Kurri Kurri Battery Recycling Facility

Environmental Impact Statement

Prepared for Pymore Recyclers International Pty Ltd | November 2016

Main Report

EMM

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Main Report

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Environmental Impact Statement

Battery Recycling Facility

129 Mitchell Avenue, Kurri Kurri

Prepared for Pymore Recyclers International Pty Ltd | 11 November 2016

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Environmental Impact Statement

Final

Report J15156RP2 | Prepared for Pymore Recyclers International Pty Ltd | 11 November 2016

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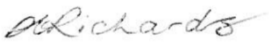
Signature			Signature	
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CERTIFICATION

For submission of an environmental impact statement (EIS) under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979*

EIS prepared by

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Bachelor of Environmental Science and Management	Bachelor of Science, Master of Environmental Planning	Bachelor of Town Planning (Honours)

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Applicant

Pymore Recyclers International Pty Ltd

Governor Macquarie Tower

Level 40, 1 Farrer Place

Sydney NSW 2000

Proposed development

Battery recycling facility

Refer to Chapter 3 of this EIS for a description of the proposed development

Land to be developed

Lots 796 and 797 in Deposited Plan 39877

Certification

We certify that we have prepared this EIS in accordance with the Secretary's environmental assessment requirements issued for the battery recycling facility on 18 March 2016 and to the best of our knowledge the information contained in this EIS is neither false or misleading

David Richards	Rachael Thelwell	Brett McLennan
11 November 2016	11 November 2016	11 November 2016

Executive Summary

ES1 Project overview

Pymore Recyclers International Pty Ltd (Pymore) proposes to construct and operate a battery recycling facility in Kurri Kurri (the project). The project would recycle approximately 60,000 tonnes per annum (tpa) of used lead-acid batteries (ULABs) and would convert a ULAB into materials which can be recycled for use in new products. The project represents a significant investment in the Hunter region, with a capital investment value of approximately $39.8 million, and would provide direct employment for approximately 60 people.

The project is State significant development (SSD) which requires development consent under Part 4, Division 4.1 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (EP&A Act). This environmental impact statement (EIS) accompanies a development application (DA) for the project.

The project would be located at 129 Mitchell Avenue, Kurri Kurri (the site), approximately 40 km north-west of Newcastle in the Cessnock Local Government Area (LGA). The site is located in an existing industrial area and covers an area of approximately 34,000 square metres (m^2). It is legally described as Lots 796 and 797 in Deposited Plan (DP) 39877. Large areas of the site are heavily disturbed with hardstands, gravel tracks, fill and storage of large pieces of industrial equipment and machinery.

ES2 Project need

The project would be located in close proximity to Sydney, the Hunter region and the NSW east coast. These areas, some of which are currently experiencing high residential and industrial growth with subsequent demands for waste disposal and recycling facilities, would receive immediate benefits from the project through the collection and recycling of ULABs. However, the project would also provide for the recycling of ULABs nationwide.

Predicted increases in population and associated vehicle ownership levels in Australia will drive demand for additional ULAB recycling facilities. The use of lead acid batteries for standby power in ATMs, computer networks, households and other establishments is also rapidly increasing. The project would build capacity in two phases (30,000 tpa in the first phase and 60,000 tpa in the second phase). This would mean that the project would not just ensure that ULABs from existing sources are processed in an environmentally safe and compliant manner in a system that is stable, efficient, and sustainable, but would also provide capacity for the recycling of increasing quantities of ULABs in future years.

The *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* (EPA 2014a) provides a framework for actions to minimise environmental harm from waste generation through to disposal, as well as maximising efficient resource use. The strategy sets targets for preventing waste generation, increasing the recovery and use of secondary resources, reducing toxic substances in products and materials, and reducing litter and illegal dumping. The project would make important contributions to a number of the objectives and targets identified within this strategy.

By providing full product management of the lead acid battery production cycle, the project would promote product stewardship and extended manufacturing responsibility. The project would also provide an environmentally beneficial means of managing ULABs. Recycling ULABs keeps heavy metals and other waste materials out of landfill and saves resources by utilising recovered plastics and lead bullion in the manufacture of new products.

The project provides an efficient, effective, and environmentally compliant system of collecting, transporting, and recycling ULABs through the following:

- Pymore would actively engage its affiliates, Supercharge Batteries and Marshall Power, to utilise their network of distributors, battery dealers and shops to collect ULABs from customers buying new batteries;
- the technology used for the project would be supplied by Engitec Technologies S.p.A (Engitec) known worldwide as one of the best providers in ULAB recycling technology as acknowledged by both the European Union and the United States Environmental Protection Agency;
- the project would incorporate the latest environment and operational controls, thereby enabling easier compliance with statutory environmental requirements compared to older and less efficient facilities;
- the project involves the complete recycling of ULABs to produce stable and non-hazardous lead bullion for export; and
- the project would also provide a local source of sodium sulphate which is a by-product of the ULAB recycling process.

ES3 Environmental assessment

A range of detailed technical assessments were prepared for the project by leading professional specialists in accordance with relevant legislation, policies and guidelines. A summary of the predicted impacts of the project are provided below.

ES3.1 Waste management

The project would accept large quantities of ULABs, which are defined by clause 49(d) of Schedule 1 of the NSW *Protection of the Environment Operations Act 1997* (POEO Act) as a hazardous waste. Each ULAB would be converted into materials which are recycled for use in new products namely, lead bullion, sodium sulphate and polypropylene plastics. Each of these products would be saleable items and are not considered wastes.

The only waste products produced by the battery recycling process would be slag generated from the furnace and polyethylene (PE) separators contained within the battery separators. Whether the slag produced by the project would be classified as hazardous would depend on the operating temperature of the furnace and the toxicity characteristics leaching procedure (TCLP) values of the slag. The slag produced by the facility would be tested after commencement of operations to confirm its waste classification and to determine the appropriate management method. Regardless of the classification of the slag, it would be collected, transported and disposed of by a licensed receiver of this type of waste. It is noted that there is a licensed hazardous waste facility in the vicinity of the site that has indicated it is capable of transporting, receiving and treating the slag generated by the facility if it is classified as hazardous.

In addition to the slag and PE separators, minor quantities of waste would be generated by the day-to-day operation of the facility. Wastes would also be generated during construction of the project. All wastes are to be managed in accordance with the *Waste Classification Guidelines – Part 1: Classifying Waste* (EPA 2014b).

ES3.2 Human health

As part of the human health risk assessment, a detailed assessment of the potential exposure pathways for onsite workers and offsite sensitive receivers was conducted. Exposure to lead was considered the primary exposure scenario. Onsite workers have the potential to have both direct and indirect contact with lead dust during project activities conducted within the buildings. These activities include the receipt and collection of ULABs, transportation and storage of ULABs, and battery breaking.

To reduce employee's lead dust exposure during the operation of the facility, a number of control measures would be implemented. These would include:

- compliance with the NSW *Work Health and Safety Regulation 2011* (WHS Regulation) requirements to control exposure;
- implementation of specific engineering controls;
- provision of personal protective equipment (PPE);
- conducting health monitoring and blood level monitoring of all employees; and
- provision of employee education and awareness campaigns.

The lead exposure controls listed above would also provide suitable protection for other chemicals encountered during the ULAB recycling process.

ES3.3 Hazards and risk

A preliminary hazard analysis (PHA) concluded that with the implementation of mitigation and management measures, incidents resulting from the operation of the project would not have any offsite impacts in terms of injury and fatality. The risks resulting from the project were found to meet NSW Department of Planning and Environment (DP&E) criteria for adjacent land uses. Therefore, the PHA concluded that the project is not 'hazardous development' as defined by *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33).

Fuel gas (natural gas) release and ignition was the only scenario found with a potential for an offsite impact. To manage this offsite impact it was recommended that a remotely operated shutoff valve be provided for the natural gas supply to ensure that leaks can be isolated.

No transport incidents with potential for serious impact were identified during the route evaluation study. The route evaluation study concluded that there would not be a significant increase in risk to local traffic users and sensitive land uses along the transport routes to the site. Consequently, the project's transport operations would meet DP&E criteria for acceptable risk. A number of safety systems would be provided for the proposed transport operations.

ES3.4 Traffic and transport

A traffic assessment considered the project's impacts on the local road network and key intersections. The assessment found that on surrounding roads, project generated daily traffic movements during both the peak construction and operational periods would be proportionately greatest on the section of Mitchell Avenue west of the site, between Johnson Avenue and Government Road. Project generated daily traffic increases on this section of Mitchell Avenue would be between +5.7% and +5.3%. On other routes, project generated daily traffic increases would be significantly lower and not generally noticeable.

The existing design standard and width of roads in the local road network would continue to remain adequate for the predicted traffic usage and would not require any additional road widening or traffic controls. Further, SIDRA intersection analyses showed that there would be only minimal changes to the level of service (LoS) at the assessed intersections as a result of project generated traffic.

ES3.5 Noise and vibration

A noise and vibration assessment found that the project's operational noise levels are predicted to meet the relevant criteria at all assessment locations for calm and adverse weather conditions during the daytime, evening and night periods. Further, it was considered unlikely that night-time operations from the project would awaken people at any of the assessment locations.

An assessment of cumulative industrial noise from the project with existing and proposed industrial noise sources in the vicinity has also been conducted. The combined impacts of the project and these sources are predicted to have a negligible impact on the existing ambient amenity of the area.

The overall increase in road traffic noise level at residences would be negligible and is predicted to satisfy relevant criteria. Similarly, construction noise levels are predicted to be below the relevant criteria at all assessment locations considered.

The most significant source of vibration associated with the project would be the hammer mill which is used to break up the ULABs. The hammer mill would be designed to reduce the amount of vibration transferred through the ground. Further, to prevent cosmetic damage to surrounding properties, the recommended safe working distances for vibration intensive plant would be followed.

ES3.6 Air quality and greenhouse gas

An air quality and greenhouse gas (GHG) assessment for the project found that incremental project-related concentrations and deposition rates occurring due to the project's operations were predicted to be below applicable impact assessment criteria and goals at all representative receptors. The project-related cumulative concentrations and deposition rates were also below applicable impact assessment criteria and goals at all representative receptors.

A GHG quantification assessment was undertaken for the project. The projects annual GHG emissions would represent approximately 0.009% of total GHG emissions for NSW and 0.002% of total GHG emissions for Australia.

ES3.7 Surface water

The proposed surface water management strategy would mitigate potential water quality and quantity impacts. Water balance model results indicate that stormwater harvesting would supply between 67% and 90% of the project's process water demand with mains water to be used to meet any shortfall. Proposed water quality management measures have been established in accordance with current best practice guidelines.

A flood risk management assessment was undertaken to identify the potential for the project to impact flooding on adjoining properties and the potential mobilisation of hazardous materials in flood waters. The probability of a flood exceeding the minimum finished floor levels (FFL) for the project is estimated to be 1 in 20,000 in any given year. The project is not expected to result in a material increase in flood risk on adjoining properties.

ES3.8 Contamination and soils

A preliminary contamination assessment did not identify significant contamination issues that would preclude the proposed future land use as an industrial facility. The analytes detected in soil samples collected at the site are considered to represent a low risk to groundwater quality, and the construction of the project would further mitigate the potential for leaching of residual contaminants from soil in the former fill area, which is considered to be the most significant former contamination source.

Desktop and field based contamination investigations indicated a limited potential for the surrounding land uses to contribute to the contamination of the site.

ES3.9 Aboriginal heritage

An Aboriginal Cultural Heritage Assessment (ACHA) assessed the Aboriginal cultural heritage values of the site through field survey, site meeting and consultation with the Aboriginal community. A single Aboriginal artefact, SC01 (isolated find), identified within the site would be impacted by ground disturbance activities associated with the project. The isolated find would be subject to unmitigated impacts resulting in total loss.

Unavoidable harm to Aboriginal objects is acknowledged as a result of the project. The project is a relatively small development with a discrete footprint that would impact on a landscape that has historically been subject to significant ground disturbances. The project would have a negligible impact on the Aboriginal archaeological record in the area.

ES3.10 Historic heritage

No potential historical heritage items or areas of archaeological potential were identified or are anticipated to exist on the site. Similarly, the project would not impact any historical heritage items of local or State significance.

The South Maitland Railway System is the closest listed heritage item to the site. The heritage cartilage of the South Maitland Railway System would not be physically impacted by the project. Potential visual impacts to the heritage item would be negligible as the project would be consistent with the existing industrial landscape.

ES3.11 Fire and incident management

The site is located in and adjacent to bushfire prone vegetation. A bushfire hazard assessment identified the required asset protection zones (APZ) for the project and these would be managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at project buildings. The risk of the project initiating a bushfire would be minimised through the implementation of a number of fire management measures. A fire fighting system, including a number of different water sources would assist with fire fighting on the site.

The surface water management system has been designed to capture and treat any accidental spills. Any spill that enters the stormwater system is likely to be contained onsite in the stormwater capture basin which would be dewatered via pumping to the untreated water holding basin. Emergency resources equipment would be available on site to respond to and manage any significant incidents encountered during the construction and operation of the project.

ES3.12 Visual

The project is unlikely to have significant visual impacts given that the surrounding landscape is dominated by low density industrial facilities interspersed between remnant native vegetation and cleared land. The site entrance would be visible from the corner of Mitchell Avenue and Johnson Avenue. This area would be landscaped and kept tidy to manage visual impacts. The project would not be visible from the nearest residence located approximately 200 m from the southern site boundary on Mitchell Avenue.

ES3.13 Biodiversity

Construction of the project has the potential to result in direct and indirect impacts on biodiversity, including the clearing of native vegetation and habitat, erosion and sedimentation and weed invasion if not managed appropriately. The proposed disturbance area occupies almost the entire site; therefore, the scope to avoid areas of biodiversity value, are limited.

A total of 1.47 hectares (ha) of native vegetation would be cleared to facilitate the construction of the project. To compensate for the loss of this native vegetation, a biodiversity offset strategy would be prepared in accordance with the requirements of the *Framework for Biodiversity Assessment: NSW Biodiversity Offsets Policy for Major Projects* (FBA) (OEH 2014b).

ES3.14 Socio-economic

Economically, the project would stimulate positive economic feedbacks from construction capital expenditure and purchasing carried out during operations, as well as, a ripple down effect from expenditure in the local and wider community. During construction and operations there would be greater economic activity and employment opportunities than currently exist within the Cessnock LGA. The social benefits of stronger local and regional economies would include more diverse employment opportunities for local residents and the availability of enhanced community and business services.

ES4 Justification and conclusion

Modern ULAB recycling facilities incorporate the latest environment and operational controls and provide the ability to retire older and less efficient facilities in locations where land use conflicts are increasingly occurring. This EIS comprehensively describes the likely impacts of the project, including environmental impacts on both the natural and built environments. It also describes commitments proposed by Pymore to mitigate and manage these impacts. The project would minimise negative environmental impacts through the implementation of mitigation measures identified in this EIS, and would operate in a manner that reasonably and feasibly avoids or minimises impacts to the environment.

The project would provide an opportunity for the recycling of ULABs within Sydney, the Hunter region and the NSW east coast as well as nationwide. The facility would convert ULABs into materials which can be recycled for use in new batteries. Lead bullion from lead paste, grids and poles and polypropylene plastics from the ULAB cases would be used in the manufacture of new batteries. Dry sodium sulphate crystals, which are a by-product of the ULAB recycling process, would be readily used in other industries. The facility would utilise Engitec technology, which is operational in over 60 facilities globally and is recognised as the best available technology by a number of the world's regulatory bodies.

The project has many benefits from an economic, social and environmental perspective. Specifically, the project would:

- divert hazardous, recyclable and reusable wastes from landfill;
- preserve space in existing landfills for less recyclable materials, thereby extending the life of landfills;
- provide an alternative to the transport of ULABs to overseas recycling facilities, thereby eliminating the environmental and safety concerns associated with the international movement of a recognised hazardous waste item;
- produce recycled materials that can be used in the manufacture of new batteries and other industries;
- reduce demand for virgin materials and the environmental impacts associated with the mining and manufacturing of these materials;
- reduce the level of contamination in existing recycling programs for organic materials;
- provide a commercial return, with an expected annual revenue of over $50 million at full operation, thereby contributing to the economy of NSW;
- provide direct employment for 60 people within the facility; and
- provide indirect benefits to the community generated by job creation.

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1 Introduction

1.1 Proposal overview

Pymore Recyclers International Pty Ltd (Pymore) proposes to construct and operate a battery recycling facility (the facility) at 129 Mitchell Avenue, Kurri Kurri (the site) that would recycle approximately 60,000 tonnes per annum (tpa) of used lead-acid batteries (ULABs) (the project).

The facility would have four main processes – crushing, screening and separation; desulphurisation; crystallisation; and lead recovery. The entire process would convert a ULAB into materials which can be recycled for use in new products. Lead bullion from lead paste, grids and poles, and polypropylene plastics from the ULAB cases would be reused by affiliated battery manufacturing company to manufacture new lead acid batteries. Dry sodium sulphate crystals, which are a by-product of the ULAB recycling process, can be readily used in other industries including manufacture of soaps and detergents, textiles, glass and paper (DoI - DRE 2016). The project would be in accordance with the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* (Basel Convention) in that no hazardous wastes would be transported overseas for use in the production of new batteries.

The proximity of the project to Sydney, the Hunter region and the NSW east coast would provide immediate benefits to these areas through the collection and recycling of ULABs. Additionally, the applicant's affiliates which sell and distribute new batteries through their national network of distributors, dealers and shops would be actively involved in collecting ULABs from customers buying new batteries. Therefore, the project would be able to service and provide benefits to all areas of Australia where new batteries are sold and where ULABs originate. Areas currently experiencing high residential and industrial growth with significant demands for waste disposal and recycling facilities would also be properly serviced. The project would provide an environmentally beneficial means of managing ULABs. Recycling ULABs keeps heavy metals and other waste materials out of landfill and saves resources by utilising recovered plastics and lead bullion in the manufacture of new products.

1.2 The applicant

The applicant is Pymore, an Australian company wholly owned by PRI Holdings. PRI Holdings have major interests in and actively operates lead recycling operations in other countries and over 35 years experience in ULAB and lead recycling productions. Pymore is part of the Ramcar group of companies which include the largest battery manufacturing company in Southeast Asia, and supplies Australia with 'Supercharge', 'Exide', and 'Marshall' brands of lead acid batteries through its affiliates, Supercharge Batteries and Marshall Power.

Pymore, through its affiliated companies that sell lead acid batteries in Australia, is in the unique position to have in place a national distribution network for the sale of new lead acid batteries which can be used to collect and recycle ULABs. The project promotes product stewardship and extended manufacturing responsibility by providing full product management of the lead acid battery production cycle where a battery is made, distributed, sold, collected, recycled, and made into new batteries, all by companies in the Ramcar group.

1.3 Purpose of report

This environmental impact statement (EIS) accompanies a development application (DA) for the project under the State significant development (SSD) provisions of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The consent authority for the DA is the NSW Minister for Planning, or delegate.

This EIS has been prepared in accordance with the EP&A Act and NSW Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), and addresses the Secretary's environmental assessment requirements (SEARs) and matters raised during consultation with Cessnock City Council (CCC), other government agencies and the local community.

1.4 Secretary's environmental assessment requirements

As required under Section 78A of the EP&A Act, this EIS has been prepared to address the SEARs for the project which were issued on 18 March 2016 (reference SSD 7520) and are provided in Appendix A. Input into the SEARs were provided by CCC and various NSW government agencies.

The SEARs and where they are addressed in this EIS are summarised in Table 1.1.

Table 1.1 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
General requirements	
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.	Table 4.1
• a detailed description of the development, including: – need for the proposed development; – justification for the proposed development; – likely staging of the development (including demolition, construction and operational stages); – likely interactions between the development and any existing, approved and proposed operations in the vicinity of the site; and – plans of any proposed building works.	Chapters 3 and 8
• demonstrate that the site is suitable for the proposed use in accordance with *State Environmental Planning Policy No 55 – Remediation of Land*;	Section 4.3.1 Section 7.9 Appendix K
• consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments;	Chapter 4
• risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;	Chapter 6
• a detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the project, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanisms;	Section 7.15

Table 1.1 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
• a detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: – a description of the existing environment, using sufficient baseline data; – an assessment of the potential impacts of all stages of the development, including any cumulative impacts resulting from the development, and existing, approved and planned land uses in the vicinity, taking into consideration relevant guidelines, policies, plans and statutes; and – a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment.	Chapter 2 Chapter 7 Chapter 8
• a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS; and	Chapter 7
• the EIS must be accompanied by a report from a qualified quantity surveyor.	Appendix C
Waste management	
• identification of the quantity, type and classification of waste that would be handled, stored, processed or disposed of at the site;	Section 7.2
• a description of the waste processing and recycling measures, timeframes for processing and recycling and the quality control measures to be implemented;	Section 3.2
• details of the potential impacts associated with treating, storing, using and disposing of any waste and waste products; and	Section 7.3
• an assessment of the development under the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021.*	Chapter 9
Human Health	
• an assessment of the potential impacts to employees at the facility and any off-site impacts including: – details of measure to manage the exposure of employees to lead including the use of appropriate personal protective equipment and engineering controls; – details of health monitoring of employees and awareness and education measures; – preventative measures for community exposure from the off-site transfer of contaminants; and – details of a work Health and Safety System consistent with the requirements of the Work Health and Safety Regulation 2011.	Section 7.3
Hazards and risks	
• a preliminary risk screening in accordance with *State Environmental Planning Policy No. 33 - Hazardous and Offensive Development*, and *Applying SEPP 33* (DoP 2011a), with a clear indication of class, quantity, package size, and location of all dangerous goods and hazardous materials associated with the development; and	Section 7.3
• a Preliminary Hazard Analysis (PHA) should the preliminary risk screening indicate that the project is "potentially hazardous".	Appendix E
Traffic and transport	
• details of site access, internal road layout and vehicular parking required as a result of the development;	Section 7.5
• accurate predictions of the traffic generated by the development during construction and operation;	Section 7.5

Table 1.1 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
• details of proposed haul routes, site access, internal roads and parking required for the development;	Section 7.5
• an assessment of the potential impacts of the development on the capacity, efficiency and safety of the road network during construction and operation; and	Section 7.5
• details of any required upgrades to road infrastructure.	Section 3.4.5
Noise and vibration	
• a description of all potential noise and vibration sources during construction and operation, including road traffic noise;	Section 7.6
• a noise and vibration assessment in accordance with the relevant Environment Protection Authority (EPA) Guidelines; and	Section 7.6 Appendix H
• a description and appraisal of noise and vibration mitigation and monitoring measures.	Section 7.6 Table 8.1
Air and odour	
• a quantitative air quality assessment of the potential air quality and odour impacts of the proposed development including impacts on any surrounding receivers. The assessment must consider impacts from construction and operation, and include: – details of the air emission inputs and outputs; – identification of all pollutants of concern; – a quantitative assessment of all potential impacts using dispersion modelling, including adequate justification and validation (where appropriate) of all model inputs and outputs; – a cumulative assessment of all existing and proposed emission sources; and – details of the proposed management and monitoring measures.	Section 7.7 Appendix I Table 8.1
Soil and water	
• a quantitative assessment of existing flooding on the site, potential impacts to and as a result of the development and proposed mitigation measures;	Section 7.8 Table 8.1 Appendix J
• an assessment of impacts to surface and groundwater resources, soil and agricultural resources and impacts to groundwater dependent ecosystems;	Section 7.8 Section 7.14
• a description of local soils, geology, topography, drainage (including flooding) and landscapes;	Chapter 2
• a site water balance including the details of any water supply and licensing requirements;	Section 7.8
• details of proposed stormwater, leachate, groundwater and waste water management, including erosion and sediment controls for the construction phase of the development;	Section 7.8 Table 8.1
• wastewater predictions and the measures that would be implemented to treat, reuse and/or dispose of this water; and	Section 3.3 Appendix J
• a description and appraisal of impact mitigation and monitoring measures.	Table 8.1 Appendix J
Contamination	
• a preliminary investigation of the land carried out in accordance with the contaminated land planning guidelines; and if necessary	Section 7.9 Appendix K
• a detailed investigation of the land, carried out in accordance with the contaminated land planning guidelines; and	Appendix K

Table 1.1 Secretary's environmental assessment requirements

Assessment requirements	Reference in EIS
• a risk assessment of the potential for the proposal to contaminate drink water, ground water, surface water and rain water tanks.	Section 7.3.1 Appendix D
Heritage	
• an Aboriginal cultural heritage assessment (including cultural and archaeological significance), which must demonstrate effective consultation with relevant Aboriginal community groups; and	Section 7.10 Appendix L
• a non-Aboriginal cultural heritage assessment, (including both cultural and archaeological significance) which must outline any proposed management and mitigation measures.	Section 7.11
Fire and incident management	
• information on the equipment to be installed on the premises such as spill clean-up equipment and bushfire/fire management (including asset protection zones) and containment measures.	Section 7.12 Appendix M
Design, visual impacts and landscaping	
• details of building design and potential visual impacts from the proposed building, lighting and signage and the proposed mitigation measures to minimise these impacts such as landscaping.	Section 7.13 Appendix B
Biodiversity	
• an assessment of the proposal under the *Framework for Biodiversity Assessment (October 2014)* if necessary, and an assessment of any potential impacts on any riparian vegetation and any groundwater dependent ecosystems.	Section 7.14 Appendix N
Cumulative impacts	
• cumulative environmental impacts resulting from the development and existing, approved and planned land uses in the vicinity, in particular, the Hunter Ecological Industrial Park (SSD 5448), taking into consideration relevant guidelines, policies, plans and statutes.	Section 7.6 Section 7.7 Appendices H and I
Plans and documents	
• the EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000.	Appendix B
Consultation	
• During the preparation of the EIS, consultation is required with: – Cessnock City Council; – Environment Protection Authority; – WorkCover NSW; – Hunter New England Local Health District; – Department of Primary Industries, including NSW Office of water; – Office of Environment and Heritage; – Roads and Maritime Services; and – surrounding landowners and occupiers that may be affected by the proposal. • The EIS must describe the consultation process and the issues raised, and identify where the development has been amended in response to those issues. Where amendments have not been made to address an issue, an explanation should be provided.	Chapter 4

1.5 Report structure

This EIS consists of the main EIS document and supporting appendices and is structured as follows:

- Chapter 1 – Introduction

  Provides an introduction to the project, including an overview of the project, information about the applicant, the purpose of this EIS, and the SEARs.

- Chapter 2 – Existing environment

  Provides a description of the site and surrounds, including the project location, the biophysical environment, socio-economic factors, cultural factors, and other surrounding developments.

- Chapter 3 – Project description

  Provides a detailed outline of the project, including a description of the ULAB recycling process, project details and objectives and alternatives considered during the design process.

- Chapter 4 – Legislative framework

  Provides information on the legislative framework and approval process for the project under relevant Commonwealth and NSW legislation and environmental planning instruments.

- Chapter 5 – Stakeholder consultation

  Provides an overview of stakeholder consultation and engagement activities undertaken for the project and a summary of the consultation results.

- Chapter 6 – Preliminary risk assessment

  Provides a preliminary risk assessment of the potential environmental impacts of the project.

- Chapter 7 – Impact assessment

  Provides an assessment of the likely impacts of the project as required by Section 79C(1b) of the EP&A Act.

- Chapter 8 – Statement of commitments

  Provides a summary of the management and mitigation measures that would be included in the site-specific environmental management plan (EMP).

- Chapter 9 – Conclusion and justification

  Provides a justification for the project, including discussion of the suitability of the site.

- Appendices

  The appendices to the EIS which support the main document, including all copies of all technical assessments.

  - Appendix A – SEARs;
  - Appendix B – Plans of proposed battery recycling facility;
  - Appendix C – Quantity Surveyor's Report;
  - Appendix D – Human Health Risk Assessment;
  - Appendix E – Preliminary Hazard Analysis;
  - Appendix F – Route Evaluation Study;
  - Appendix G – Traffic Assessment;
  - Appendix H – Noise and Vibration Assessment;
  - Appendix I – Air Quality and Greenhouse Gas Assessment;
  - Appendix J – Surface Water Assessment;
  - Appendix K – Preliminary Contamination Assessment;
  - Appendix L – Aboriginal Cultural Heritage Assessment;
  - Appendix M – Bushfire Hazard Assessment;
  - Appendix N – Biodiversity Assessment Report; and
  - Appendix O – Land owner’s consent.

It should be noted that this main EIS document provides a summary of all the technical assessments prepared to support the EIS (eg noise and vibration assessment, air quality and greenhouse assessment etc). The technical studies provide a full and comprehensive assessment of the project relating to each technical area.

2 Existing environment

2.1 Site description

2.1.1 Location and characteristics

The site is located at 129 Mitchell Avenue, Kurri Kurri and is legally described as Lots 796 and 797 in Deposited Plan (DP) 39877. The site would occupy part of the lot on which the Weston Aluminium Dross Recycling Plant (the aluminium recycling plant) is located. A site survey plan is provided in Appendix B.

The site is located in an existing industrial area and covers approximately 34,000 square metres (m^2) (refer to Figure 2.1). The elevation of the site is between 10 and 16 metres (m) Australian Height Datum (AHD). The site slopes from south to north in a gentle downwards gradient towards Swamp Creek, which forms the site's northern boundary.

The site is in the Cessnock local government area (LGA), approximately 40 kilometres (km) north-west of Newcastle (refer to Figure 2.2). The site is zoned IN3 Heavy Industrial under the Cessnock Local Environmental Plan 2011 (Cessnock LEP) (refer to Figure 2.3).

Large areas of the site are heavily disturbed with hardstands, gravel tracks, fill and storage of large pieces of industrial equipment and machinery. There are patches of vegetation; however these are heavily disturbed with partial clearing, weed invasion and canopy dieback prevalent. The site does not include any natural features which are particularly notable or unusual.

The site is held under freehold title by Weston Aluminium.

The site is located within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and the Hunter IBRA subregion.

Photographs 2.1 to 2.8 illustrate varying sections of the site.

