA. Additional demographic data is available in Appendix J.

Table 6.78 Demographic summary of Wagga Wagga LGA, 2021 (ABS, 2022)

Data type	Key statistics
Total population	The estimated resident population of Wagga Wagga LGA was 67,609 in 2021, an 8.4% increase from 2016.
Population projection	From 2021 to 2040, the population is expected to increase, from 65,835 persons in 2021 to 73,267 persons in 2041 (NSW Planning, 2022).
Indigenous population	At the time of the 2021 Census, 6.6% of the total population identified as Aboriginal or Torres Strait Islander, which was less than the Riverina Region (7.5% of the population) but higher than NSW overall (3.4%).
Gender	There are a relatively similar proportion of males and females living in the LGA (48.7% and 51.4% respectively). This is similar to the Riverina Region (where 49.5% are males, and 50.6% are females).
Age profile	The median age of the population in the LGA is 35 years, which is slightly younger than the median age for Riverina overall (40 years).
Cultural diversity	At the time of the 2021 Census, there was a higher proportion of the population born in non-English speaking countries (8.6%) compared to Riverina (5.6%), though significantly less than NSW overall (23%). This indicates a low level of cultural diversity in the area. This is also indicated by the low proportion of residents who speak a language other than English at home in the LGA (9.1%) compared to NSW (26.6%).

Data type	Key statistics
Education	The most common highest level of education in the Wagga Wagga LGA was a 'certificate' level qualification (45.9%), which was similar to the Riverina Region (50.5%). This is a higher proportion of those who complete a certificate as their highest form of education in NSW on average (32.3%). This indicates a significant presence of technical and trade occupations in the LGA (15%), all of which require certificate-based qualifications.
Income	In 2021, the median household income was $1,638 per week in Wagga Wagga LGA, which was higher than that in the Riverina region ($1,374) but less than the NSW median of $1,829 per week.
Advantage / disadvantage	Wagga Wagga LGA has an Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) of 7. This indicates the residents in the LGA experience a moderate level of advantage.
Health and wellbeing	A higher proportion of the population of the LGA experience long-term health conditions (54.7%) compared to NSW overall (47.8%). The most common health condition reported in the LGA was asthma.
Need for assistance	At the time of the 2021 Census, 2.8% of the population in the LGA reported that they need assistance with daily activities. This is similar to Riverina region (3.1% of the population).

6.7.2.3 Economic Profile

Wagga Wagga LGA's Gross Regional Product (GRP) was approximately $5.41 billion in 2023, which was an increase of four per cent from the GRP in 2022. Public administration and safety made up the largest contribution (14.9 per cent) to the GRP for the LGA, generating $678 million in 2022/23 (.id, 2024). Healthcare and social assistance was the second largest industry in the region ($634 million, 14 per cent) followed by education and training ($418 million, 9.2 per cent). (.id, 2024).

At the time of the 2021 Census, the top industries of employment in Wagga Wagga LGA were health care and social assistance (17.9 per cent), education and training (10.6 per cent), and public administration and safety (9.9 per cent). The prominence of these sectors is an indicator of the LGA's positioning as the region's hub.

As shown in Table 6.79, 64.4 per cent of people over 15 years old in Wagga Wagga LGA are actively employed or seeking employment (labour force participation). This is a higher rate of labour force participation than both Riverina (60.6 per cent) and NSW overall (58.7 per cent).There is a well-documented skill shortage in regional NSW, with research finding that unemployment rates are at an all-time low, presenting employers with the challenge of attracting and retaining a workforce as people elect for jobs closer to urban centres with a greater availability of social services and diverse job choices (Cavanough & O'Brien, 2023).

Table 6.79 Labour force participation, (ABS, 2022)

Labour force participation	Wagga Wagga LGA	Riverina	NSW
Total labour force	34,679	76,054	3,874,012
Employed	96.0%	95.9%	95.1%
Unemployed	4.0%	4.1%	4.9%
Labour force participation	64.4%	58.5%	58.7%

6.7.2.4 Community facilities and services

Community facilities and services in the LGA are concentrated in the town of Wagga Wagga, more than four kilometres from the project site area. Most residents within the LGA are likely to travel to Wagga Wagga to access facilities and services, including those living in the local study area.

6.7.2.5 Housing and accommodation

On the night of the 2021 Census, 92.5 per cent of the dwellings in Wagga Wagga LGA were occupied. Residents in Wagga Wagga LGA have a lower rate of home ownership (63.6 per cent) compared to Riverina (67.9 per cent) and NSW overall (64 per cent). In 2021, 11 per cent of renters in Wagga Wagga LGA and the Riverina received housing from the NSW Government, compared to 9.8 per cent across NSW (ABS, 2022). There is an oversupply of 3-bedroom social housing cottages, while 84 per cent of the priority waitlist is for smaller dwellings, indicating a mismatch between supply and demand (NSW Government, 2021). There are several short-term accommodation

facilities in the Wagga Wagga LGA to support visitors. These are concentrated in the town of Wagga Wagga, along the key roads of Stuart Highway to the east and Olympic Highway to the north. There are around 50 short-term accommodation facilities available in Wagga Wagga, ranging from hotels to motels and caravan parks. There are also over 250 places in and around Wagga Wagga listed on Airbnb.

6.7.3 Potential impacts

6.7.3.1 Construction

Economy and employment

The project would contribute towards the local and regional economy through procurement and employment opportunities for local and regional businesses and workforce.

The total direct contributions during the construction phase are estimated to include:

– $1.5 million capital investment
– Up to 16 employment opportunities for the nine week construction period.

Construction of the project may provide a small number of local businesses with opportunities to supply the project, and a small number of local residents may be employed in one of the limited roles available during construction.

Access and connectivity

The TIA identified that construction would generate up to 18 additional trips each morning and afternoon peak hour due to construction activities. This includes construction workforce arriving and leaving site each day, a single heavy vehicle movement, and the movement of the Fanna crane. The impact of these movements on the road network, which is considered to operate with a good level of service with minimal delays, is expected to fall within typical daily fluctuations and therefore would be negligible. The impact to public transport and active transport would also be negligible. There is sufficient on-site parking to accommodate construction vehicles and also sufficient internal manoeuvring space for heavy vehicles.

While other nearby businesses may notice an increase in traffic, they are not likely to experience disruptions.

Changes to local amenity

Construction activities may generate noise, vibration, and dust in the immediate vicinity however, given that the project is located within an industrial area inside a building, and that the nearest residential area is located over 800 metres away, these changes are unlikely to affect residents. Employees of nearby businesses may experience minimal noise disturbance. Those potentially impacted include the Wagga & District Kart Racing Club (100 metres) and dsm-firmenich Wagga Wagga (300 metres).

The *AQIA* found that dust from construction activities would be within regulatory limits and are not expected to significantly impact air quality in the area. As the work fitting an existing industrial building minimal dust is expected to be generated during construction and therefore nearby business and community members are unlikely to be affected.

Community wellbeing and community values

Community members and stakeholders may have concerns regarding risks associated with the storage and transportation of construction chemicals which could lead to stress and anxiety and affect wellbeing for some individuals.

The Hazard and Risk Assessment assumed that there is likely to be minimal storage of construction chemicals on site and that no chemical stockpiling would occur. Therefore, construction chemical storage is anticipated to fall within regulatory thresholds. The risks for community members are therefore anticipated to be minimal.

To assist with managing potential community concerns, it is recommended the community and stakeholder engagement strategy has a focus on sharing information with communities and stakeholders about how construction hazards and risks would be managed. This should include targeted consultation with residents and businesses in the local study area of East Wagga Wagga.

6.7.3.2 Operation

Economy and employment

Operation of the project would contribute towards the local and regional economy through procurement opportunities for local and regional businesses. Local workers may also benefit long term from up to 22 FTE jobs created by the project, including day operators, administration, and maintenance staff.

The project would also contribute towards the development of a circular economy for LIB in Australia, while supporting the objectives of the Wagga Wagga Special Activation Precinct by supporting the region as a leader in sustainable industrial practices and drawing in investments, particularly in the fields of advanced manufacturing, circular economy, and clean technology.

It is recommended that Calibre prioritise local and Indigenous suppliers, and local employees for operational employment opportunities where feasible.

Access and connectivity

According to the TIA the impact on the road network from increased traffic volume during the operational phase is expected to fall within typical daily fluctuations and therefore would be negligible. The impact to public transport, active transport and parking would also be negligible. Nearby businesses and other community members are therefore unlikely to be affected by dust during construction.

Changes to local amenity

Due to the site's location in an industrial area, potential changes to local amenity resulting from the operation of the project are not expected to affect most community members, including nearby businesses.

Community wellbeing and community values

The PHA found that the screening thresholds for dangerous goods storage and transport movements were not exceeded by any of the dangerous goods proposed to be stored on site and the project is not considered 'potentially hazardous'.

Community members and stakeholders may have concerns regarding risks associated with the storage and transportation of dangerous goods which could lead to stress and anxiety and affect wellbeing for some individuals. However, the project's objective to advance sustainability initiatives through improving circular economic practices will contribute to the community's shared environmental goals, particularly reducing the area's landfill waste (City of Wagga Wagga, 2018).

6.7.3.3 Cumulative

As outlined in section 6.9, major projects that may be constructed and operating in the region and may contribute to cumulative socio-economic impacts include:

– Inland Rail – Albury to Illabo (Assessment stage)
– Belhaven Battery Energy Storage System (EIS preparation stage)
– Gregadoo Solar Farm – Modification 3 (Determination stage)
– Culcairn to Wagga Pipeline – Modification 1 Uranquinty Compressor Station (Mod report preparation stage)
– Maxwell Downs Solar Farm (EIS preparation stage)
– Narrung Street Former Landfill Site (Commenced)
– Pine Gully Road Upgrade (in construction)
– Bill Jacob Athletics Centre Upgrade (In construction).

Bolton Park Sports Hub (in construction). The potential cumulative socio-economic impacts which may affect local and regional communities are summarised below:

– Increased demand for labour during construction and operation may contribute to competition for labour across the region, resulting in labour shortages and staff needing to be sourced from other areas.
– Consultation and construction fatigue, along with cumulative concerns about the overall change to rural character, which may affect community wellbeing and cohesion.

A summary of the social impact is available in Appendix J.

6.7.4 Mitigation and management measures

The social impacts and benefits identified and assessed in this report would be managed and mitigated through a range of measures, including those recommended in other EIS specialist studies (such as the noise and vibration assessment, air quality assessment, traffic and transport assessment, and hazard and risk assessment).

