Calala Battery Energy Storage System

Equis Energy (Australia) Projects (NGUMI4) Pty Ltd as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust

Waste Management Plan

153,154 | 65416

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We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

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1. Introduction

JBS&G Australia Pty Ltd (JBS&G) was engaged by Mecone Group Pty Ltd (Mecone) on behalf of Equis Energy (Australia) Projects (NGUMI4) Pty Ltd as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust (Equis, the Client) to prepare a waste management plan (WMP) for the proposed Calala Battery Energy Storage System (BESS) at 57 Burgess Lane, Calala NSW (also known as 474 Calala Lane, Calala NSW) (the Site).

The Site is legally identified as part of Lot 17/DP 629969 and occupies a total area of approximately 36 hectares (ha) (**Figure 1**), with the BESS expected to occupy approximately 8.9 ha of this Lot (or 89,000m²). The portion of the site the BESS will be located on is currently an unoccupied field used for grazing.

The Client is currently preparing the development application for the proposed BESS. This is under a State Significant Development application (SSD-52786213). The application seeks consent for construction of the Calala BESS, which includes:

- The construction and operation of a BESS with an estimated capacity of up to 300 megawatt (MW) / 1200 megawatt-hour (MWh), and
- Associated infrastructure, including underground grid connection to the Tamworth 330kV substation.

1.1 Scope

This WMP has been developed to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment as part of the SSD. The waste requirements from the SEARs are presented below in **Table 1.1**.

Table 1.1: Relevant SEARs

Key Issue	Requirement
Waste	Identify, quantify and classify the likely waste stream to be generated throughout all stages of the project, and describe the measures to be implemented to reduce waste generation, manage, reuse, recycle and safely dispose of this waste.

In accordance with the SEARs listed above, this WMP is to address likely waste streams generated during the works as well as proposes management, reuse, recycling and disposal procedures during the excavation, construction and operational phases for the proposed BESS.

1.2 Objectives

The key objective of this WMP is to support the Client in their project through identifying the types and quantities of potential waste streams and to establish management measures to prevent environmental harm, minimise waste and maximise resource preservation.

This WMP specifically aims to:

- Address the SEARs for waste as required by legislation;
- Promote waste minimisation through avoiding and reducing waste generation;
- Promote the recycling of materials;
- Comply with legislative criteria and adhere to waste minimisation guidance and standards;
- Apply the waste management hierarchy (**Section 3.3**) throughout construction; and
- Specify safe and appropriate management of potentially contaminated wastes.

Prior to commencement of construction, a Construction Environmental Management Plan (CEMP) will need to be developed. This WMP will form a sub-plan of the CEMP for the redevelopment works. The CEMP must also include a soil management plan which is to include parameters for erosion and sediment control.

2. Project Description

57 Burgess Lane, Calala NSW is currently used for grazing. The proposed renewable energy development for the site includes a 300MW/1200MWh BESS. Specific details of the Site and proposed BESS are provided in the following sections.

2.1 Location and Site Layout

Information relating to the site are provided in **Table 2.1** below. The site location is illustrated in **Figure 1**.

Table 2.1: Site Details

Site Address	57 Burgess Lane, Calala NSW 2340
Local Government	Tamworth Regional Council
Zoning	RU4 Primary Production Small Lots
Surrounding Land Use	The immediate surrounds of the Site are also zoned as RU4 Primary Production Small Lots. Further east to the Site the land is zoned as RU1 Primary Production. The Site is approximately 6km south-east of Tamworth and 1.7km west of the Calala town centre.

2.2 Project Scope of Works

The Project involves the construction and operation of a large-scale BESS at Calala, NSW. The BESS will have a capacity up to 300MW and would provide up to 1200MWh of battery storage capacity or up to 4 hours of storage duration. The EIS proposal will comprise the following:

- Large-scale BESS including battery enclosures, inverters, DC and AC combiner boxes, transformers and auxiliary components.
- 33/330 kV switchyard
- Underground transmission line connection between the BESS and the nearby TransGrid Tamworth 330 kV substation
- Ancillary elements including site access from Calala Lane, internal access roads and parking, control room and staff amenities, warehouse, stormwater and fire management infrastructure, utilities, signage, fencing, security systems, 4m and 5m high noise attenuation walls and landscaping.

Detailed design drawings are included in **Appendix A**.

2.3 Existing Environment

The Site is legally identified as part of Lot 17 DP 629969 the footprint of the proposed BESS occupies approximately 8.9 ha of the southeastern portion of this Lot.

A review of the regional topography (LPMA[1]) identified that the footprint of the proposed BESS (the Site) had a slight gradient towards the north. The Site has an elevation of between approximately 400 to 412 metres Australian Height Datum (mAHD) and currently has no direct access to Burgess Lane or Calala Lane. The portion of the Site relevant to the BESS does not have any existing structures and is generally cleared land used for agriculture.

[1] Land and Property Information, Spatial Information Exchange website, http://maps.six.nsw.gov.au/ accessed 10 July 2023

The Site is not situated within an area of known occurrence of acid sulfate souls (ASS), according to the Tamworth Regional Local Environmental Plan 2010 (Tamworth LEP).

The Site is predominately covered in grass with some scattered trees present. There is an agricultural dam located approximately 50m west of the Site.

Due to the Site having previously been used for agricultural activities there is the potential for contaminated soil to be present. Should any soil or material require disposal off site as part of the scope of works, it will be classified as per the NSW EPA Waste Classification Guidelines (EPA 2014[2]) as discussed in **Section 4.1** and appropriately disposed of in accordance with the requirements of its classification.