Photograph 2.1 **Example of the level of disturbance on the site**

Photograph 2.2 **Example of patches of remnant vegetation contained on the site**

Photograph 2.3 **Example of industrial equipment and machinery currently stored on the site**

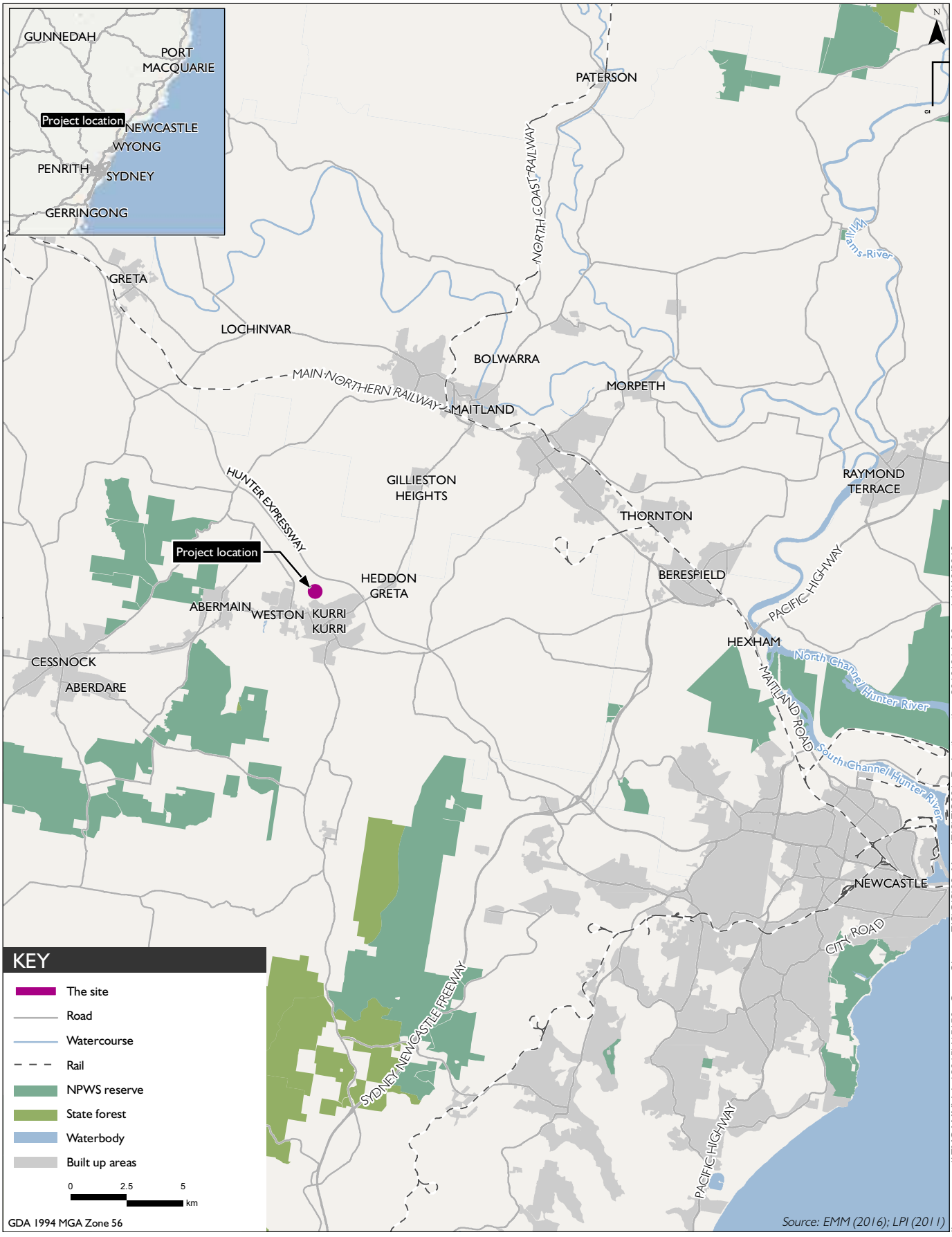
Photograph 2.4 **Example of hardstands and remnant vegetation currently on the site**

Photograph 2.5 **Cleared area in the north of the site**

Photograph 2.6 **Exotic grassland in the north of the site**

Photograph 2.7 **Proposed site entrance location on the northern side of Mitchell Avenue**

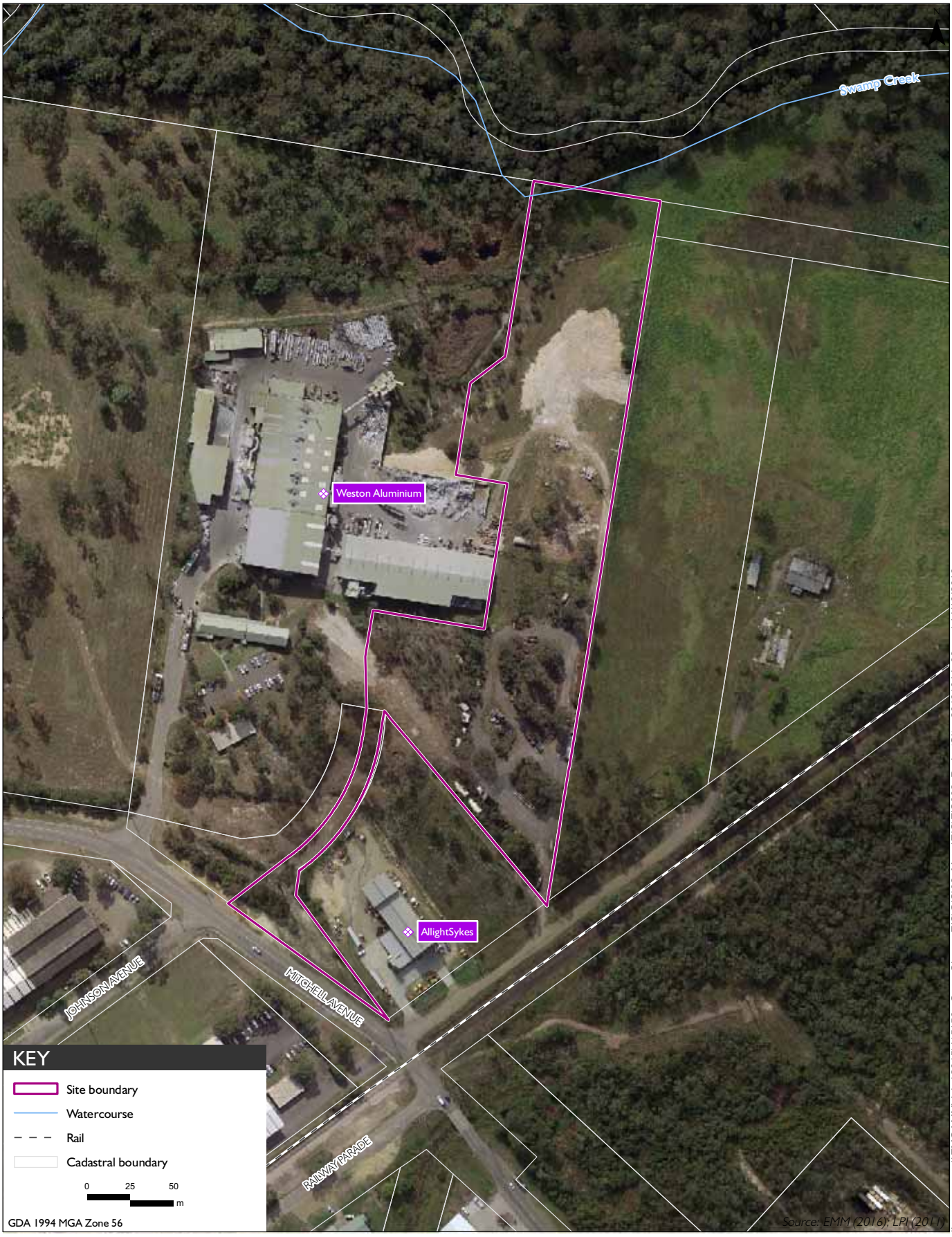
Photograph 2.8 **View of Weston aluminium recycling plant from the site**



Project location

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement

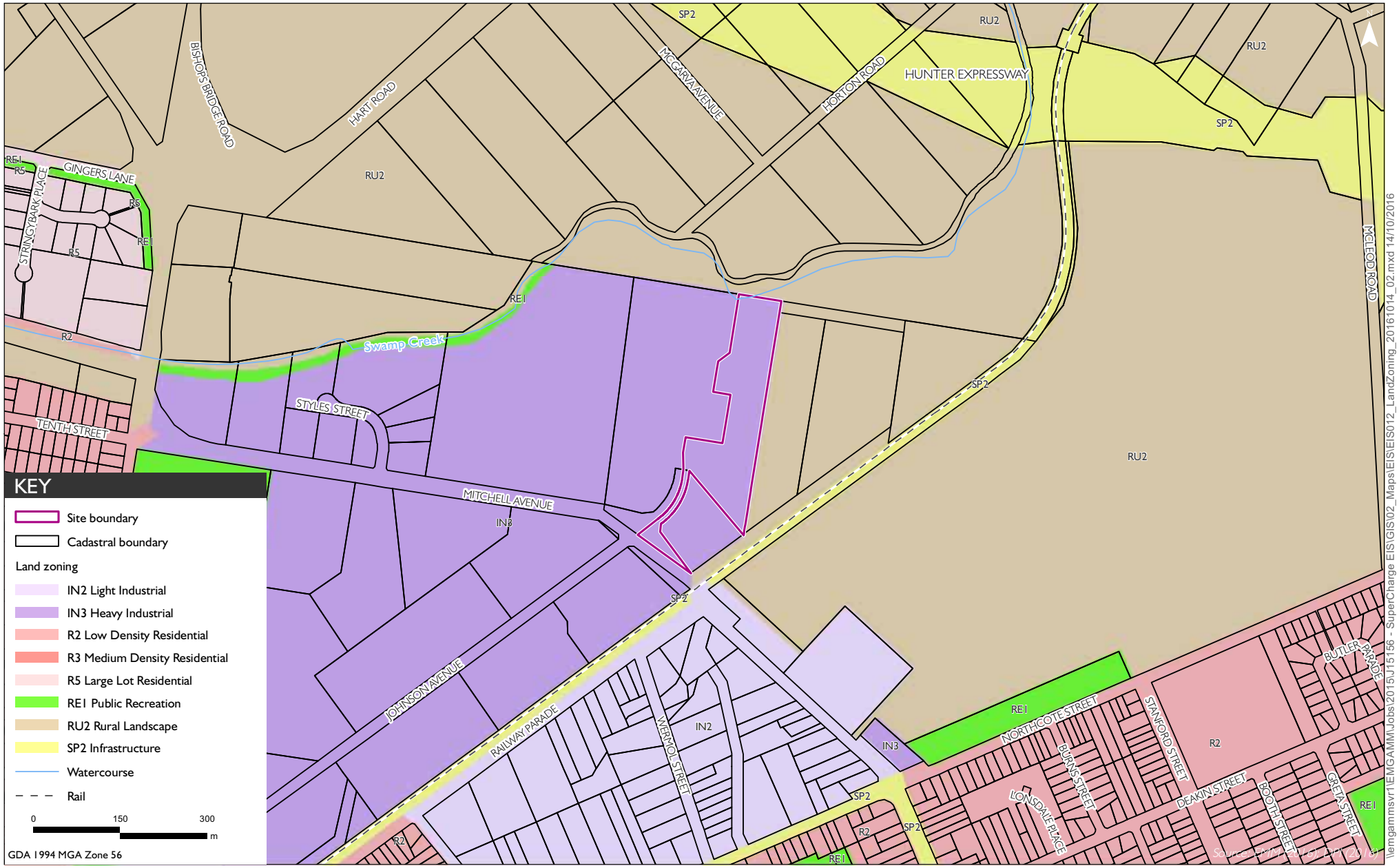
Figure 2.1



Project site

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement

Figure 2.2



Land zoning

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement
Figure 2.3

2.1.2 Historical land uses

Historical aerial imagery was obtained from the NSW Land and Property Information (LPI) database and a brief overview is provided in Table 2.1, with the images included in Figure 2.4.

Table 2.1 Review of historical aerial imagery from 1951–2015

Year	Site boundary	Surrounds
1951	Undeveloped comprising native vegetation and a minor unsealed track.	Undeveloped comprising native vegetation and minor unsealed tracks. Land to the east is cleared, with minor buildings and assumed to be used for night soil disposal.
1984	Undeveloped comprising native vegetation and cleared land to the north. Minor unsealed tracks.	Largely as above, with addition of three large buildings/warehouses to the south and some smaller properties to the north. Tracks visible to the east associated with night soil disposal.
1998	Some minor land clearing in the north revealing exposed soil.	Aluminium recycling plant constructed to the west, with two dams to the north-east. Additional large buildings/warehouses to the south-west and residential properties to the south.
2010	Vegetation in the south has been thinned, machinery is being stored in the middle of the site and there is some fill material stockpiled in the mid-north.	The trees to the west of the aluminium recycling plant have been thinned. A sealed road has been constructed into the landfill to the west, which has also expanded slightly.

The site is currently used for the storage and disposal of heavy industrial parts and machinery, associated with the aluminium recycling plant. Spoil and fill have also been stored on the site.

2.1.3 Surrounding environment

The site is located in an existing industrial area and surrounding land uses include the aluminium recycling plant to the west, a waste water treatment facility 750 m to the east, and the decommissioned Hydro Aluminium Kurri Kurri Smelter 1.3 km to the north. The residential areas of Kurri Kurri and Weston are approximately 650 m to the south-east and 1 km to the west of the site, respectively. The Hunter Expressway is situated approximately 550 m to the north-east, providing connections to Newcastle to the south-east and the New England Highway to the north. A private rail line, owned and operated by a nearby coal mine, exists 25 m to the east of the site.

Surrounding land uses have been identified in Figure 2.5. Photograph 2.9 is an aerial image of the site looking north. Within this photo, the aluminium recycling plant (located west of the site), AllightSykes (located south of the site), cleared land previously used as a sanitary landfill and dog kennel (located east of the site), and the decommissioned Hydro Aluminium Kurri Kurri Smelter (located north of the site) are all visible. The Hunter Expressway had not been constructed at the time this image was captured.

Cleared land directly east of the site was previously used for the disposal of human sanitary waste (also known as night soil) by CCC. More recently, this area was used as a dog kennel; however, the land has been unused since 2012.

The site abuts a vegetated creek corridor (Swamp Creek) to the north. Swamp Creek, located approximately 70 m from the site's northern boundary, flows to the north-east, joining the Hunter River approximately 12 km from the site (refer to Photograph 2.10).

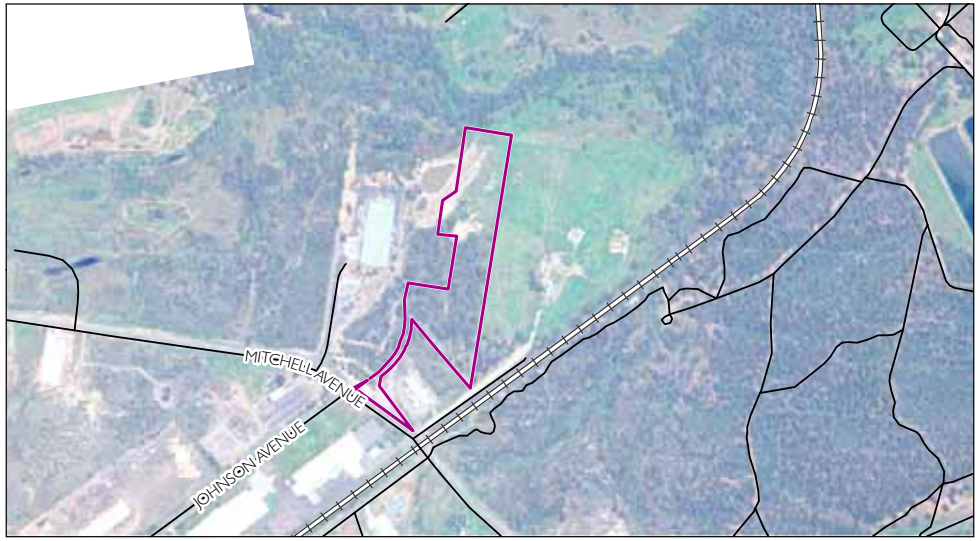
Werakata National Park is located approximately 4.5 km south-east of the site. A large wetland area also exists approximately 5 km downstream of the site (Wentworth Swamp), between Kurri Kurri and Maitland, and is associated with Swamp Creek.

Photograph 2.9 **Aerial image of the site looking north illustrating the surrounding land uses**

Photograph 2.10 **Swamp Creek located north of the site**

1951

1984



1998

2010

KEY

Site boundary

0 100 200 m

GDA 1994 MGA Zone 56

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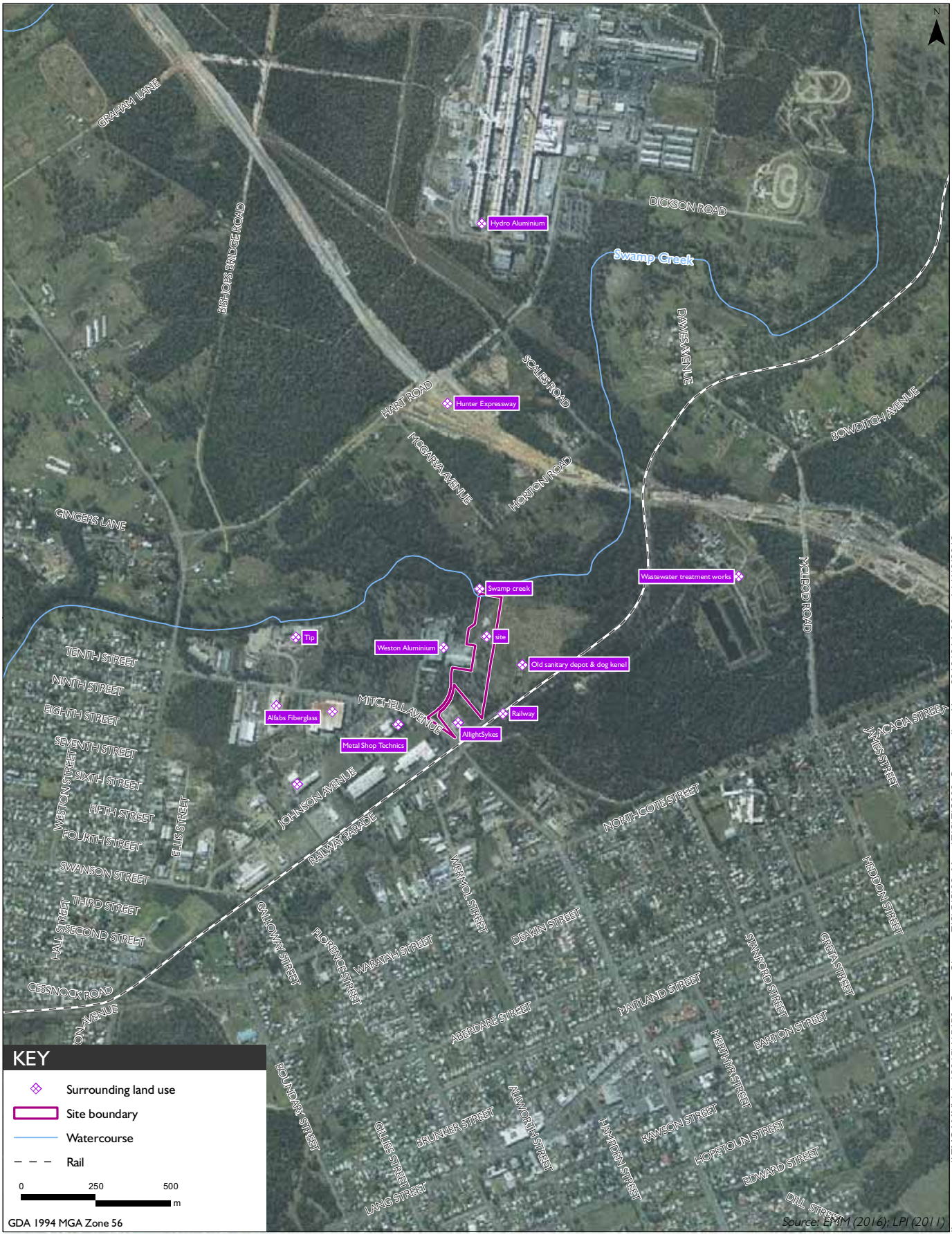
EMM

Historical aerial imagery

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement
Figure 2.4



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Surrounding land uses

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement

Figure 2.5

2.2 Biophysical environment

2.2.1 Climate

The Hunter region has a sub-tropical to temperate climate, with seasonal variations in both temperature and rainfall (OEH 2014a). Climate data for the site has been obtained from the Australian Bureau of Meteorology's (BoM) station in Maitland (Station number 061388), approximately 10 km north-east. Mean monthly minimum and maximum temperatures range between 16.4°C to 30.2°C in summer and 5.5 to 20°C in winter (BoM 2016a). The area experiences a mean annual rainfall of 821.3 millimetres (mm) with more cloudy days than clear throughout the average year (BoM 2016a).

2.2.2 Topography and landform

The elevation of the site is between 10 and 16 m AHD. The site slopes from south to north in a gentle downwards gradient towards Swamp Creek, which forms the northern boundary of the site.

The existing topography at the site is characterised by a subtle ridge line that is aligned in a north-south direction. Under existing conditions, the western portion of the site drains towards the aluminium recycling plant where it accumulates in the plant's water management dams. These dams overflow to Swamp Creek when they reach capacity. The eastern portion of the site drains to the east as sheet flow.

2.2.3 Geology

The site is in the northern end of the Permo-Triassic Sydney Geological Basin. This basin comprises Permian and Triassic sedimentary units, overlain by Quaternary alluvium associated with watercourses. Reference to the *1:100 000 Newcastle Coalfield Regional Geology map sheet* (Hawley et al 1995) confirms Quaternary alluvial soils and unconsolidated sands are deposited adjacent to Swamp Creek.

The Quaternary deposits are underlain by Early Permian, Dalwood Group, comprising silty sandstone and siltstone. Weathering of this unit produces sandy, silty clay and the depth to competent rock is 7 m below ground level. There is no reportable presence of acid sulphate soils (potential or actual) at the site or in the surrounding area.

2.2.4 Surface water resources

The closest surface water feature to the site is Swamp Creek, which flows to the north-east, joining the Hunter River approximately 12 km north-east of the site. Shallow groundwater flow is expected to follow a muted reflection of topography, with an assumed flow direction to the north. Some shallow groundwater is expected to discharge into Swamp Creek, along with any water that moves through the unsaturated zone.

Swamp Creek is a major watercourse that has a contributing catchment area upstream of the site of more than 80 km^2. Downstream of the site, Swamp Creek enters into Wentworth Swamp, a large ephemeral water body that is known to accumulate large amounts of surface water following rainfall. Wentworth Swamp drains into Wallis Creek before entering the Hunter River.

Swamp Creek has a known history of flooding with recent major floods occurring in June 2007 and April 2015. Flooding on the Swamp Creek floodplain is known to occur from both back water flooding during a Hunter River flood event and from flooding produced by rainfall in the Swamp Creek catchment.

2.2.5 Groundwater resources

The closest registered groundwater bores are approximately 2.2 km north of the site (DPI Water 2016). These bores are monitoring bores associated with the Hydro Aluminium Smelter. No information on water bearing zones, standing water levels or geology is provided in the bore summaries.

There are no actual or potential groundwater dependent ecosystems on the site or in the surrounding area which are listed in the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* (NSW DW&E 2009) or in the BoMs *Groundwater Dependent Ecosystem Atlas* (BoM 2016b).

2.2.6 Soils

The subsurface of the site comprises light brown/grey, very fine to fine grained sandy loam with minor clay and organic matter (refer to Section 6.1 of Appendix K). Fine grained light yellow/brown sand and organic matter was observed adjacent to Swamp Creek in the northern end of the site.

The site has been disturbed and has been subject to filling activities. More details on the content of these fills have been provided in the preliminary contamination assessment (Appendix K).

2.2.7 Biodiversity

Vegetation on the site was compared to all plant community types (PCTs) for the Hunter IBRA subregion. A total of two communities were recorded. These included:

- PCT 1633 Parramatta Red Gum - Narrow-leaved Apple - Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area; and
- PCT 1594 Cabbage Gum-Rough-barked Apple grassy woodland on alluvial floodplains of the lower Hunter.

Exotic grasses and forbs with no native canopy or mid-stratum species were recorded in the central and northern areas of the site. Midstorey species were limited to the exotic Green Cestrum, Lady-of-the-Night (*Cestrum nocturnum*) and Blackberry (*Rubus fruticosus aggregate*). Each species was limited to small patches and were not a dominant component. Native ground cover species were limited to Bracken and Common Couch (*Cynodon dactylon*), both of which were abundant. These species are often abundant in disturbed areas. Exotic groundcover was dominated by Paspalum (*Paspalum dilatatum*), with other common weeds including Lacy Ragweed, Pigeon Grass (*Setaria sp.*), Purpletop (*Verbena bonariensis*) and Narrow-leaved Plantain (*Plantago lanceolata*).

Two heavily disturbed threatened ecological communities (TECs) listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) have been recorded on the site. No endangered ecological communities (EECs) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded on the site.

A total of 144 flora species were recorded on the site, of which 106 were native species and 38 were exotic weeds. The majority of the diversity was associated with Parramatta Red Gum – Narrow-leaved Apple Community, with up to 90 native species recorded. Two threatened flora species were recorded on the site; Earp's Gum and Slaty Red Gum. Native fauna observed on the site included one frog and 11 bird species.

2.3 Socio-economic factors

2.3.1 Land ownership

The site is owned by Weston Aluminium Pty Ltd.

2.3.2 Existing land uses

Land to the east, south and west of the site is used predominantly and historically for industrial purposes (refer to Figure 2.5). Specifically, the site is surrounded by the following land uses:

- South – AllightSykes Pty Ltd, an existing mining and construction equipment hire business that currently occupies the industrial property located immediately south of the site, Mitchell Road and other industrial properties;
- East – cleared land previously used for the disposal of human sanitary waste by CCC and more recently as a dog kennel; however, the land has been unused since 2012;
- North – native vegetation along Swamp Creek; and
- West – the Weston Aluminium Recycling Plant including associated industrial structures and managed vegetation.

2.3.3 Community profile

The site is located close to the towns of Kurri Kurri (approximately 650 m south-east of the site) and Weston (approximately 1 km west of the site) in the Hunter region of NSW (refer to Figure 2.1). Retail and community facilities, infrastructure and services are concentrated in these towns, which are both part of the Cessnock LGA.

Kurri Kurri is the second largest town within the Cessnock LGA and the towns of Kurri Kurri and Weston have traditionally been the industrial centres of the Cessnock LGA. The Cessnock LGA is well serviced in terms of education and training, cultural and community, health, aged care, recreational and sporting facilities (CCC 2014).

The Cessnock LGA has experienced moderate population growth since 2001 with a total increase in population of 12.8% to 50,840 people in 2011 (ABS 2016a). Similarly, the townships of Kurri Kurri and Weston also experienced a growth in population over this period, with populations reaching 5,772 and 3,682, respectively. The percentage of the population who identify themselves as Aboriginal and Torres Strait Islander people within the Cessnock LGA (4.8% in 2011) is close to double the national and state average (ABS 2016a).

The unemployment rate within the Cessnock LGA, recorded as 9.7% in June 2016, was higher than those recorded for NSW and Australia, which were 5.4% and 5.9%, respectively (Department of Employment 2016). In June 2016, the unemployment rate for the statistical area of Kurri Kurri–Abermain was 10.8% of the labour force (8,284), which was higher than the unemployment rates recorded for the Cessnock LGA, NSW and Australia, respectively (Department of Employment 2016).

As at 2011, the main industries of employment within the Cessnock LGA are coal mining, cafes, restaurants and takeaway food services, accommodation and school education (ABS 2016a). Between 2001 and 2011, there was significant growth in employment in coal mining (56.78%) within the Cessnock LGA. Coal mining is recognised as the main industry of employment in both Kurri Kurri and Weston.

As at 2011, the most common occupations in Cessnock LGA are technicians and trade workers (19.0%), machinery operators and drivers (14.6%), labourers (13.4%) and clerical and administrative workers (11.4%) (ABS 2016a). Similarly, the most common occupations in both Kurri Kurri and Weston are also technicians and trades workers. As recognised by the *Cessnock LGA Economic Development Strategy* (CCC 2014), there is a higher proportion of 'blue collar workers' and a lower proportion of people engaged in professional and management positions in the Cessnock LGA when compared with the greater Hunter region and NSW, respectively.

The *Cessnock LGA Economic Development Strategy* has highlighted the need for additional government funding within the area to address the challenges and disadvantages identified as part of this strategy. This should include the delivery of more services that target areas of poor health, education and labour force participation, as well as, working with businesses to help break generational unemployment issues (CCC 2014). Opportunities for growth in agriculture, forestry, manufacturing, construction, viticulture, tourism and education were also identified within this strategy.

2.4 Cultural factors

2.4.1 Aboriginal heritage

The dominant Aboriginal language group for local area were the Wonnarua people. Their territory extended from the Hunter River above Maitland, west to the Dividing Range and from Singleton to Merriwa (Tindale 1974).

It is thought that Aboriginal people travelled across the area in small family groups subsisting on plant foods, aquatic life from the Hunter River and creeks and a variety of animal life such as possum, kangaroo, snakes and lizards. Brayshaw (1986) collated and examined ethno-historical sources of early settlers and explorers in the Hunter Valley. These sources have indicated that Aboriginal people would have used a variety of items for subsistence procured from stone, shell, animal components (such as fur and bone) and plants.

A search of the Aboriginal Heritage Information Management Systems (AHIMS) identified 51 Aboriginal sites in a 5 km by 5 km search area centred on the site. The four closest AHIMS sites to the site (within 1 km) are situated to the north-east in close proximity to Swamp Creek. Three of the sites are isolated finds with the fourth an isolated find with an area of potential archaeological deposit (PAD). All four of the sites are situated between 75-175 m from Swamp Creek.

Previous Aboriginal heritage reports from the Kurri Kurri area were also requested from AHIMS. Stuart (1994) identified a single open artefact site during an archaeological survey of the site. The single artefact site consisted of two flakes located next to the eastern boundary fence of the site.

A pedestrian survey of the site under the guidelines stipulated within the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010a) was undertaken by EMM. A previously undiscovered isolated find was identified during the survey (a silcrete unidirectional core – SC01). The isolated find was identified in a disturbed context on a simple slope in the centre of the site. The single open artefact site identified by Stuart (1994) could not be relocated.

2.4.2 Historic heritage

The Hunter Valley was first sighted by Lieutenant John Shortland in 1797 during his search for escaped convicts. Cessnock lies between Australia's earliest European settlements — Sydney, the Hawkesbury and the Hunter. European settlement in the form of pastoral selection increased around the land near present day Kurri Kurri and Cessnock in the 1820s.

Pastoral and agricultural pursuits were the predominant type of industry in the Hunter during the early and mid 19th century. Toward the end of the century, however, the Hunter Valley coal industry swiftly gathered pace.

In 1886, the Assistant Geological Survey for the Mines Department NSW was sent to the Lochinvar area, to the northeast of Kurri Kurri, to investigate the Northern Coalfields. Townships began to form adjacent to coal mine pit tops and rail heads on the Greta seam. The coal industry reached its peak in the mid 1920s and by the 1960s had started to dwindle. As a result numerous light industries were established in the district with particular focus on aluminium smelting.

A search of the State Heritage Inventory (SHI), which is a list of all heritage items in NSW including the State Heritage Register (SHR), interim heritage orders, state agency heritage registers and local environmental plans indicates that there are no registered historic heritage items located on the site. A historic heritage survey of the site did not identify any evidence of previous structures or development on the site.

2.5 Other developments

Proposed developments in proximity to the site are discussed below. Where relevant, the technical assessments for the project have considered the cumulative impacts of these developments.

- Weston Aluminium Plant – Medical and Other Thermal Processing Facility (SSD 7396) – Weston Aluminium Pty Ltd proposes to install and operate equipment to thermally process up to 8,000 tpa of medical and other wastes, including clinical, pharmaceutical, pathogenic and cytotoxic-related wastes, as well as, solvents, pitch residues, documents and oily rags. The proposed thermal oxidiser and feeding systems will be integrated within the northern end of the aluminium recycling plant, directly west of the project site, and would utilise existing plant, equipment and infrastructure. Operations for this proposal would occur 24 hours per day, 7 days per week.

  A DA for this proposal has been issued to the Department of Planning and Environment (DP&E) and the EIS publically exhibited between 8 September and 24 October 2016. Weston Aluminium are currently reviewing submissions received during the exhibition period. There are also a number of minor modifications to Weston Aluminium's existing development consent (86-04-01) which were recently exhibited. Cumulative impacts of this development and the project have been considered in the noise and air quality assessments (see Appendices H and I).

- Former Hydro Aluminium Smelter – Demolition and remediation (SSD 6666) – Hydro Aluminium Kurri Kurri Pty Ltd propose to demolish the redundant smelter buildings and structures, remediate the site, and design, construct and operate a waste management facility on Hart Road, Loxford. The waste management facility would include a purpose built containment cell that would encapsulate certain waste materials from the demolition and remediation activities. The facility would also be capable of treating leachate and leachate impacted groundwater from the capped waste stockpile located on the site.

  A DA for this proposal has been issued to DP&E and public exhibition of the EIS concluded on 12 September 2016. The proponent is currently reviewing submissions received during the exhibition period. Cumulative impacts of this development and the project have been considered in the noise and air quality assessments (see Appendices H and I).

- Hunter Industrial Ecology Park (SSD 5448) – Industrial Ecology Australia proposes to construct Stage 1 of the Hunter Industrial Ecology Park on Mitchell Avenue. The proposal includes a waste to energy plant, a materials recovery facility, a community drop off centre, and an administration centre (including a testing laboratory, a research centre, an education centre, and a maintenance facility), plus community title subdivision into 23 lots. It is noted that area subject of this application includes the project site.

  SEARs for the development were issued on 3 December 2012. Correspondence to Pymore from the landowner (Weston Aluminium) on 8 April 2016 indicated that the application is intended to be withdrawn. Given this, and the lack of publically available data on the project, the proposal has not been considered further in this EIS.

- Hunter Industrial Ecology Park – Energy from Waste Facility (SSD 6779) – Omega Energy proposes to construct and operate an energy from waste plant at 135 Mitchell Avenue. The EFW was to receive residue waste from existing waste contractors and landfills for thermal conversion and the consequential generation of gas and/or electrical power.

  SEARs for the development were issued on 19 December 2014. Correspondence to Pymore from the landowner (Weston Aluminium) on 8 April 2016 indicated that this application would likely be withdrawn. Given this, and the lack of publically available data on the project, the proposal has not been considered further in this EIS.

3 Project description

3.1 Overview

This chapter provides a detailed description of the project, its objectives and alternatives considered. A site layout plan is provided in Figure 3.1. Full project plans are provided in Appendix B which include site survey, site layout, building layouts, cross sections, elevations, drainage, lighting, material storage, landscaping, services, fencing and signage.