Table 6.80 identifies the mitigation measures identified in response to the potential social impacts that may result from construction and operation of the project. Social impacts would be monitored on an ongoing basis by implementation of a complaints mechanism and continued stakeholder and community engagement. The management strategies are therefore largely focussed on the construction period, but are adaptive, and would be reviewed and updated as required in response to community and stakeholder feedback.

Table 6.80 Social mitigation measures

Impact/ Aspect	ID	Recommended mitigation measure	Timing
Socio-economic impacts, communication and engagement	SE1	A Communication Plan (CP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP) to help provide timely and accurate information to the community during construction. The CP will include (as a minimum): – Mechanisms to provide details and timing of proposed activities to affected stakeholders, including changed traffic and access conditions – Toll free number and email address for enquiries and complaints – How the project webpage will be maintained for the duration of the proposal – A complaint's handling procedure – Consultation activities to be carried out.	Pre-construction, construction
Local employment and procurement	SE2	Calibre Metals will seek to maximise the participation of local and Fist Nations businesses and workforce in the project construction and operation where feasible.	Pre-construction, construction

6.8 Other matters

A Statement of Environmental Effects (SEE) and supporting specialist studies was prepared by SKM (2022) on behalf of Flip Screen for the development of the Stage 1 - Flip Screen Industrial Estate (see Appendix F). The Stage 1 - Flip Screen Industrial Estate SEE and supporting specialist studies assessed the impacts for development of seven industrial buildings, and subdivision of the land. The Stage 1 - Flip Screen Industrial Estate Development was approved by Council (DA22_0534) on 3 of March 2023 (Appendix F). A subsequent Notice of Determination (DA 22_0534.010) was provided by Council on 18 April 2023, following a modification application to correct a minor error in the BDAR.

As described in section 1.4, Calibre Metals are leasing Building 107, 61 Edison Road, East Wagga Wagga, within the Flip Screen Industrial Estate, for the purposes of this project and installing a fully automated battery recycling machine, positioned wholly within the industrial building. No clearing of vegetation or earthworks are proposed or required as part of the LIB recycling facility project. The access, pavement, carparking, the stormwater collection system, power, water and sewer are constructed as part of the approved development consent (DA 22_0534) and do not form part of this project.

This section assesses impacts on environmental matters that are anticipated to be low to very low due to the nature of construction and operation of this project.

6.8.1 Soils and contamination

This section assesses the potential soils and contamination impacts associated with the project. The SEARs relating to soils and contamination are detailed in Table 6.81.

Table 6.81 SEARs for soils and contamination

Requirements	Where addressed
Soils –	
an assessment of potential impacts on soil resources and riparian land on and near the site, including: – impacts on soil erosion, salinity and acid sulfate soils – details of earthworks, including cut and fill volumes – description of the proposed erosion and sediment controls during construction.	Section 6.8.1.2 and Appendix F
Contamination –	
a site contamination assessment in accordance with the Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land (DUAP, 1998), including: – characterisation of the nature and extent of any contamination on the site and surrounding area.	Section 6.8.1.2 and Appendix F

6.8.1.1 Existing environment

Assessment of the potential impacts of the Flip Screen Industrial Estate in relation to contamination, soil resources, earthworks requirements and erosion and sedimentation were considered in the SEE provided in Appendix F.

The investigations found that there was no evidence of the site being used historically for potentially contaminating activities, a search of the Contaminated Site Registry did not return any identified sites relating to the Industrial Estate, and there have not been any land restrictions or notices issued by Council or the EPA for the site. As such it was considered that a Preliminary Site Investigation was not necessary in accordance with Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land (DUAP, 1998).

6.8.1.2 Potential impacts

All earthworks and ground disturbance for the approved Stage 1 - Flip Screen Industrial Estate development, is being carried out under the existing approval. Calibre Metals will be leasing Building 107, Edison Road from Flip Screen, and installing the LIB recycling equipment inside the existing building. There are no earthworks and no activities that involve disturbance of soil for the LIB recycling facility project and for this reason no impacts to soil or contamination are anticipated.

6.8.1.3 Mitigation and management measures

No specific mitigation and management measures are proposed in relation to soils and contamination. Mitigation measures associated with storage or materials and spill management measures and included in section 6.8.2.3.

6.8.2 Water management and flooding

This section assesses the potential water management and flooding impacts associated with the project. Applicable SEARs are detailed in Table 6.82.

Table 6.82 SEARs for water management and flooding

Requirements	Where addressed
Water management –	
an integrated water management strategy, including: – a surface and groundwater discharge assessment in accordance with relevant guidelines, including an assessment of potential impacts on watercourses, riparian areas, key fish habitat and recreational fishing, groundwater, and groundwater-dependent communities nearby – a detailed site water balance including a description of the water demands and breakdown of water supplies, and any water licensing requirements – details or any augmentation to existing on-site stormwater/wastewater management design including the capacity of onsite detention system(s), onsite sewage management and measures to treat, reuse or dispose of water – description of the measures to minimise water use – characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria using a MUSIC water quality model (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters and monitoring activities and methodologies)	Sections 6.8.2.1 and 6.8.2.2, and Appendix F
– details of any surface or groundwater mitigation, management and monitoring activities and methodologies.	Section 6.8.2.3 and Appendix F
Flooding –	
A flood impact risk assessment, that: – identifies any flood risk on site having regard to adopted flood studies. The land is subject to flooding from both the Murrumbidgee River and Major Overland Flow as defined in the Wagga Wagga Revised Murrumbidgee Floodplain Risk Management Study and Plan (2018) and the Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan (2021), respectively. – a Flood Impact and Risk Assessment (FIRA) should be part of any EIS. The FIRA should be consistent with the NSW Flood Risk Management Manual (2023) and the FIRA Guideline (LU01) that considered both the Riverine and Overland Flow flooding mechanisms – the potential effects of climate change and any relevant provisions of the NSW Flood risk management manual (2023) – where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the *Flood Impact and Risk Assessment – Flood Risk Management Guide LU01*	Sections 6.8.2.1 and 6.8.2.2, and Appendix F
– details design solutions and operational procedures to mitigate flood risk, where required.	Section 6.8.2.3 and Appendix F

6.8.2.1 Existing environment

The project site is within flood prone lands associated with:

– Riverine flooding from the Murrumbidgee River, which has a catchment area of some 100,000 square kilometres. The Murrumbidgee River, located approximately two kilometres north of the site, drains east to west along the northern boundary of urban Wagga Wagga. The Murrumbidgee River spans approximately 900 kilometres in length, rising in the Monaro Plains, flowing westward to its junction with the Murray River downstream of Balranald.

– Local overland flooding associated with heavy rainfall in the local catchment areas.

Flood Data for the site is available from Councils flood studies as follows:

– Riverine flooding - Wagga Wagga Revised Murrumbidgee River Floodplain Risk Management Study and Plan (WMA 2018)
– Local overland flooding - Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan (WMA 2021)

Wagga Wagga City Council's online flood mapping tool shows:

– The location of the site and building is within both the riverine and local overland flooding Flood Planning Areas.
– In the 5% AEP riverine flood the site is flood free, with the flood extent some 2km north of the site. In the 5% AEP overland flood the site and building are not inundated, with flooding generally along the edge of the property boundary with Edison Road.
– In the 1% AEP riverine and overland flood the site and building are located within the flood inundation area.

It is noted that the site grades in a north-westerly direction at approximately 0.2 % and therefore overland flood levels at the proposed building would be lower than east of this location, as overland flooding flows are conveyed in a north-westerly direction. Council's report on Development Application DA22/0534 and Property Flood Information Report (Lot91 DP 1299517) provide flood level information at the location of the site buildings as listed in Table 6.83.

Table 6.83 Flood Data at locations of buildings on the site

Event	Riverine (mAHD)	Overland (mAHD)	Comment/Source
1% AEP Flood Level	182.49	182.69	Flood levels at the building locations obtained from Council's report on Development Application DA22/0534 for both riverine and overland flooding
5% AEP Flood Level	not flooded	182.31	Property Flood Information Report, noting that the lower level would apply given the site grading in the overland flooding case

Further to the flood levels in the table and with reference to Appendix L, it is noted:

– Flood depths at the location of the buildings are generally less than 0.15m in both the 1% AEP riverine and overland flood, which constitutes shallow flowing flood waters.
– The flood mapping in Appendix L shows that the location of the buildings on the site is in areas designated flood Hazard H1 in a 1% AEP flood for both riverine flooding and overland flooding. This presents no constraints to the use of the site as demonstrated in Figure 6-16.
– Flooding associated with the Murrumbidgee River is known to have longer warning times than overland flooding, thereby providing opportunity to evacuate the site. A Site Flood Emergence Response Plan would recommend evacuation following orders from the SES. Emergency egress for staff and contractors is available with rising road access to the south via Bakers Lane avoiding restrictions associated with a low flood island as highlighted in Appendix L.