3.2 Need for the project

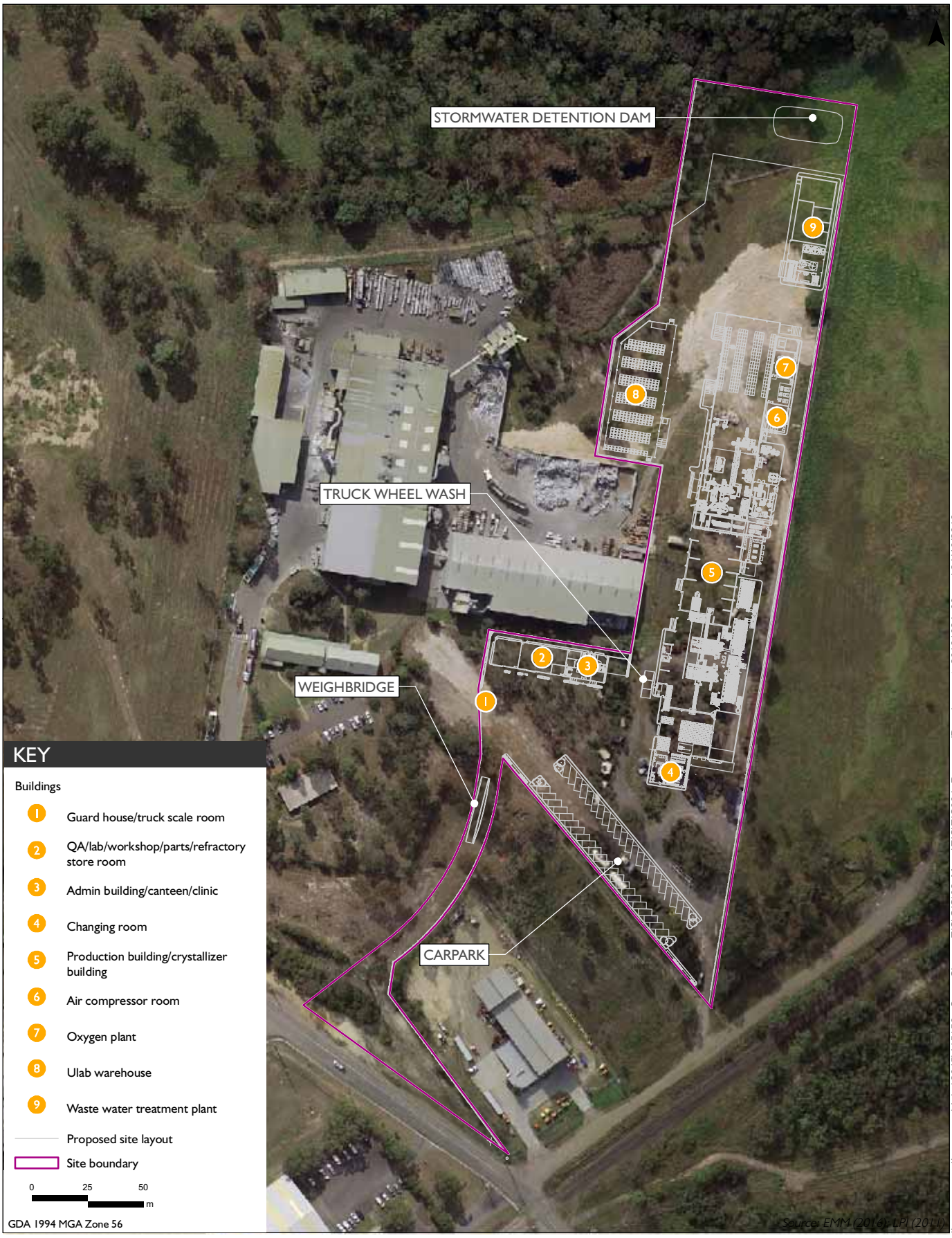
Recycling of waste results in a wide variety of tangible and measurable environmental benefits compared with landfill disposal. These include energy savings, avoidance of greenhouse gas emissions, water savings, avoidance of waste, and significant reductions in natural resource use.

The NSW Government has committed close to $500 million to transform waste and recycling in NSW. The *Waste Less, Recycle More: A Five-year $465.7 million Waste and Resource Recovery Initiative* (EPA 2013) and the *NSW Waste Avoidance and Resource Recovery Strategy: 2014-21* (EPA 2014a) emphasise the importance of removing problem wastes to reduce the possibility of contaminating existing recycling streams and to create opportunities to improve the recycling of other materials. In recognition of this, significant investments have been made to establish permanent drop-off points and collection events for common household waste items, including batteries.

The *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* (EPA 2014a) provides a framework for actions to minimise environmental harm from waste generation through to disposal, as well as maximising efficient resource use. The strategy sets targets for preventing waste generation, increasing the recovery and use of secondary resources, reducing toxic substances in products and materials, and reducing litter and illegal dumping. Specifically, the strategy has set the following measurable objectives and targets for waste avoidance and resource recovery within NSW:

- by 2021–22, reduce the rate of waste generation per capita;
- by 2021–22, increase recycling rates for municipal solid waste (from 52% to 70%), commercial and industrial waste (from 57% to 70%), and construction and demolition waste (from 75% to 80%);
- by 2021–22, increase the waste diverted from landfill (from 63% to 75%);
- by 2021–22, establish or upgrade 86 drop-off facilities or services for managing household problem wastes statewide;
- by 2016–17, reduce the number of litter items by 40% compared with 2011–12 levels and then continue to reduce litter items to 2021–22; and
- by 2016–17, reduce the incidence of illegal dumping in Sydney and the Illawarra, Hunter and Central Coast regions by 30% compared with 2010–11.

The project would make important contributions to a number of the objectives and targets identified above.



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Site layout

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement

Figure 3.1

Under the NSW *Protection of the Environment Operations Act 1997* (POEO Act) and the Commonwealth *Hazardous Waste (Regulation of Exports and Imports) Act 1989*, ULABs are classified as a hazardous waste item and, consequently, they should not be disposed of with regular waste. Despite this, it is estimated that 135,000 car batteries are sent to landfill each year, and a further 111,000 are stockpiled in places like household garages (Planet Ark 2011). Whilst these numbers represent a small portion of the millions of ULABs generated each year, the environmental impact of these is still significant. The constituents of ULABs are highly recyclable materials with up to 98% of the materials able to be recovered (ABRI n.d.). By recycling ULABs, two significant stages of the waste process can be avoided, namely the extraction of raw materials and the disposal of waste to landfill. This results in significant environmental benefits through the consequent reduction in demand for finite resources and the removal of heavy metals and other toxic materials from the waste stream.

The project provides for an efficient, effective, and environmentally compliant system of collecting, transporting, and recycling ULABs. The applicant would actively engage its affiliates, Supercharge Batteries and Marshall Power, to utilise their network of distributors, battery dealers and shops to collect ULABs from customers buying new batteries. This provides a more convenient method of disposal for customers and battery store owners, who need not look for buyers and collectors, as well as a more efficient use of sales personnel and delivery vehicles associated with these affiliated companies.

It is also considered that predicted increases in population and associated vehicle ownership levels in Australia will drive demand for additional ULAB recycling facilities such as the project. ULABs are generated by cars, trucks, motorcycles, marine and recreational vehicles, and other vehicles requiring lead acid batteries. It is noted that electric vehicles, hybrids, and start-stops, still use lead acid batteries for starting, lighting, and ignition. At the start of 2016, there were 18.4 million registered motor vehicles in Australia which is an increase of 2.1% from 2015 levels (18 million) and 12.3% from 2011 levels (16.4 million) (ABS 2016b). A study undertaken by Wang, Huo and Johnson (2006), identified a vehicle ownership saturation level for Australia of 800 per 1,000 people. Based on this saturation level, current levels of ownership, and future population projections, it is estimated that there will be more than 4 million additional vehicles in Australia in the next 10 years. Assuming vehicles change batteries on average every 2.5 years; this represents an additional 26,000 tpa of ULABs from new vehicles alone. Figure 3.2 shows vehicle registration numbers in Australia between 2000 and 2015 with projected ownership numbers as detailed above. Figure 3.3 shows these numbers as vehicle ownership per 1,000 people.

The use of lead acid batteries for standby power in ATMs, computer networks, households and other establishments is also rapidly increasing in numbers.

The project would build capacity in two phases as discussed further below. This would mean that the project would not just ensure that ULABs from existing vehicles are processed in an environmentally safe and compliant manner in a system that is stable, efficient, and sustainable, but would also provide capacity for the recycling of increasing quantities of ULABs in future years.

There is also a need to address Australia's growing environment concerns and tighter environment regulations in battery recycling operations. The technology used for the project would be supplied by Engitec Technologies S.p.A (Engitec) known worldwide as one of the best providers in ULAB recycling technology as acknowledged by both the European Union (EU) and the United States Environmental Protection Agency (US EPA). Engitec has developed the CX Integrated System, which uses a combination of hydrometallurgical and pyrometallurgical processes for the recovery of lead and associated by-products from ULABs. This technology has been proven to be very effective and environmentally safe and is currently used in over 60 ULAB recycling plants worldwide including one in Australia, the Renewed Metal Technologies (RMT) plant in Wagga Wagga. The project would also incorporate the latest environment and operational controls, thereby enabling easier compliance with statutory environmental requirements compared to older and less efficient facilities.

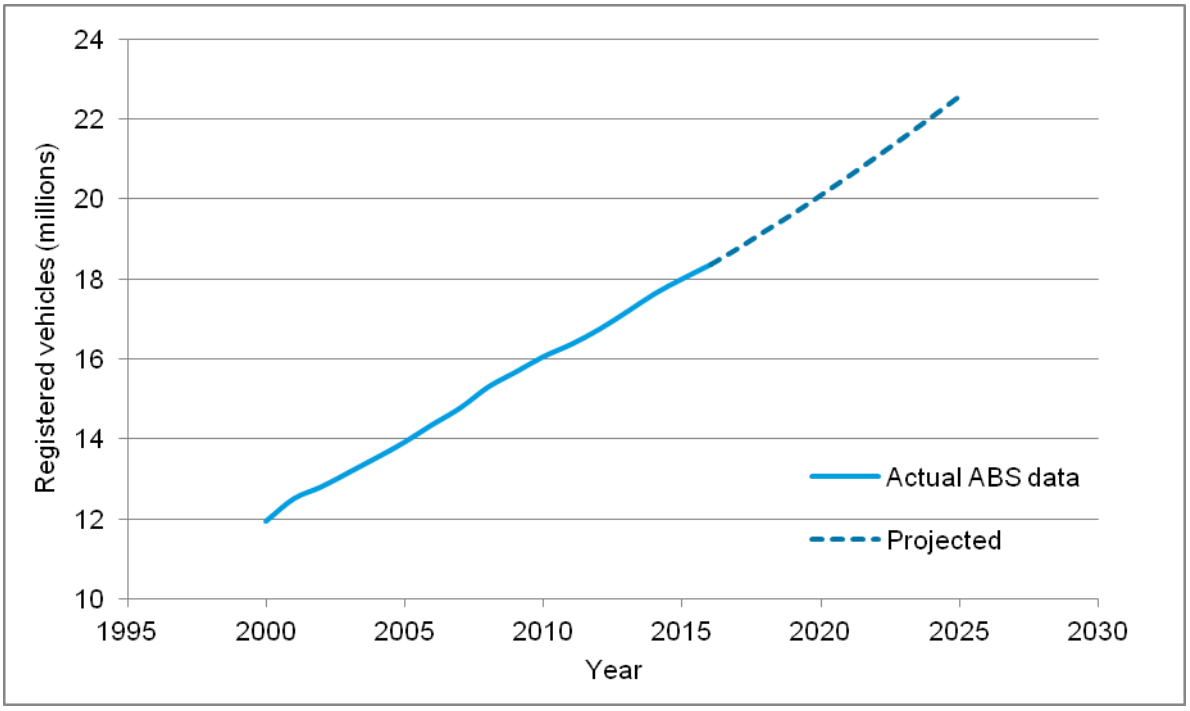


Figure 3.2 **Australian registered vehicles – actual and projected numbers**

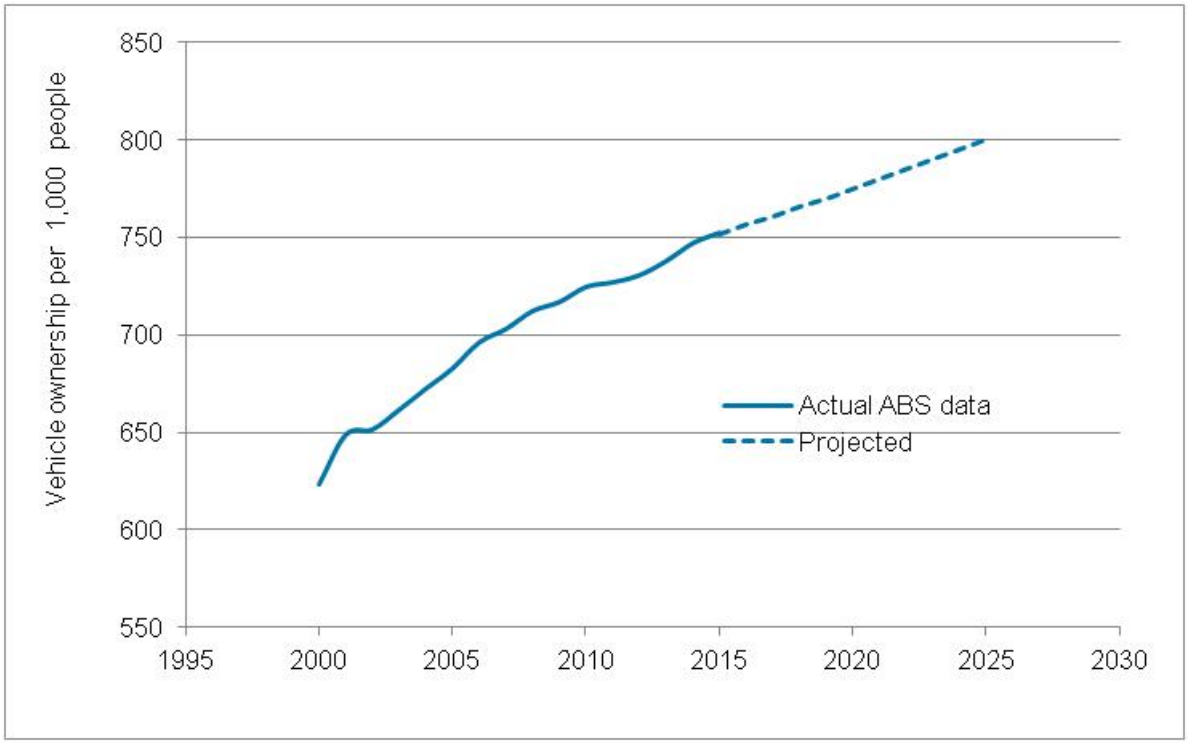


Figure 3.3 **Australian vehicle ownership per 1,000 people**

This project would recycle ULABs to produce stable and non-hazardous lead bullion for export. This is in accordance with the Basel Convention, of which Australia is a party, that limits the movement of hazardous wastes between countries to prevent transfer of hazardous waste from developed to less developed countries and ensure more environmentally sound management.

Lead is a commodity which is openly traded in the international market. Its price, primarily determined by the London Metal Exchange (LME), has shown wide variations in the past 10 years, and dictates the prices of ULABs. The financial viability of the project, however, would not be affected by the fluctuation of lead prices as the economic benefit for the proponent would be realised by the continued supply of lead bullion to its affiliated companies in the manufacture of new batteries.

The project would also provide a local source of sodium sulphate which is a by-product of the ULAB recycling process. Australia has no recorded sodium sulphate resources of commercial potential and currently imports sodium sulphate for use in manufacturing from other countries (DoI – DRE 2016).

The project would also make important contributions to the efforts of the Australian Battery Recycling Initiative (ABRI), a not-for-profit association established in 2008 to promote the collection, recycling and safe disposal of all batteries, including ULABs. ABRI was formed by a group of battery manufacturers, recyclers, retailers, government bodies and environmental groups who collectively encourage effective stewardship of all batteries at end of life.

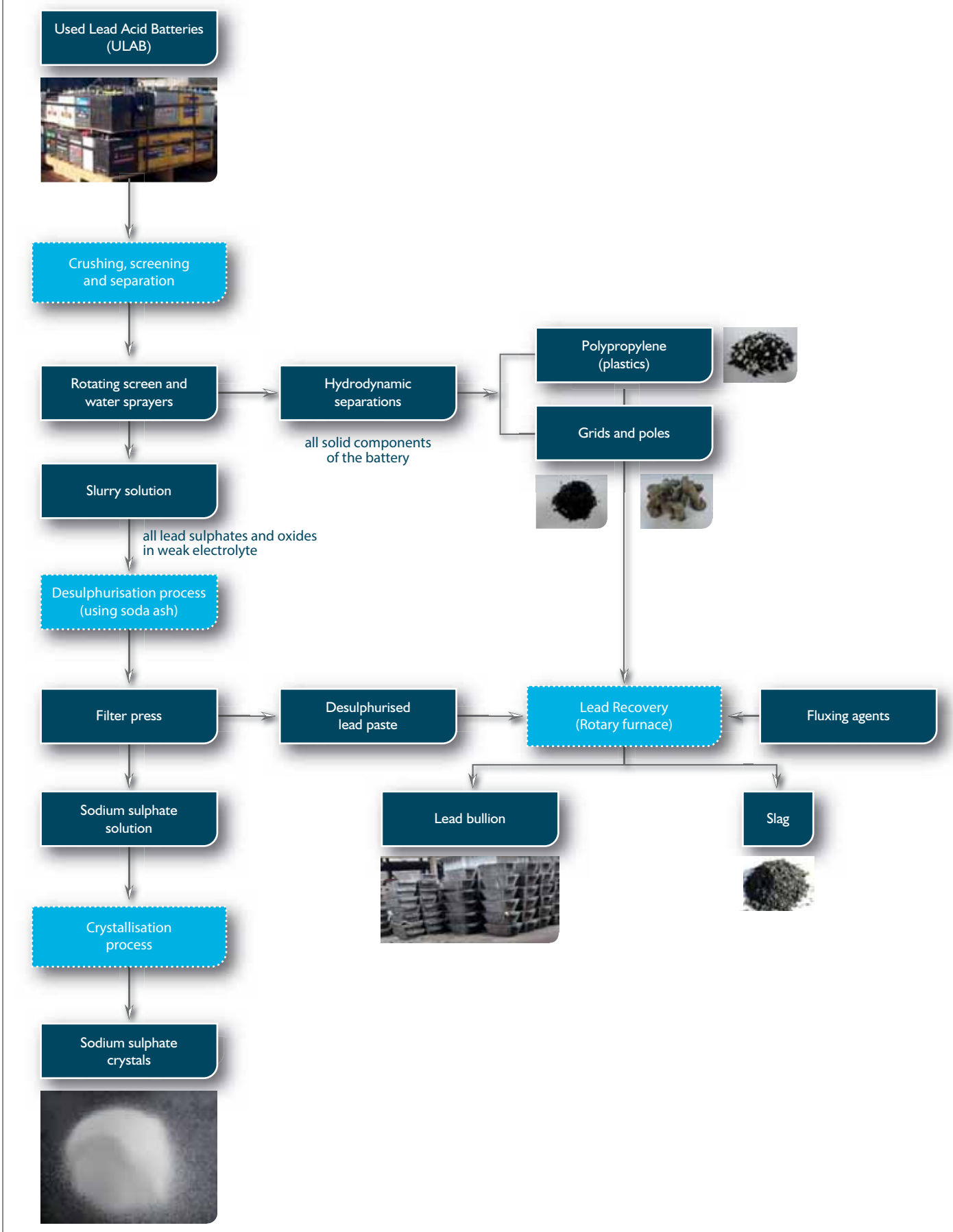
3.3 Used lead-acid battery recycling process

3.3.1 Overview

The facility would have four main processes – crushing, screening and separation; desulphurisation; crystallisation; and lead recovery – which are described further below. The technical information presented below has been provided by the equipment manufacturers, Engitec. Machinery and storage layout plans are provided in Appendix B. Figure 3.4 shows a simplified flow process of the facility.

Batteries are assumed to have the following average composition:

- electrolyte 25-28% battery weight (b.w.) (H2SO4 content: 15% b.w.);
- lead sulphate 20-30% b.w.;
- lead oxides 10-15% b.w.;
- grid metals 20-30% b.w.;
- polypropylene (PP) 4-7% b.w.; and
- polyethylene (PE) separators 1-4% b.w.



EMM

ULAB recycling process flow diagram

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement
Figure 3.4

3.3.2 Crushing, screening and separation

The ULABs are sent through an automatic de-palletiser, into a vibrating feed hopper, and transported on a belt conveyor into a crushing mill. To protect the crusher a metal detector is installed to remove iron and other unwanted metallic objects while the ULABs are still on the belt conveyor. The batteries are crushed to 50 – 80 mm in size. The crushing mill is fully enclosed in an acoustic chamber to mitigate noise as well as prevent dust emissions. All fugitive emissions created by the breaking process are sucked by the negative pressure and drawn into a suction ducting passing through wet scrubber, cleaning the air in the process before releasing it on the stack chimney.

The crushed materials pass through a rotating screen and are wetted down with high pressure water sprayers using recycled water. This screen separates the solid and liquid components of the batteries. These materials include:

- lead metals such as battery posts (or poles) and battery plates (called grids);
- crushed PP plastic from the battery casing and PE separators; and
- a slurry solution produced from the lead paste and electrolyte in the battery.

The solid components (lead metals and plastics) go through a further hydrodynamic separation process using continuous circulation and controlled flow of recycled water which naturally separates the materials due to their differences in density. The solid metals are collected and fed into a rotary furnace, while the PP plastics are washed and cleaned. The clean, ground PP plastics are placed in jumbo bags and transferred to the ground PP storage area in Building 5 (see material storage plan in Appendix B). The PE separators are collected and disposed of by a licensed contractor (see Section 7.2 for further information on disposal).

The PP plastics would be transported by truck to Port Botany where they would be sent to Pymore's affiliated plastic recovery plant overseas. They would then be pelletized and reused in new battery casings and covers thereby ensuring a closed loop production system. Around 3,600 tpa of polypropylene would be produced by the facility.

3.3.3 Desulphurisation and crystallisation

The slurry solution of lead sulphates, lead oxides and sulphuric acid goes through a desulphurisation process which effectively removes the sulphur from lead sulphates and sulphuric acid. This is an important step in minimising sulphur (sulphur dioxide and sulphur trioxide) emissions by eventually converting them to a solid form instead of gases emitted from the furnace. Removal of the sulphur prior to feeding the material to the furnace significantly improves its efficiency.

Desulphurisation involves mixing the slurry with soda ash (or caustic soda) to produce sodium sulphate. The resulting solution is further processed in a filter press which separates the desulphurised lead paste (lead carbonate or lead oxide) from the sodium sulphate solution.

The sodium sulphate solution is stored in a holding tank. It is processed further by chemical treatment to remove impurities from the brine solution. The clean solution would then be send through a crystallizer which removes water, purifies, and converts the solution to sodium sulphate crystals. Sodium sulphate crystals would be packed and sold for use in the manufacture of soaps and detergents, textiles, glass and paper. Around 9,300 tpa of sodium sulphate would be produced by the facility.

3.3.4 Lead recovery

The lead recovery process uses a rotary furnace to reduce the lead metals and lead oxide from the lead paste, subjecting them to high temperatures to recover the lead and produce lead bullion. Desulphurised lead paste is fed into a rotary furnace, mixed with the solid metals and fluxing agents, and processed under high temperatures into lead bullion. The facility is designed to accommodate two furnaces; however, only one furnace may be installed at the time of operation with a second furnace installed at a later date, depending on ULAB supply to the facility.

From the rotary furnace, the molten lead bullion is tapped off and poured into crucibles, where the lead solidifies. The solid lead bullion is then transferred to the lead bullion storage warehouse for temporary storage. The solid lead bullion would be transported by truck to Port Botany where it would be sent to Pymore's affiliated lead refining facilities overseas. It would then be used for production of new batteries thereby ensuring a closed loop production system. Around 30,000 tpa of lead bullion would be produced by the facility.

In the same system, waste slag is poured into similar crucibles to solidify. Slags would be discharged to the slag demolition area for further treatment. This area would be enclosed, ducted and connected to the dust collection system under strong negative pressure. A spray misting system would be installed to quicken the oxidation process of the slag to deter leaching and ensure safe handling/transport.

3.4 Project details

3.4.1 Site components

The project layout is shown in Figure 3.1. Detailed site and building layouts are provided in Appendix B.

The main components of the facility include:

- Building 1 – Guard house/truck scale room;
- Building 2 – Quality assurance (QA) laboratory, workshop, parts and refractory store room;
- Building 3 – Administration building including canteen and clinic;
- Building 4 – Employee change rooms;
- Building 5 – Production and crystallizer building;
- Building 6 – Air compressor room;
- Building 7 – Oxygen plant;
- Building 8 – ULAB storage warehouse;
- Building 9 – Waste water treatment plant;
- truck scale/weighbridge and automatic wheel wash station;
- employee vehicle parking; and
- storm water detention dam.

3.4.2 Construction

The construction period for the project would be around 18 months. It is anticipated that up to 70 persons would be employed during construction. Construction hours would be between 7 am and 6 pm Monday to Friday and between 8 am and 1 pm on Saturdays. There would be no construction on Sundays or public holidays.

Construction costs, or the capital investment value, for the project is approximately $39.8 million (refer to Appendix C).

It is proposed to grade the site so that it slopes gently to the north. To achieve this grading concept, the southern and central portions of the site would be established in cut, and filling would be required to achieve design levels in the northern portion of the site. A retaining wall is proposed around the northern and majority of the eastern and western boundaries of the proposed fill extent. Detailed site grading plans will be provided at the detailed design stage.

Proposed hardstand levels and finished floor levels (FFLs) for the facility have been included in Appendix B.

3.4.3 Production capacity and operational aspects

Pymore may install up to two rotary furnaces within the facility. In this EIS, Phase 1 is used to describe the scenario where one furnace is operating and Phase 2 is the scenario where two furnaces are operating. The maximum capacities of the facility are:

- Phase 1 (one furnace) – 100 tonnes per day (tpd), 30,000 tpa; and
- Phase 2 (two furnaces) – 200 tpd, 60,000 tpa.

The facility would operate 24 hours, seven days a week with occasional shut down days for maintenance.

At full production, approximately 60 full time operational staff and 13 contractors would be employed by the project. Workforce shift operations will typically result in three shifts on weekdays (ie 6am – 2pm, 2pm – 10pm, and 10pm – 6am) for the majority of the site workforce. Administration staff would typically work normal business hours (ie 9am to 5pm).

3.4.4 Occupational health and safety

The project would implement several control measures to ensure the health and safety of its employees. In particular, to reduce employee's lead dust exposure during operation, the following measures would be implemented:

- compliance with requirements of the NSW Work Health and Safety Regulation 2011 (WHS Regulation);
- implementation of specific engineering controls;
- provision of personal protective equipment (PPE);
- conducting health monitoring and blood lead level monitoring of all employees; and
- provision of employee education and awareness programs.

The employee change rooms have been specifically designed to minimise secondary lead exposure from contaminated clothing. Clean work clothes would be provided to employees working within the plant at the beginning of each shift. Contaminated work clothes would be removed and washed in a commercial laundry. A separate canteen is provided in the site layout. Only clean street clothes and shoes will be allowed inside the canteen.

Further information on proposed occupational health and safety measures is provided in Section 7.2 and the Human Health Risk Assessment (Appendix D).

3.4.5 Site access, ULAB delivery and parking

The proposed site access is located on the north side of Mitchell Avenue, approximately 20 m from the intersection with Johnson Avenue. A new intersection design would be constructed which incorporates the existing intersection of Mitchell and Johnson avenues and localised lane and shoulder widening on Mitchell Avenue would be required to accommodate the vehicle swept paths for the largest type of vehicles (ie B-double trucks) which are proposed to utilise the site. Vehicle swept paths are included in Appendix G. Mitchell Avenue is currently approved for B-double access.

A secondary access point is being investigated to the south-east of the employee car park. This access is to the unnamed road that connects lots immediately east of the site with Mitchell Avenue. The site frontage with this road is not wide enough for vehicles, so investigations are currently being undertaken with adjoining landowners to enter into an agreement for vehicle access to the site. This secondary access would only be accessed by light vehicles.

Traffic generation would occur during construction and operation of the project. The majority of vehicle movements, particularly heavy vehicle movements, are expected to travel west of the site on Mitchell Avenue from and towards the Hunter Expressway. Movements to and from the south would travel via the Hunt Road entrance and exit. Movements to and from the north can also travel via the Hunt Road entrance and exit, turning at the Main Road interchange approximately 2.8 km south of Hunt Road.

The predicted quantities of ULABs collected from each State and territory are:

- NSW and ACT – 20,000 tpa;
- Queensland – 15,000 tpa;
- Victoria – 15,000 tpa;
- SA and NT – 5,000 tpa; and
- WA – 5,000 tpa.

All trucks delivering ULABs would enter the site via the weighbridge. Vehicles would then proceed to the guard house/truck scale room where the load would be inspected for potential contaminants. The driver would then deliver ULABs to the ULAB storage warehouse where it would be carefully deposited and further inspected prior to the vehicle being directed back to the weighbridge area. Vehicles would be re-weighed as they leave the site to determine the mass of the load delivered. Any rejected loads would be immediately reloaded for removal from the site and recorded in a ‘rejected load’ register. All incoming ULABs would be inspected according to the incoming waste quality management plan prior to being accepted.

The project layout provides 46 light vehicle car spaces which includes two disabled spaces. All the site car parking space dimensions and surfacing would be designed to comply with the requirements of *Australian Standard AS 2890.1:2004*.

3.4.6 Fire fighting and emergency

The project would include a fire fighting system to protect sensitive areas of the plant such as the ULAB storage warehouse and offices as shown in Appendix B. The system would include a concrete water basin, fire fighting pumps, fire hydrants, fire hose cabinets, fire detectors and fire extinguishers.

Water for fire fighting would be provided on site as follows:

- existing fire hydrants in Mitchell Avenue;
- extinguishers and fire hydrants at buildings;
- a 205 m^3 fire water tank with a booster pump; and
- the 600 m^3 stormwater detention basin.

The project would provide building setbacks from bushfire prone land to provide defensible space for fire fighting. See Section 7.11 and Appendix M for further information.

Hazardous goods would be stored within bunded areas in accordance with *Storing and Handling Liquids: Environmental Protection Participant's Manual* (DECC 2007).

3.4.7 Landscaping and signage

Landscaping and signage plans for the project are shown in Appendix B.

There would be two signs located at the front main entrance and at the secondary entrance to the south-east of the employee car park. There are two options for signage at the main entrance, either a singular pylon sign or a gantry type sign across the entrance. The signage at the secondary entrance will be a singular pylon sign.

Landscaping will be provided around the administration building, the employee car park and select areas of the site. Substantial areas of landscaping are not proposed to reduce bush fire hazard risks.

3.4.8 Lighting and security

The project would include a lighting system for each individual building as well as an outdoor lighting system as shown in Appendix B.

A 2.5 m boundary fence would be constructed around the permitter of the site as shown in Appendix B. The fence would consist of chain mesh at the main gate and to the rear of the site, and a concrete hollow block wall with barbed wire along the western, eastern and southern boundaries.

The project would include a security system composed of a network of alarming sensors. All the main production areas would be covered by a CCTV network, with monitors located in the relevant control room. The entrance/exit and the boundary fence shall also be surveyed by a dedicated CCTV with the relevant monitors located in the entrance guardhouse. The buildings where finished products are stored and the administration offices shall also be protected against intrusion with special reinforced doors and/or windows.

3.4.9 Services

The project would require connections to the electricity, gas, and water and sewer network with servicing diagrams shown in Appendix B.

Gas would be used in the furnace as a fuel source. Mains water would be used in all amenities and to top-up the process water supply tank, as required. Gas and water mains are located on Mitchell Avenue and consultation with relevant service providers has confirmed that there is available capacity for the project.

The project would connect to the existing electrical transmission line located along the southern boundary of the site.

The project would also require connection to the sewer mains for water produced from showers, lavatories and restrooms.

3.4.10 Environmental management

The project incorporates a number of environmental management measures as summarised in Table 8.1. In particular, the project would strictly control dust emissions and water management to prevent lead particles from leaving the facility. Further detail on the proposed air quality and water management systems is provided below.

i Air quality

The project would be strictly managed to minimise the emission of air pollutants and odours with an enclosed system for dust collection and treatment.

Polluted air would be collected from a number of locations across the site in a closed duct system and either carried to the baghouse filtration system, gas scrubber system, or combustion exhaust duct prior to venting to the atmosphere via five individual point sources (stacks).

The sanitary and furnace bag houses' filtration system are both made up of eight modules, with numerous 'bags' per module. It has an automatic cleaning system (pulse-jet) where dust-laden gas enters the system through the inlet and is filtered through the bag, depositing dust on the outside surface of the bag. The dust is removed by a blast of compressed air injected into the top of the opening of the filter bags. The air blast creates a shock wave that causes the bag to flex and particulate is released into a hopper below. The dust filtered out is recovered and reprocessed in the furnace. The bags are regularly maintained and replaced as required.

All potentially odorous processes would be connected to a dedicated wet scrubber system to prevent all fugitive emissions to ambient air from potentially odorous activities such as the internal reactors and tanks. The treated air is then released into atmosphere via a separate stack. In the unlikely event that the scrubber system fails, the battery breaker plant would be temporarily shut down to ensure that no odorous emissions would occur. For these reasons an assessment of odour impacts for the project was not considered to be required (see Section 7.7 and Appendix I for further information).

The air quality management system for different aspects of the project includes:

- the crushing mill and associated conveyors would be fully controlled to prevent dust emissions;
- acid fumes from the process tanks and equipment in the battery breaker area would be under strong negative pressure via a gas scrubber system;
- all crushed materials would pass through a rotating screen and would be wetted down with high pressure water sprayers using recycled water;
- the charge preparation building would be completely closed and under strong negative pressure to draw dusty air off in a closed duct system and carry it to the sanitary air bag house filtration system;
- process fumes from the rotary furnace would be sucked into a furnace bag house filtration system;
- ambient air from the furnace feeding area would be injected to the settling chamber before passing to the sanitary bag house filtration system;
- flue dust collected from both the furnace and sanitary bag house filters would be recovered and mixed with the lead paste for reprocessing in the rotary furnace; and
- the sodium sulphate crystals silo would be equipped with a bag house for de-dusting prior to discharge.

Further information on air quality management is provided in Section 7.7 and Appendix I.

ii Water

The ULAB recycling process is a net user of water, and no liquid effluents are produced. This enables a contained surface water management system to be established, whereby stormwater runoff and wash-down water is captured and used in the ULAB recycling process. This eliminates any liquid waste streams and substantially reduces the volume of stormwater runoff that would be discharged from the site.