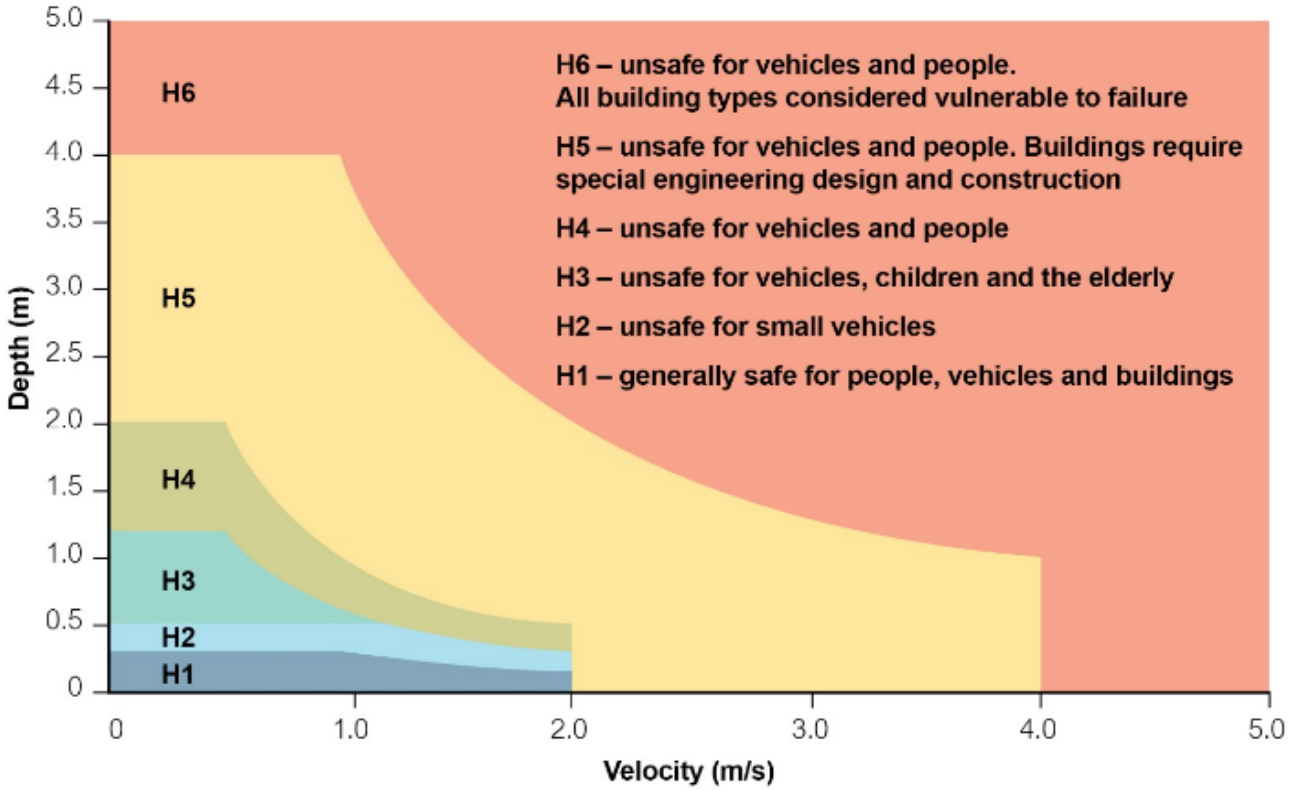


Figure 1 General flood hazard vulnerability curve

Note: Categories H1 to H4 in this guideline are equivalent to low hazard and H5 to H6 equivalent to high hazard in the 2005 *Floodplain development manual* (DIPNR 2005).

Source: Figure 6 AIDR 2017b.

Figure 6-16 Flood hazard vulnerability curve

6.8.2.2 Potential impacts

Process water

The LIB recycling facility process is largely a dry process, with the only parts of the system that require the use of water being the brine bath and the water cooling tower. The brine bath will be used to ensure complete removal of any residual charge in the LIB and will be continually reused. The cooling tower has minimal water usage requirements, being 200 litres per tonne of waste LIB processed, equating to 0.6 ML per annum. There will be a bleed stream from the water cooling tower that will be disposed of via the sites existing trade waste connection.

There will be no discharge of process water to either surface or groundwater and no impacts to local receiving waters or groundwater dependent ecosystems.

Stormwater management

Site water management was assessed as part of the approved Stage 1 – Flip Screen Industrial Estate development application. A stormwater strategy was developed in consultation with Council for the Stage 1 - Flip Screen Industrial Estate comprising a series of open channels that direct stormwater to the northern boundary of the industrial estate, with three discharge points to an existing Council managed drainage channel to the north of the site located on Lot 10 DP1163676.

Each of the seven industrial building sites have individual on-lot stormwater management systems that discharge into the industrial estate stormwater system approved as part of the Construction Certificate process.

The project involves the fit-out of Building 107 in the Flip Screen Industrial Estate. There will be no increase in impervious surfaces or modifications to the building that would increase the volume of stormwater generated at the site beyond the capacity of the approved stormwater management system.

The existing stormwater system has been designed and approved to accommodate the existing warehouse subdivision and the internal fit-out of one of the warehouse buildings will not require any alteration to the approved system.

Flooding

The potential risks associated with flooding were considered as part of the approval process for the Flip Screen Industrial Estate development (Development Application DA22/0534) taking into consideration the Wagga Wagga Major Overland Flow Flood Study (WMA, 2021) and the Wagga Wagga Revised Murrumbidgee River Floodplain Risk Management Study (WMA, 2018). The existing warehouse development has been designed in accordance with Councils flood planning requirements included in Section 5.21 of the Wagga Wagga LEP 2010 which required the Stage 1 – Flip Screen Industrial Estate development application to demonstrate the warehouse development:

(a) is compatible with the flood function and behaviour on the land, and

(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and

(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and

(d) incorporates appropriate measures to manage risk to life in the event of a flood, and

(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

The potential effects of climate change and provisions of the NSW Floodplain Management Manual 2005 (now superseded) were used in the development of the adopted flood planning levels and considered as part of the approval process for the Flip Screen Industrial development as applicable at the time of the consent. The warehouse facility design was determined to be compatible with the flood hazard of the land and a new stormwater conveyance system was included to manage transfer of flows to ensure that flood behaviour on adjoining sites would not be adversely impacted.

The design of the existing warehouses was completed in collaboration with Council (and based on Councils DCP controls) adopting a standard for building floor levels to meet the lesser of the 5% AEP plus 0.5m or the 1% AEP flood levels in the Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan. This ensured the overall development would meet the Wagga Wagga DCP controls for Industrial and High Impact Commercial premises in the East Wagga Industrial area to maintain floor levels greater than the 5% AEP flood level (plus freeboard) and for applicants of non-habitable developments to demonstrate that area is available to store goods above the 1% AEP flood level (plus freeboard).

A final warehouse floor level of 183.1 mAHD and office floor level of 183.6 mAHD have been surveyed during the construction process for the approved development. Table 6.84 demonstrates that the warehouse building satisfies the Flip Screen Industrial Estate DA, providing surplus freeboard over and above the freeboard required by Councils DCP flooding controls.

Table 6.84 Surplus freeboard to Councils DCP flooding controls

Item	Riverine	Overland	
1% AEP Flood Level (1%FL)	182.49	182.69	mAHD
5% AEP Flood Level (5%FL)	not flooded	182.31	mAHD
Council DCP FPL control based on 1% AEP	182.49	182.69	mAHD
Council DCP FPL control based on 5% AEP + 0.5m freeboard	not flooded	182.81	mAHD
Adopted Council DCP FPL control	**182.49**	**182.81**	**mAHD**
Surplus freeboard - Warehouse floor level (183.1mAHD) to Council DCP FPL control	0.61	0.29	m
Surplus freeboard - Office floor level (183.6mAHD) to Council DCP FPL control	1.11	0.79	m

Given the nature of the recycling operations, a sensitivity assessment has been undertaken, comparing the building flood levels to the 1% AEP flood level plus 0.5m freeboard in Table 6.85. The results show the warehouse

and office buildings typically have in excess of the required 0.5m freeboard, with exception of the warehouse in the 1% AEP overland flooding case. However, in this case the available freeboard is only marginally less than 0.5m and given the overland flood waters are shallow and slow flowing flood waters and a lesser free board of 0.3m is considered appropriate. On this basis the warehouse and office floor levels are considered appropriate.

Table 6.85 Available Freeboard Sensitivity

Item	Riverine	Overland	
1% AEP Flood Level (1%FL)	182.49	182.69	mAHD
1%AEP FL plus 0.5m freeboard	182.99	183.19	mAHD
Available freeboard to warehouse floor level (183.1mAHD)	0.61	0.41	m
Available freeboard to office floor level (183.6mAHD)	1.11	0.91	m

In terms of flood impacts, the project involves the internal fit-out and use of an existing warehouse building which is currently under construction and previously approved as compatible with the flood function and behaviour of the land. All recycling operations will be internal and raised within the warehouse facility, with, air vents, a small cooling water system and LPG tanks the only external elements of the project. These are not considered to have potential for any alteration or risk to flood behaviour beyond the recently approved warehouse development.

The recycling process is sealed and elevated on structural steel columns within the warehouse building as shown in Appendix A - A-2. All equipment is raised above the 1%AEP FL plus 0.5m freeboard with the exception of the machine guard to the bucket elevator which captures space for the return conveyor and, which does not include any process material. Product includes black mass stored in activated carbon bags on pallets and copper and aluminium stored in containers on pallets within the warehouse facility and will also be elevated above the 1% AEP plus 0.5m freeboard.

While the flooding assessment has shown that warehouse and office floor levels are considered appropriate when evaluated against Council DCP flooding controls, there are several additional flooding safeguards and flood management strategies included in the design as described in Section 6.8.2.3.

Handling of high-risk materials

Waste LIB arriving on site will be stored in the specially designed water-tight containers (refer Section 3.3.2) for a maximum of five days and there is no potential to impact upon the quality of water entering the stormwater system. The water tight containers have an in-built pallet type base are 740 mm high and will therefore extend above the 1% AEP flood event plus freeboard for both overland flow and riverine flood events as shown in Figure 6-17 and Figure 6-18. The containers will have a weight of approximately 400kg when storing batteries and will have no potential to wash-away due to the low velocity of water on the flood fringe and the ability of water to pass beneath each container.

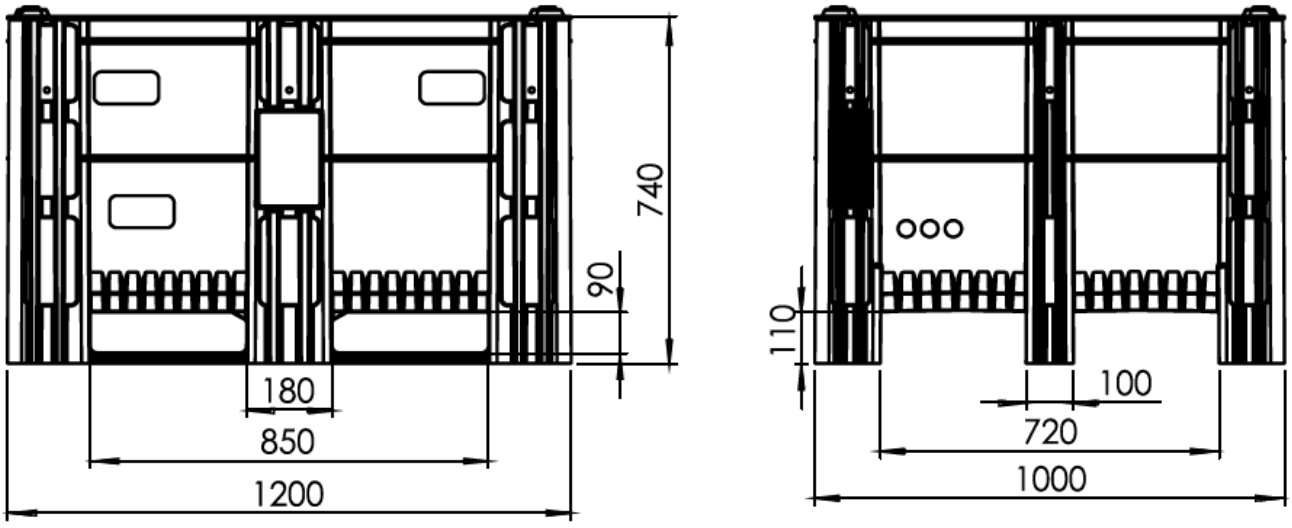


Figure 6-17 Dimensions of battery storage containers

Figure 6-18 Proposed battery storage containers

All recycling operations will be undertaken internally within the warehouse building and will be predominantly dry operation and raised above the 1%AEP FL plus 0.5m freeboard. Product includes black mass stored in activated carbon bags on pallets and copper and aluminium stored in containers on pallets within the warehouse facility and will also be elevated above the 1% AEP plus 0.5m freeboard.

Potential activities where handling of hazardous materials could occur may include the accidental spills, e.g. fuels (diesel) from construction equipment or delivery vehicles. The potential impact associated with the handling of these components includes the potential mobilisation into downstream waterways either via direct flow of the material itself, or through washing from rainfall derived runoff. The risk of handling these materials is typical of works of this nature and well understood control measures are commonly used, such as bunding, safely storing hazardous materials, and visual inspection of the works area and waterways and are commonly employed during implementation of CEMPs and SWMPs which are required to be implemented for the project.

On this basis, with the specified future development of required mitigation and plans the project is anticipated to result in negligible water quality impacts due to handling of high-risk materials during construction or operations.

6.8.2.3 Mitigation and management measures

Table 6.86 Water management and flooding mitigation measures

Impact/Aspect	ID	Mitigation measure	Timing
High risk materials	WF1	Implementation of a CEMP and Soil and Water Management Plan (SWMP) which includes the implementation of typical control measures such as bunding, safely storing hazardous materials, and visual inspection of the works area and waterways.	Detailed design Construction
Chemical and fuel storage	WF2	All chemical/fuel storage and loading areas will be compliant with relevant Australian Standards.	Construction Operation
Spill management	WF3	Spill response kits will be provided on site and will be located in clearly defined locations.	Construction Operation
Operational phase surface water	WF4	Implementation of an Operation Environment Management Plan (OEMP) which includes the implementation of typical control measures such as	Operation

Impact/Aspect	ID	Mitigation measure	Timing
		bunding, safely storing hazardous materials, and visual inspection of the works area and waterways, as well as pipeline maintenance. A Pollution Incidence Response Management Plan (PIRMP) would be implemented as part of the OEMP.	
Flood risk	WF5	Compile a site Flood Emergence Response Plan which documents the responsible staff, flood characteristics, flood warnings, flood response including evacuation, emergency contacts, and flood recovery.	Construction Operation

6.8.3 Aboriginal Heritage

This section describes the existing environment in relation to Aboriginal heritage, potential impacts and measures to mitigate risks. The SEARs relating to Aboriginal heritage are provided in Table 6.87.

Table 6.87 SEARs for Aboriginal heritage

Requirements	Where addressed
Aboriginal cultural heritage –	
an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with relevant policy and guidelines, identifying, describing and assessing any impacts to Aboriginal cultural heritage sites or values associated with the project. The ACHAR must:	Section 6.8.3.1
– be prepared in accordance with the Guide to Investigating, Assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Codes of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of thorough archaeological survey and test excavations (where required);	Section 6.8.3.1
– include evidence of adequate and continuous consultation with Aboriginal stakeholders in determining and assessing impacts, developing and selecting options for avoidance of Aboriginal cultural heritage and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010).	Sections 6.8.3.2 and 6.8.3.3, Table 5.3 and Appendix F

6.8.3.1 Existing environment

The project site is an existing building located on hardstand (Building 107, 61 Edison Road, Wagga Wagga). Historically, the land was owned by Council (prior to the land being sold to Flip Screen) and used for stockpiling materials and leased out for grazing livestock. The site was highly disturbed as a result of historical landuse.

The SEE (SKM, 2023) prepared on behalf of Flip Screen for the Stage 1 – Flip Screen Industrial Estate development (DA22_0534) assessed potential impacts of the project on Aboriginal heritage. The SEE identified two Aboriginal Heritage Information Management System (AHMS) listed sites (scar trees) located approximately 70 metres west of the project site (refer to Appendix F). The AHIMS sites were retained and not impacted by the development.

Following approval of the Flip Screen Industrial Estate, the project site has been extensively modified by earthworks as part of construction, resulting in very low potential for any future discovery of objects of heritage value following commencement of construction of the Industrial Estate, as shown in Figure 6-19.

A recent AHIMS search, completed on 7 May 2024, confirmed the two sites (scar trees) located approximately 70 metres west of the project site, and did not identify any newly listed sites within the vicinity of the project site. Noting that there is no clearing or intrusive ground disturbance required for Calibre Metals project, it is considered that there is no risk of impacts to Aboriginal heritage as part of this project.

GHD consulted with both DPHI and Heritage NSW regarding the SEARs for preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and sought and obtained concurrence from the departments to adopt a due diligence approach to Aboriginal heritage assessment for the project. Wagga Wagga LALC were provided with details of the proposed LIB recycling facility project via letter (refer to Table 5.3), seeking their feedback and input. Several attempts have been made to follow up with the LALC for feedback, but no response has been received to date. Further effort to reach out to the LALC for feedback will be made throughout the development of the project.

Figure 6-19 Current site

6.8.3.2 Potential impacts

Construction of the LIB recycling facility would involve installation of the LIB recycling machinery within the existing industrial building. Installation of a water cooling tower (that does not involve any ground disturbance), installation of venting on the roof of the building and installation of two LPG tanks on existing hardstand. All other associated infrastructure necessary for operation of the facility, including access, pavement, parking and utilities have been installed as part of the existing industrial building. The site is hardstand and there are no excavations required, therefore, there is no potential for impacts upon Aboriginal cultural heritage.

6.8.3.3 Mitigation and management measures

No impacts upon Aboriginal heritage are predicted, and therefore no mitigation and management measures are proposed.

6.8.4 Non-Aboriginal Heritage

6.8.4.1 Existing environment

A desktop assessment of publicly available data was undertaken to identify the existing non-Aboriginal heritage features and potential of the project site and identify potential impacts. The desktop assessment involved searching the following heritage register on 1 February 20243 to identify heritage items within or near the project site and identify potential impacts, including the following:

– World heritage list
– National Heritage List
– Commonwealth heritage list
– State Heritage Register and State Heritage Inventory

– Wagga Wagga LEP.

No heritage items or areas were identified within the project site or within two kilometres of the project site. The closest heritage item to the site is Kooringal Stables and Woolshed (ID: I222) listed as local heritage under the Wagga Wagga LEP and is approximately 2.2 kilometres west of the proposed site.

6.8.4.2 Potential impacts

There are no heritage-listed items or sites identified on or within two kilometres of the project site, no direct or visual impacts on items or sites of local, state or national heritage significance are anticipated. The project involves installation of the LIB recycling machinery within an existing industrial building. Installation of a water cooling tower (that does not involve any ground disturbance), installation of venting on the roof of the building and installation of two LPG tanks on existing hardstand.

All other associated infrastructure necessary for operation of the facility, including access, pavement, parking and utilities will be installed as part of the existing industrial building, approved by Council (DA22_0534).

The project site has been extensively modified since commencement of construction of the Flip Screen Industrial Estate, and with no earthworks or ground disturbance proposed as part of the LIB recycling facility project, there is unlikely to be any opportunity for discovery of unexpected finds.

6.8.4.3 Mitigation and management measures

No impacts upon non Aboriginal heritage are predicted, and no mitigation and management measures are proposed.

6.8.5 Visual

This section describes the existing environment and potential impacts in relation to visual amenity. The SEARs relating to visual assessment are detailed in Table 6.88.

Table 6.88 SEARs for visual

Requirements	Where addressed
Visual –	
including:	
– an assessment of the potential visual impacts of the project on the amenity of the surrounding area	Sections 6.8.5.1 and 6.8.5.2, and Appendix F
– detailed plans showing suitable landscaping which incorporates endemic species as well as how it maximises opportunities for green infrastructure, consistent with Greener Places (Government Architect NSW, 2020).	Appendix A - A-1 and A-2 and Appendix F

6.8.5.1 Existing environment

The proposed LIB recycling facility will be located within E4 – General industrial zone, within the Flip Screen Industrial Estate (refer to Figure 3-1). To the east of the project site east along Edison Road and Dangar Place are existing industrial businesses, which screen the project site from the nearest residential area, Governors Hill, approximately 800 metres away. To the north east of the site on the opposite side of Edison Road is the Wagga and District Go Kart Racing Club and surrounding land to the west and south is primarily rural (paddocks). Approximately 950 metres to the east of the project site is the rural residential suburb of Lake Albert, and the area in between consists of open paddocks, and the Wagga – Tumbarumba railway line is located on the southern boundary of the project site. Construction of the Stage 1 – Flip Screen Industrial Estate is currently underway, as can be seen in Figure 2-1, Figure 6-20 and Figure 6-22.

The SEE prepared for the Flip Screen Industrial Estate (Section 5.1 of the SEE located in Appendix F) considered and assessed the visual impacts associated with construction of the industrial estate, including Building 107, Edison Road, which Calibre Metals will lease for the purposes of this project. The assessment concluded that given the distance to the nearest residential receptors, screening provided (to the nearest residential receptors) by existing buildings located via Dangar Place and Edison Road, the strategic location of the development within an identified industrial area, existing and proposed landscaping, there would be no negative impact on the amenity.

A landscaping plan has been prepared in accordance with the consent conditions for DA22_0534, refer to Council Notice of Determination located in Appendix F, and landscaping plans located in Appendix G of the BDAR waiver located in Appendix K of this EIS. Construction of the approved industrial building is currently underway as shown in Figure 6-20, and landscaping will be installed on the project site by Flip Screen.

Figure 6-20 Project site

6.8.5.2 Potential impacts

The project will primarily comprise of installation of LIB battery recycling machinery within the existing industrial building. There are minimal changes proposed to the outside of the building, limited to installation of a water cooling tower, three exhaust chimneys for the baghouses and installation of two LPG tanks on existing hardstand areas. The water cooling tower will be approximately 2.3m in height and 3.6m in width, installed on the eastern side of the industrial shed. A photo of a similar water cooling tower with a single fan unit (the unit proposed for the project will have two fans), installed internally at the factory acceptance test at the OEM site, is provided in Figure 6-21. Site plans showing the size and dimensions of the water cooling tower and exhaust chimneys have been provided in Appendix A, A-2.