Runoff from the stormwater management area would be collected in a piped drainage system. The piped drainage system would drain under gravity to the north of the site. A flow diversion pit would be established to divert stormwater into the stormwater capture basin. When the stormwater capture basin is full, all additional flows would spill via an overflow weir that would be established in the flow diversion pit. All overflows would drain into the detention basin that would be constructed at lower levels on the Swamp Creek floodplain.

During and following rainfall, the stormwater capture basin would be dewatered via pumping to the untreated water storage basin. Stormwater discharge from the site would only occur during intense rainfall or during extended periods of wet weather when both the stormwater capture basin and untreated water storage basin are full.

All water from the truck wheel wash and the wash-down of plant and equipment would drain directly to the untreated water storage basin through a drainage system that is separate to the site's stormwater drainage. Water stored in the untreated water storage basin would be treated in a water treatment plant. Treated water would be used in the ULAB recycling process and for wash-down water.

Storm water collected from the paved roads, yards and building roofs would be directed to the water treatment facility to remove traces of potential contaminants.

Further information on surface water management is provided in Appendix J. Surface water management objectives and associated management measures that have been applied to the development of the surface water management strategy for the project are detailed in Table 4.1 of Appendix J and in Chapter 8 of this EIS.

3.5 Project alternatives

i Do nothing

The site is currently undeveloped. If it is not developed with a battery recycling facility, it would be developed for some alternative industrial purpose. Under this scenario, a suitable location for the recycling of ULABs would not be provided within the Hunter region.

The 'do nothing' scenario is considered inappropriate as ULABs, a recognised problem waste under the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (EPA 2014a), would remain in the waste stream where they are able to contaminate alternative recycling streams and further add to the existing load on traditional landfill waste management operations.

ii Alternative land use and technology

The type of development must be located in an appropriately zoned area with suitable heavy vehicle access to the existing road network. The site is zoned for heavy industrial uses, thereby preventing residential and/or commercial development. The facility is classed as industrial use and is, therefore, considered a suitable use for the site. The site is also located in an easily accessible position, particularly to allow for the delivery of ULABs to the site and the removal of recyclable materials post processing.

Alternative technology for this type of operation has not been considered as the facility would utilise the best available technology as acknowledged by both the EU and the US EPA.

4 Legislative framework

4.1 Introduction

This chapter describes the relevant Commonwealth and NSW legislative and regulatory framework under which the project would be assessed and determined.

4.2 Commonwealth legislation

4.2.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places which are defined as matters of national environmental significance (MNES).

MNES, as defined under the EPBC Act, include:

- world heritage properties;
- national heritage places;
- wetlands of international significance;
- listed threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, actions (or developments) that may have a significant impact on a MNES are deemed to be 'controlled actions' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that potentially has an impact on a MNES is required to be referred to the Department of the Environment and Energy (DoEE) for determination as to whether or not the action is a controlled action.

The project was referred to DoEE on 21 September 2016 (reference EPBC 2016/7782) as a non-controlled action. The conclusion to the referral stated:

> The project is proposed in a highly disturbed area, which is zoned for heavy industrial usage. The project will have nil input of waste products into the surrounding landscape, nor any inputs of into watercourses. Therefore no impacts to downstream environs are anticipated.

> There is the potential for several migratory and threatened fauna to occur within the project area. However their occurrence is likely to be transient, with the habitat is considered sub-optimal. Given the small area and the low importance of the habitat cleared, any impacts were considered negligible.
>
> The proposal will impact the vulnerable Earp's Gum, with a loss of up to 37 individuals. The clearance constitutes a small proportion of the important Kurri Kurri-Cessnock population (2500 to 8000 individuals). This reduction in population size is considered a low magnitude impact and unlikely significantly impact the Kurri Kurri- Cessnock population. Several trees within the project area had severe canopy dieback and recruitment within the site was low. The subspecies viability within the site is also uncertain in the long term due to ongoing disturbance. The subspecies is anticipated to persist in the surrounding habitats with no significant impacts to the subspecies anticipated.

On 6 October 2016, DoEE wrote to EMM seeking more information of the project, specifically:

> ... how the proposal will be undertaken to ensure that no contaminant laden water will be discharged from the project area and that the risk of accidental input to watercourses is very low, given that untreated process water will be reused in the facility, the facility will store more than 1,000 tonnes per year of ULABs (which have the potential to leak), and there will be stormwater discharges during heavy rain.

Information on these matters was provided to DoEE on 12 October 2016. This information was provided to DoEE on 12 October 2016.

On 17 October 2016, DoEE requested further information on potential impacts of the project on the New Holland Mouse which is listed as vulnerable under the EPBC Act. The DoEE also requested conformation that the option of harvesting (or extracting) water from Swamp Creek does not currently form part of the project.

Further information on the New Holland Mouse and confirmation that the project will not extract water from Swamp Creek will be provided in November 2016 after targeted surveys for the mouse have been undertaken.

4.3 NSW legislation

4.3.1 Environmental Planning and Assessment Act 1979

i Planning approval requirements

The EP&A Act and the EP&A Regulation form the statutory framework for planning approval and environmental assessment in NSW. Implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils. It contains three parts that impose requirements for planning approvals:

- Part 4 which provides for control of 'development' that requires development consent from the relevant consent authority. A division of Part 4 (Division 4.1) provides for control of SSD where the Minister for Planning (or delegate) is the consent authority;
- Part 5 which provides for control of 'activities' that do not require approval or development consent under or Part 4; and

- Part 5A which provides for control of State significant infrastructure that do not require approval or development consent under Part 4.

The requirement for development consent is set out in environmental planning instruments (EPIs); state environmental planning policies (SEPPs), regional environmental plans (REPs) or local environmental plans (LEPs).

ii State significant development approval process

Section 89C(2) of the EP&A Act states that:

> ... State environmental planning policy may declare any development, or any class or description of development, to be State significant development.

Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) identifies what constitutes SSD, with one form being development for the purpose of recycling facilities that store more than 1,000 tpa of ULABs. As the project is of a kind described within Schedule 1 of the SRD SEPP (ie will store more than 1,000 tpa of ULABs), it meets the requirements for SSD (see below for further information).

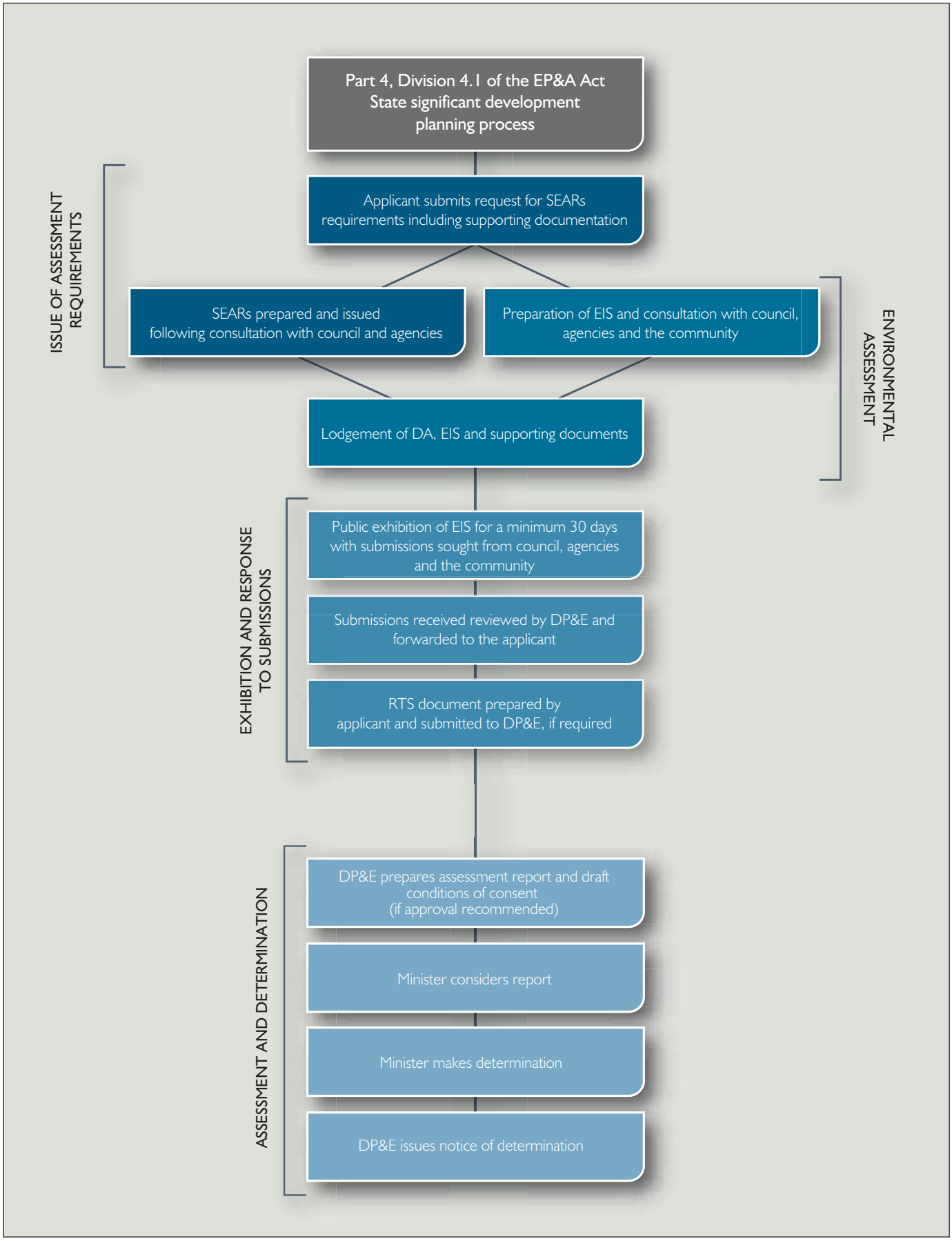
Under section 89D of the EP&A Act, the NSW Minister for Planning is the consent authority for SSD. However, pursuant to section 23 of the Act, the Minister may delegate the consent authority function to the Planning Assessment Commission (PAC), the Director-General or to any other public authority.

A DA for SSD must be accompanied by an EIS, prepared in accordance with the EP&A Regulation. Before preparing an EIS, an applicant must request SEARs (which are essentially terms of reference and were previously known as Director-General's requirements) which specify what must be addressed in an EIS. The SEARs for the Project, which were issued on 18 March 2016, are included with this EIS in Appendix A.

Upon finalisation, the EIS will be lodged with the DA and supporting documentation with the Department of Planning and Environment (DP&E) for public exhibition. The EIS will be placed on public exhibition for a minimum of 30 days by DP&E and submissions will be sought from CCC, government agencies and the community. Any submissions received by DP&E will be reviewed and forwarded to Pymore to consider and respond to (via a response to submissions (RTS) report).

Following receipt of the RTS report, DP&E will prepare its assessment report considering this EIS, all submissions received during the exhibition process and the RTS report. This report is forwarded to the consent authority (Minister or PAC) for consideration before determining the DA.

The planning approval process for SSD (under Division 4.1 of Part 4 of the EP&A Act) can be seen in Figure 4.1.



Planning approval process for SSD
Kurri Kurri Battery Recycling Facility
Environmental Impact Statement
Figure 4.1

iii Matters for consideration

When assessing a DA for SSD, the consent authority (ie Minister for Planning or PAC) is required to take into consideration the matters outlined in section 79C of the EP&A Act. This states:

> (1) Matters for consideration – general
>
> In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:
>
> (a) the provisions of:
>
> (i) any environmental planning instrument, and
>
> (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
>
> (iii) any development control plan, and
>
> (iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F, and
>
> (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and
>
> (v) any coastal zone management plan (within the meaning of the *Coastal Protection Act 1979*),
>
> that apply to the land to which the development application relates,
>
> (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
>
> (c) the suitability of the site for the development,
>
> (d) any submissions made in accordance with this Act or the regulations,
>
> (e) the public interest.

Despite the above, clause 11 of the SRD SEPP states that development control plans do not apply to SSD.

The matters for consideration that apply to the project are discussed below.

iv Approvals not required or which cannot be refused

Under section 89J of the EP&A Act, the following authorisations are not required for SSD:

(a) the concurrence under Part 3 of the *Coastal Protection Act 1979* of the Minister administering that Part of that Act;

(b) a permit under Section 201, 205 or 219 of the *Fisheries Management Act 1994*;

(c) an approval under Part 4, or an excavation permit under Section 139, of the *Heritage Act 1977*;

(d) an Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974*;

(e) an authorisation referred to in Section 12 of the *Native Vegetation Act 2003* (or under any Act repealed by that Act) to clear native vegetation or State protected land;

(f) a bush fire safety authority under Section 100B of the *Rural Fires Act 1997*; and

(g) a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act 2000*.

Further, under section 89K of the EP&A Act, the following authorisations cannot be refused and are to be substantially consistent with a development consent for SSD:

(a) an aquaculture permit under Section 144 of the *Fisheries Management Act 1994*,

(b) an approval under Section 15 of the *Mine Subsidence Compensation Act 1961*,

(c) a mining lease under the *Mining Act 1992*,

(d) a production lease under the *Petroleum (Onshore) Act 1991*,

(e) an environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* (for any of the purposes referred to in Section 43 of that Act),

(f) a consent under Section 138 of the *Roads Act 1993*,

(g) a licence under the *Pipelines Act 1967*.

v Environmental planning instruments

The following environmental planning instruments are relevant to the project:

- SRD SEPP;
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33);
- State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44);
- State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55);

- State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64); and
- Cessnock LEP.

The relevant provisions of the above instruments to the project are discussed in the following sections.

a. State Environmental Planning Policy (State and Regional Development) 2005

The SRD SEPP, among other matters, defines certain development that is SSD. Clause 8 of the SEPP states:

> (1) Development is declared to be State significant development for the purposes of the Act if:
>
> (a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and
>
> (b) the development is specified in Schedule 1 or 2.

Schedule 1 of the State and Regional Development SEPP defines a range of general SSDs, including waste and resource management facilities. Clause 23 of Schedule 1 states:

> (5) Development for the purpose of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste.

The project would store more than 1,000 tpa of ULABs that would be processed to recover reusable lead. ULABs are defined as a hazardous waste (Dangerous Good Class 8). Therefore, the project is SSD as it meets the requirements of clause 8(1) of the SRD SEPP.

The project is not permissible without development consent (ie it requires development consent) under the Cessnock LEP.

The project meets both the requirements of clause 8 of the SRD SEPP as it is not permissible without development consent and is development specified in Schedule 1. Therefore, the project is SSD for the purposes of the EP&A Act.

b. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

SEPP 33 requires the consent authority to consider hazard potential of proposed activities including the location of the activity, the way in which it is to be carried out, and the storage of dangerous goods. One of the key aims of SEPP 33 is to:

> ... to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact;

Under SEPP 33, potentially hazardous and potentially offensive industry are defined as:

> ***potentially hazardous industry*** means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:
>
> (a) to human health, life or property, or
>
> (b) to the biophysical environment,
>
> and includes a hazardous industry and a hazardous storage establishment.
>
> ***potentially offensive industry*** means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment.

Clause 8 of SEPP 33 states that:

> In determining whether a development is:
>
> (a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or
>
> (b) an offensive storage establishment, offensive industry or other potentially offensive industry,
>
> consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development.

A number circulars and guidelines have been published by DP&E relating to hazardous or offensive development. The key guidelines are the *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Applying SEPP 33) (DoP 2011a) and series of hazardous industry planning advisory papers, including *Hazard Industry Planning Advisory Paper No 11 Route Selection* (HIPAP 11) (DoP 2011b).

Clause 12 of SEPP 33 states:

> A person who proposes to make a development application to carry out development for the purposes of a potentially hazardous industry must prepare (or cause to be prepared) a preliminary hazard analysis in accordance with the current circulars or guidelines published by the Department of Planning and submit the analysis with the development application.

To assess the project's hazard potential two assessments were undertaken by Sherpa Consulting; preliminary hazard analysis (PHA) and a route evaluation study. The PHA was undertaken in accordance with Applying SEPP 33 and the route evaluation study was undertaken in accordance with Applying SEPP 33 and HIPAP 11. The PHA is summarised in Section 7.4 and contained in Appendix E. The route evaluation study is summarised in Section 7.4 and contained in Appendix F.

The PHA found that the project is not deemed to be hazardous or offensive. The route evaluation study found that the routes used to transport hazardous materials between the site and the Hunter Expressway were suitable from a hazard risk perspective.

c. State Environmental Planning Policy No. 44 – Koala Habitat Protection

SEPP 44 encourages the conservation and management of koala habitats, to ensure permanent free-living koala populations will be maintained over their present range.

Part 2 of SEPP 44 applies to development control of koala habitats. It applies to land to which a development application has been made that has an area of more than 1 ha. It requires the consent authority to consider if the land subject to the DA is 'potential koala habitat' or 'core koala habitat'.

Under SEPP 44 potential koala habitat and core koala habitat are defined as:

> ***potential koala habitat*** means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.
>
> ***core koala habitat*** means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.

Clauses 7 and 8 of SEPP 44 states that if the land subject to a DA is not a potential koala habitat or core koala habitat, the consent authority is not prevented (because of SEPP 44) from granting consent to the DA.

An assessment of potential and core koala habitat has been undertaken for the project as part of the biodiversity assessment (refer to Section 7.14 and Appendix N). This assessment determined that while the site contains potential koala habitat, it does not contain core koala habitat. Surveys undertaken as part of the biodiversity assessment did not record any koalas on the site.

d. State Environmental Planning Policy No 55 – Remediation of Land

SEPP 55 was enacted to provide a state wide planning approach to the remediation of contaminated land, and aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human and environmental health.

Clause 7 of SEPP 55 states that:

> (1) A consent authority must not consent to the carrying out of any development on land unless:
>
> (a) it has considered whether the land is contaminated, and
>
> (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
>
> (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

(3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.

(4) The land concerned is:

(a) land that is within an investigation area,

(b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,

(c) to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land:

(i) in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and

(ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).

In relation to clause 7(4)(b) of SEPP 55, Table 1 of the contaminated land planning guidelines, *Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning (DUAP) 1998) is entitled *Some Activities that may Cause Contamination*. It lists 'scrap yards' and 'smelting and refining' as purposes (or activities) which is potentially cause contamination.

Accordingly, given that the site is currently used for the storage of disused industrial equipment and was previously used for the storage of bonded ceramics used in brick refractories, clause 7 of SEPP 55 requires that a report specifying the findings of a preliminary investigation of the site, carried out in accordance with the contaminated land planning guidelines, be prepared to accompany the application the project.

As such a preliminary contamination assessment was prepared for the project (refer to Section 7.9 and Appendix K), which details the results of the preliminary contamination investigation and provides the consent authority with the information it needs to carry out its planning functions under SEPP 55. The preliminary contamination assessment did not identify significant contamination issues that would preclude the project being developed as an industrial land use.

The preliminary contamination assessment found that there were some localised detections of petroleum hydrocarbon compounds within shallow soil on the site. These results do not exceed the applicable guideline criteria and do not preclude the use of the site for industrial purposes. It also found that there is limited evidence to suggest that surrounding land uses pose a contamination risk to the site. While there is the potential for groundwater to the east to be contaminated associated with historic land uses, groundwater flow is considered unlikely to be towards the site. Similarly to the far west, groundwater flow from a tip is also expected to be towards the north.

e. State Environmental Planning Policy No. 64 – Advertising and signage

SEPP 64 applies to all signage that can be displayed with or without development consent, and is visible from any public place or public reserve. Proposed signage plans are included in Appendix B.

Under Clause 8 of SEPP 64, a consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied:

- that the signage is consistent with the objectives of the policy as set out in clause 3(1)(a); and
- that the signage the subject of the application satisfies the assessment criteria specified in Schedule 1 to the policy.

The compliance of the project's proposed signage with the provisions of SEPP 64 is detailed in Table 4.1.

Table 4.1 Compliance with SEPP 64 provisions

Provision	Comment on compliance
Clause 3 Aims, objectives etc	
(1) This Policy aims:	
(a) to ensure that signage (including advertising):	
(i) is compatible with the desired amenity and visual character of an area, and	The sign is considered compatible with this aim.
(ii) provides effective communication in suitable locations, and	The sign is considered compatible with this aim.
(iii) is of high quality design and finish, and	The sign is considered compatible with this aim.
Schedule 1 – Assessment Criteria	
1 Character of the area	
Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?	Yes, the sign is considered compatible with the existing character of the area.
Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?	There is no particular theme for outdoor advertising in the area.
2 Special areas	
Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?	The project is not located in an environmentally sensitive area, heritage area, natural or other conservation area, open space area, waterway, rural landscape or residential area.
3 Views and vistas	
Does the proposal obscure or compromise important views?	No.
Does the proposal dominate the skyline and reduce the quality of vistas?	No.
Does the proposal respect the viewing rights of other advertisers?	Yes, the sign does not obstruct any other advertisements or signs.
4 Streetscape, setting or landscape	
Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?	The scale, proportion and form sign is considered appropriate for the streetscape, setting and landscape.
Does the proposal contribute to the visual interest of the streetscape, setting or landscape?	The sign is considered to contribute to the visual interest of the streetscape, setting and landscape.

Table 4.1 Compliance with SEPP 64 provisions

Provision	Comment on compliance
Does the proposal reduce clutter by rationalising and simplifying existing advertising?	There is no existing advertising within the project area.
Does the proposal screen unsightliness?	No. However, there are no features that are considered 'unsightly' within the site.
Does the proposal protrude above buildings, structures or tree canopies in the area or locality?	No.
Does the proposal require ongoing vegetation management?	No.
5 Site and building	
Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?	Yes, the sign is considered to be compatible with the scale and proportion of the site.
Does the proposal respect important features of the site or building, or both?	The sign is not inconsistent with the important features of the site.
Does the proposal show innovation and imagination in its relationship to the site or building, or both?	Compliance with this point is not considered appropriate given that signs are business identification signs, separate from buildings.
6 Associated devices and logos with advertisements and advertising structures	
Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?	The gantry signage option for the main entrance (option 1) achieves required height clearances for heavy vehicles. No other safety devices are required.
7 Illumination	Signage will not be illuminated.
8 Safety	
Would the proposal reduce the safety for any public road?	No, the signage will not interfere with driver's vision.
Would the proposal reduce the safety for pedestrians or bicyclists?	No, the signage will not interfere with vision or provide an obstruction to pedestrians or cyclists.
Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?	No, the signage would not obscure sightlines from public areas.

f. Cessnock Local Environmental Plan 2011

As stated above, under the Cessnock LEP, the site is zoned IN3 Heavy Industrial. Within this zone, a battery recycling facility (waste or resource management facility) is permissible with development consent. Waste or resource management facilities are defined under the Cessnock LEP as:

> ***waste or resource management facility*** means any of the following:
>
> (a) a resource recovery facility,
>
> (b) a waste disposal facility,
>
> (c) a waste or resource transfer station,
>
> (d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).

Specifically a resource recovery facility is defined as:

> ***resource recovery facility*** means a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration.

The project would be a place used for the recovery of resources (ie lead and plastics) from waste (ie ULABs) including works such as separating and sorting, processing of waste, temporary storage, and transfer and sale of the recovered resources. The project would not re-manufacture lead acid batteries on site, and the vast majority of the resources recovered would be transferred or sold. Only a very small proportion (ie slag and PE separators) would be required to be disposed by landfill.

The objectives of zone RU1 include:

- To provide suitable areas for those industries that need to be separated from other land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of heavy industry on other land uses.
- To support and protect industrial land for industrial uses.

The project is considered to be consistent with these objectives.

vi Planning agreements

One of the matters of consideration under section 79C of the EP&A Act is the relevant provisions of any planning agreements. Section 93F of the EP&A Act relates to planning agreements, which:

> ... is a voluntary agreement or other arrangement under this Division between a planning authority (or 2 or more planning authorities) and a person (the developer):
>
> (a) who has sought a change to an environmental planning instrument, or
>
> (b) who has made, or proposes to make, a development application, or
>
> (c) who has entered into an agreement with, or is otherwise associated with, a person to whom paragraph (a) or (b) applies,
>
> under which the developer is required to dedicate land free of cost, pay a monetary contribution, or provide any other material public benefit, or any combination of them, to be used for or applied towards a public purpose.

Section 93F enables the applicant (or proponent) of a development to enter into a voluntary planning agreement (VPA) or another arrangement with planning authorities in lieu of a section 94 contribution. Pymore do not propose to enter into a VPA with CCC for the project.

vii Environmental Planning and Assessment Regulation 2000

As previously stated, a DA for SSD must be accompanied by an EIS, prepared in accordance with the EP&A Regulation. Schedule 2 of the EP&A Regulation stipulates:

- requirements of the Director-General and approval bodies in relation to EISs (ie the SEARs); and
- general provisions relating to EISs.

The general provisions specify the form (clause 6) and the content (clause 7) of an EIS. The clause 6 and 7 requirements and where they are addressed in the EIS are set out in Table 4.2 below.

Table 4.2 Schedule 2 requirements for an EIS

Requirement	Where contained in the EIS
Name, address and professional qualifications of the person(s) who prepared the EIS	Certification page at the front of this EIS
Name and address of the responsible person (the applicant)	Certification page at the front of this EIS
Address of land	Section 2.1
Description of development	Chapter 3
Assessment of the environmental impact	Chapter 7
Declaration that the EIS has been prepared in accordance with this Schedule, contains all available information that is relevant to the environmental assessment of the development and that the information contained in the statement is neither false nor misleading	Certification page at the front of this EIS
Summary of the EIS	Executive summary
A statement of the objectives of the development	Section 3.2
An analysis of feasible alternatives, having regard to its objectives, including the consequences of not carrying out the development	Section 3.5
A full description of the development	Chapter 3
A general description of the environment likely to be affected by the development	Chapter 2
The likely impact on the environment of the development	Chapter 7
A full description of the measures proposed to mitigate any adverse effects of the development	Chapter 8
A list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out	Section 4.5
A compilation of the measures referred to in item (d) (iv)	Chapter 8
The reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development	Chapter 9

viii Likely impacts of the development

This EIS comprehensively describes the likely impacts of the project based on the SEARs, including environmental impacts on both the natural and built environments, and social and economic impacts in the local area, region and State. It also describes commitments proposed by Pymore to mitigate and manage these impacts. These descriptions are based on technical studies prepared by specialists, which are appended to this EIS. The technical studies were prepared using the most recent and accurate scientific data relevant to the project in consideration of current policies and legislation. In addition, the technical studies adopted conservative assumptions to enable the upper limit of likely impacts to be assessed.

ix Suitability of the site for the development

It is considered that the site of the project is suitable for a battery recycling facility for a number of reasons which are detailed in Chapter 9.

Principally, the project would facilitate the recovery and recycling of valuable resources that make up lead acid batteries to facilitate the manufacturing of new batteries. It would also be undertaken on privately-owned land which has been zoned to facilitate heavy industrial uses. As such, is considered to be broadly compatible with surrounding land uses.

A range of commitments have been made by Pymore to mitigate potential impacts of the project on surrounding land uses. Subject to the application of the commitments, the project is unlikely to have a significant impact on these land uses.

x Submissions

As previously stated, this EIS will be placed on public exhibition for a minimum of 30 days by DP&E and submissions will be sought from CCC, government agencies and the community. Any submissions received by DP&E will be reviewed and forwarded to Pymore consider and respond to (via a RTS report).

Following receipt of the RTS report, DP&E will prepare its assessment report considering this EIS, all submissions received during the exhibition process and the RTS report.

xi Public interest

To assist the consent authority in determining whether the project is in the public interest, this EIS provides a justification for the project (refer to Chapter 9), taking into consideration its potential environmental impacts, and the suitability of the site. It also considers the project against the principles of ecologically sustainable development (ESD). The consent authority will also be required to consider all submissions received during the public exhibition of the EIS.

4.4 Other NSW legislation

4.4.1 Protection of the Environment Operations Act 1997

The POEO Act is the principal NSW environmental protection legislation which is administered by the EPA. Schedule 1 of the POEO Act lists the 'scheduled activities' which are to be regulated by an environment protection licence (EPL) which includes criteria and monitoring requirements for environmental pollution.

Clause 34 of Schedule 1 includes 'recovery of hazardous and other waste' activities, meaning:

> ... the receiving of hazardous waste, restricted solid waste or special waste (other than asbestos waste or waste tyres) from off site and its processing, otherwise than for the recovery of energy.

Clause 49 of Schedule 1 of the POEO Act provides definitions for the following classes of waste:

- special waste;
- liquid waste;
- hazardous waste;
- restricted solid waste;
- general solid waste (putrescible); and
- general solid waste (non-putrescible).

Hazardous waste is further defined in clause 49 of Schedule 1 to mean waste (other than special waste or liquid waste) that includes any of the following:

(a) anything that is classified as:

  (i) a substance of Class 1, 2, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or

  (ii) a substance to which Division 4.1, 4.2, 4.3 or 6.1 of the Transport of Dangerous Goods Code applies,

(b) containers, having previously contained:

  (i) a substance of Class 1, 3, 4, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or

  (ii) a substance to which Division 6.1 of the Transport of Dangerous Goods Code applies,

  from which residues have not been removed by washing or vacuuming,

(c) coal tar or coal tar pitch waste (being the tarry residue from the heating, processing or burning of coal or coke) comprising more than 1% (by weight) of coal tar or coal tar pitch waste,

(d) lead-acid or nickel-cadmium batteries (being waste generated or separately collected by activities carried out for business, commercial or community services purposes),

(e) lead paint waste arising otherwise than from residential premises or educational or child care institutions,

(f) anything that is classified as hazardous waste pursuant to an EPA Gazettal notice,

(g) anything that is classified as hazardous waste pursuant to the Waste Classification Guidelines,

(h) a mixture of anything referred to in paragraphs (a)–(g).

The project involves the receival and processing of a hazardous waste (ie ULABs) and is, therefore, a scheduled activity under the POEO Act and would require an EPL. If development consent is granted, the EPL for the project is to be issued in terms that are substantially consistent with the development consent, in accordance with section 89K of the EP&A Act.

4.4.2 Roads Act 1993

The NSW *Roads Act 1993* (Roads Act) regulates activities that may impact on public roads in NSW. Section 138 of the Roads Act states that

> A person must not:
>
> (a) erect a structure or carry out a work in, on or over a public road, or
>
> (b) dig up or disturb the surface of a public road, or
>
> (c) remove or interfere with a structure, work or tree on a public road, or
>
> (d) pump water into a public road from any land adjoining the road, or
>
> (e) connect a road (whether public or private) to a classified road,
>
> other than with the consent of the appropriate roads authority.

The potential impacts of the project on the existing road network are discussed in Section 7.5. Works to connect the driveway to Mitchell Avenue (ie a public road) and localised road widening works would require an approval under section 138 of the Roads Act from CCC. Under section 89K of the EP&A Act, an approval under section 138 of the Roads Act is to be issued in terms that are substantially consistent with a development consent for SSD.

4.4.3 Contaminated Land Management Act 1997

Under the NSW *Contaminated Land Management Act 1997* (CLM Act), the EPA regulates contaminated sites where the contamination is significant enough to warrant regulation. Contaminated sites that are not regulated by the EPA are managed by local councils through land-use planning processes.

The EPA also administers the NSW site auditor scheme under Part 4 of the CLM Act, makes or approves guidelines for use in the assessment and remediation of contaminated sites, and administers the public record of regulated sites under the CLM Act.

As previously stated, a preliminary contamination assessment has been prepared for the project. As part of this assessment, a review was undertaken of the public records of regulated sites under the CLM Act. The review indicated that the site is not, or has not, been regulated under the Act.

4.4.4 National Parks and Wildlife Act 1974

The NSW *National Parks and Wildlife Act 1974* (NPW Act) provides for nature conservation in NSW including the conservation of places, objects and features of significance to Aboriginal people and protection of native flora and fauna. A person must not harm or desecrate an Aboriginal object or place without an Aboriginal heritage impact under section 90 of the NPW Act. However, a section 90 permit is not required for SSD approvals by virtue of section 89J of the EP&A Act.

Potential impacts to Aboriginal heritage objects resulting from the project are detailed in Section 7.10.

4.4.5 Threatened Species Conservation Act 1995

The TSC Act aims to conserve biological diversity in NSW through the protection of threatened flora and fauna species and EECs.

The potential impacts of the project on threatened species and EECs listed under the TSC Act are discussed in Section 7.14.

4.4.6 Native Vegetation Act 2003

The NSW *Native Vegetation Act 2003* (NV Act) provides for the promotion, improvement and protection of native vegetation in NSW. Approval to clear native vegetation in NSW is required under the NV Act. Under section 89J of the EP&A Act, SSD is exempt from an authorisation to clear native vegetation under section 12 of the NV Act.

Potential impacts to native vegetation resulting from the project are detailed in Section 7.14.

4.4.7 Rural Fires Act 1997

The NSW *Rural Fires Act 1997* (RF Act) aims to among other things, to prevent, mitigate and suppress bush and other fires in LGAs (or parts of areas) and other parts of NSW constituted as rural fire districts, including Balranald.

On 1 August 2002, the EP&A Act and the RF Act were both amended to enhance bush fire protection through the development assessment process. The EP&A Act establishes a system for requiring bush fire protection measures on bush fire prone land at the DA stage.