These minor adjustments to the building are not expected to have a negative impact on the context or setting of the locality including the amenity of residential receptors to the east and are consistent with the existing amenity of the site and surrounding industrial estate.

Figure 6-21 ***Single fan water cooling tower unit installed internally on LIB recycling equipment during the factory acceptance test at the OEM site***

6.8.5.3 Mitigation and management measures

Visual impacts are considered to be negligible during construction and decommissioning of the project. On this basis, no mitigation measures are proposed.

6.8.6 Biodiversity

This section describes the existing environment in relation to biodiversity, potential impacts and measures to mitigate risks. The SEARs relating to biodiversity assessment are detailed in Table 6.89.

Table 6.89 ***SEARs for biodiversity***

Requirements	Where addressed
Biodiversity –	
an assessment of the proposal's biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016*, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.	Appendix F and Appendix K

6.8.6.1 Existing environment

A BDAR (AEP, 2022) was prepared for the Stage 1 – Flip Screen Industrial Estate development (see Appendix F). The BDAR determined the following:

– No threatened species were identified within the site.
– Only one plant community type (PCT) is located within the Flip Screen Industrial Estate subdivision site – Western Grey Box Tall Grassy Woodland on Alluvial Clay Soils in NSW Southwestern Slopes and Riverain bioregions.

– Due to the degraded nature of the site (extensively disturbed by historical land use including grazing and use of the site by Council to stockpile materials) the vegetation integrity score was low (less than 15) resulting in no ecosystem credits being required.
– Two trees located at the rear of Lots 106 and 107 were to be retained.
– An area of 0.23 hectares of PCT 76 at the rear of Lot 206 was to be retained and regenerated under a Biodiversity Management Plan (BMP).
– The proposal will require one species credit for *Crinia sloanei* to offset the residual impact of the proposed development.

The tree identified in the BDAR on Lot 107 (Building 107, Edison Road), that Calibre Metals will lease from Flip Screen for the LIB recycling facility project, has been retained since Flip Screen commenced construction of the Industrial Estate, and is fenced of and sign posted in accordance with the BMP, as shown in Figure 6-22. Flip Screen have also retired the required species credit for *Crinia sloanei,* and a copy of the receipt of payment for this credit is provided in Appendix K.

Figure 6-22 Retained tree on Lot 107 of the Flip Screen Industrial Estate

6.8.6.2 Potential impacts

The construction of the project would involve installation of the LIB recycling machinery within an existing industrial building. Installation of a water cooling tower (that does not involve any clearing or ground disturbance), installation of venting on the roof of the building and installation of two LPG tanks on existing hardstand. All other associated infrastructure necessary for operation of the facility, including access, pavement, parking, utilities and landscaping will be installed as part of the existing industrial building under DA22_0534 as shown in the site plans located in Appendix A - A-1.

During preparation of this EIS consultation took place with the BCS, DCCEEW in relation to the existing BDAR prepared for DA22_0534, and the nature of the LIB recycling facility project. As a result, a BDAR waiver has been prepared for the project and is located in Appendix K. The tree identified for retention in the BDAR (Figure 6-22) on Lot 107 will continue to be retained on site when Calibre Metals lease the building for the LIB recycling facility project.

6.8.6.3 Mitigation and management measures

As there are no anticipated impacts upon biodiversity for the project, no mitigation or management measures have been proposed.

Table 6.90 Biodiversity mitigation and management measures

Impact/Aspect	ID	Mitigation measure	Timing
Vegetation	SC1	The tree identified in the Stage 1 - Flip Screen Industrial Estate SEE (SKM, 2022) and BDAR (AEP, 2022) will be retained.	Detailed design Construction

6.8.7 Bushfire

This section describes the existing environment and considerations relating bushfire as requested in SEARs (Table 6.91).

Table 6.91 SEARs for bushfire

Requirements	Where addressed
Bushfire –	
a bush fire hazard assessment report prepared by a suitably qualified person. The assessment shall include site-specific recommendations for : – Asset protection zones (APZ) – measures to prevent a fire occurring within the site from developing into a bush/grass fire risk to the surrounding area – water supply for fire fighting purposes – vegetation management – emergency management procedures, including the development of a Fire Management plan in consultation with the local NSW RFS District Fire Control Centre – emergency and evacuation arrangements for occupants/visitors	Appendix F and sections 6.5, 3.5.4
– an outline of the Bush Fire Emergency Management and Evacuation Plan prepared in accordance with relevant RFS guidance.	Section 6.8.7.3

6.8.7.1 Existing environment

Bushfire risks were considered as part of the SEE for the approved Stage 1 – Flip Screen Industrial Estate development (DA 22_0534). The SEE identified the site was not located in bushfire prone land. A search of DPHI spatial viewer on 15 October 2024 confirmed the site is not located on bushfire prone land. The SEE states that an asset protection zone will be installed and maintained around the Flip Screen Industrial Estate.

6.8.7.2 Potential impacts

The project involves installation of LIB recycling equipment within an existing industrial building. Hazard and fire management in relation to potential fire incidents arising on site from storage, handling and processing waste LIB, is discussed in section 6.5. and details of emergency equipment including fire fighting equipment is shown in Figure 3-9. Emergency Management and Evacuation Plans to manage potential risks associated with a fire caused by on site operations will be developed for operation of the facility.

Given the project site is not located on bushfire prone land and an asset protection zone will be installed and maintained around the Flip Screen Industrial Estate, the potential for ignition from bushfire is unlikely.

6.8.7.3 Mitigation and management measures

As noted in the SEE for DA 22_0534, the site is surrounded by grassed paddocks and an asset protection zone is installed around the Flip Screen Industrial Estate and will be maintained. In addition to this a number of additional safety measures are proposed for preparation post approval, see Table 6.92.

Table 6.92 Bushfire management measures

Impact/Aspect	ID	Management measure	Timing
Bushfire Emergency Management Plan	BF1	Prepare a 'Bushfire Emergency Management and Evacuation Plan' in accordance with the RFS document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' for the construction and operation phases of the project.	Construction / Operation
Training	BF2	Staff to be made aware of and trained in the project Bushfire Emergency Management and Evacuation Plan.	Construction / Operation
Emergency equipment	BF3	Ensure firefighting equipment is installed and maintained in accordance with relevant Australian Standards.	Construction / Operation
Vegetation	BF4	Ensure grass surrounding the inside perimeter of the project site is maintained.	Operation

6.8.8 Infrastructure requirements

This section considers infrastructure requirements, as asked for in SEARs issued for the project and provided in Table 6.93.

Table 6.93 SEARs for infrastructure requirements

Requirements	Where addressed
Infrastructure requirements –	
an infrastructure delivery, management and staging plan that includes: – an assessment of impacts of the development on existing utility infrastructure and service provider assets surrounding the site – a detailed written and/or graphical description of infrastructure required on the site, including any electrical substation/s and on-site switch yard/s – details of the existing capacity of the site to service the proposed development and any extension or augmentation, property tenure or staging requirements for the provision of utilities, including arrangements for electrical network requirements, drinking water, wastewater and recycled water – a description of how any upgrades will be co-ordinated, funded and delivered on time and be maintained to facilitate the development	Section 6.8.8 and Appendix F
– identification of any existing infrastructure or easements on or off the site which may be impacted by construction or operation of the development and details of measures to be implemented to address any impacts.	Table 6.94, Appendix A - A-1, A-2 and Appendix F

6.8.8.1 Existing environment

The LIB recycling facility will be located within the Flip Screen Industrial Estate, which has been designed to suit the operational needs of a range of intended industrial sectors, including fabrication, agriculture, civil construction, waste processing and recycling, remediation and landscaping. As identified in the Stage 1 – Flip Screen Industrial Estate SEE (Appendix F) and approved Stage 1 Flip Screen Industrial Estate plans (Appendix A) the existing site is serviced by access, water, stormwater, sewer, electricity, telecommunications and trade waste connection as detailed in Table 6.94.

Table 6.94 Infrastructure services

Infrastructure services	Description
Roads	Extension of Edison Road which is designed to cater for 26 m B-Double heavy vehicles in accordance with Council's development standard. The industrial site will have established access to a newly extended section of Edison Road.
Sewers	A sewer pump station is located, west of the project site, on Lot 3 DP582720. The pump station directs sewage to an existing sewer main located at the Gun Club, north of the project site. New sewer infrastructure would be installed in the Edison Road reserve. Each of the proposed buildings would be connected to this main by an individual junction.
Water	A water main is located in Edison Road. The water main would be extended to the west within the Edison Road reserve. Each industrial building would be connected to this water main via an industrial water meter. The water main would also be extended to the south in the new road reserve. The existing building will have suitable water supply for the operation of the proposed plant. Towns water, for both domestic (toilets, sinks) and process use will come from connection to Riverina Water pipeline. Domestic sewer (toilets, sinks) will be connected to the Riverina Water sewage network.
Electricity	The existing building will have suitable power supply for the operation of the proposed plant. The site will be connected to the local electrical grid. There is a Transgrid power easement that runs across the western portion of the site, as shown in Figure 3-1 and Appendix A - A-1 and A-2. Impacts to this easement were avoided as part of the Stage 1 Flip Screen Industrial Estate Development. Any impacts to this easement would also be avoided as part of this project, with no works to occur on this portion of the site.
Stormwater	For the industrial estate development, each industrial building (project site) and the associated hardstand areas would have a pit and pipe network discharging to the estate stormwater system. A new stormwater collection and conveyance system was designed for the entire industrial part development. The system would consist of a series of open channels directing stormwater overland to the northern boundary and then discharging via three points to the drainage channel to the north of the site within Lot 10 DP1163676. There are existing stormwater easements on this lot benefitting the lots within the industrial estate. The site stormwater system will utilise these easements to discharge stormwater.
Waste	The existing building will have suitable trade waste connection for the operation of the proposed plant. The process includes a water-cooling tower that will have a bleed stream for disposal. Connection to the trade waste is required for this bleed stream. Saline solution used in the LIB recycling process can be infinitely re-used and will not require disposal.

6.8.8.2 Potential impacts

The LIB recycling facility project primarily involves installation of LIB recycling machinery within an existing industrial building. The project does not involve any changes to existing utility infrastructure or service provider assets, with the exception of installation of two 7.5 KL LPG tanks on existing hardstand.

The LIB recycling facility is not an energy intensive operation as shown in Table 6.95, and existing electricity supply to the site consists of a 500kVA transformer, which will adequately service the project needs.