Generally DAs on bush fire prone land must be accompanied by a bush fire assessment report demonstrating compliance with the aim and objectives of *Planning for Bush fire Protection 2006* (PBFP guidelines) and the specific objectives and performance criteria for the land use proposed. A bushfire hazard assessment (BHA) of the project has been undertaken in accordance with the PBFP guidelines and is provided in Appendix M

4.4.8 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) aims to protect and conserve the natural and cultural history of NSW, including scheduled heritage items, sites and relics. Approvals under Part 4 or an excavation permit under section 139 of the Heritage Act are not required for SSD by virtue of section 89J of the EP&A Act.

The project would not have any direct or indirect impacts on registered or scheduled heritage items, site and relics. An assessment of historic heritage is provided in Section 7.11.

4.4.9 Water Management Act 2000

The *Water Management Act 2000* (WM Act) regulates the use and interference with surface and groundwater in NSW where a water sharing plan has been implemented. The Hunter Unregulated and Alluvial Water Sources Water Sharing Plan 2009 applies to the site. Under section 89J of the EP&A Act, SSD is exempt from requiring a water use approval under section 89, a water management work approval under section 90 and an activity approval (other than an aquifer interference approval) under section 91 of the WM Act.

4.5 Summary of licences approvals and permits

Table 4.3 contains a summary of the licences, approvals and permits that are likely to be required for the project.

Table 4.3 Summary of required licenses approvals and permits

Legislation	Authorisation	Consent or approval authority
EP&A Act	Project Approval	DP&E or PAC
	Construction certificate	CCC or Private Certifier
	Occupation certificate	CCC or Private Certifier
POEO Act	EPL	EPA
Roads Act	Section 138 permit	CCC

As stated in Section 4.2.1, a referral under the EPBC Act has been submitted to DoEE. The referral states that the project is unlikely to have any significant impact on MNES and, therefore, an approval under the EPBC Act is not required.

DoEE has requested more information on the project, particularly potential impacts on the New Holland Mouse. This will be provided in November 2016. Following provision of this information, DoEE will make its determination on the referral.

5 Stakeholder consultation

5.1 Overview

This chapter provides an overview of stakeholder consultation and engagement activities undertaken for the project, including a summary of the results of the consultation and engagement.

The development of strong relationships with stakeholders is important to Pymore. Throughout the development of this project, its first in Australia, Pymore has strived to build these relationships by demonstrating the values of commitment, integrity and responsibility.

5.2 Consultation objectives

The aim of stakeholder consultation activities for the project has been to facilitate structured stakeholder input to inform relevant environmental assessments and demonstrate open, transparent engagement through EIS development and publication.

To achieve this aim, a number of objectives have been established, including:

- consult early to establish points of contact, develop Pymore's profile within government agencies and ensure all government requirements are identified;
- identify other relevant stakeholders who have a known or potential future interest in the project;
- establish relationships with the community;
- provide stakeholders with accurate and regular information on the project;
- identify and understand the aspects of the project which are of most interest to stakeholders; and
- continually seek feedback on relevant areas of project and the strategies proposed to minimise impacts, and identify opportunities to accommodate feedback into the project design.

Stakeholder engagement and consultation has been led by Pymore with support from stakeholder management specialists, the Fifth Estate, EMM, and technical specialists, as required.

5.3 Formal consultation requirements

Among the objectives of the EP&A Act, one objective is ‘to provide increased opportunity for public involvement and participation in environmental planning and assessment’. Accordingly, stakeholder engagement and consultation forms a key information input in the preparation of environmental impact assessments.

The SEARs for the project state that stakeholders must be consulted during the preparation of the EIS. Specifically, the SEARs state:

> During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with:
>
> - Cessnock City Council;

- Environment Protection Authority;
- WorkCover NSW;
- Hunter New England Local Health District;
- Department of Primary Industries, including NSW Office of water;
- Office of Environment and Heritage;
- Roads and Maritime Services; and
- surrounding landowners and occupiers that may be affected by the proposal.

The EIS must describe the consultation process and the issues raised, and identify where the development has been amended in response to those issues. Where amendments have not been made to address an issue, an explanation should be provided.

Stakeholder engagement has been undertaken to meet the requirements of the SEARs as a minimum.

It should be noted that the consultation process did not result in any amendments to the design of the project. As stated below, consultation, particularly with CCC and government agencies, was undertaken early to identify issues that needed to be considered in the design of the project.

5.4 Stakeholder consultation activities

5.4.1 Consultation strategy

To assist in the development of consultation activities, Pymore has developed two strategies in support of:

- community consultation, including for EIS requirements and community relations exercises; and
- government consultation and relations.

The consultation strategy is inclusive of field activities required to support technical studies that were prepared to support the EIS. These strategies were developed following a stakeholder identification process.

5.4.2 Stakeholder consultation planning overview

Stakeholder consultation requires planning, execution and documenting of engagement and other relevant events, incorporating a process of continual improvement and refinement to reflect changes within the stakeholder groups, issues or local and regional sensitivities.

The basis of planning for Pymore's preliminary (before preparation of this EIS) and formal consultation activities incorporated the following key tasks:

- stakeholder identification and assessment;
- early stakeholder consultation and scoping;
- issues identification and analysis;

- event identification and evaluation;
- development of consultation plans/strategies; and
- implementation, monitoring, documenting and review of consultation activities.

i Stakeholder identification and assessment

The objective of the stakeholder identification process was to identify, as far as reasonably practicable, those stakeholders deemed to hold a direct or indirect interest in the development of the project. In identifying stakeholders and developing a stakeholder register, Pymore considered the range of government and community stakeholders. The stakeholder register was regularly updated as engagement activities evolved.

Three stakeholder categories were identified; community, government and Indigenous, each with a number of sub-groups as follows:

- community - property owners, local businesses, schools, the local community, special interest groups, service providers and the media;
- government - CCC, State and Commonwealth government agencies, local members and Ministers; and
- Indigenous - registered Aboriginal parties (refer to Section 7.10 and Appendix L) and the local indigenous community.

Once stakeholders were identified, a qualitative assessment of each stakeholder, their relationships and areas of interest or concern were established and assessed, as they pertain to the project and its perceived/potential impacts or benefits, to allow Pymore to define stakeholder engagement strategies tailored to individual or group needs and at the most relevant time given the project schedule.

ii Early stakeholder consultation

Pymore places a high level of importance on early engagement both with the local community and government stakeholders. Before the project was designed and technical assessments commenced, Pymore undertook initial consultation with government stakeholders, engaged with targeted members of local organisations and Indigenous stakeholders. This high level of engagement sought to introduce Pymore and the project to new stakeholders and has continued through the environmental impact assessment process, up to publication of this EIS.

This early engagement provided Pymore with the opportunity to commence building relationships with the key stakeholder groups that would form the basis for consultation planning and ongoing activities through the development of this EIS.

iii Issues identification and assessment

To identify issues that may be raised by one or more stakeholders, Pymore, with the assistance of the Fifth Estate and EMM, implemented an issues identification process to establish a list of potential matters of concern or interest.

iv Event identification

Different stakeholder engagement tools and methods were considered and used, including:

- face-to-face meetings;
- drop-in session;
- media articles and advertising; and
- meetings with CCC and government agencies.

v Development of consultation plans and strategies

Following the completion of the stakeholder and issues identification and assessment process, project action plans were developed to guide stakeholder engagement.

vi Consultation activities and events

As outlined above, to achieve the consultation objectives and demonstrate appropriate consultation with community, government and Indigenous stakeholders, different formal and informal stakeholder engagement methods (ie events) have been employed in accordance with project action plans.

Table 5.1, 5.2 and 5.3 lists the consultation activities undertaken in support of the project and detail the purpose and key issues raised by each stakeholder.

vii Government consultation

CCC, State and Commonwealth government agencies were principally consulted to identify key issues for this EIS, to seek guidance on assessment approaches and to investigate government policies that apply to the project. The primary consultation tool was to hold targeted meetings with agency representatives, either face-to-face, or by phone. Table 5.1 provides an overview of those meetings and briefing sessions held with government agencies to date and the key issues discussed.

Pymore will continue to engage with CCC and relevant government agencies on a regular basis throughout the EIS approval and project development processes associated with the project.

Table 5.1 Government consultation activities and outcomes

Agency	Date	Purpose and key issues
Local government		
CCC (Senior staff or Council, as identified)	5 May 2016	Meeting to senior officers (ie director and manager level) to provide project briefing, the approval process (ie SSD) and environmental impact assessment process. It was generally agreed at the meeting that the site was well located for the project and that all relevant technical assessments were being undertaken. No concerns were raised with the project, although it was acknowledged that the meeting was being held prior to the project being designed and the results of technical assessments were available. It was resolved that meetings be arranged with CCC after the results of the technical assessments were available to brief both the senior officers and the elected councillors.

Table 5.1 Government consultation activities and outcomes

Agency	Date	Purpose and key issues
State government agencies		
DP&E	16 December 2015	Meeting with senior officers within the industry assessments team within DEP&E's major projects group to provide project briefing and justification for project being defined as SSD. It was agreed at the meeting that given the volume of ULABs to be stored on site, the project could be defined as SSD. A request for SEARs was subsequently prepared and provided to DP&E. SEARs were provided on 18 March 2016.
NSW Health	5 May 2016	Meeting with environmental health officer to provide project briefing, the approval process (ie SSD) and environmental impact assessment process. The officer from NSW Health stated that their role on the project relates to general population health, not occupational health which is regulated by SafeWork NSW. As such, the officer stated that the key area for consideration from the agency's perspective related to potential lead emissions from the site, and how these emissions were managed. These measures needed to be documented within the EIS. The officer stated that NSW Health would be interested in discussing the preliminary results of key technical assessments (air quality and health risk assessments) when available.
	28 September 2016	The officer from NSW Health stated during a telephone call with Ramboll Environ (who undertook the (air quality and health risk assessments) that based on the preliminary results, they were happy to review the EIS when finalised and made publicly available.
OEH	6 May 2016	A meeting was held with a senior officer within OEH's floodplain management group to provide project briefing, the approval process (ie SSD) and environmental impact assessment process. The meeting was held at the same time as the meeting with the EPA. Matters raised in OEH's letter attached to the SEARs relating to flooding risk and floodplain management were also discussed, including OEH's comment about the suitability of the site for the project. In this regard, a presentation was provided to OEH on flood levels at the site compared to the likely finished floor level of the project, as well as and management of hazardous materials stored on site. OEH advised that their initial position (in the letter attached to the SEARs) regarding suitability of the site was made without any detailed information on the location and level of the project relative to flood levels. OEH provided no firm commitment, but indicated that the measures outlined in the presentation regarding hazardous materials management would be appropriate, provided further information is provided on material mobilisation risks. Specifically, OEH recommended that information be provided justifying a Flood Planning Level below the Potential Maximum Flood (PMF) level. Details around the extent and scope of flood modelling were discussed. OEH stated that flood modelling would only be required if works associated with the project are proposed below the 200 year average recurrence interval (ARI) flood extent. OEH also advised they would consider a qualitative assessment if it can be demonstrated via comparison of existing and design levels that the project would have a neutral to beneficial effect on flooding (below the 200 year ARI level).
	23 May 2016	A telephone call was held with a regional biodiversity assessment officer within OEH to arrange a time to meet with them to brief them on the project. The officer stated that there was no need to meet with them and that they would review the biodiversity assessment when the EIS was publicly available.

Table 5.1 Government consultation activities and outcomes

Agency	Date	Purpose and key issues
EPA	6 May 2016	A meeting was held with senior officers within EPA's hazardous materials, chemicals and radiation group to provide project briefing, the approval process (ie SSD) and environmental impact assessment process. The meeting was held at the same time as the meeting with the OEH. Officers from the EPA stated that all relevant technical assessments from the Authority's perspective were being undertaken (ie noise, air quality and surface water). It should be noted that the EPA were provided the same presentation that was provided to OEH regarding flooding matters. In response, the EPA stated that flood risk management measures would be required to be provided in a pollution response management plan which would be a requirement of any condition of the development consent.
RMS	12 May 2016	A message was left with an officer from RMS to arrange a time for a briefing on the project. An email was subsequently sent. No response was received.
	17 May 2016	A second message was left with the officer from RMS. No response was received.
SafeWork NSW	23 May 2016	A telephone call was held with a senior officer within SafeWork NSW's hazardous chemical services group. He stated that the SafeWork NSW would be responsible for overseeing occupational health matters (ie worker's health) for the project. The officer stated that the project would be required to comply with SafeWork NSW's thresholds for blood lead levels for workers. He also stated that the agency was aware of recommendations being made by SafeWork NSW and the National Health and Medical Research Council to lower the thresholds for blood lead levels for workers and stated that they would expect Pymore to implement the lower levels if adopted. He stated that the existing and proposed levels should be considered in the health risk assessment. The senior officer stated that he would get a lead specialist within SafeWork NSW to ring separately in relation to the proposal to lower the thresholds for blood lead levels for workers (see below).
	24 May 2016	A second telephone call was held with lead specialists within SafeWork NSW. The officer confirmed the proposal to lower the thresholds for blood lead levels for workers (see below) and that the health risk assessment should consider both the existing and proposed thresholds.
DPI-Water	15 June 2016	A telephone call was held with an officer from DPI-Water to discuss the project. Based on the details of the project that was provided and the technical studies being undertaken, the officer stated that they did not need to meet to be briefed on the project. The officer stated that they would review the EIS when it was lodged for assessment, and provide comments if required.

Table 5.1 Government consultation activities and outcomes

Agency	Date	Purpose and key issues
Commonwealth government		
DoEE	9 September 2016	A teleconference was held with officers from the Department's North NSW assessments group to discuss the project and its potential impacts on matters of national environmental significance (MNES) under the EPBC Act. The teleconference was held ahead of Pymore's submission of a referral under the Act. As stated in Section 4.2, a referral was submitted to DoEE on 21 September 2016 (2016/7782). The referral stated that the project would not have a significant impact on MNES and therefore was not a controlled action. On 6 October 2016, DoEE requested further details on the project, specifically on matters relating to soil and water, contamination, and flooding and floodplain management. This information was provided to DoEE on 12 October 2016. On 17 October 2016, DoEE requested further information on potential impacts of the project on the New Holland Mouse which is listed as vulnerable under the EPBC Act. The DoEE also requested conformation that the option of harvesting (or extracting) water from Swamp Creek does not currently form part of the project. Further information on the New Holland Mouse and confirmation that the project will not extract water from Swamp Creek will be provided in November 2016 after targeted surveys for the New Holland Mouse have been completed.

5.5 Indigenous stakeholder consultation

Aboriginal stakeholders were engaged in accordance with OEH's *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010b) and DEC's *Draft Guidelines for Aboriginal cultural heritage impact assessment and community consultation* (DEC 2005) as part of the Aboriginal cultural heritage assessment for the project.

The Aboriginal cultural heritage consultation requirements provide detailed guidance on the implementation of a four stage consultation process. The four stages are:

- Stage 1 – notification of the project and registration of interest;
- Stage 2 – presentation of information about the project;
- Stage 3 – gathering information about the cultural significance; and
- Stage 4 – review draft cultural heritage assessment report.

Invitations to register as a registered Aboriginal party (RAP) for the project were issued in April 2016. Twenty RAPs registered their interest in the project. The RAPs were sent information on the project and the proposed fieldwork methodology. Seven RAPs attended a site meeting on 19 May 2016.

The draft Aboriginal Cultural Heritage Assessment (ACHA) was also issued to the RAPs for their comment prior to finalisation. Research and consultation with the Aboriginal community was conducted to determine whether any socio-cultural heritage value relates specifically to the extension area regardless of archaeological evidence.

Engagement with Aboriginal stakeholders is detailed in Section 7.10 and Appendix L, including key issues raised and proposed mitigation measures.

5.6 Community and service provider consultation

Consultation within the local community in which the project is proposed to operate is crucial in identifying potential issues and benefits with the relevant stakeholder groups. Given the often varied demographic base of community stakeholders, it is important to implement a number of strategies to provide the greatest reach possible to all sectors of the community. As such, Iluka has sought to implement strategies to reach the following key groups:

- landholders with a direct relationship to the project;
- business community and service providers; and
- residents and community members.

The following sections detail the processes and outcomes of a range of consultation activities undertaken to achieve Pymore's community consultation objectives.

5.6.1 Initial consultation

To start the community consultation process, Pymore initially established relationships with community stakeholders who could aid with planning and developing a project specific consultation plan. Initial stakeholders were CCC's planning department, CCC councillors, Hunter Region Business Enterprise Centre (BEC), and Weston Aluminium. These stakeholders were briefed about the project in a number of separate meetings and were asked to provide feedback on the next steps for the consultation process, and possible issues that may be raised. The issues detailed below were highlighted in the initial meetings with the above stakeholders.

i Consultation process

Pymore was given a number of recommendations on the community consultation process that they should undertake including:

- using newspapers and the local BEC network will likely be the best way to reach the wider community; and
- Pymore will need to demonstrate its experience in ULAB recycling to give confidence to the community that the project will be successful with no variations from the original plan.

During the initial meetings, stakeholders indicated that at the main community issues would likely be related to trucks on the road, noise, and emissions/smell.

ii Project support

All initial stakeholders acknowledged that there is a growing need for investment and jobs in the region following the closure of the Hydro aluminium smelter and decline in mining jobs. As such, most stakeholders were supportive of the project. There was particular interest in how much of the investment would involve local contractors as well as the makeup of the full time jobs proposed for the project. Emphasis was placed on the youth unemployment in the region and the need for up skilling by local businesses.

iii Environmental issues

Although stakeholders indicated broad support for the project, they were still interested on how plant emissions would be managed and handled, particularly emissions from stacks. After explanation, stakeholders seemed satisfied with the environmental controls proposed to be implemented as part of the project. The key environmental issues raised included:

- emissions from stacks;
- waste slag produced and how it would be handled;
- water treatment and disposal; and
- noise generation.

5.6.2 Community information session

During the initial consultation it was decided that to hold a community information session to engage the wider community. The session was organised on 13 October 2016 and provided an opportunity for the community to engage directly with representatives of Pymore about the project. The community information session was held at the Hunter Region Business Hub in Barton Street, Kurri Kurri between midday and 7.00 pm.

The information session was advertised in the local newspaper (Cessnock Advertiser) on 5 and 12 October 2016 at the same time articles on the project were run. Attendees were able to read project display boards and talk to representatives from Pymore about the project.

Information provided included details on ULAB recycling, plans of the project and the preliminary results of the technical assessments. The major issues raised are discussed below.

i Emissions

Some of the residents that attended the information session claimed that they regularly cleaned black soot from their roofs and could see air emissions coming from existing local facilities. They highlighted the need for Pymore to be answerable to government with regards to their environmental performance.

ii Roads

A few residents who attended the information session expressed concerned about trucks on Mitchell Avenue and how they would impact both the quality of the road and the local traffic flows. They stated that the road was in poor condition and that further use by trucks could make it worse. Some residents asked whether Pymore would be working proactively with CCC to upgrade the road and keep it in good condition.

Some concerns were also raised about whether or not trucks would be able to turn right out of the site onto Mitchell Avenue. They believed that the road is already too busy and that trucks turning right could cause problems and also be dangerous.

On a positive note though, residents seemed to be happy that most trucks would access the site from Government and Hart roads, and not through town.

iii Water treatment

Most of the residents that attended the information session expressed concern about the possibility of hazardous materials getting washed into Swamp Creek. However, these residents concerns seemed to be allayed after the water management measures proposed for the project were explained.

iv Employment plans

Most residents that attended the information session were interested about the employment plans of Pymore once the project was up and running. Overall, they seemed encouraged by the prospect of more jobs coming to the region. Emphasis was placed on the high level of youth unemployment in the region and how Pymore might implement a plan to up skill people in their business.

v Construction plans

Some residents were interested in the construction schedule for the project and when it would be operational. These were generally positive comments with residents keen to see the project operational sooner rather than later. People were also interested how much would be spent locally when building the plant.

5.7 Ongoing stakeholder engagement

Stakeholder engagement undertaken by Pymore on the project has been comprehensive and reflects the requirements of the SEARs. Pymore will continue to work closely with CCC, State and Commonwealth agencies, landholders, service providers, and the Kurri Kurri community to ensure the project meets the reasonable expectations of stakeholders.

Pymore will seek to undertake further consultation activities following finalisation of this EIS to complement the approvals process.

6 Risk assessment

6.1 Overview

A preliminary risk assessment of potential environmental impacts of the project was undertaken to identify the key issues for further assessment. This preliminary risk assessment was submitted to DP&E to assist the Department, CCC and NSW government agencies to prepare the SEARs. The preliminary risk assessment was updated following receipt of the SEARs with the final risk assessment presented in Table 6.1.

The risk assessment was based on knowledge of the existing environment (refer to Chapter 2), environmental interactions, and the project description. Potential environmental impacts were identified and then ranked according to their likelihood of occurrence and potential consequences. The assessment assumed conventional mitigation practices would be adopted as necessary.

Table 6.1 Risk assessment of potential environmental impacts

Potential impacts	Risk rating
Waste management	
Diversion of hazardous wastes from landfill	High
Production of hazard wastes during operation	Low
Human health	
Impacts to employee health	Moderate
Off-site health impacts	Low
Noise	
Operational noise impacts	Low
Cumulative noise impacts from the project and surrounding land uses	Low
Air quality and odour	
Air quality and odour impacts associated with the project	Low
Cumulative air quality and odour impacts from the project and surrounding land uses	Low
Hazards	
Hazards from the storage and transport of dangerous goods	Moderate
Ability to respond to and manage fires and incidents at the facility	Low
Bushfire risks to facility	Moderate
Groundwater	
Impacts on groundwater flow, quantity and quality	Low
Surface water	
Changes to surface water flows and quality	Moderate
Flooding impacts to facility	Moderate
Ecology	
Impact on threatened species and communities	Moderate
Aboriginal cultural heritage	
Impacts on Aboriginal artefacts	Low
Impacts on cultural heritage values	Low
Historic heritage	
Impacts on historic heritage	Low

Table 6.1 Risk assessment of potential environmental impacts

Potential impacts	Risk rating
Traffic and transport	
Impacts to local road networks	Moderate
Final landform and rehabilitation	
Ability to effectively rehabilitate site	Low
Visual amenity	
Impacts on surrounding visual receptors	Low
Potential impact on the nature of the visual character of the surrounding area	Low
Land and soils capability	
Increased risk of erosion	Low
Reduction in agricultural productivity	Low
Economics	
Impacts on property values due to noise and dust impacts	Low
Local and regional employment opportunities	Moderate
Social	
Community concerns about amenity	Moderate
Effects on traffic and roads	Moderate

6.2 Priority issues for EIS

Based on the risk assessment results in Table 6.1, the following risk ratings were assigned to each potential impact:

- High – diversion of hazardous wastes from landfill;
- Moderate – human health, hazards, surface water, ecology, traffic and transport, economics, and social matters; and
- Low – all other matters.

Accordingly, the high and moderate ranked issues were given greater attention during preparation of this EIS. These issues have been fully investigated using established and well proven technical assessment methodologies (refer to Chapter 7).

This section provides an assessment of the potential socio economic impacts of the project. It is based on an analysis of baseline socio-economic data and the results of engagement with local community.

7 Impact assessment

7.1 Introduction

This chapter provides an assessment of the likely environmental impacts of the project as required by Section 79C(1b) of the EP&A Act. Predominantly, it provides a summary of the technical assessments prepared for the project. Further details of the existing environment, assessment methods, assessment criteria, predicted impacts and proposed management measures are provided in the technical assessments (refer Appendices D–N of the EIS).

7.2 Waste management

As detailed in Section 4.4.1, the POEO Act defines 'waste' for regulatory purposes and establishes management and licensing requirements for waste in NSW.

The project would accept large quantities of ULABs, which are defined by clause 49(d) of Schedule 1 of the POEO Act as a hazardous waste. As detailed in Chapter 3, each ULAB would be converted into materials which are recycled for use in new products namely, lead bullion, sodium sulphate and polypropylene plastics. Each of these products would be saleable items and are not considered wastes.

The only waste products produced by the battery recycling process are slag generated from the furnace and PE separators contained within the battery separators as detailed in Section 3.3. Old refractory bricks will also be produced as wastes from the replacement of bricks in the furnace approximately every 12 months. These wastes are not classified as hazardous goods under clause 49(a) – (f) or (h) of Schedule 1 of the POEO Act. To determine if the wastes are classified as hazardous under clause 49(g) of Schedule 1 of the POEO Act, waste generators must chemically assess their waste in accordance with Step 5 of the *Waste Classification Guidelines* (EPA 2014b). The chemical assessment process is based around the waste's potential to release chemical contaminants into the environment through contact with liquids, which leads to the production of leachates.

The two measurable properties of chemical contaminants used to classify waste are:

- the Specific Contaminant Concentration (SCC) of any chemical contaminant in the waste, expressed as milligrams per kilogram (mg/kg); and
- the leachable concentration of any chemical contaminant using toxicity characteristics leaching procedure (TCLP), expressed as milligrams per litre (mg/L).

General and restricted solid waste limits for SCC and TCLP are identified in Tables 1 and 2 of the *Waste Classification Guidelines* (EPA 2014b). Wastes that exceed these limits are classified as hazardous wastes.

The SCC limits for lead contaminants are 6,000 mg/kg (ie 0.6%). The typical concentration for lead in PE separators is 2–3% and, therefore, is classified as a hazardous waste. The old refractory bricks are also classified as hazardous waste due to their lead content.

A typical chemical composition for slag, based on actual analyses of slags from existing plants using Engitec technology, is provided in Table 7.1 below.

Table 7.1 Typical slag composition

Element		Compound	
Ag	0.00038%	AgS	0.00049%
As	0.0045%	As_2S_3	0.0073%
B	0.05%	B_2O_3	1.59%
Ba	0.20%	$BaSO_4$	0.37%
Ca	0.60%	$CaSO_4$	2.04%
Cd	< 0.001%		
Cr	0.0029%	Cr_2O_3	0.0042%
Fe	16.50%	FeS	25.92%
Hg	0.00028%	HgS	0.00032%
Na_2O	18.30%	Na_2SO_4	41.92%
Pb	4.0%	PbS	4.62%
Se	< 0.0001%		
SiO_2	14.50%	SiO_2	14.50%
Al	3.50%	Al_2O_3	6.61%
Mg	0.80%	MgO	1.33%
		Other, not detected	1.10%
		Total	**100%**

The typical concentration for lead in slag as shown in Table 7.1 is 4% which would mean it is also classified as hazardous waste. However, it is noted that, pursuant to the provisions of clause 28 of the NSW *Protection of the Environment Operations (Waste) Regulations 1996*, the NSW EPA has authorised General Approval 2009/07 in relation to lead (and other contaminants) contained in metallurgical furnace slag which states that the SCC threshold limits in the *Waste Classification Guidelines* (EPA 2014b) do not apply to slag produced in a furnace operating at temperatures in excess of 1,000°C. In this case the slag can be classified according to its leachable concentration (ie TCLP values) alone.

Whether the slag produced by the project would be classified as hazardous would depend on the operating temperature of the furnace and the TCLP values of the slag. The classification of the slag would be confirmed after commencement of operations. It is noted that there is a licensed hazardous waste facility in the vicinity of the site (approximately 25 km east at Kooragang Island) that has indicated it is capable of transporting, receiving and treating the slag generated by the facility if it is classified as hazardous. It has been conservatively assumed in EIS that the slag is classified as hazardous waste in order to fully assess all potential impacts of the project.

It is noted that Pymore are investigating opportunities to recycle the slag and PE separators, as well as, the potential reuse of the PE separators as a supplementary fuel in the battery recycling process, which may form part of a future application.

In addition to the PE separators and slag, minor quantities of waste would be generated by the day-to-day operation of the facility. Wastes would also be generated during construction of the project. All wastes produced are to be managed in accordance with the *Waste Classification Guidelines – Part 1: Classifying Waste* (EPA 2014b). A summary of the waste types, classification, proposed management methods and estimated annual quantities of wastes produced by the project during operation and construction is provided in Table 7.2.

Table 7.2 Summary of wastes produced by the project

Waste type	Classification	Proposed management method		Estimated annual quantities
		Onsite treatment	Off-site treatment	
Waste from administration operations				
General residual waste	General solid waste (putrescible)	Segregation onsite to recover recyclables from other residual wastes. Residual wastes will be stored in garbage bins and regularly collected by suitably licensed contractor.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	63 t
Recyclable food and beverage containers (including glass and plastic bottles and aluminium cans)	General solid waste (non-putrescible)	Segregation onsite to recover recyclables. Recyclables will be stored in recycling bins and regularly collected by suitably licensed contractor.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	42 t
Electronic waste, dry cell batteries and printer cartridges	Hazardous waste	Will be stored in e-waste bins and regularly collected by suitably licensed contractor.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	0.07 t
Paper and cardboard waste	General solid waste (non-putrescible)	Segregation onsite to recover recyclables. Recyclables will be stored in recycling bins and regularly collected by suitably licensed contractor.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	0.36 t
Waste from recycling process				
Slag	To be confirmed	From the rotary furnace, molten slag is poured into crucibles and allowed to solidify under a hooded area. The crucibles are then transferred using forklifts into the slag room area where the solidified slag will be removed from the crucible using chained hooks. The slag room area is enclosed, ducted and connected to the dust collection system under strong negative pressure. The slag is regularly collected by a suitably licensed contractor for offsite disposal.	Disposal at a licensed hazardous waste facility (i.e. Cleanaway Waste management Facility in Kooragang).	3,200 t
PE separators	Hazardous waste	The PE separators are temporarily stored in the PE separator area and are regularly collected by a suitably licensed contractor for offsite disposal.	Disposal at a licensed hazardous waste facility (i.e. Cleanaway Waste management Facility in Kooragang).	3,100 t
Old refractory bricks	Hazardous waste	Collected during replacement of furnace bricks every 12 months. Removed by a suitably licensed contractor for disposal at a licensed hazardous waste facility.	Disposal at a licensed hazardous waste facility (i.e. Cleanaway Waste management Facility in Kooragang).	20 t
Waste from construction				
Sand, soil, waste concrete and aggregates	General waste	Reused on site for earthworks.	N/A	Nil

Table 7.2 Summary of wastes produced by the project

Waste type	Classification	Proposed management method		Estimated annual quantities
		Onsite treatment	Off-site treatment	
Timber	General waste	Reused on site as fuel for pre-heating of furnace lining.	N/A	Nil
Metals	General waste	Stored separately on site and removed by a licensed waste disposal contractor to a building and demolition waste depot or licensed landfill.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	2 t
Packaging materials	General waste	Stored separately on site and removed by a licensed waste disposal contractor to a building and demolition waste depot or licensed landfill.	Disposal at waste facility (i.e. Cessnock Waste and Reuse Centre on Old Maitland Road).	0.5 t

7.3 Human health

7.3.1 Impact assessment

A human health risk assessment was prepared for the project by Ramboll Environ Australia Pty Limited (Ramboll Environ) (Appendix D). This assessment addresses the potential health risks associated with the project and the potential for the project to adversely affect the health of onsite workers and offsite sensitive receivers.

As part of the human health risk assessment, a detailed assessment of the potential exposure pathways for onsite workers and offsite sensitive receivers was conducted. Given the chemicals that would be used during the operation of the project, the composition of ULABs and the production waste materials likely to be generated by the project's activities, exposure to lead was considered the primary exposure scenario. The assessment concluded that onsite workers have the potential to have both direct and indirect contact with lead dust during project activities conducted within the buildings. These activities include the receipt and collection of ULABs, transportation and storage of ULABs, battery breaking and charge preparation and furnace feeding.

In addition to lead dust exposure, a number of other potential exposure scenarios were also considered. Table 7.3 lists the exposure scenarios associated with the project and summarises the potential for adverse health effects due to each of these scenarios.

Table 7.3 Exposure scenarios and potential for adverse health effects

Exposure scenario	Potential for adverse health effects
Particulates exposure to offsite sensitive receptors	The air quality and GHG assessment (Appendix I) indicated that the concentrations of air quality parameters for offsite sensitive receptors were below the adopted assessment criteria and, therefore, the potential for adverse health impacts to offsite receptors from the project's construction and operation is low.

Table 7.3 Exposure scenarios and potential for adverse health effects

Exposure scenario	Potential for adverse health effects
Particulates exposure to onsite employees	The air quality and GHG assessment (Appendix I) indicated that the concentrations of air quality parameters for onsite workers were below the adopted assessment criteria for workers in the outdoor environment. Strict work health and safety procedures have been developed which comply with Australian work place regulations, and compliance with these regulations would reduce indoor exposure to particulates in the workplace.
Particulates exposure via tank water collected offsite	Potential health risks to users of rainwater tanks in the vicinity of the site are considered to be low.
Particulates exposure to drinking water supplies	Drinking water for the site would be sourced from Chichester Dam located more than 60 km to the north of the site. The air quality and GHG assessment (Appendix I) indicated that particulate concentrations at the perimeter of the site were negligible. Consequently, dust deposition from the project to Chichester Dam is highly unlikely.
Exposure from impacted soil and groundwater beneath the site to onsite and offsite receptors	The preliminary contamination assessment (Appendix K) involved the collection of soil samples from across the site. Soil samples were screened against appropriate health-based assessment criteria for commercial/industrial land for both direct exposure pathways and vapour inhalation pathways. Concentrations of analytes were either below the laboratory limit of reporting or the adopted health-based assessment criteria for commercial/industrial land use. Consequently, potential health risks due to soil exposure on the site are considered to be low.
Exposure from impacted surface water to onsite and offsite receptors	The surface water assessment (Appendix J) proposed a number of water quality management measure s to adequately mitigate potential impacts from the project on surface water features in the surrounding environment. Environmental risks associated with hazardous materials becoming mobilised in flood waters are negligible.
Noise and vibration emissions to offsite sensitive receptors	The noise impact assessment (Appendix H) concluded that predicted noise and vibration levels for the project would be within the adopted guideline levels for offsite sensitive receptors. Adverse health impacts from noise and vibration are considered to be low.

7.3.2 Management and mitigation

As stated above, exposure to lead was considered to be the primary exposure scenario for assessment. The lead exposure controls described below would also provide suitable protection for other chemicals encountered during the ULAB recycling process. To reduce employee's lead dust exposure during the operation of the facility, a number of control measures would be implemented. The WHS Regulation outlines a number of measures to control exposure to lead during lead risk work. To comply with the WHS Regulation, the project would adopt a number of preventative exposure measures detailed in Section 3.4.4.

A number of engineering controls would also be adopted to reduce lead exposure during the activities conducted onsite. These engineering controls are described in Table 7.4. In addition to these controls, PPE would be made available to all employees. Specific PPE requirements would be dependent on the specific activity in which an employee is engaged in as detailed in Table 7.5. Employees may be disciplined for omitting to wear safety equipment and may be discharged without cause for refusing to wear the appropriate PPE.

Table 7.4 Engineering Controls to be adopted to reduce lead exposure

Activity	Engineering controls to reduce lead exposure
Battery breaking	All pieces of equipment involved in battery breaking are enclosed and placed under suction from the ventilation system. The control room of this section of the plant is provided with a temperature-controlled, positive-pressure, filtered supplied clean air system. If the periodical environmental control or source identification sampling should identify that lead is coming from this part of the plant, or adjacent areas, the material handling patterns and work practices will be revaluated, the area isolated through barriers, and ventilation will be provided as needed. Workstations in this section will be periodically cleaned using high-pressurised water cleaners, and the waste water will be fed to the water treatment plant. No dry sweeping of the floors will be carried out.
Industrial battery breaking	In addition to the above engineering controls, this activity will be performed in an area of the plant where a side draft ventilation and local exhaust hoods are available. Curtains or shields on battery breaking equipment will be installed to contain mist and liquid droplets containing lead particulate. Wet suppression techniques to prevent lead from drying on equipment surfaces may be used.
Battery separation	This activity is not anticipated to cause significant lead exposure as this process is performed with a sink/float process. Building walls and fixed equipment will be washing down with water periodically to remove splashes of lead-laden liquid.
Foundry, material handling and charge preparation	Proper operator training and good housekeeping are identified as key in minimising lead emissions during mobile equipment operation associated with this activity. All surfaces to be paved to facilitate good housekeeping (see below).
Foundry, lead recovery and furnace discharge Baghouses	The furnace is to be placed under suction by the ventilation system to collect lead dusts emitted during the smelting process and during lead pouring. The screw conveyor system is to be enclosed, and cover gaskets on this system to be periodically maintained, and leaks to be repaired immediately. Air emissions from both baghouses are monitored by two opacity meters. All bag replacements are to be recorded, as well as plant operational data.
General housekeeping activities	All surfaces will be maintained as free as practicable of accumulations of lead dust. Floors and other surfaces where lead may accumulate will not be cleaned by the use of compressed air. Shovelling, wet sweeping and brushing will only be used where vacuuming or other equally effective methods have been tried and found not to be effective. No dry sweeping to be carried out. At the end of each shift, each employee will be responsible for cleaning his/her work station.

Table 7.5 PPE to be adopted to reduce lead exposure

Activity	PPE to be adopted
Battery breaking, industrial battery breaking, battery separation Foundry (includes material handling, charge preparation, lead recovery and furnace discharge)	• Acid resistant gloves • Rubber boots • Eye wash stations and emergency flushing facilities to be provided. • Protective clothing: clean and dry coveralls or similar full-body work clothing. • Dust mask or respirator: complete with a cloth pre-filter and a double • exchangeable cartridge (lead and gas filter). Respirators must be cleaned and • checked daily and filter cartridges must be substituted when necessary. • Safety helmet • Safety shoes • Protective glasses/goggles/shield • Thermal insulated gloves • Ear protection when the noise level is over 85dBA

The project will also health and blood lead exposure monitoring. In Australia, work health and safety laws prescribe blood lead removal levels, blood lead return to work levels and air workplace exposure standards for lead risk work. Safe Work Australia is currently reviewing workplace blood lead removal levels and the associated workplace exposure standard for lead. Decisions regarding the proposed amendments will not be made final until late 2016 or early 2017. A recommendation of the human health risk assessment is that Pymore will consult the final Safe Work Australia workplace lead exposure guidance, prior to commencement of operations, to ensure that the project's lead health monitoring requirements are compliant with the relevant regulatory framework.

Prior to working on the site, all personnel would be fully acquainted with the safety standards and must have read and understood the instructions relevant to the equipment used during the ULAB recycling process. Employee awareness and education training would be undertaken which would include:

- all personnel would be made aware of the location of safety showers, fire-fighting clothes and eye-wash stations and would be required to attend periodical seminars where all plant safety procedures would be reviewed;
- all personnel would be informed of the hazards of lead exposure and about the related safety issues, as well as the hazards associated with the handling of other materials; and
- key personnel would be trained in first aid procedures.

7.4 Hazards and risks

7.4.1 Hazard identification

A preliminary risk screening in accordance with *Applying SEPP 33* (DP&I 2011) indicated that the project was a potentially hazardous development due to the types and amounts of dangerous goods stored on site. Therefore, in accordance with the provisions of SEPP 33, a PHA was prepared for the project. The project was also found to be potentially hazardous due to the types and volumes of dangerous goods proposed to be transported and a transport route evaluation study was prepared for the project. The PHA and route evaluation study for the project were prepared by Sherpa Consulting Pty Ltd and are attached as Appendices E and F to this EIS. The outcomes of these studies are detailed below.

As part of the hazard identification process conducted during the PHA, a review of past incidents at similar facilities was undertaken. No incidents were found that directly related to a battery recycling facility, except for one incident related to mechanical handling. Several incidents were found relating to hydrogen peroxide and the class 8 substances that would be stored at the facility. However, these involved bulk storage of chemicals and inadequate separation of incompatible substances. No significant incidents were found.

Potential incidents that could occur during operation of the project were assessed in the PHA for potential offsite impacts. A summary of these is provided in Table 7.6.

Table 7.6 Summary of incidents assessed to have potential offsite impacts

Scenario description	Safeguards	Offsite impact?
Failure of desulphurisation process resulting in increased emissions of SO_2.	• Monitoring of plant operation (flows, pH) • Shutdown and repair plant • Untreated paste not passed onto foundry • Stock pile of desulphurised paste will allow recovery operations to proceed	No
Molten metal explosion in the foundry area due to contact with water.	• Preheating of crucibles • Control of water sources • Separation distance to other plant areas. • Wet paste not passed onto furnace.	No
Fuel gas release and ignition resulting in fire.	• Inspection/maintenance of systems	Yes

As part of the route evaluation study, four potentially hazardous incidents resulting from materials transport to and from the site were identified. These included:

- dislodged loads leading to spill of electrolyte, slag or chemicals;
- traffic accidents leading to injury or fatality;
- windage loss during slag transport; and
- dust generation during transport and unloading of slag.

7.4.2 Risk assessment

Fuel gas release and fire was the only scenario identified in the PHA with the potential for offsite impact. To manage this offsite impact it is recommended that an automatic slam shutoff valve be provided for the natural gas supply to ensure that leaks can be isolated. The frequency of the ignited release was calculated and determined to meet all of the required criteria for adjacent land uses detailed in DP&E's *Hazardous Industry Planning Advisory Paper (HIPAP) 4 Risk Criteria for Land Use Safety Planning*, Ref (3). Therefore, incidents resulting from the operation of the project would not impact offsite areas in terms of injury and fatality.

The potential for external incidents from adjacent sites that could affect the project were also reviewed. The potential for incidents from adjacent facilities and other external events impacting on the project are considered to be of minimal concern. Risks to the biophysical environment from the project were also determined to be low.

Therefore, the PHA concluded that the project is not 'hazardous development' as defined by SEPP 33.

Of the potentially hazardous incidents identified in the route evaluation study, only incidents related to spills or traffic accidents were considered to have potential to be significant. Other incidents identified relating to the transport and unloading of slag were assessed to be of very low likelihood or consequence with proposed safeguards including the covering of trucks carrying slag and careful unloading at the end user.

Due to the nature of materials being transported, the safety and environmental consequences of incidents resulting in spills was considered very low for the following reasons:

- most incidents will result in only small quantities of slag being spilt and the effect of spills can be minimised by prompt recovery action;
- the consequences of electrolyte spill from dislodged batteries will be limited by transporting ULABs on pallets with holding ties and wrapped in plastic, the structural integrity of the battery casing, the electrolyte is diluted sulphuric acid, and approximately half of the ULABs sourced will not contain electrolyte; and
- the consequence of chemical spills will be limited by structural integrity of the truck and packaging, and the nature of chemicals transported meaning they have limited impact area on loss of containment.

The increased volume of truck traffic resulting from the transportation of materials to and from the site may result in an increase in the number of traffic accidents. Consideration of the potential routes from the project concluded that there would not be a significant increase in risk to local traffic users and sensitive land uses along these routes. Route 1 (via Hart Road, Government Road and Mitchell Avenue) was identified as the preferred route for trucks travelling north and south on the Hunter Expressway due to:

- lower impact on residential or sensitive land uses and associated populations;
- lower accident rates relative to the other two routes; and
- removal of additional hazard posed by crossing at railway level crossing on alternate routes.

Best practice for transport contractor operations of potentially hazardous materials includes implementation of driver training program to ensure observance of speed limits and traffic indication and to use designated routes only.

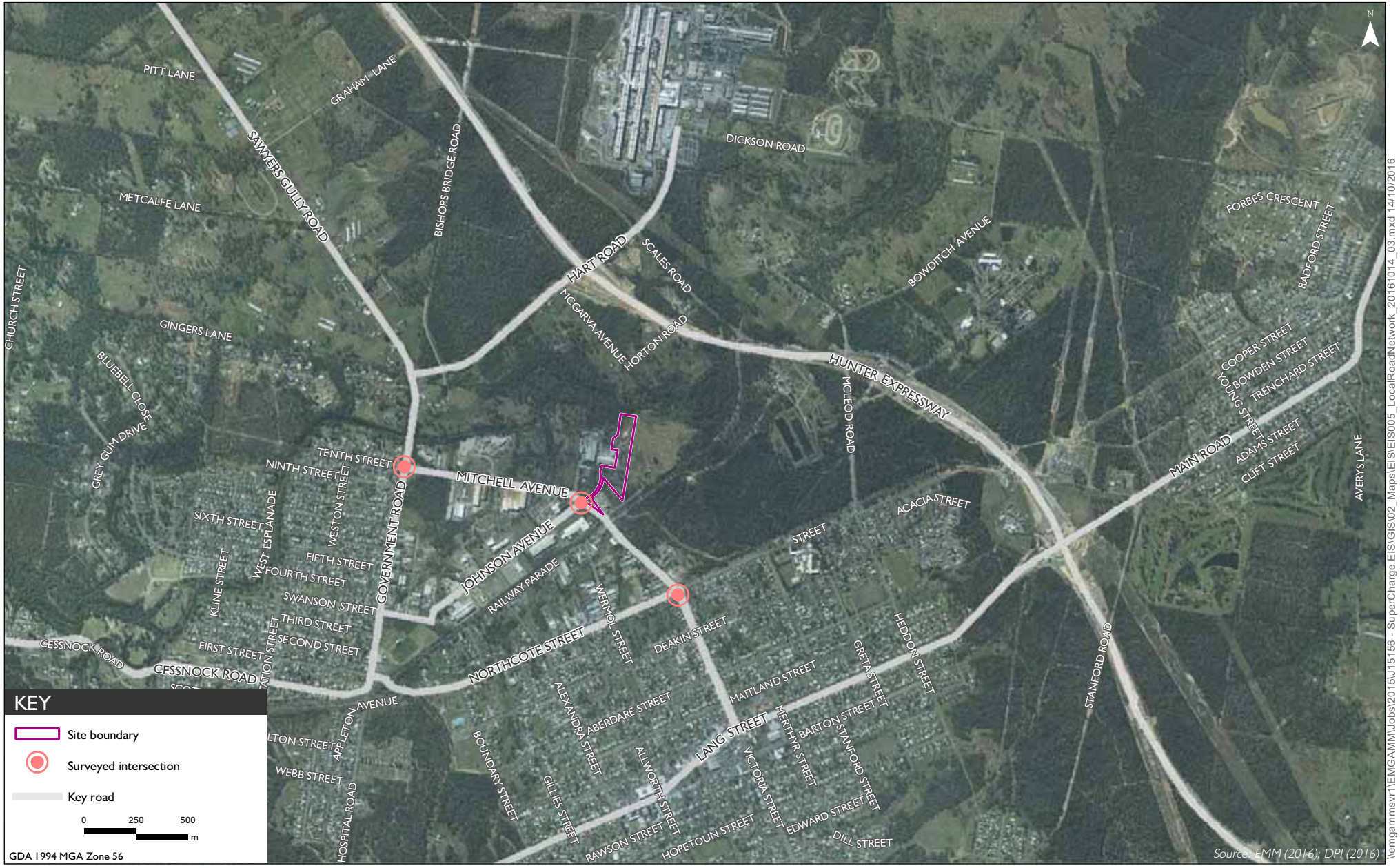
7.5 Traffic and transport

A traffic assessment was prepared by EMM (Appendix G). This assessment assesses the potential traffic impacts of the construction and operational phases of the project, and has been prepared in accordance with the SEARs and relevant guidelines.

The regional and local road network likely to be used by project generated traffic is shown in Figure 7.1. Potential external road network impacts of additional project traffic during operation and construction were assessed at three intersections, including:

- the future site access intersection from Mitchell Avenue (near Johnson Avenue);
- the Mitchell Avenue/Government Road intersection; and
- the Mitchell Avenue/Northcote Street intersection.

Existing traffic volumes at the three identified intersections were determined by peak hour traffic surveys in March 2016. The existing volumes and the estimated local road network traffic increases resulting from the project are presented in Table 7.7 and Table 7.8 for the construction and operations stages, respectively.



EMM

Local road network

Kurri Kurri Battery Recycling Facility
Envionmental Impact Statement
Figure 7.1

Table 7.7 Summary of additional generated daily traffic movements during construction

Road	Intersection survey location	Existing average weekday traffic*	Existing average weekday heavy vehicles*	Additional future site daily traffic movements	Additional future site daily heavy vehicle movements	% Daily traffic increase
Mitchell Avenue	West of the site	2,300	147	132	48	5.7
Government Road	North of Mitchell Avenue	9,300	205	98	42	1.1
Government Road	North of Mitchell Avenue	8,100	122	34	6	0.4
Mitchell Avenue	East of the site	3,900	215	68	12	1.7
Mitchell Avenue	East of Northcote Street	9,900	446	34	6	0.3
Northcote Street	South of Mitchell Avenue	9,000	198	34	6	0.4

*Notes: * Existing daily vehicle numbers have been determined from the am and pm peak period heavy vehicle traffic proportions.*

Table 7.8 Summary of additional generated daily traffic movements during operations

Road	Intersection survey location	Existing average weekday traffic*	Existing average weekday heavy vehicles*	Additional future site daily traffic movements	Additional future site daily heavy vehicle movements	% Daily traffic increase
Mitchell Avenue	West of the site	2,300	147	122	32	5.3
Government Road	North of Mitchell Avenue	9,300	205	88	28	0.9
Government Road	North of Mitchell Avenue	8,100	122	34	4	0.4
Mitchell Avenue	East of the site	3,900	215	68	8	1.7
Mitchell Avenue	East of Northcote Street	9,900	446	34	4	0.3
Northcote Street	South of Mitchell Avenue	9,000	198	34	4	0.4

*Notes: * Existing daily vehicle numbers have been determined from the am and pm peak period heavy vehicle traffic proportions.*

On surrounding roads, project generated daily traffic movements during both the peak construction and operational periods would be proportionately greatest on the section of Mitchell Avenue west of the site, between Johnson Avenue and Government Road. Project generated daily traffic increases on this section of Mitchell Avenue would be between +5.7% and +5.3%.

On the other adjacent section of Mitchell Avenue, east of the site between Johnson Avenue and Northcote Street, project generated daily traffic increases would be significantly lower, at +1.7% during both the peak construction and operational periods. On other routes, such as Government Road and Northcote Street, project generated traffic increases would be generally around +1% or less and not generally noticeable.

The existing design standard and the width of these roads, which have one traffic lane generally in each direction (except for Mitchell Avenue east of Northcote Street) would continue to remain adequate for the predicted traffic usage and would not require any additional road widening or traffic controls.

SIDRA intersection analyses shows that there would be only minimal changes to the level of service (LoS) at the assessed intersections as a result of project generated traffic. The analyses found that the intersections would remain at their current LoS, which is either A of B. The future site access intersection would be combined as a four way intersection with Johnson Avenue, which is on the opposite side of Mitchell Avenue. The LoS of this intersection would change from A to B, primarily as a result of the change in the intersection configuration from a T-intersection to a four way intersection, as the proportional traffic increases at the intersection, with the site traffic, would be relatively minor.

Significant locality traffic reductions have occurred in recent years in this area of Kurri Kurri, with the opening of the Hunter Expressway bypass and the closure of the Hydro aluminium smelter. The major road network in the area now has a high degree of spare traffic capacity such that further analysis of 10 year future traffic growth projections for the area would be unlikely to show any significant changes in the project traffic impacts compared to the assessment under the current surveyed traffic volumes.

7.6 Noise and vibration

7.6.1 Methodology

A noise and vibration assessment was prepared by EMM (refer to Appendix H). The assessment was undertaken in accordance with the EPA's *Industrial Noise Policy* (INP)*, Interim Construction Noise Guideline* (ICNG) and *Road Noise Policy* (RNP).

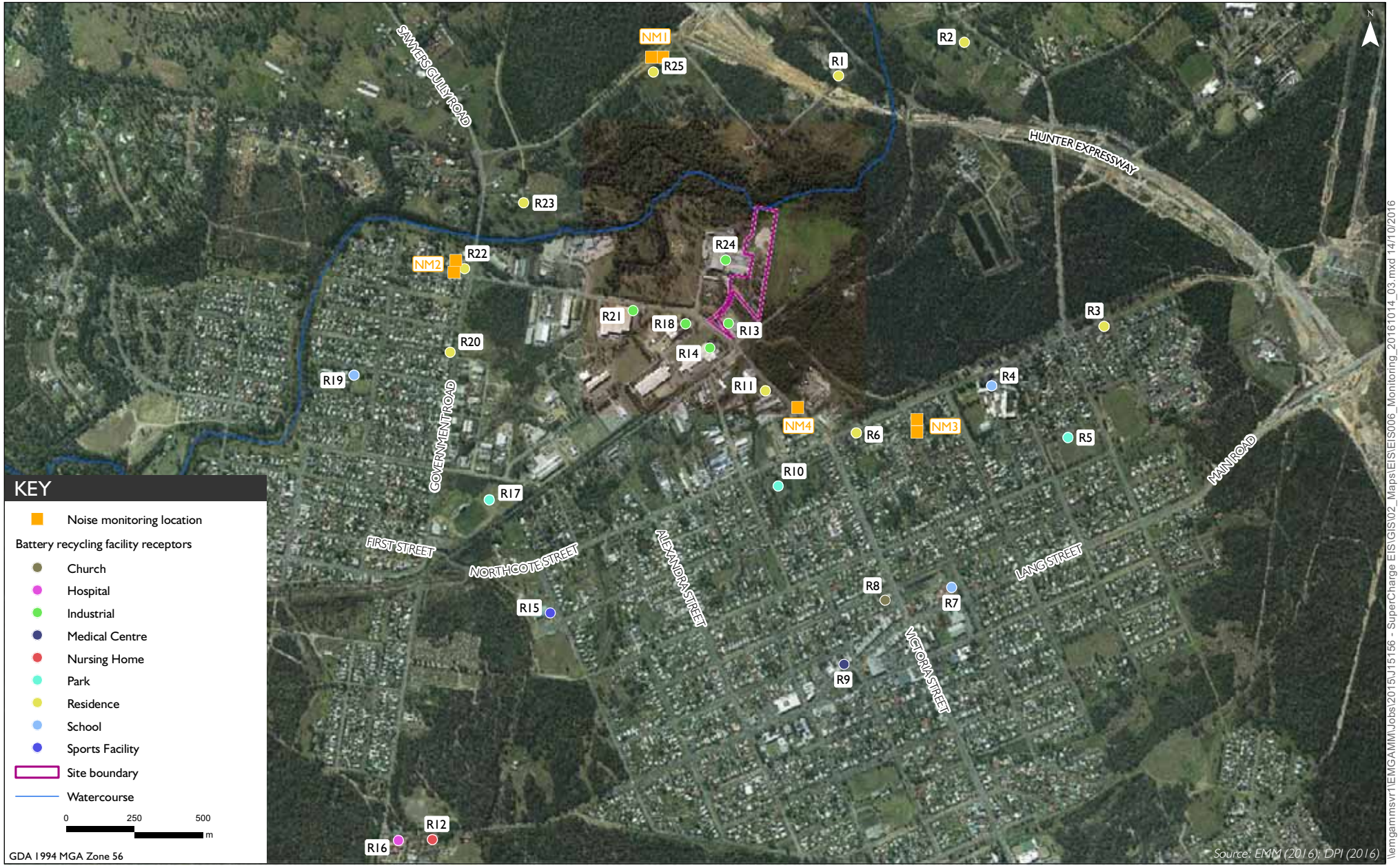
The noise and vibration assessment considered potential impacts to 25 representative assessment locations (refer Figure 7.2) during construction and operation of the project. Noise levels at assessment locations were modelled using Brüel and Kjær Predictor noise modelling software. The modelling conservatively assumed that all plant and equipment operate simultaneously to allow maximum noise levels to be predicted and, therefore, is considered to represent worst-case scenarios. Sound power levels for the plant to be used on the site were determined based on sound levels from similar equipment listed in EMM's noise emissions database.

The noise and vibration assessment also considered potential cumulative noise impacts from existing and proposed development in the vicinity of the site.

7.6.2 Noise impact assessment

i Operational noise

The INP guideline for assessing industrial facilities was used for the assessment of operational noise. Assessment criteria depend on the existing amenity of areas potentially affected by a proposed development. Long-term unattended ambient noise monitoring was undertaken at three locations in Kurri Kurri and Weston between 11 and 24 February 2016 to quantify the existing ambient acoustic environment, with on-site (or attended) observations made during deployment of the loggers. Background noise levels derived from the long-term noise monitoring results were used to determine the relevant noise criteria for the project or the project specific noise levels (PSNLs) as summarised in Table 7.9.



EMM

Assessment locations

Kurri Kurri Battery Recycling Facility
Environmental Impact Statement

Figure 7.2

Table 7.9 Project specific noise levels

Assessment location	PSNL, dB		
	Day	Evening	Night
R1	49	48	46 $L_{Aeq,15min}$/42 $L_{Aeq,period}$
R2	49	45	46 $L_{Aeq,15min}$ /42 $L_{Aeq,period}$
R3	46	44	40 $L_{Aeq,15min}$ /45 $L_{Aeq,period}$
R4	35	35	35
R5	55	55	55
R6	46	44	40 $L_{Aeq,15min}$ /45 $L_{Aeq,period}$
R7	35	35	35
R8	40	40	40
R9	65	65	65
R10	55	55	55
R11	46	44	40 $L_{Aeq,15min}$ /45 $L_{Aeq,period}$
R12	35	35	35
R13	70	70	70
R14	70	70	70
R15	55	55	55
R16	35	35	35
R17	55	55	55
R18	70	70	70
R19	35	35	35
R20	47	41	35 $L_{Aeq,15min}$ /44 $L_{Aeq,period}$
R21	70	70	70
R22	47	41	35 $L_{Aeq,15min}$ /44 $L_{Aeq,period}$
R23	47	41	35 $L_{Aeq,15min}$ /44 $L_{Aeq,period}$
R24	70	70	70
R25	49	45	46 $L_{Aeq,15min}$ /42 $L_{Aeq,period}$

Operational noise levels have been assessed for the daytime, evening and night time periods during calm and adverse weather conditions. Operational noise levels are predicted to meet the relevant PSNL at all assessment locations for calm and adverse weather conditions during the daytime, evening and night periods. Therefore, it is unlikely that project noise emissions would cause adverse impacts at the assessment locations.

An assessment of cumulative industrial noise from the project with other industrial noise sources in the vicinity was conducted. As described in Section 2.6, Weston Aluminium currently has an EIS on exhibition for the construction and operation of a thermal waste processing plant at the aluminium recycling plant. A preliminary noise assessment conducted as part of the preparation of this EIS indicates that the existing aluminium plant noise levels would increase by up to 1 decibel (dB) with the addition of the proposed thermal waste processing plant. Thus, the combined impact of these projects is predicted to have a negligible impact on the existing ambient amenity of the area. Cumulative noise impacts from the Hydro aluminium smelter proposal were predicted to be negligible.

ii Sleep disturbance

The project would operate during the night-time period from 10.00 pm to 7.00 am. Therefore, assessment of sleep disturbance is required in accordance with the INP. The INP application notes (last updated June 2013) recognise that the current sleep disturbance criteria is not ideal. The assessment of potential sleep disturbance is complex and poorly understood and the EPA believes that there is insufficient information to determine a suitable alternative criteria. In the interim, the INP guideline suggests that the $L_{A1,1min}$ (or L_{Amax}) level of 15 dB above background noise levels is a suitable screening criteria for sleep disturbance for the night-time period. Guidance regarding potential for sleep disturbance is also provided in the RNP which recommends internal noise levels, which equate to external noise levels in the order of 60–65 dB calculated at the facade of a residence.

Likely maximum noise events during the night period for the project are likely to be associated with the loading and unloading of trucks. Noise modelling predicts that the INP sleep disturbance screening criteria would be met at all assessment locations with the exception of one (R11). The highest predicted external maximum noise level at this assessment location would meet the RNP recommended internal noise levels. R11 is situated in an existing industrial area, with a number of surrounding industries operating throughout the night period. Further to this, existing noise levels during the night period are more than 10 dB above the predicted noise levels from the project which are attributable to local traffic.

Therefore, it is unlikely that night-time operations from the project would awaken people at any of the assessment locations. Nonetheless, work practices during the night period would be appropriately managed to minimise the impact and number of potential events.

iii Road traffic noise

The principle guidance for assessing the impact of road traffic noise is RNP. Road traffic noise assessment criteria for residential land uses are identified in the RNP according to the relevant road category. As the majority of vehicle movements generated by the project would be via Mitchell Avenue, the RNP assessment criteria for sub-arterial roads was used in the road traffic noise assessment. The RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2 dB. In addition to meeting the assessment criteria, any significant increase in total traffic noise at assessment locations must be considered against relevant RNP criteria.

The project would result in additional traffic movements; however, the increase would be minor in comparison to existing traffic volumes and the overall increase in road traffic noise level at residences would be negligible and are predicted to satisfy RNP criteria.

iv Construction noise

The ICNG provides guidelines for the assessment and management of noise from construction works provides noise management levels (NMLs) for residential receivers for both recommended standard construction hours and outside of these periods. The construction NMLs for the project detailed in Table 7.10 were developed using the noise monitoring data described above and in accordance with the ICNG.

Construction noise levels are predicted to be below the NMLs at all assessment locations considered. Given that the predictions assume equipment operating simultaneously; it is likely that actual construction noise levels would be less than those predicted.

Table 7.10 Construction noise management levels

Receiver	Period	Representative RBL, dB(A)	NML[1], $L_{Aeq,15min}$, dB
R1, R2, R25	Recommended standard hours	44	54
R3, R6, R11	Recommended standard hours	41	51
R20, R22, R23	Recommended standard hours	42	52
Offices, retail outlets	When in use	N/A	70
Neighbouring industrial premises	When in use	N/A	75
Classrooms	When in use	N/A	45 (Internal)/55 (External)
Hospital wards and operating theatres	When in use	N/A	45 (Internal)/55 (External)
Places of worship	When in use	N/A	45 (Internal)/55 (External)
Active recreation areas	When in use	N/A	65
Passive recreation areas	When in use	N/A	60

Notes: N/A = not applicable.

1. External noise levels.

7.6.3 Vibration assessment

To assess potential vibration impacts of the project consideration was given to the *Environmental Noise Management – Assessing Vibration: a technical guideline* (the ENM, DEC 2006), *Australian Standard AS 2187.2 – 2006 – Explosives - Storage and Use - Use of Explosives*, and British Standards relevant to Australian conditions. The ENM presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques.

The most significant source of vibration associated with the project would be the hammer mill. The hammer mill would be designed to reduce the amount of vibration transferred through the ground. This would be achieved by incorporating vibration absorbing rubber pads between the hammer mill supporting steel structure and the concrete foundation of the building. Heavy vehicle movements within the boundaries of the site may also generate vibration; however, this is considered to be of low risk and vibration impacts are considered unlikely.

The nearest building to the site is the Weston Aluminium industrial building positioned directly west on the property boundary. It is, therefore, envisaged that cosmetic damage to nearby structures (rather than human response) would be the most likely impact. To prevent cosmetic damage to this property, the recommended safe working distances for vibration intensive plant identified in Table 6.5 of Appendix H would be followed during the project. Additional construction vibration management measures would also be implemented as detailed in Chapter 8.

7.7 Air quality and greenhouse gas

7.7.1 Methodology

An air quality and GHG assessment was prepared for the project by Ramboll Environ (Appendix I). The assessment considered the potential air quality and greenhouse has impacts (including dust, odour and cumulative impacts) of the facility at various assessment locations. Impacts were determined based on consideration of:

- potential sensitive receivers (refer to Figure 7.2);
- prevailing meteorological conditions;
- existing sources of air emissions; potential air emissions during operations; and
- the proposed control measures.

The pollutants identified, quantified and assessed for the project included:

- particulate matter (PM) with an equivalent aerodynamic diameter of less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$);
- nuisance dust (or dust deposition);
- lead (Pb);
- nitrogen dioxide (NO_2);
- sulphur dioxide (SO_2);
- sulphur trioxide (SO_3);
- sulphuric acid (H_2SO_4);
- volatile organic compounds (VOCs), specifically benzene, toluene, xylene, ethylbenzene and formaldehyde;
- arsenic (As); and
- dioxins and furans.

Cumulative impacts were accounted for through the modelling of emissions from the neighbouring aluminium recycling plant, proposed developments (see Section 2.6), and existing ambient air quality based on monitoring data from the NSW OEH Beresfield air quality monitoring station. There are also a number of other National Pollutant Inventory (NPI) sources within 10 km of the site, including hard rock quarrying, open cut coal mining, animal by-product rendering, construction industry product manufacturing and chemical manufacturing facilities. Further, the surrounding local industrial zones contain smaller industrial emission sources; however, emissions from these facilities are not quantitatively assessed as part of the cumulative modelling scenario. These existing operations are assumed to be accounted for in the consideration of baseline or background air quality.

All potentially odorous processes would be connected to a dedicated scrubber system to prevent any kind of fugitive emission from internal reactors and tanks to ambient air (see Section 3.4.10). Therefore, odour emissions from the project to ambient air are considered unlikely and were not considered as part of the air quality assessment.

7.7.2 Air quality impacts

A comparison between the project's estimated in-stack concentrations and the concentration limits prescribed by the NSW Protection of the Environment Operations (Clean Air) Regulation 2010 is given in Table 7.11.

Table 7.11 Comparison with in-stack standards of concentration

Pollutant	Stack	Estimated in-stack concentration (mg/m^3)	Limit ($mg/m^{3)}$
PM	C-720	1	50
	C-720A	2.5	
	C-530	5	
	PK-520	-	
	U-421/PK-420	5	
Pb	C-720	0.2	1
	C-720A	0.5	
	C-530	0.5	
	PK-520	-	
	U-421/PK-420	-	
NO_X	C-720	80	300
	C-720A	200	
	C-530	-	
	PK-520	150	
	U-421/PK-420	-	
SO_3	C-720	0.7	100
	C-720A	2	
	C-530	-	
	PK-520	-	
	U-421/PK-420	-	
Dioxins and furans	C-720	0.04	0.1
	C-720A	0.1	
	C-530	-	
	PK-520	-	
	U-421/PK-420	-	

All emission sources are predicted to comply with the relevant limits.

In addition to process emissions, emissions associated with the transportation of raw material to the site and product material from the site were also quantified.

Assuming continual operations of all emission sources associated with the project (process emissions and vehicle movements), the annual air pollutant emission concentrations of PM_{10}, $PM_{2.5}$, NO_2, SO_2, individual air toxins and dust deposition were calculated using dispersion modelling. These concentrations were compared against applicable NSW EPA assessment criterion and National Environment Protection Measure (NEPM) reporting goals.

Incremental project-related concentrations and deposition rates occurring due to the project's operations were predicted to be below applicable impact assessment criteria and goals at all representative receptors. The project-related cumulative concentrations and deposition rates were also below applicable impact assessment criteria and goals at all representative receptors.