Table 6.95 Estimated project energy usage

Phase	Estimated electricity use (kWh)	Estimated gas usage (GJ)	Fuel – diesel (L)
Construction (nine weeks)	3,135	0	1632
Commissioning (two weeks)	12,661	135	0
Operation (per week)	10,791	118	0

Water demands for the operation are also low as shown in Table 6.96 and existing town water supply to the site will provide sufficient supply for LIB recycling facility operations.

Table 6.96 Estimated project water usage

Phase	Water requirement (L)
Construction	0
Commissioning	0
Operation (per week)	11,538

6.8.8.3 Mitigation and management measures

The SEE for DA 22_0534 considered infrastructure requirements of the project site, and the LIB recycling facility does not include changes to an upgrade to utility services, as such no mitigation and management measures are proposed.

6.8.9 Ecologically sustainable development

This section considers planning and developer contributions as requested in SEARs, as summarised in Table 6.97.

Table 6.97 SEARs for ESD

Requirements	Where addressed
Ecologically Sustainable Development –	
including: – identification of how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development – demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards – demonstration of how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources – if Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 applies: • demonstrate how the development has been designed to address the provisions set out in in Chapter 3.2(1)	Section 6.8.9.2 and Appendix F
• provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.	Section 6.8.9.2 and Appendix F

6.8.9.1 Existing environment

While a NABERS form was not specifically prepared for the Stage 1- Flip Screen Industrial Estate development, ecologically sustainable development considerations were taken into account for development of the Flip Screen Industrial Estate (refer to section 4.7 in Appendix F).

Calibre Metals are proposing to lease an existing building within the Flip Screen Industrial Estate and building sustainability and environmental performance were assessed as part of the Stage 1 – Flip Screen Industrial Estate approval.

The project does not involve the erection of a new building or enlargement or extension to the existing building and Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 is not considered to apply to the project.

6.8.9.2 Potential impacts

An assessment of the Greenhouse gases (GHG) emissions from energy usage was undertaken in accordance with the principles of ISO 14064-2 and the general principles for estimating emissions in the National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008. Appropriate methods for the quantification of emissions from individual sources are:

– NGER (Measurement) Determination 2008 (as amended) and NGER Act 2007, Commonwealth Department of Industry, Science, Energy and Resources; and
– National Greenhouse Accounts (NGA) Factors, Commonwealth Department of Industry, Science, Energy and Resources, 2020.

These guidelines are considered representative of good practice GHG accounting in Australia and are applicable to the Project. This assessment only represents the GHG emission of scope 1 and scope 2 emission from the energy usage across the lifespan of the project. It was assumed for this assessment that the usage of diesel fuel would be from stationary equipment and vehicle.

A summary of the scope 1 and 2 GHG emission from the construction, commissioning and operations energy usage is presenting in Table 6.98 for the construction period, Table 6.99 for the commissioning period and Table 6.100 for the operational period (on a weekly basis).

Table 6.98 Summary of emission for nine week construction period

Energy source	Quantity	Units	Scope 1 (t CO_2-e)	Scope 2 (t CO_2-e)
Electricity	3135	kWh	0.00	2.07
Natural gas	0	GJ	0.00	0.00
Stationary Diesel fuel	1.632	kL	4.42	0.00

Table 6.99 Summary of emissions for two week commissioning period

Energy source	Quantity	Units	Scope 1 (t CO_2-e)	Scope 2 (t CO_2-e)
Electricity	12661	kWh	0.00	8.36
Natural gas	135	GJ	6.96	0.00
Stationary Diesel fuel	0	kL	0.00	0.00

Table 6.100 Summary of emissions for operations on weekly basis

Energy source	Quantity	Units	Scope 1 (t CO_2-e)	Scope 2 (t CO_2-e)
Electricity	10791	kWh	0.00	7.12
Natural gas	118	GJ	6.08	0.00
Stationary Diesel fuel	0	kL	0.00	0.00

The quantity of emissions estimated to occur during the first year of activities, which would include the construction, commissioning and operation, is approximately 260.7 t CO_2-e scope 1 emissions and 302.4 t CO_2-e scope 2 as shown in Table 6.101. The total emission to occur during a full year (52 weeks) operations is expected to be 316.2 t CO_2-e scope 1 and 370.3 t CO_2-e Scope 2 per annum from the energy usage. The resulting net GHG emissions from the lifespan of the project, including construction, commissioning and 40-year operational service life for energy usage is 12,659 t CO_2-e scope 1 and 14,824 t CO_2-e.

Table 6.101 Total emissions for Construction, Commissioning and Operation

	Scope 1 (t CO_2-e)	Scope 2 (t CO_2-e)	Total (t CO_2-e)
First year (include construction and commissioning phase)	260.7	302.4	563.1
Operation (annual)	316.2	370.3	686.5
Net total emission (40 Years)	12,659	14,824	27,483

The emissions from the energy usage are negligible compared to annual emissions in NSW and Australia and does not meet the scope 1 reporting thresholds under NGER.

The emissions estimated to occur from the energy usage from the construction, commissioning and operational phases of the project will contribute negligible amount to the Australian and NSW annual emissions. With the first year of activities contributing 0.0001% to Australia 2023 emission and 0.0002% to NSW annual emissions. Similarly, the emissions from a full year of operations will contribute 0.0002% to 2023 level of Australia's annual emissions and 0.0003% to NSW emissions, as provided in Table 6.102.

Table 6.102 Comparison of emissions with Australian and NSW Annual emissions

Australian Emissions (Mt CO_2-e)	% of emissions	NSW Emissions (Mt CO_2-e)	% of emissions
432.9	0.0001% for the first year 0.0002% for operational years	132.05	0.0004% for the first year 0.0005% for operational years

The LIB recycling facility project supports the energy transition in Australia, and in this context the anticipated emissions predicted for the project are considered to be even more negligible.

6.8.9.3 Mitigation and management measures

No mitigation and management measures are proposed for ESD.

6.8.10 Planning agreement/developer contributions

This section considers planning and developer contributions as requested in SEARs as provided in Table 6.103.

Table 6.103 SEARs for planning and developer contributions

Requirements	Where addressed
Planning and developer contributions –	
– including consideration of any applicable State and local development contributions and/or details of any Voluntary Planning Agreement required should a contributions plan not be in place.	Section 6.8.10

There are no State or local development contributions or Voluntary Planning Agreements (VPA's) currently proposed for the project. Developer contributions have already been applied to DA22_0534 for the Stage 1 – Flip Screen Industrial Estate.

6.9 Cumulative impact

This section describes the potential cumulative impacts of the project and other existing or proposed major projects. The cumulative impact assessment draws on the findings of other specialist assessments of the project contained through the EIS and publicly available assessment documentation on other existing or proposed major projects in the vicinity of the project.

6.9.1 Methodology

The approach undertaken for the cumulative impact assessment is:

– A desktop review of concurrent projects has been conducted by reviewing the following:
  - DPHI's online major projects database
  - Local council websites/ DA tracking databases
  - Proponent websites
– Review project environmental aspects to determine those with the potential to result in cumulative impacts:
  - Undertake a desktop cumulative impact assessment for environmental aspects with the potential for cumulative impacts to occur.

Recommend additional management measures to address identified cumulative impacts where they have not been suitably addressed elsewhere as part of the assessment of the project.

6.9.2 Existing environment

A search of the DPHI's Major Projects Portal was undertaken on 17 July 2024 to identify other major projects that would potentially contribute to cumulative impacts and summarised in Table 6.104.

Table 6.104 Proposed and existing major projects

Project	Development	Timing/Stage	Distance to the Project
Major Projects Portal			
Inland Rail – Albury to Illabo	The Albury to Illabo section of Inland Rail includes enhancements along approximately 185 km of existing rail corridor from the Victoria-NSW border to Illabo in regional New South Wales.	Assessment	Approximately 5.3 km north west
Belhaven Battery Energy Storage System	Construction and operation of a 400 MW / 800 MWh Battery Energy Storage System including transmission connection and associated infrastructure	Prepare EIS	Approximately 7.5 km south west
Gregadoo Solar Farm – modification 3	The modification seeks to: – Increase the AC capacity from 43MWAC to 65MWAC – Increase DC capacity from ~52MWDC to ~75MWDC – Reduce the spacing between solar panel rows by 55 cm from 5.50 m to 4.95 m.	Determination	Approximately 6.5 km south west
Culcairn to Wagga Pipeline – Modification 1 Uranquinty Compressor Station	The proposed modification proposes to construct a compressor station on Lot 781/DP878179 adjacent to the Uranquinty Power Station	Prepare Mod Report	Approximately 7.6 km north
Maxwell Downs Solar Farm	Development a 104 MW solar farm with battery storage facility and associated infrastructure.	Prepare EIS	Approximately 18 km south

Project	Development	Timing/Stage	Distance to the Project
Energy Connect	Development of a new transmission line connecting Buronga Substation and Wagga Wagga Substation, and construction of the new Dinawan Substation.	Determination	Approximately 7 km southwest
Teys Australia Abattoir MOD 12	Construction of a new plate freezer/store, a new switch room and temporary workshop.	Determination	Approximately 7.2 km north
Uranquinty Compressor Station – MOD 1	Construction and operation of a compressor station at Uranquinty.	Prepare Mod	Approximately 6.8 km north
Major Projects with Wagga Wagga City Council			
Stage 1 – Flip Screen Industrial Estate	Flip Screen Industrial Estate industrial subdivision and construction of seven industrial buildings.	In Construction	Project site located within this new industrial estate.
Narrung Street Former Landfill Site	Council is remediating a section of land adjoining Narrung Street that was previously used as a landfill site.	Commenced in January 2024.	Approximately 6.7 km north west
Pine Gully Road Upgrade	Council is upgrading a section of Pine Gully Road and Old Narrandera Road, located south-west of the suburb of Estella in North Wagga Wagga	In Construction	Approximately 11 km north west
Bill Jacob Athletics Centre Upgrade	Council is upgrading the Bill Jacob Athletic Centre to a multi-sport community facility capable of providing requirements for regional, state and national sporting bodies.	In Construction	Approximately 6.7 km south west
Bolton Park Sports Hub	Council aims to activate the Bolton Park Precinct, turning it into a sports hub that attracts athletes, officials, and tourists. Stage 1 of the Bolton Park Sports Hub project is the redevelopment of the Jim Elphick Tennis Centre.	In Construction	Approximately 4.5 km north west

6.9.3 Potential Impacts

Table 6.105 summarises the relevant environmental aspects assessment for the project and their associated cumulative impacts.

Table 6.105 Review of environmental aspects for potential cumulative impacts

Environmental Aspect	Cumulative impact summary
Hazard and risk	Negligible. The compliance to the relevant risk criteria from *HIPAP 4* for the cumulative risk shows that the project will comply with the risk criteria.
Traffic and transport	Traffic movements for the project will result in minor-negligible cumulative traffic impacts on the public road network as described in section 6.3.
Soils and water resources	No Impact anticipated.
Noise and vibration	The project will generate noise which has the potential to result in cumulative impacts at sensitives receptors.
Air quality	The project will generate some minor construction dust during construction. The air quality assessment found the operation and construction would not exceed any established criteria. As such cumulative impacts are negligible.
Waste	Minor. Whilst the project would generate some waste streams that might require offsite disposal, such waste streams are likely to be minor and not create capacity issues at local waste management facilities.
Soil	No Impact anticipated.

Environmental Aspect	Cumulative impact summary
Water/flooding	No Impact anticipated.
Biodiversity	No Impact anticipated.
Non-Aboriginal heritage	No Impact anticipated.
Aboriginal heritage	No Impact anticipated.
Visual	No Impact anticipated.
Social and economic	Minor positive impact. The project has the potential to contribute to cumulative impacts with other projects in the locality. Key areas of impact include workforce changes and investment into the surrounding area.
Land use and property	No Impact anticipated.

Table 6.16 provides details of other nearby major projects that are located within proximity to the project, with emissions to air. There are five other major projects between 4.5 kilometres and 7.2 kilometres of the Wagga LIB recycling facility project. There are not anticipated to be any cumulative impacts in relation to air pollutants from the project and other major projects in the area.

6.9.4 Mitigation and management measures

Negligible cumulative impacts are anticipated for the project, and the existing mitigation and management measures provided in section 6 and summarised in Appendix E, address potential impacts associated with the project.

7. Environmental management

This chapter summarises proposed environmental management framework that will be implemented during delivery of the project. Environmental management measures and plans have been recommended based on the projects potential environmental impacts as identified in section 6.

7.1 Overview

This chapter provides an overview of the strategic environmental management framework which would apply during all stages of development of the LIB recycling facility. It describes the overarching environmental management strategy and associated issue-specific environmental management subplans that would be developed and implemented to avoid, mitigate, and manage the potential environmental impacts associated with the construction and operation of the project.

7.2 Environmental management system

The environmental management strategy would be prepared in accordance with the mitigation measures and commitments detailed in this EIS and the subsequent SSD approval, if the project is granted development consent by the NSW Minister for Planning. It would also be prepared in accordance with any other statutory or licensing requirements that apply to the project at the time and be consistent with policies or standards in place at the time, such as Australian Standards (AS)/New Zealand Standards (NZS) 14001:2015 Environmental Management Systems. The project specific Environmental Management System (EMS) would also be consistent with Calibre Metals internal environmental management system. Figure 7-1 details an indicative environmental management structure for the project.

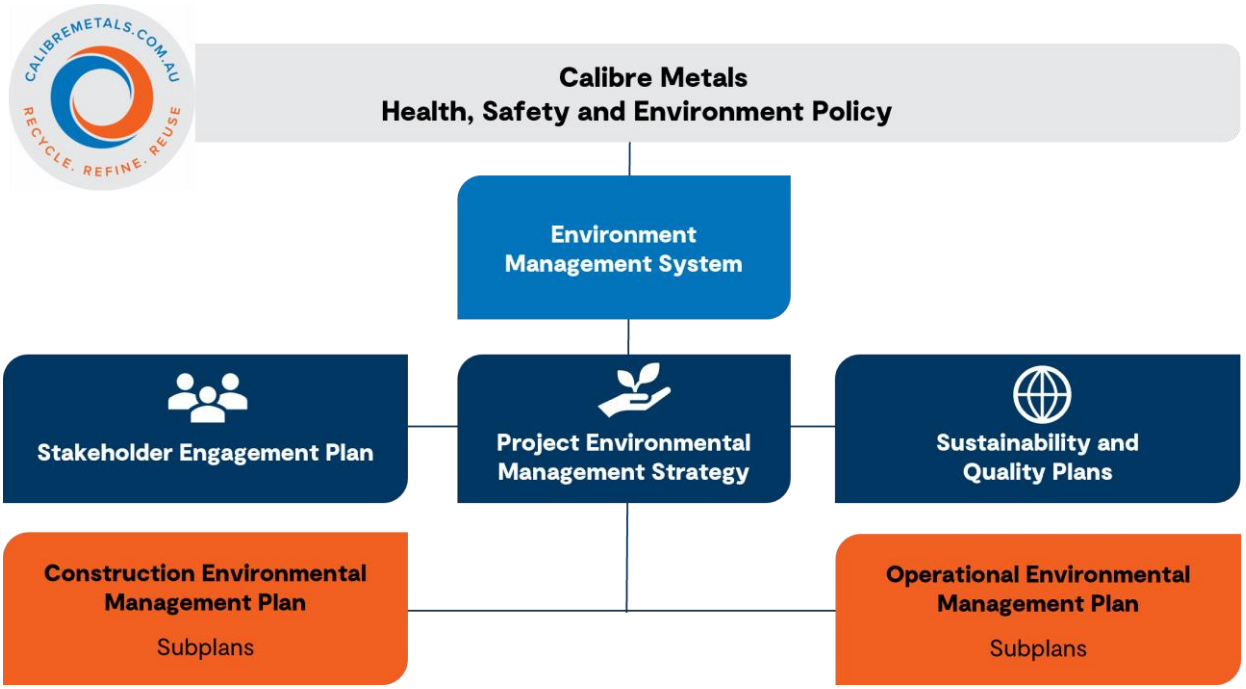


Figure 7-1 Indicative project environmental management structure

The purpose of the environmental management strategy would be to ensure that environmental management measures outlined in the issue-specific environmental management plans are incorporated into a comprehensive framework to facilitate appropriate management throughout the life of the project. The environmental management strategy would include requirements to:

– Ensure that controls are properly implemented, regularly monitored, and audited to assess their effectiveness
– Ensure processes for resourcing and implementing the environmental management strategy are developed to provide certainty of delivery
– Demonstrate compliance with statutory, legislative and consent conditions
– Minimise impacts on the community and the environment
– Ensure timely and efficient response to environmental incidents and complaints
– Monitor, review, and report on environmental impacts of construction, operation, and decommissioning and rehabilitation activities.

7.3 Issue specific environmental management subplans

7.3.1 Requirements

The issue-specific environmental management subplans are to be developed and implemented as part of the environmental management strategy and would include various construction environmental management subplans, operational environmental management subplans. The issue-specific environmental management subplans would be living documents and would be reviewed and amended, as necessary, over the life of the project.

The issue-specific environmental management subplans would be prepared in accordance with the mitigation measures and commitments detailed in this EIS and the subsequent SSD approval, if development consent is granted the project is approved by the NSW Minister for Planning. They would also be prepared in accordance with any other statutory or licensing requirements that apply to the project at the time.

In addition to the above requirements, the issue-specific environmental management subplans would be developed to be consistent with any other overarching plans, policies or standards in place at the time, such as:

– ISO 14001:2015 Environmental Management Systems
– NSW Environmental Management Plan Guideline (DPIE 2020).

The issue-specific environmental management subplans would also make reference to the relevant industry standard guidelines for specific issues and activities.

7.3.2 Content and structure

The content of the issue-specific environmental management subplans would follow the same basic structure, similar to that outlined in Table and in accordance with the requirements listed in section 7.3.1.

Table 7.1 Example content of issue-specific environmental management subplans

Chapter	Content
Introduction	– Purpose, scope and objectives of the plan – Identification of the conditions of consent to which the plan relates and where in the document these are addressed
Project description	– Project overview – Site location – Scope of works – Timing of activities
Community and stakeholder engagement	– How the community and other stakeholders will be informed about the project status and environmental performance – How complaints and enquiries will be managed

Chapter	Content
Environmental management framework	– Relationship to environmental management system – Environmental management structure and responsibilities – Legal and compliance requirements – Training and awareness – Environmental risk assessment – Hold points – Environmental management measures – Environmental monitoring program – Environmental inspections – Environmental control maps or plans – Environmental management documents – Compliance monitoring and reporting – Environmental auditing – Environmental incident and emergency planning, preparedness, and response – Corrective and preventative actions – Review and revision

7.4 Work method statements and protocols

Work method statements/protocols would be developed for construction and operation for the project. These work method statements/protocols would contain instruction for contractors (during construction) and for employees (during operation) on how to implement the environmental management measures outlined in the issue-specific environmental management subplans. Contractors would likely develop their own work method statements/protocols.

7.5 Mitigation measures

A summary of mitigation measures (excluding mitigation measures that are built into the physical layout and design of the project and captured in the project description) is provided in Appendix E. These mitigation measures would be incorporated into the environmental management strategy and environmental management plans developed for the construction and operation for the project.

8. Project justification

This chapter provides the justification for the project with consideration to the objectives of the EP&A Act. A conclusion has been provided to fully evaluate the project's expected impact and assess whether the potential benefits of the project are considered to significantly outweigh any potential negative impacts.

8.1 Justification

8.1.1 Strategic justification

Calibre Metals vision is for a LIB recycling facility to remove 3,000 tons of LIB from landfill per annum and recover the critical minerals contained within. Furthermore, the project is critical to establishing a circular LIB industry in Australia to account for the significant gap that currently exists in Australia's LIB value chain.

The project benefits the Riverina Murray Region and New South Wales:

– Serving as the first LIB facility in NSW to reduce waste and recover resources
– Being complimentary to the land use as it is located within an existing industrial estate
– By avoiding significant adverse environmental, social or economic impacts
– It is consistent with the principles of ecologically sustainable development and the objectives of the EP&A Act.

8.1.2 A critical, recognised need

With the transition to renewable energy, the global demand for batteries is increasing and is largely driven by the imperative to reduce climate change. It is expected on a global scale the demand for LIB is expected to grow by 33 per cent annually by 2030 (McKinsey, 2023). Australia has the potential to be a renewable energy superpower. Australia is well positioned to offer mineral and manufacturing to a wide range of battery chemistries across the value chain.

Batteries will have a critical role for Australia's transition to net zero emissions The state and territories in Australia have set higher targets for renewable energy uptake and batteries will be an important part of the transition for renewables. Australia can play a role to advance secure, resilient, and sustainable global supply chains and whole of life cycle management for LIBs. The industry has now reached a critical stage where the government would be seeking the development of LIB recycling especially with the expected increase of electric vehicles (ABRI, 2023).