7.7.3 Greenhouse gasses

A GHG quantification assessment was undertaken for the project. The estimation of GHG emissions for the project is based on the *National Greenhouse Accounts Factors Workbook* (DoE 2014).

The annual Scope 1 emissions (direct emissions from fuel combustion by onsite plant and equipment), Scope 2 emissions (indirect emissions associated with the consumption of purchased electricity) and Scope 3 emissions (indirect emissions that occur from upstream and downstream activities) have been estimated in Table 7.12. These represent approximately 0.009% of total GHG emissions for NSW and 0.002% of total GHG emissions for Australia, based on the *National Greenhouse Gas Inventory* for 2014.

Table 7.12 Summary of estimated annual GHG emissions (tonnes CO_2-e/annum)

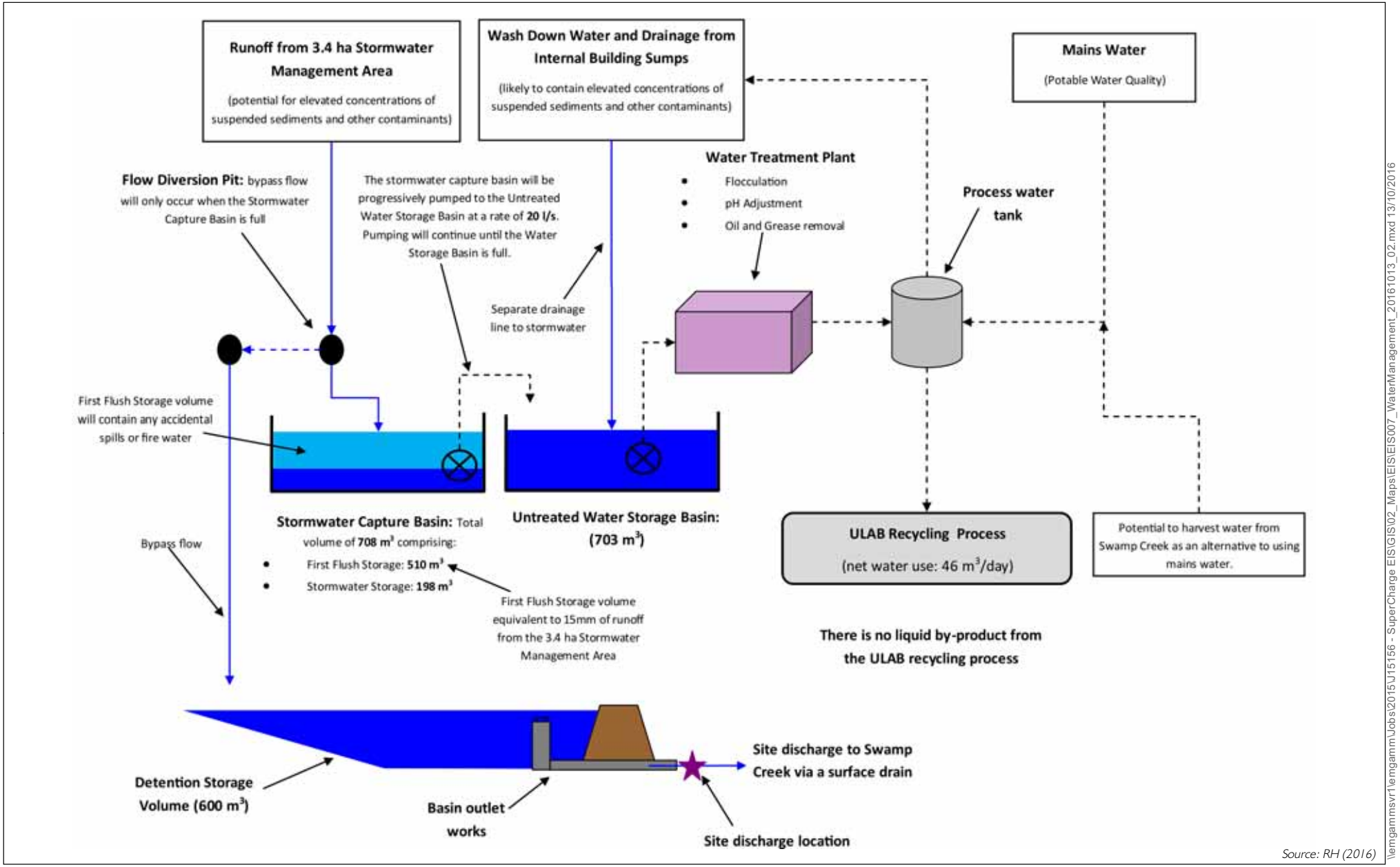
Scope 1 emissions			Scope 2 emissions	Scope 3 emissions				
Diesel (onsite)	Natural gas	Total	Electricity	Diesel (onsite)	Natural gas	Electricity	Diesel (transport)	Total
216	5,293	5,510	3,704	11	1,397	529	1,094	3,0391

7.8 Surface water

A surface water assessment was prepared for the project by Royal HaskoningDHV (Appendix J).

7.8.1 Water balance modelling

As part of the surface water assessment a site water balance model was developed. The water balance model reflects the surface water management strategy described in Section 3.4.10 and shown in Figure 7.3. The water balance model was developed using a Visual-Basics Programme, developed by Royal HaskoningDHV. The model applies a continuous simulation methodology that simulates the performance of the surface water management strategy under a range of climatic conditions. Results are presented for typical dry (10^{th} Percentile), average and wet (90^{th} Percentile) years.



Source: RH (2016)

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Water management strategy

Kurri Kurri Battery Recycling Facility
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Figure 7.3

A summary of the water balance model results is provided below.

- Stormwater harvesting would reduce runoff volumes by between 49% (wet year) and 81% (dry year). The calculated long term average reduction is 60% of runoff. The stormwater system is designed to capture initial runoff during a rainfall period, which is more likely to contain elevated concentrations of pollutants than runoff that occurs after substantial rainfall. As a result, the stormwater capture and harvesting system is expected to substantially reduce pollutant loads from the facility.

- Stormwater harvesting would supply between 67% (dry year) and 90% (wet year) of the process water demand. The calculated long term average is 73% of total demand. It is proposed to use mains water to meet any shortfall. Mains water use would range between 2,000 and 10,000 KL/year. There is potential to harvest water from Swamp Creek to further reduce the need to access mains water.

Water harvesting from the stormwater capture and untreated water storage basins is considered to be excluded works under Schedule 1, Item 3 of the NSW Water Management (General) Regulation 2011. Accordingly, the projected is expected to have no requirements for water licensing.

7.8.2 Water quality

Proposed water quality management measures have been established in accordance with current best practice guidelines. Therefore, these measures are expected to adequately mitigate any potential impacts from the project on runoff water quality. A surface water monitoring program that comprises quarterly monitoring of a full suite of analytes would be implemented during wet weather conditions under the project.

7.8.3 Flooding impacts

A flood risk management assessment was undertaken to identify the potential for the project to impact flooding on adjoining properties and the potential mobilisation of hazardous materials in flood waters.

Site hardstand and FFLs for the project of 15.6 m AHD would be substantially above the predicted peak 1% and 0.5% annual exceedance probability (AEP) levels. The probability of a flood exceeding the minimum FFL of 15.6 m AHD is estimated to be 1 in 20,000 in any given year. The Probable Maximum Flood (PMF) levels for the site (17.6 m AHD) are higher than the proposed FFLs and significantly higher than the 1% (11.5 m AHD) and 0.5% (12.6 m AHD) AEP levels. The PMF would inundate the majority of the site with over floor flooding of up to 2 m expected in the site building. It is noted that a PMF is estimated to have a 1 in 10,000,000 probability of occurring in any given year.

In the unlikely event that a 1 in 20,000 year or greater magnitude flood occurs, floodwater would be expected to inundate the floor levels of the onsite buildings. If this occurs, the stored ULAB and ULAB recycling by-products in buildings 5 and 8 would be exposed to floodwaters. An assessment was undertaken to establish environmental risks associated with the stored ULAB and ULAB recycling by-products being exposed to floodwaters. The outcomes of this assessment are summarised in Table 7.13 below.

Table 7.13 ULAB and by-product flood risk assessment

Product	Potential to become mobilised in floodwaters[1]	Consequence if mobilised in floodwaters	Risk to environment
ULAB	Stored batteries are not expected to be mobilised in floodwaters due to weight. Some leaching of acid may occur.	Negligible consequences of acid leaching due to dilution	Negligible
Polypropylene plastics	Plastic is buoyant and would be readily mobilised in floodwaters. However, the majority of the mobilised plastics would be expected to remain within the building.	Ground plastics are non-toxic but would be considered litter.	Risks are limited to litter being mobilised in floodwaters.
Sodium sulphate	Sodium sulphate is highly soluble and would be expected to dissolve in flood waters.	Negligible consequences as sodium sulphate is non-toxic and would be significantly diluted.	Negligible
Lead bullion	Lead bullion is not expected to be mobilised in flood waters due to weight.	Not applicable	Negligible

Notes: 1. It is noted that all materials would be stored in enclosed buildings and would therefore be shielded from excessive flow velocities.

Flood risk management measures to mitigate the risks identified would be implemented under the project as detailed in Chapter 8.

Flood impacts on adjoining properties as a result of the project were also assessed as part of the flood risk management assessment. Flood modelling indicates that the proposed fill extent would encroach onto the periphery of the current 1% and 0.5% AEP flood extents. Flood modelling indicated that:

- predicted flood impacts during a 1% AEP event are limited to a 13 mm increase in flood levels at the location of the aluminium recycling plant's water management dams, which are located immediately west of the site;
- predicted flood impacts during a 0.5% AEP event range between 11–17 mm in the floodplain area located to the west of the site. This minor increase in predicted flood levels extends approximately 300 m upstream of the site and only affects land used for industrial purposes; and
- predicted flood impacts during a PMF range from 13–17 mm in upstream areas, which is negligible considering the extent of inundation.

These minor changes to peak flood levels are not expected to result in a material increase in flood risk on adjoining properties.

7.9 Contamination and soils

A preliminary contamination assessment was undertaken by EMM (Appendix K). The aim of this contamination assessment was to identify any potential site contamination issues to satisfy the provisions of SEPP 55 and the CLM Act.

7.9.1 Methodology

i Desktop assessment

A desktop based appraisal of the site history was undertaken and all relevant, publicly available information about the site was reviewed and assessed. A search of the EPA's contaminated land public record of notice and list of sites notified to the EPA under Section 60 of the CLM Act did not return any information on reported contamination or any regulatory notices issued for the site.

The desktop assessment of contamination concluded that there are no known contamination issues on the site. There are potentially contaminating activities in the vicinity of the site, including activities associated with the aluminium recycling plant (ie filling of bonded ceramics used in brick refractories).

Potentially contaminating activities in the vicinity of the site could be mobilised via groundwater. However, the majority of the potentially contaminating activities are above ground in contained buildings. The exception is land immediately to the east of the site which was used by CCC to dispose of night soil. This activity ceased in 2001. Further, groundwater flow from this site is expected to be to the north towards Swamp Creek, and not towards the site.

ii Field contamination investigation

A field investigation comprising soil sampling supplemented the desktop assessment described above. Soil samples from the site were collected to assess the potential for contamination related to the historical use of the land. The field investigation was undertaken on 26 April 2016 by EMM.

There was no visible evidence of contamination on the site and no surface staining or petroleum sheens were observed.

The analyses of the soil samples collected from the site identified residual total phosphorous where old fill material had been removed from the site. This is assumed to be related to the phosphate bonded ceramics used in some brick refractories. Elevated total phosphorus concentrations were also identified at down gradient locations. However, the potential contamination risk is considered low and the site is not considered to be incompatible with an industrial land use. There were some localised detections of total petroleum hydrocarbon (TPH) and total recoverable hydrocarbon (TRH) compounds within shallow soil on the site. These results do not exceed the applicable guideline criteria and do not preclude the use of the site for industrial purposes.

There is a low risk that soil based fluoride can leach into groundwater. However, as the bulk of the source material has been removed from the site and the project would prevent ongoing leaching, this is considered to be a low risk that is not incompatible with an industrial land use. The environmental value of groundwater is considered to be low, and the potential groundwater contribution from the site to the down gradient Swamp Creek is minimal in the context of the entire catchment area for Swamp Creek.

There is limited evidence to suggest that surrounding land uses pose a contamination risk to the site. While there is the potential for groundwater to the east to be contaminated with nutrients, TPH/TRH and polycyclic aromatic hydrocarbons (PAH) (from historic land uses of the adjacent site), groundwater flow is considered unlikely to be towards the site. Similarly to the far west of the site, groundwater flow from a tip is expected to be towards the north.

7.9.2 Impact assessment

The preliminary contamination assessment did not identify significant contamination issues that would preclude the proposed future land use as an industrial facility.

The analytes detected in soil samples collected at the site are considered to represent a low risk to groundwater quality, and the construction of the project would further mitigate the potential for leaching of residual contaminants from soil in the former fill area, which is considered to be the most significant former contamination source.

The desktop and field based contamination investigations indicated a limited potential for the surrounding land uses to contribute to the contamination of the site. The surrounding potentially contaminating activities do not produce mobile sources of contamination, with the possible exception of groundwater from the adjacent eastern night soil and possibly the far western tip plots. However, as described above, groundwater is expected to flow to the north, towards Swamp Creek and not towards the site.

It is recommended that a construction environmental management plan (CEMP) is prepared for the development of the site, which should include an unexpected finds protocol to ensure that as yet undiscovered contamination, if encountered, can be appropriately managed. If evidence of contamination is encountered during the construction phase of works, advice should be sought from an appropriately qualified environmental consultant. In addition the construction phase of works should ensure no contamination is introduced to the site.

7.10 Aboriginal heritage

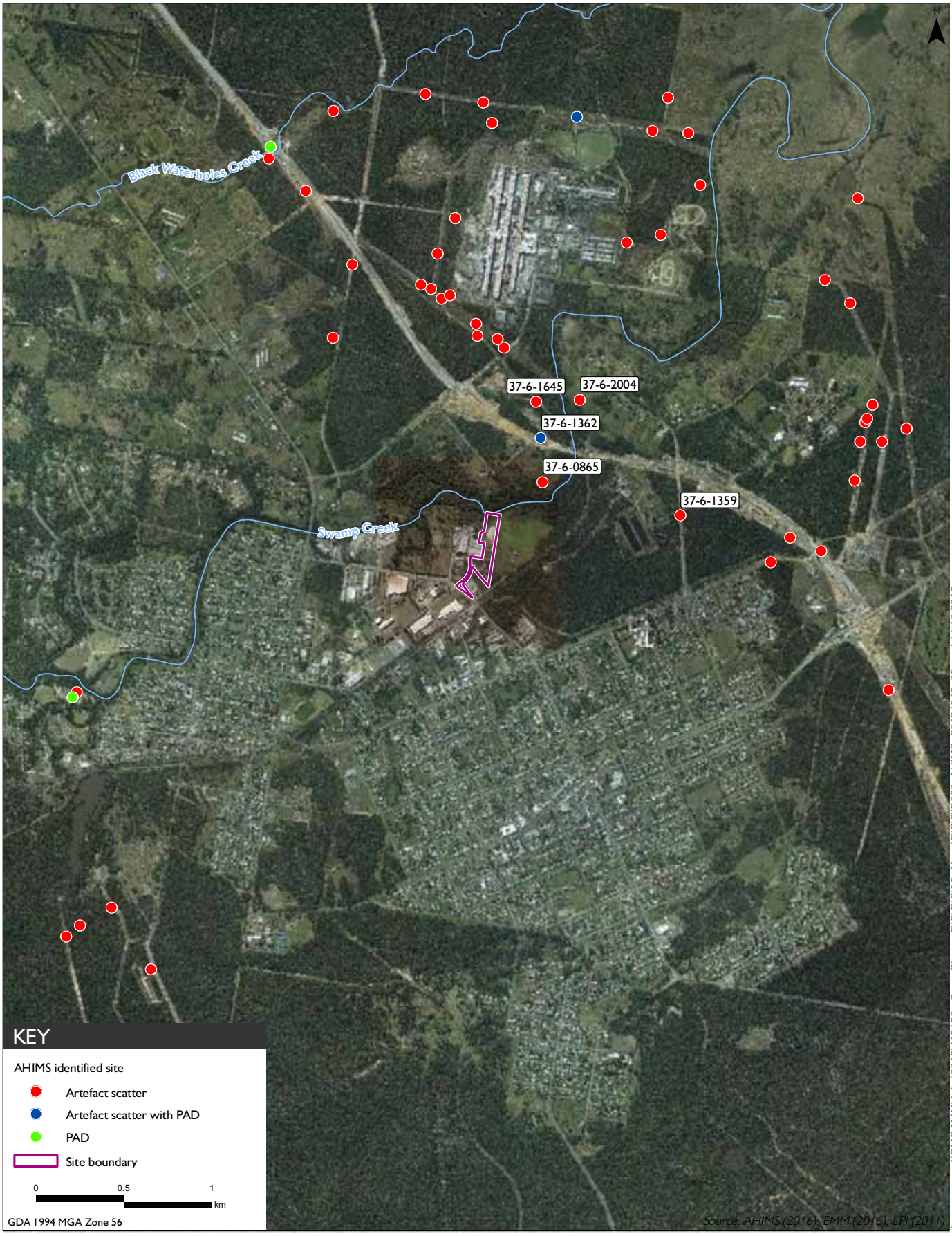
7.10.1 Methodology

An ACHA for the project was undertaken by EMM (Appendix L). The ACHA was completed in accordance with the SEARs and relevant guidelines. The ACHA assessed the Aboriginal cultural heritage values of the site through field survey, site meeting and consultation with the Aboriginal community.

A search of the AHIMS register for the site was completed on 29 January 2016. The search covered 5 km by 5 km centred on the site and identified 51 Aboriginal sites, none of which are located on the site (see Figure 7.4). The four closest AHIMS sites to the site (within 1 km) are situated to the north-east in close proximity to Swamp Creek. Three of the sites are isolated finds with the fourth an isolated find with an area of PAD. All four of the sites are situated between 75–175 m from Swamp Creek.

Previous Aboriginal heritage reports from the Kurri Kurri area were also requested from AHIMS. Stuart (1994) identified a single open artefact site during an archaeological survey of the site. The single artefact site consisted of two flakes located next to the eastern boundary fence of the site.

A pedestrian survey of the site under the guidelines stipulated within the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010a) was undertaken by EMM on Thursday 18 February 2016. A previously undiscovered isolated find was identified during the survey (a silcrete unidirectional core – SC01). The isolated find was identified in a disturbed context on a simple slope in the centre of the site. The single open artefact site identified by Stuart (1994) could not be relocated during the pedestrian survey.



AHIMS results

Kurri Kurri Battery Recycling Facility
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Figure 7.4

7.10.2 Impact assessment

The single Aboriginal artefact, SC01 (isolated find), identified within the site would be impacted by ground disturbance activities associated with the project. The isolated find would be subject to unmitigated impacts resulting in total loss. Impact minimisation to the isolated find is not a viable option as the artefact could not be relocated during an additional site visit on 19 May 2016. The level of recording undertaken of the isolated find during the initial due diligence survey obtained sufficient detail to categorise the artefact as a low significance item.

The site identified by Stuart (1994) located next to the eastern boundary fence of the site has been determined to have already been destroyed.

Unavoidable harm to Aboriginal objects is acknowledged as a result of the project. The project is a relatively small development with a discrete footprint that would impact on a landscape that has historically been subject to significant ground disturbances. The project would have a negligible impact on the Aboriginal archaeological record in the area. To date, no information has been received that identifies specific heritage values unrelated to the Aboriginal object in the project area

Procedures would be implemented should unexpected relics be uncovered during project construction as detailed in Appendix L and summarised in Chapter 8.

7.11 Historic heritage

7.11.1 Methodology

An assessment of the potential impact of the project on historic heritage was undertaken in accordance with the SEARs. The purpose of this assessment was to investigate the potential for items of heritage value to exist on the site; assess the significance of historic heritage items on site (if present); assess the potential impacts of the project on items of historic heritage on the site (if present); and formulate management measures for the protection of any identified historic heritage items on the site (if present). The assessment was conducted using the principles of *The Australian International Council on Monuments and Sites, Charter for Places of Cultural Significance* (also known as the *Burra Charter,* Australia ICOMOS 2013) and the NSW *Heritage Manual* (Heritage Office 2006).

Statutory and non-statutory registers were reviewed and primary and secondary research was undertaken for the assessment. Primary research included an investigation of archives that may hold original material, such as newspaper articles, photographs, land titles information, maps, plans, sketches, current aerial photography, and historic aerial photography. Secondary research was conducted using published material such as books, journals and interpretive material, as well as unpublished sources such as university theses.

A pedestrian survey of the site was undertaken on Thursday 18 February 2016 by EMM. The inspection was undertaken concurrently with a survey program for the ACHA produced for the project. The site showed significant levels of recent disturbance including heavy vehicle movement, dumping, filling, clearing and levelling. No evidence of potential historic heritage items was identified on the site. Archaeological potential on the site is considered nil to low.

The research and field study conducted as part of this assessment did not identify any evidence of previous structures or development on the site.

The former North Kurri Kurri Railway Station was located approximately 35 m to the south east of the site in the south eastern portion of the level crossing between Mitchell Avenue and the South Maitland Railway. No physical evidence of the station remains above ground however there is moderate potential for archaeological evidence of the station to remain subsurface.

No listed heritage items have been identified on the site. The closest listed heritage items to the site are listed in Table 7.14.

Table 7.14 Listed heritage items in the vicinity of the site

Item name	Item number	Significance	Distance from site
South Maitland Railway System	I212	Local	Edge of 50 m buffer around item ends approximately 5 m east of the south eastern corner of site
Trade Union Banners	I116	Local	970 m east of site
Sandstone kerbs, gutters, roads in Kurri Kurri	I114	Local	1.12 km south east of site
Kurri Kurri Courthouse & Police Station Group	I123	Local	1.14 km south east of site
Kurri Kurri Fire Station	I121	Local	1.15 km south east of site
Weston Public School	I189	Local	1.27 km west of site
Kurri Kurri General Cemetery	I186	Local	1.38 km south west of site
Aberdare Hotel	I181	Local	1.54 km south west of site

7.11.2 Impact assessment

No potential heritage items or areas of archaeological potential were identified or are anticipated to exist on the site. Similarly, the project would not impact any items of local or State significance.

The South Maitland Railway System is the closest listed heritage item to the site. The physical railway tracks are located at a distance of 25 m from the south-eastern corner of the site. The heritage buffer associated with this listing (I212) extends to within approximately 5 m of the site. The South Maitland Railway System (I212) as listed on the Cessnock LEP is assessed as being of local significance. According to the SHI listing (Database number 1340065), as of the 5 September 2016, the item has been recommended for nomination to the SHR.

The heritage cartilage of the South Maitland Railway System would not be physically impacted by the project. Potential visual impacts to the heritage item would be negligible as the project would be consistent with the existing industrial landscape.

An unexpected finds protocol would be followed if unexpected historical archaeology is discovered during construction of the project (refer to Chapter 8).

7.12 Fire and incident management

7.12.1 Fire management

The site is located in and adjacent to bushfire prone vegetation. Therefore, a BHA was prepared for the project (refer to Appendix M) to satisfy the relevant requirements of the *Planning for Bush Fire Protection Guideline* (RFS 2006). The BHA identifies the required asset protection zones (APZ) for the project; that is, the distance that buildings are set back from vegetation that represents a bushfire hazard. APZs would be provided and managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at project buildings. A small portion of the wastewater treatment plant falls within the APZ to the north of the site. This part of the building is not habitable and would contain water tanks and other water storage structures.

All APZs would be maintained in a manner that prevents accumulation of fine flammable debris on the ground so that fuel quantities are reduced, thus lessening flame heights and potential for crowning. Detailed discussion of how these APZs would be maintained is available in the BHA (Appendix M).

As detailed in Section 7.4.1, the PHA for the project identified fuel gas (natural gas) release and ignition as having the potential to cause fires and an automatic slam shutoff valve would be provided for the natural gas supply to ensure that leaks can be isolated.

The availability of water is critical during the event of a fire. Water for fire fighting provided on site was detailed in Section 3.4.6. Stormwater collected from the paved surfaces, roofs and yards would also be available for reuse internally for purposes, such as fire-fighting. The stormwater drainage system would be designed to capture any fire water that may be produced in the event of a major fire at the site.

If a fire occurs when the stormwater capture basin is full, additional emergency storage could be achieved by manually blocking the detention basin outlet control point with sandbags.

Water, gas and electricity services would be located and installed in a manner that reduces the potential for them to contribute to fire hazards. Suitable extinguishing material would also be made available to combat interior and exterior fires. This would include; water spray; alcohol-resistant foam; dry chemical; and carbon dioxide extinguishers.

7.12.2 Incident management

As part of the hazard identification process conducted during the PHA (refer to Appendix E), a review of past incidents at similar facilities was undertaken. No incidents were found that directly related to a battery recycling facility, except for one incident related to mechanical handling. Several incidents were found relating to hydrogen peroxide and the class 8 substances that would be stored at the facility. However, these involved bulk storage of chemicals and inadequate separation of incompatible substances. No significant incidents were found.

A detailed emergency response plan in accordance with DoP's *Hazardous Industry Planning Advisory Paper No 1 – Emergency Planning* (DoP 2011c) would be developed under the project.

Any accidental spills would trigger the response and management measures detailed in Chapter 8. The surface water management system has also been designed to capture and treat any accidental spills. Any spill that enters the stormwater system is likely to be contained onsite in the stormwater capture basin which would be dewatered via pumping to the untreated water holding basin.

The following emergency resources equipment would be available on site:

- fixed fire equipment (ie extinguishers, hose reels and hydrants);
- first aid cabinets;
- respiratory protection for lead, dust and acid mist;
- spill control equipment (ie spill kits (clearly signposted and labelled), absorbent materials, lime or soda ash for neutralising sulphuric acid spills, brooms, shovels, and appropriate waste disposal drums);
- rescue harness and ropes;
- emergency lighting;
- fire indicator panel;
- pumps for emptying sumps;
- visual detection alarms;
- safety shower and eyewash stations; and
- PPE (ie full face-piece respirators, acid resistant suits and impervious gloves and boots) would be made available to all employees dependent on the specific activity in which an employee is engaged in.

7.13 Visual

This section provides an assessment of the potential visual impact of the project. It assesses the potential visual impacts of the project on the amenity of the surrounding area as required by the SEARs.

The visual character of the land surrounding the site is predominantly industrial with industrial properties located directly to the west (the aluminium recycling plant) and south (AllightSykes Pty Ltd) of the site. Other dominant visual features surrounding the site include a waste water treatment facility 750 m to the east, and the Hydro Aluminium Kurri Kurri Smelter 1.5 km to the north. The Hunter Expressway, a dual carriageway freeway, is situated approximately 550 m to the north of the site and a private rail line exists 25 m to the east of the site. The broader landscape is dominated by low density industrial facilities interspersed between remnant native vegetation and cleared lands (refer to Figure 2.5 and Photograph 2.9 in Chapter 2).

Cleared land directly east of the site was previously used for the disposal of human sanitary waste (also known as night soil) by CCC. More recently, this area was used as a dog kennel; however, the land has been unused since 2012.

The elevation of the site is between 10 and 16 m AHD. The site slopes from south to north in a gentle downwards gradient towards Swamp Creek, which forms the site's northern boundary. Swamp Creek flows to the north-east, joining the Hunter River approximately 12 km from the site.

The closest residential areas of Kurri Kurri and Weston are located approximately 650 m to the south-east and 1 km to the west of the site, respectively. Werakata National Park is located approximately 4.5 km south-east of the site. A large wetland area also exists approximately 5 km downstream of the site, between Kurri Kurri and Maitland, and is associated with Swamp Creek.

7.13.1 Visual impact assessment

The project is unlikely to have significant visual impacts given that the surrounding landscape is dominated by low density industrial facilities interspersed between remnant native vegetation and cleared land.

The site entrance would be visible from the corner of Mitchell Avenue and Johnson Avenue (refer to Photograph 7.1). The landscaping and boundary fence (included in the site establishment works) would enhance the visual appearance of the site entrance from the public domain. As per Figure 3.1, all elements of the project would be set back from the southern site boundary. Consequently, views of all elements of the project from motorists on Mitchell Avenue would be totally or partially screened by existing vegetation, the industrial property located immediately south of the site and the proposed boundary fence. The site entrance on Mitchell Avenue would be landscaped and the area would be kept tidy to manage visual impacts.

Photograph 7.1 Location of the site entrance on Mitchell Avenue

The removal of trees on the site's southern and eastern boundaries may lead to partial views of the project from the industrial property located immediately south of the site, the unnamed road south of the southern site boundary and the cleared, vacant block located immediately east of the site. The unnamed road is predominantly used by customers and employees from AllightSykes Pty Ltd and visual impacts are considered to be low.

Partial views of the project may also be possible from the private rail line located to the east of the site. This rail line is owned and operated by a nearby coal mine. Given the infrequent use of the rail line and the partial screening of the site provided by the industrial property located to the south of the site and existing vegetation, the visual impact of the project on the rail operators is considered to be negligible.

Views to the site from industrial and residential receptors to the north would be screened by existing vegetation, topography and the Hunter Expressway.

The project would not be visible from the nearest residence located approximately 200 m from the southern site boundary on Mitchell Avenue (refer to Photograph 7.2).

Photograph 7.2 View towards the site from the nearest residence

7.14 Biodiversity

7.14.1 Methodology

A biodiversity assessment report (Appendix N) was prepared by EMM in accordance with the requirements of the Framework for Biodiversity Assessment: NSW Biodiversity Offsets Policy for Major Projects (FBA) (OEH 2014b). It also assesses matters of national environmental significance (MNES), specifically listed species and communities and migratory species listed under the EPBC Act.

A number of databases and vegetation mapping systems were reviewed to identify biodiversity values relevant to the project and to inform the scope of field surveys. Field surveys were completed in accordance with the methods described in the FBA (OEH 2014b). A preliminary site inspection was completed on 18 February 2016 by an EMM ecologist. The purpose of this investigation was to assess potential ecological constraints for the project. Subsequent surveys, including targeted species surveys, were conducted in May and August 2016. A detailed description of the survey methodology is outlined in Chapter 2 of Appendix N.

7.14.2 Impact assessment

A brief description of the existing biodiversity within the site boundary has been provided in Section 2.3.7. As discussed, two PCTs (PCT 1633 and PCT 1594) were recorded on site and the extent of these PCTs across the proposed disturbance area for the project is illustrated in Figure 7.5.

A total of 144 flora species were recorded on the site, of which 106 were native species and 38 were exotic weeds. Native fauna observed on the site included one frog and 11 bird species.

The following threatened species and TECs were recorded within the site boundary as shown on Figure 7.6:

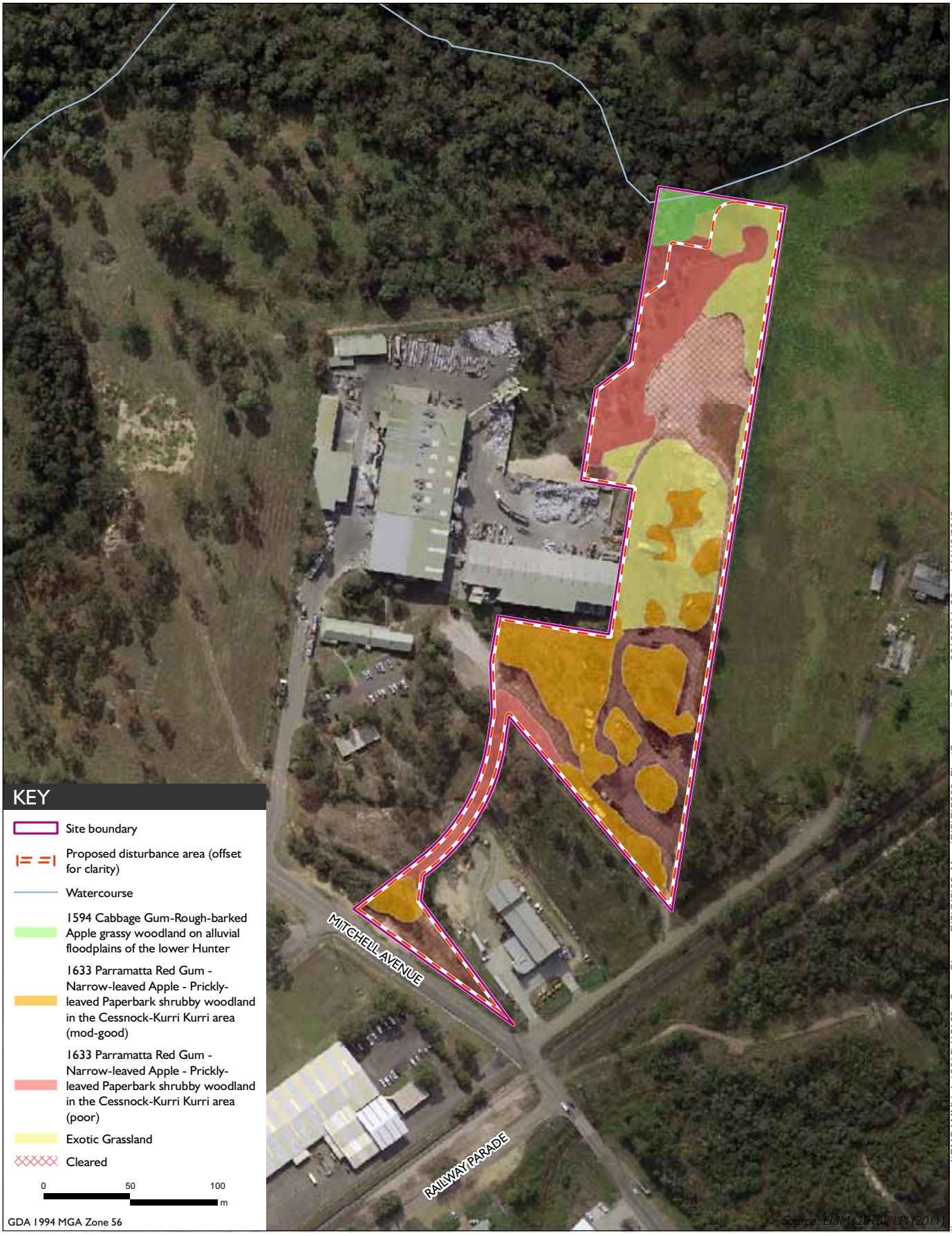
- two TECs listed under the TSC Act – Kurri Sand Swamp Woodland in the Sydney Basin Bioregion endangered ecological community (KSSW) and River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions Endangered Ecological Community (RFEF);
- an EPBC Act listed threatened species – Earps Gum; and
- a TSC Act listed threatened species – Grey-crowned Babbler.