The demand for and use of LIB is accelerating across Australia. Despite that, there is currently only one LIB recycler in Australia, located in Melbourne, Victoria. This existing recycler has reported recycling rates of 1,300 tonnes per annum in 2022. Another current leading problem with the battery value chain is the lack of attention to the disposal and recovery of batteries. Unprofessional or illegal disposal of batteries would have the potential to cause sever toxic pollution.

The study of *Waste Lithium Ion Battery Projections* by Randall Environmental Consulting (2016) estimated there is 10,562 tonnes of LIB waste projected for 2024. Accounting for the one existing recycler in Victoria, there is an excess of 9,000 tons of LIB waste destined for landfill. As such the project is critical to the establishment adequate LIB recycling services in Australia to support the increasingly LIB-enabled industries in Australia and the broader renewable energy transition.

8.1.3 A suitable site

The project is located at 61 Edison Road, East Wagga Wagga (Lot 9 DP846835) within an existing industrial area of approximately 1.5 hectares via Edison Road, East Wagga Wagga. The project site is situated on pre-disturbed land that currently undergoing construction of the new industrial building, internal roads and carparking, approved by Council (DA22_0534).

The site location of Wagga Wagga serves as transport links to the major east coast population centres and the existing infrastructure services of the industrial building, would negate the need for any intrusive ground works. As such the project is consistent with the intended development use of the site and as the majority of the project would be a fit out of an industrial shed, there would be no significant adverse environment, social or economic impact during construction.

Project alternatives were considered as part of the early development of the project. These are discussed in section 2.4 of this EIS.

8.1.4 Project benefits

The project would result in positive benefits to the local, regional and state communities and economy in both the short and long term. These benefits include:

– Providing the first LIB recycling facility in NSW and only one of two in Australia to process 3,000 tonnes of LIB per annum, supports the transition to renewable energy
– Reducing landfill waste and recovering crucial minerals to create a key battery chain value
– Utilise a more advanced technology that maximises the recovery of crucial mineral, by improving the separation process steps to produce purer and cleaner products, all while minimising waste
– Indirect benefits to local services through the construction and operation phases
– Creating employment opportunities during the construction phase of the project and long-term job opportunities during operations.

8.1.5 No significant environmental, social or economic impacts

The project has been through a comprehensive environmental, social and economic impact assessment to assess and quantify impacts of the proposed LIB recycling facility. Through a combination of desktop assessments, site surveys and investigations, as well as consultation with key stakeholders and the local community, the project has been able to identify and verify the characteristics of the existing environment and assess the potential environmental, social, and economic impacts during construction and operation of the project.

Key environmental issues identified were air quality, hazard and risk, noise and traffic. The environmental impacts on biodiversity, soil, water and flooding, visual, heritage (Aboriginal and non-Aboriginal), waste, land use and cumulative impacts have all been assessed to be minimal to negligible. The EIS has adopted the mitigation hierarchy approach for addressing the potential impacts of the project. The mitigation hierarchy emphasises best-practice of avoiding, minimising, and managing potential impacts. By using this approach, the identified impacts were able to be addressed either through ongoing design investigation, management actions or through mitigation measures. Therefore, the residual impact of each environmental issue has been reduced to low-negligible.

The project would have a positive social, economic and environmental impact for the Wagga Wagga LGA and the wider community. This project would provide employment opportunities, aid in reducing waste being sent to landfill and contribute in the transition to renewable energy.

The identified impacts that occur during construction would be negligible and of a temporary nature. The recommended mitigation measures identified would assist in being able to avoid or mitigate potential environment impacts associated with the construction of the project.

8.1.6 Ecological sustainable development

The principles of ecologically sustainable development (ESD) include:

– The precautionary principle (see section 8.1.6.1) – Where there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
– Inter-generational equity (see section 8.1.6.2) – The present generation should ensure that the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations.
– Conservation of biological diversity and ecological integrity (see section 8.1.6.3) – Conservation of biological diversity and ecological integrity should be a fundamental consideration.
– Improved valuation, pricing, and incentive mechanisms (see section 8.1.6.4) – Includes the recognition of the principles that the costs of environmental externalities should be internalised, and that the polluter should bear the costs associated with environmental pollution.

8.1.6.1 The precautionary principle

This principle states *"if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".*

The precautionary principle is utilised when uncertainty exists about potential environmental impacts. It provides that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. The precautionary principle requires careful evaluation of potential environmental impacts in order to avoid, wherever practicable, serious or irreversible damage to the environment.

Desktop and field investigations have been undertaken to ensure that the potential environmental, social, and economic impacts of the project are understood with a high degree of certainty. The assessments undertaken have adopted accepted scientific methodologies and have taken into account relevant statutory and government agency plans, policies, and guidelines within the context of the project involving the retrofitting of an existing warehouse facility. Proactive mitigation measures to prevent environmental degradation have been included within the construction and operation phases of the project.

8.1.6.2 Intergenerational equity

This principles states, *"the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations'.*

The project would deliver intergenerational equity by supporting the transition to renewables. With the rising utilisation of electric vehicles and LIB powered devices the demand for LIB recycling and circular economy solutions are becoming prevalent. The project would contribute to resource recovery and recycling as such the project is inherently a matter of ensuring environmental quality for future generations.

The implementation of applicable standards and relevant design codes and guidelines and the identified mitigation and control measures would help reduce the likelihood of significant impacts that would diminish the health, diversity, or production of the environment for present or future generations.

8.1.6.3 Conservation of biological diversity and ecological integrity

This principle states the *"diversity of genes, species, population and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival'.*

The project would be located within an existing industrial park, the development primarily involves fit out of an existing industrial building. No intrusive groundworks are involved in the construction and operation of the project, therefore a BDAR waiver is being sought. No impacts are anticipated on any species, population, community and ecosystem.

8.1.6.4 Improved valuation, pricing and incentive mechanisms

This principle requires that “costs to the environment should be factored into the economic costs of a project”.

The environmental impact assessment has identified the potential environmental, social, and economic impacts of the project and identified mitigation and management measures, where appropriate, to manage potential impacts. The project recycles waste LIB to recover critical minerals and other products for reuse, adding value to what would otherwise be waste disposed of to landfill. The project will contribute to development of the LIB recycling industry and circular economy for LIB in Australia.

If approved, the project would be undertaken in accordance with these mitigation and management measures. These requirements would result in an economic cost to the proponent, indicating that environmental resources have been given appropriate valuation in the development of the project.

The project has been designed with an objective of minimising potential impacts on the surrounding environment. This indicates that the project has been developed with consideration of environmental outcomes.

8.1.7 Biophysical, economic and social merits of the project

The biophysical, economic and social costs and benefits of the project have been assessed in detail throughout the EIS. The biophysical impacts of the project would be generally limited due to the already disturbed nature of the majority of the site.

The potential impacts of the project relate to hazards and risks, air quality, noise and traffic. These environmental aspects have been assessed in detail in section 6 of this EIS. The project is not expected to have a significant impact on the environment. Overall, the potential impacts of the project on the environment are considered limited and would be readily managed with the implementation of the mitigation and control measures discussed through this report that would be collated in environmental management plans.

The project would be the second LIB recycling facility in Australia and with the rising use of electric devices and vehicles for the transition to renewable energy, the need for a LIB recycling facility is crucial to reduce waste, conserve and recover resources and create a circular economy. This project is consistent with the National Battery strategy with the projected increase supply and demand for LIB.

8.2 Objects of the EP&A Act

The project’s consistency or otherwise with the objects of the EP&A Act is summarised in Table 8.1.

Table 8.1 Objects of the EP&A Act

Object	Comment
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State’s natural and other resources,	This project would create employment opportunities and supports the recycling of LIB, promoting a circular economy and better manage resources.
(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,	The project is consistent with the principles of the ESD, as outlined in section 8.1.6.
(c) to promote the orderly and economic use and development of land,	The project is located within the approved Industrial estate development where the purpose is to promote industrial development. The project is in line with the economic use and development of this land.
(d) to promote the delivery and maintenance of affordable housing,	Not relevant to the project.

Object	Comment
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,	The project would not have a significant impact on the environment, including threatened and other species of native animals and plants, ecological communities and their habitats. As the project would be located within an existing industrial building, a BDAR Waiver has been granted for the project and is located in Appendix K.
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	No impacts Aboriginal cultural and non-Aboriginal Heritage is anticipated. Not relevant to the project.
(g) to promote good design and amenity of the built environment,	Good design and amenity of the built environment has and would continue to be considered during ongoing project development. Early consideration was given to the configuration of the site and placement of the main project components with a view to optimising the site layout in conjunction with minimising the potential for social and environmental impact.
(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,	A preliminary hazard assessment has been completed for the project that has identified initial risks and mitigation measures to be implemented based on ongoing design and procurement of infrastructure components. The design, construction and maintenance of the project would be undertaken in accordance with manufacturer requirements and other applicable standards and relevant design codes and guidelines.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,	Not relevant to the project.
(j) to provide increased opportunity for community participation in environmental planning and assessment.	Consultation with the community and stakeholders has been ongoing throughout the development of the project and preparation of the EIS and will continue throughout the assessment phase.

8.3 Conclusion

The project involves establishment and operation of a LIB recycling facility, fitting out an existing industrial building with best available modern LIB recycling equipment, within an industrial estate. The LIB recycling facility will have capacity to store and process 3,000 tpa of waste LIB and will recover a range of critical minerals including lithium, copper, manganese and graphite, as well as metal and plastic.

The project has been declared SSD in accordance with Section 4.36(2) of the EP&A Act and clause 23, Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). The Minister for Planning or the Independent Planning Commission (pursuant to Part 2.2 of the Planning Systems SEPP) is the consent authority in accordance with Section 4.5(a) of the EP&A Act.

This EIS has been prepared to assess the short, medium and long term impacts associated with the project, taking into consideration the principles of ESD. Many of the potential issues identified for the project have been effectively managed through careful selection of design, technology, site and location. To manage other issues, and in some cases eliminate them completely, the EIS identifies a range of mitigation measures that will be implemented during construction and operation of the project. The EIS has demonstrated that the project would not have a significant impact on the environment with implementation of the proposed mitigation measures and is consistent with the principle of ESD.

The project will assist in reducing the amount of waste LIB ending up in landfill, support establishment of a circular economy for LIB in Australia, and aid in the transition to renewable energy. Considering the merits of this project, its consistency with objectives and strategies, the project is considered to be in the public interest and it is recommended that the application be approved.

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