Construction of the project has the potential to result in direct and indirect impacts on biodiversity, including the clearing of native vegetation and habitat, erosion and sedimentation and weed invasion if not managed appropriately. The proposed disturbance area occupies almost the entire site; therefore, the scope to avoid areas of biodiversity value, are limited. The exception to this is in the north of the site where the storm water basin has been moved from the north-western corner of the site to the eastern boundary. This avoids the requirement to clear any riparian forest (PCT: 1594 Cabbage Gum-Rough-barked Apple grassy woodland on alluvial floodplains of the lower Hunter) a TSC Act listed EEC.

A total of 1.47 ha of native vegetation would be cleared to facilitate the construction of the project. The project would directly impact the following vegetation communities and potential habitat for ecosystem and species credit species:

- approximately 0.87 ha of moderate to good condition Parramatta Red Gum - Narrow-leaved Apple - Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area (PCT 1633);
- approximately 0.61 ha of moderate to good condition Parramatta Red Gum - Narrow-leaved Apple - Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area (PCT 1633) in a derived grassland form; and
- approximately 1.56 ha of habitat for Earps Gum, which would include the removal of 37 individuals.

No other species credit species are anticipated to occur within the site boundary. Further targeted surveys will be conducted in November 2016 within the optimal survey season.



Plant community types

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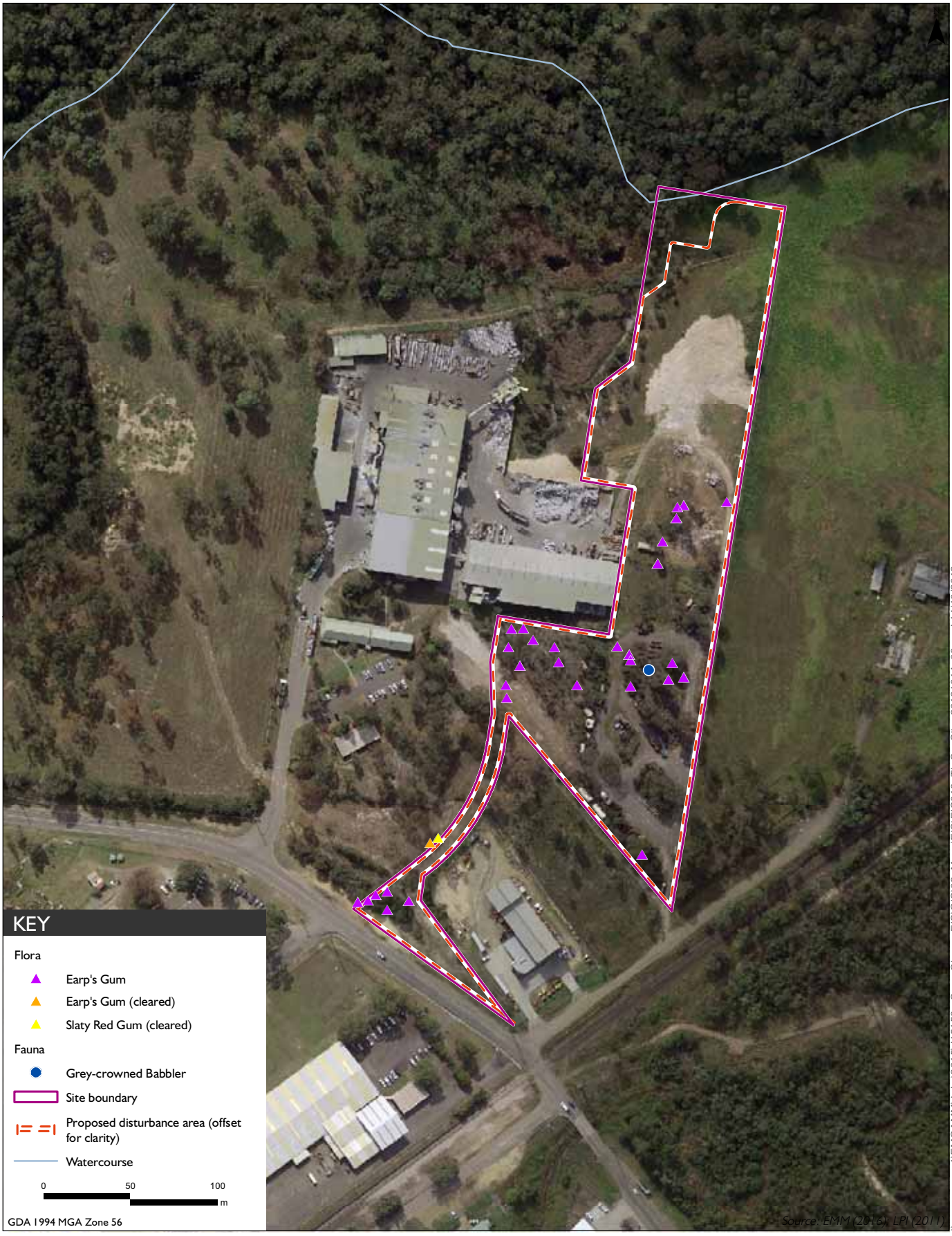
Figure 7.5



Threatened species within the site boundary

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Figure 7.6

Despite the level of disturbance on the site, the extant patches of native woodland and native grassland have a site score of greater than 17 under the FBA (OEH 2014b). Potential habitat for threatened species also exists within the woodland areas. For these reasons, offsetting is required in accordance with Section 3.3.1.3 of the FBA (OEH 2014b). A total of 58 ecosystem credits and 518 species credits (Earp's Gum) would be required to offset the project's impacts in accordance with the FBA. Investigations are underway to secure a suitable offset for the project.

In addition to the avoidance of the PCT: 1594, a number of mitigation measures have been proposed to minimise and/or mitigate potential biodiversity impacts from the project as detailed in Chapter 8. These include the development of a biodiversity offset strategy to identify offsets to compensate for the project's impacts.

The Atlas of Groundwater Dependent Ecosystems (BoM 2016b) does not identify any groundwater dependent ecosystems (GDEs) in the site boundary. The RFEF EEC, associated with Swamp Creek north of the site may be supplemented by ground water flow and may be considered partially ground water dependent. The project would result in an increase in the amount of impervious areas. Runoff would be retained in a storm water basin to reduce contamination, with any discharges limited to clean water. The minor hydrological changes implemented as part of the project are not likely to significantly affect any GDEs. Further, there are large vegetated, permeable areas in the vicinity of the site which would maintain groundwater recharge and groundwater would not be accessed for the project.

7.15 Socio-economic

The site is in an established industrial area and each of the assessments conducted as part of this EIS have indicated that the project can be operated with minimal environmental impacts. Similarly, assessments of potential hazards, risks and human health and local amenity impacts associated with the project have indicated that the project is unlikely to pose a risk to the health and wellbeing of surrounding communities.

The CCC *Economic Development Strategy* (CCC 2014) included a detailed assessment of the economic profile of the Cessnock LGA and the Hunter Region. As part of this assessment, the Cessnock LGA was identified as having the second highest unemployment rate within the region (CCC 2014). Further, the population within the area is expected to continue to grow, creating greater demand for additional employment opportunities. This has been identified as a significant challenge to address if the Cessnock LGA is to secure a sustainable social and economic future.

As part of the project, up to 70 construction workers are estimated to be required onsite during the peak construction period. In addition, the project would directly employ an operational workforce of 73, which would include 60 full-time operational staff and 13 contractors. Unemployment levels indicate that the labour force within the Cessnock LGA is not effectively utilised. Based on the rate of unemployment within the Cessnock LGA and the continued population growth forecast for the Cessnock LGA and the towns of Kurri Kurri and Weston, it is anticipated that there would be a large enough labour pool available to be taken up by the project. A key matter to be addressed in relation to the project's workforce is to ensure opportunities are created for local residents to gain employment.

The results of the 2011 Census indicate that there are 1,904 unoccupied private dwellings in the Cessnock LGA (ABS 2016a). While the condition of these dwellings is unknown, the results indicate that there would be more than enough housing stock within the area to meet any demand for housing generated by the project.

It is anticipated that the project would also assist in improving the social fabric of the Cessnock LGA and, more specifically, the towns of Kurri Kurri and Weston by contributing to the presence of more people in these areas during both the construction and operational phases of the project. This would provide more opportunities for participation in civic, social and sporting events, as well as, contributing to increased levels of activity around town with subsequent economic benefits generated through increased spending in local businesses.

The project would have an estimated capital investment value of $39.8 million. The project would stimulate positive economic feedbacks from construction capital expenditure and purchasing carried out during operations, as well as, a ripple down effect from expenditure in the local and wider community. The project has the potential to help strengthen the local region's economic base and businesses within the Cessnock LGA would likely benefit through direct expenditure and the extra money injected into the area through employment and services catering to the project.

As identified within the *Economic Development Strategy*, Cessnock LGA is ranked second lowest in NSW in terms of education and occupation, which is one of the four indices used to measure the relative socio-economic advantage and disadvantage of areas in Australia (CCC 2014). To address this disadvantage, CCC has noted that it is imperative that programs be put in place to encourage and facilitate the development and attraction of a greater diversity of employment opportunities within the Cessnock LGA (CCC 2014). In addition to the direct capital required for construction and the ongoing employment opportunities created during operations, one of the key economic benefits of the project is that it would increase the level of economic diversification within the Cessnock LGA.

There would be local and regional flow-on benefits from project-related capital investment during construction, ongoing employment and purchasing carried out during operations. During construction and operations there would be greater economic activity and employment opportunities than currently exist within the Cessnock LGA. The social benefits of stronger local and regional economies would include more diverse employment opportunities for local residents and the availability of enhanced community and business services.

8 Statement of commitments

The environmental management measures to be implemented under the project identified in the IES and technical studies are summarised in Table 8.1.

Table 8.1 Summary of management and mitigation measures

Key issue	Management and mitigation measures
Waste management	Management of construction wastes would be detailed in a Construction Management Plan. An operational waste management plan would be prepared and implemented during the project.
Human health	To reduce employee's lead dust exposure during the operation of the facility, a number of control measures would be implemented. These would include: • compliance with WHS Regulation 2011 requirements to control exposure; • implementation of specific engineering controls; • provision of PPE; • conducting health monitoring and blood level monitoring of all employees; and • provision of employee education and awareness campaigns.
Hazards and risk	An automatic slam shutoff valve should be provided for the natural gas supply to ensure that leaks can be isolated. The following safety systems (maintained by the transport contractors) would be provided for the proposed transport operations, in compliance with the ADG Code and relevant Australian standards: • induction training for drivers including training in emergency response, fire fighting, first aid and handling procedures for materials; • appropriate dangerous goods licenses for transport of hazardous materials; • mobile phones and/or radios for communication to emergency services and to the transport company base; • fire extinguishers on trucks, where applicable; • covering slag during transport; • an ERP provided to drivers including emergency services contact numbers and safety data sheets; • regular maintenance and inspection of trucks for roadworthiness and containment integrity; • contract requirements for loading and handling procedures; and • DG driver licensing requirements.
Traffic and transport	A construction stage traffic management plan would be required for the management of the project site access (including any travel requirements for oversize vehicles) during the construction stage. This plan would be prepared prior to construction commencing. Additional site traffic management measures (including a code of conduct for the site truck drivers) would be considered to help specify preferred transport routes which would minimise the potential future traffic safety, noise and residential amenity impacts of the site truck traffic in the vicinity of other nearby urban areas of Kurri Kurri.

Table 8.1 Summary of management and mitigation measures

Key issue	Management and mitigation measures
Noise and vibration	Management measures that would be implemented during construction and operation to minimise noise impacts would include: • properly maintaining plant to ensure rated noise emission levels are not exceeded; and • undertaking construction activities guided by AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites; Universal work practices to minimise noise and vibration emissions include: • regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration; • regular identification of noisy activities and adoption of improvement techniques; • avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon residents; • minimising the use of equipment that generates impulsive noise; • minimising the movement of materials and plant and unnecessary impacts; • minimising truck movements; and • scheduling respite periods for intensive works. Measures to minimise noise emissions from plant and equipment include: • choosing quieter plant and equipment, including installing best-practice noise suppression equipment, based on the optimal power and size to most efficiently perform the required tasks; • using temporary noise barriers (in the form of plywood hoarding or similar) to shield intensive construction noise activities from residences if required; • operating plant and equipment in the quietest and most efficient manner; and • regularly inspecting and maintaining plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively; • low-frequency reversing alarms (“growlers”) would be used rather than the standard high frequency beepers; • plant and equipment would be switched off when not in use; • any vehicle queuing would be on site rather than on public roads; and • material drop heights and materials dragging along the ground would be minimised. Work scheduling to minimise the impact of noise include: • scheduling construction activities such that the concurrent operation of plant is limited; • scheduling activities to minimise impacts by undertaking all possible work during hours that would least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events; • scheduling work to coincide with non-sensitive periods; • scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive; • planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers; • optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours; • designating, designing and maintaining access routes to the site to minimise impacts; and • conducting high vibration generating activities in continuous blocks, with appropriate respite periods as determined through consultation with potentially affected neighbours.
Contamination and soils	It is recommended that a Construction Environmental Management Plan is prepared for the development of the site, which should include an unexpected finds protocol to ensure that as yet undiscovered contamination, if encountered, can be appropriately managed. If evidence of contamination is encountered during the construction phase of works, advice should be sought from an appropriately qualified environmental consultant. In addition the construction phase of works should ensure no contamination is introduced to the site.

Table 8.1 Summary of management and mitigation measures

Key issue	Management and mitigation measures
Surface water	A surface water monitoring program will be implemented that comprises quarterly monitoring of a full suite of analytes during wet weather conditions. Water quality monitoring data will be reviewed annually as part of the Annual Environmental Monitoring Report. A flood evacuation procedure will be established as part of the site's Emergency Management Plan. The following management measures have been proposed to mitigate potential flood impacts associated with increases to peak flows and filling, respectively: • detention storage will be provided to reduce developed conditions peak flows to existing rates for the 100 year ARI and lower magnitude rainfall events; • the detention basin and embankment will be established in cut to avoid any localised increases in surface levels; and • any fences established to the north of the retaining wall will be low profile to minimise any impacts to flow conveyance. The following flood risk management measures will be implemented: • all hazardous materials are to be stored and processed in fully enclosed and bunded buildings that have a minimum FFL of 15.6 m AHD. This provides 4.1 m freeboard to the peak 1% AEP and 3.1 m freeboard to the peak 0.5% AEP levels; and • site staff will be able to take refuge in building 3 if required.
Aboriginal heritage	If unexpected Aboriginal objects or sites are uncovered during the course of development, work will cease and a qualified archaeologist will be contacted to conduct a preliminary assessment. If the find is confirmed to be a relic, the Heritage Council must be notified. In the event that known or suspected human skeletal remains are encountered during the activity, the procedures detailed in Appendix L will be followed.
Historic heritage	If unexpected historical archaeology is discovered during construction, work in the immediate area must cease and an archaeologist would be contacted to make an assessment of the find. If it is determined to be a relic under the Heritage Act, further investigation may be required.
Fire and incident management	The following spill response and management measures would be implemented: • spilled materials would not be touched and walking through spilled material would be prohibited; • the extent of each spill would be assessed. If significant and hazardous, the alarm would be activated, emergency services would be contacted and personnel would be evacuated to the designated Emergency Assembly Point; • appropriate PPE would be selected and implemented dependent on the type of spilt material; • first aid would be delivered (if necessary); • all ignition sources within the immediate area would be eliminated; • all combustible materials would be kept away from spilled materials; • entry of spilled materials into waterways, sewers and confined areas would be prevented; • small spills would be contained using spill kits, absorbent pads, sand or other non-combustible absorbent material and placed into appropriate containers for disposal; • for large spills, temporary bunding would be installed ahead of the liquid spill for later disposal; • sulphuric acid spills would be neutralised with lime or soda ash; • dry lead spills would be vacuumed using a high efficiency particulate arrester vacuum; • once the bulk of the spilled material has been removed, spill areas would be appropriately cleaned; and • waste materials would be disposed of in accordance with EPA requirements.
Visual	The site entrance on Mitchell Avenue is to be landscaped and kept tidy.

Table 8.1 Summary of management and mitigation measures

Key issue	Management and mitigation measures
Biodiversity	Management and mitigation measures that would be implemented during construction and operations to minimise biodiversity impacts would include: • clearing limits would be clearly delineated in the field, which would be especially pertinent to the northern area of the site where, as described above, all direct impacts on RFEF EEC would be avoided; • the final design would be reviewed to determine if any Earps Gum can be retained. If any Earps Gum can be retained, an ecologist would mark them in the field and they would be fenced for the duration of the construction period; • a clearing procedure will be prepared which details the methods to be implemented during clearing. This procedure will include detailed instruction on the two-stage clearing protocol for felling of hollow-bearing trees in the site boundary, as well as, a requirement for a suitably trained fauna handler to be present during hollow-bearing tree clearing to rescue and relocate any displaced fauna. The clearing procedure should also mandate the completion of preclearance surveys to determine whether nesting birds are present; and • appropriate sediment and erosion controls will be implemented to ensure that there are no off-site impacts resulting from the project, particularly to Swamp Creek. A biodiversity offset strategy will be prepared to identify offsets to compensate for the project's impacts. The biodiversity offset strategy will be finalised in consultation with OEH, DP&E and DPI – Lands within 12 months of obtaining project approval.
Socio-economic	Wherever possible, a preference for local employment would be made. Further, local contractors should be encouraged to tender for work, both during the construction and operations phase.

9 Conclusion and justification

9.1 Introduction

The project requires justification, taking into account consideration its consistency with the EP&A Act. Each aspect is addressed below.

9.2 Need for the project

The need for the project is provided in Chapter 3. In short, it is estimated that 135,000 ULABs from cars are sent to landfill each year in Australia, and a further 111,000 are stockpiled in places like household garages (Planet Ark 2011). The constituents of ULABs are highly recyclable materials with up to 98% of the materials able to be recovered (ABRI n.d.).

By recycling ULABs, two significant stages of the waste process can be avoided, namely the extraction of raw materials and the disposal of waste to landfill. This results in significant environmental benefits through the consequent reduction in demand for finite resources and the removal of heavy metals and other toxic materials from the waste stream.

The NSW Government has committed close to $500 million to transform waste and recycling in NSW. The *Waste Less, Recycle More: A Five-year $465.7 million Waste and Resource Recovery Initiative* (EPA 2013) and the *NSW Waste Avoidance and Resource Recovery Strategy: 2014-21* (EPA 2014a) emphasise the importance of removing problem wastes to reduce the possibility of contaminating existing recycling streams and to create opportunities to improve the recycling of other materials.

The project would provide a suitable ULAB recycling facility capable of servicing not only NSW but Australia wide which would have the benefit of reducing waste to landfill in accordance with the *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* (EPA 2014a). The project would also have the environmental benefit of conserving natural resources used in the manufacture of new batteries.

The project would incorporate the latest environment and operational controls with negligible land use conflicts.

9.3 Objects of the EP&A Act

Section 5 of the EP&A Act sets out its objects. It states:

> The objects of this Act are:
>
> (a) to encourage:
>
> (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
>
> (ii) the promotion and co-ordination of the orderly and economic use and development of land,
>
> (iii) the protection, provision and co-ordination of communication and utility services,

(iv) the provision of land for public purposes,

(v) the provision and co-ordination of community services and facilities, and

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and

(vii) ecologically sustainable development, and

(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

The project's consistency with the objects of the EP&A Act is considered below. However, the overall conclusion is that the project is consistent with the objects of the EP&A Act either wholly or in the majority.

9.3.1 Proper management, development and conservation of resources

The object is to encourage 'the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment'.

The project would be constructed and operated on vacant and heavily disturbed industrially zoned land with sufficient separation distances to residential, educational, recreation and medical land uses. It is also located close to the Hunter Expressway which provides direct linkages to the New England Highway and M1 Pacific Motorway.

The project would provide for the recycling and reuse of materials in new batteries thereby conserving natural resources.

The project would provide social and economic benefits to the communities of Kurri Kurri and Weston. It would contribute to the presence of more people in these areas during both the construction and operational phases of the project which would provide more opportunities for participation in civic, social and sporting events.

Economically, the project would stimulate positive economic feedback from construction capital expenditure and purchasing carried out during operations, as well as a ripple down effect from expenditure in the local and wider community. There would be local and regional flow-on benefits from project-related capital investment during construction, ongoing employment and purchasing carried out during operations. During construction and operations there would be greater economic activity and employment opportunities than currently exist within the Cessnock LGA. The social benefits of stronger local and regional economies would include more diverse employment opportunities for local residents and the availability of enhanced community and business services.

For the reasons given above, the project would improve 'social and economic welfare' and 'achieve a better environment'.

9.3.2 Orderly development

The object is to encourage ‘the promotion and co-ordination of the orderly and economic use and development of land’.

The project provides for the orderly and economic development of vacant industrially zoned land. The project's planning and design has taken into account all potential impacts and incorporates measures to avoid and minimise these impacts. Residual impacts to heavily disturbed vegetation on the site would be compensated through offsetting arrangements. Thus, the development would be an orderly development.

The project would provide economic benefits to the local area, both directly and indirectly through both the construction and operational phases. It would, thus, be 'economic use and development of land'.

9.3.3 Communication and utility services

The object is to encourage 'the protection, provision and co-ordination of communication and utility services’.

The project would have no impact on 'communication and utility services'.

9.3.4 Land for public purposes

The object is to encourage ‘the provision of land for public purposes’.

The site is privately owned industrial land. The project would have no direct or indirect impact on 'the provision of land for public services'.

9.3.5 Community services and facilities

The object is to encourage ‘the provision and co-ordination of community services and facilities’.

As part of the project, up to 70 construction workers are estimated to be required onsite during the peak construction period. In addition, the project would directly employ an operational workforce of 73, which would include 60 full-time operational staff and 13 contractors.

Employment statistics indicate that the local labour force is not effectively utilised. Based on the rate of unemployment and continued population growth forecast for the local area, it is anticipated that there would be a large enough labour pool available to be taken up by the project. A key matter to be addressed in relation to the project’s workforce is to ensure opportunities are created for local residents to gain employment.

For the above reasons, the project is not anticipated to have any impacts on 'community services and facilities'.

9.3.6 Protection of the environment

The object is to encourage 'the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats'.

The project would minimise negative environmental impacts through the implementation of mitigation measures identified in this EIS, and would operate in a manner that reasonably and feasibly avoids or minimises impacts to the environment.

A total of 1.47 ha of native vegetation would be cleared to facilitate the construction of the project. While the site is heavily disturbed, some of this native woodland is in reasonable condition. To compensate for the loss of this native vegetation, offsets would be provided in accordance with the FBA.

9.3.7 Ecologically sustainable development

The object is to encourage 'ecologically sustainable development' (ESD). The principles of ESD, for the purposes of the EP&A Act, are provided in clause 7(4) of Schedule 2 of the EP&A Regulation. It states:

> The principles of ecologically sustainable development are as follows:
>
> (a) the precautionary principle, namely, 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. In the application of the precautionary principle, public and private decisions should be guided by:
>
> (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
>
> (ii) an assessment of the risk-weighted consequences of various options,
>
> (b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
>
> (c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,
>
> (d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:
>
> (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
>
> (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
>
> (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The four principles of ESD and the proposed modification's compatibility with each are considered below.

In addition, the Commonwealth's *National Strategy for Ecologically Sustainable Development* defines ESD as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

Conservation of ecological resources would be achieved through avoiding valuable areas, while rehabilitation and establishing offsets would enhance biodiversity.

i Precautionary principle

This means that if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. This EIS, prepared by experts in their respective fields, has identified and assessed the potential environmental impacts, and appropriate mitigation, management and monitoring measures have been developed in response. Taking these measures into account, it is considered that there would be no threat of serious or irreversible damage to the environment as a result of the project.

ii Inter-generational equity

Inter-generational equity is a part of social equity, as is intra-generational equity.

Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations, while intra-generational equity is applied within the same generation.

The project would contribute to social equity by providing employment in the local area both directly and indirectly. It would facilitate the production of materials for the manufacture of new LABs, soaps and detergents, textiles, glass and paper, thus developing physical and human capital through investment in infrastructure. This transformation to human capital would contribute to both inter-generational and intra-generational equity.

The project has been designed to ensure compliance with the relevant guidelines and assessment criteria for relevant environmental matters. This would ensure that the health, diversity and productivity of the environment would be maintained for future generations.

iii Conservation of biological diversity and maintenance of ecological integrity

The project would provide biodiversity offsets to compensate for the disturbance of native vegetation.

iv Improved valuation and pricing of environmental resources

One of the common broad underlying goals or concepts of ESD is economic efficiency, including improved valuation and pricing of environmental resources.

The project includes a range of controls and environmental management and mitigation measures to minimise potential impacts on the environment, and the cost of these measures would be met by Pymore.

Having considered all aspects of ESD, the conclusion is that the project is consistent with the object and with its specific components.

9.3.8 Affordable housing

The object is to encourage 'the provision and maintenance of affordable housing'. This object is not relevant to the project.

9.3.9 Sharing of responsibility

The object is 'to promote the sharing of the responsibility for environmental planning between the different levels of government in the State'. All State government agencies that have an interest in the proposed modification, and the local council (CCC) have been engaged prior to, and during the preparation of this EIS.

9.3.10 Increased public involvement

The object is 'to provide increased opportunity for public involvement and participation in environmental planning and assessment'. The preparation of this EIS has been undertaken in conjunction with consultation undertaken by Pymore with the local community. Pymore will continue to consult with the local community during and after the approval process. In addition, all stakeholders, both government and community, will have the opportunity to comment on the project, including this EIS, when it is placed on public exhibition by DP&E.

9.4 Conclusions

The project would provide an opportunity for the recycling of ULABs within the Hunter region and wider NSW. The facility would convert ULABs into materials which can be recycled for use in new batteries. Lead bullion from lead paste, grids and poles and polypropylene plastics from the ULAB cases would be used in the manufacture of new batteries. Dry sodium sulphate crystals, which are a by-product of the ULAB recycling process, would be readily used in other industries. The facility would utilise Engitec technology, which is operational in over 60 facilities globally and is recognised as the best available technology by a number of the world's regulatory bodies.

The project has many benefits from an economic, social and environmental perspective. Specifically, the project would:

- divert hazardous, recyclable and reusable wastes from landfill;
- preserve space in existing landfills for less recyclable materials, thereby extending the life of landfills;
- provide an alternative to the transport of ULABs to overseas recycling facilities, thereby eliminating the environmental and safety concerns associated with the international movement of a recognised hazardous waste item;
- produce recycled materials that can be used in the manufacture of new batteries and other industries;
- reduce demand for virgin materials and the environmental impacts associated with the mining and manufacturing of these materials;
- reduce the level of contamination in existing recycling programs for organic materials;

- provide a commercial return, with an expected revenue of over $50 million, thereby contributing to the economy of NSW;
- provide direct employment for 60 people within the facility; and
- provide indirect benefits to the community generated by job creation.

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Abbreviations

ABS	Australian Bureau of Statistics
ABRI	Australian Battery Recycling Initiative
ACHA	Aboriginal Cultural Heritage Assessment
ADG	Australian Dangerous Goods
AEP	annual exceedance probability
Ag	silver
AgS	aluminium sulphide
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management Systems
Al	aluminium
Al_2O_3	aluminium oxide
APZ	asset protection zone
ARI	average recurrence interval
As	arsenic
As_2S_3	arsenic trisulphide
Australia ICOMOS	Australia International Council on Monuments and Sites
B	boron
B_2O_3	boron trioxide
Ba	barium
$BaSO_4$	barium sulphate
Basel Convention	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
BHA	bushfire hazard assessment
BoM	Bureau of Meteorology
bw	by weight
Ca	calcium
$CaSO_4$	calcium sulphate

Abbreviations

CCC	Cessnock City Council
Cd	cadmium
CEMP	construction environmental management plan
Cessnock LEP	Cessnock Local Environmental Plan 2011
CLM Act	NSW *Contaminated Land Management Act 1997*
Cr	chromium
Cr_2O_3	chromium oxide
DA	development application
dB	decibel
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DoE	Department of the Environment
DoEE	Department of the Environment and Energy
DoI – Lands	Department of Industry – Lands
DoI – DRE	Department of Industry – Resources and Energy
DoP	Department of Planning
DP	deposited plan
DP&E	Department of Planning and Environment
DPI Water	Department of Primary Industries – Office of Water
DW&E	Department of Water and Energy
EEC	endangered ecological community
EFW Plant	energy from waste plant
EIS	environmental impact statement
EMP	environmental management plan
Engitec	Engitec Technologies S.p.A
EP&A Act 1979	NSW *Environmental Planning and Assessment Act 1979*

Abbreviations

EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Authority
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPI	environmental planning instrument
EPL	environment protection licence
ESD	ecologically sustainable development
EU	European Union
Fe	iron
FeS	iron sulphide
FFLs	finished floor levels
GDE	groundwater dependent ecosystem
GHG	greenhouse gas
H_2SO_4	sulphuric acid
Heritage Act	NSW *Heritage Act 1977*
Hg	mercury
HgS	mercury sulphide
IBRA	Interim Biogeographic Regionalisation for Australia
ICNG	Interim Construction Noise Guideline
INP	Industrial Noise Policy
km	kilometres
KSSW	Kurri Sand Swamp Woodland
LEP	local environmental plan
LGA	local government area
LME	London Metal Exchange
LoS	level of service
LPI	Land and Property Information

Abbreviations

m	metres
m^2	square metres
m^3	cubic metres
mg	milligram
Mg	magnesium
MgO	magnesium oxide
mm	millimetres
MNES	matters of national environmental significance
Na_2O	sodium oxide
Na_2CO_3	sodium carbonate
Na_2SO_4	sodium sulphate
NEPM	National Environment Protection Measure
Ni	nickel
NML	noise management level
NO_2	nitrogen dioxide
NPI	National Pollutant Inventory
NPW Act	NSW *National Parks and Wildlife Act 1974*
NSW	New South Wales
NV Act	NSW *Native Vegetation Act 2003*
OEH	Office of Environment and Heritage
PAC	Planning Assessment Commission
PAD	potential archaeological deposit
PAH	polycyclic aromatic hydrocarbons
Pb	lead
PbS	lead sulphide
PCT	plant community type
PE	polyethylene

Abbreviations

PHA	preliminary hazard analysis
PM	particulate matter
PMF	probable maximum flood
POEO Act	NSW *Protection of the Environment Operations Act 1997*
PP	polypropylene
PPE	personal protective equipment
PSNL	project specific noise level
Pymore	Pymore Recyclers International Pty Ltd
QA	quality assurance
Ramboll Environ	Ramboll Environ Australia Pty Limited
RAP	registered Aboriginal party
REP	regional environmental plan
RF Act	NSW *Rural Fires Act 1997*
RFEF	River-Flat Eucalypt Forest
RFS	Rural Fire Service
RNP	Road Noise Policy
Roads Act	NSW *Roads Act 1993*
RTS	response to submissions
S	sulphur
SCC	Specific Contaminant Concentration
SDS	safety data sheets
Se	selenium
SEARs	Secretary's environmental assessment requirements
SEPP	State environmental planning policy
SEPP 33	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
SEPP 44	State Environmental Planning Policy No. 44 – Koala Habitat Protection

Abbreviations

SEPP 55	State Environmental Planning Policy No 55 – Remediation of Land
SHI	State Heritage Inventory
SHR	State Heritage Register
SiO_2	silicon dioxide
SO_2	sulphur dioxide
SO_3	sulphur trioxide
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State significant development
TCLP	toxicity characteristics leaching procedure
TEC	threatened ecological community
tpa	tonnes per annum
tpd	tonnes per day
TPH	total petroleum hydrocarbons
TRH	total recoverable hydrocarbons
TSC Act	NSW *Threatened Species Conservation Act 1995*
ULABs	used lead-acid batteries
US EPA	United States Environmental Protection Agency
VOC	volatile organic compound
VPA	voluntary planning agreement
WHS Regulation	NSW Work Health and Safety Regulation 2011

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