[2] Waste Classification Guidelines. Part 1: Classifying Waste. NSW Environment Protection Authority (EPA 2014)

3. Legislative Requirements and Guidelines

3.1 Legislation

This WMP has been prepared in accordance with the requirements of the NSW *Waste Avoidance and Resource Recovery Act 2001* (WARR Act), and the NSW *Protection of the Environment Operations Act 1997* (POEO Act). These and other key legislation relevant to waste management at the site are provided in **Table 3.1**.

Table 3.1: NSW Waste Legislation Summary

Legislation	Purpose
Protection of the Environment Operations Act 1997 (POEO Act) Protection of the Environment Operations (Waste) Regulation 2014 Protection of the Environment Operations (General) Regulation 2009	The POEO Act is the key piece of environment protection legislation administered by the NSW Environment Protection Authority (EPA). The object of the Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment. The POEO Act enables the Government to establish policy instruments for setting environmental standards, goals, protocols and guidelines.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	The WARR Act promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation, provides for development of a state-wide Waste Strategy, and introduces a scheme to promote extended producer responsibility for the life cycle of a product. Objectives of the Act include: • To encourage the most efficient use of resources and to reduce environmental harm; • To ensure that resource management options are considered against a hierarchy (see **Section 3.3**); • Provide for the continual reduction in waste generation; • To minimise the consumption of natural resources and the final disposal of waste; • To ensure that industry shares with the community the responsibility for reducing and dealing with waste; and • To assist in the achievement of the objectives of the POEO Act.
Environmental Planning and Assessment Act 1979 Environmental Planning and Assessment Regulation 2000	This Act and its Regulation provide the overarching structure for planning in NSW. They provide for a number of other statutory documents to support the planning structure, including State Environmental Planning Policies and Local Environmental Plans. The objectives include: • The proper management, development and conservation of natural and artificial resources; and • To encourage ecologically sustainable development.

Legislation	Purpose
Environmentally Hazardous Chemicals Act 1985	This Act provides for control of the effect on the environment of chemicals and chemical wastes. The EPA is responsible for administering this legislation, in partnership with other state government agencies. It is the primary legislation for specifically regulating environmentally hazardous chemicals throughout their life cycle. The Act sets out requirements for: • Chemical Control Orders (CCOs) which are used to manage specified hazardous chemicals and chemical wastes; • Technology assessments, which ensure that premises treating or destroying chemicals are safe and appropriate for their purpose; and • Licensing of individuals or industries who manage chemicals that are subject to a CCO.
Contaminated Land Management Act 1997 Contaminated Land Management Regulation 2013	This Act establishes a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation.

3.2 Guidelines

Guidance documents and policies considered in the preparation of this WMP are included in **Table 3.2**.

Table 3.2: NSW Guidance Summary

Guideline	Purpose
NSW Environment Protection Authority (EPA) Waste Classification Guidelines 2014 (EPA 2014)	The Waste Classification Guidelines have been established by the NSW EPA to assist waste generators to classify wastes. Wastes are classified into groups that pose similar risks to environment and human health. Waste classifications are discussed further in **Section 4.1** and **Section 5.1**.
Building Code of Australia (BCA)	The BCA contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and energy efficiency as well as certain aspects of health and amenity.
NSW EPA's Waste and Sustainable Materials (WSM) Strategy 2041, Stage 1: 2021-2027	The WSM strategy aims to continually improve the state's policies and targets for waste reduction and landfill diversion. Stage 1 of the strategy sets the following targets: • reduce total waste generated by 10% per person by 2030; • have an 80% average recovery rate from all waste streams by 2030; • significantly increase the use of recycled content by governments and industry; • phase out problematic and unnecessary plastics by 2025; • halve the amount of organic waste sent to landfill by 2030.

Guideline	Purpose
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	The guide provides advice to assist architects, developers, council staff and building managers to incorporate better waste management practice into the design, establishment, operation and ongoing management of waste services in commercial and industrial developments.
How to manage and control asbestos in the workplace, SafeWork NSW Code of Practice, 2016 (NSW Government)	The Code of Practice is an approved code of practice under the *Work Health and Safety Act 2011*. The code provides guidance on how to manage risks associated with asbestos and asbestos containing material at the workplace and thereby minimise the incidence of asbestos-related diseases such as mesothelioma, asbestosis and lung cancer.
How to safely remove asbestos, SafeWork NSW Code of Practice 2016 (NSW Government)	The Code of Practice is an approved code of practice under the *Work Health and Safety Act 2011*. The code provides practical guidance on how to safely remove asbestos from all workplaces including structures, plant and equipment and is to be read in conjunction with *How to manage and control asbestos in the workplace* Code of Practice.
Australian Government Construction and Demolition Waste Guide, 2011	The aim of the guide is to help develop effective markets for materials diverted or derived from the construction waste stream.
Australian Government Sustainable Procurement Guide, 2018	The guide aims to reduce the adverse environmental, social and economic impacts of purchased products and services throughout their life through considerations such as waste disposal and the cost of operation and maintenance over the life of the goods. The guide was developed to assist Australian Government purchasers to include sustainability considerations in all stages of the procurement process, from identifying the business need to disposal of goods.
Sampling Design Guidelines – Contaminated Sites. NSW EPA, 1995	The Sampling Design Guidelines were established by the NSW EPA to: • Encourage the use of a statistically based approach to the design and sampling for contaminated sites and the interpretation of these samples for assessing and validating contaminated sites; and • Provide a convenient summary of statistical methods.

3.3 Waste Hierarchy

Waste management for the project will be undertaken in accordance with the waste hierarchy, which underpins the objectives of the *Waste Avoidance and Resource Recovery Act 2001*. The waste hierarchy shown below demonstrates preferred approaches to waste management to ensure sustainable development and use of resources.

The hierarchy also aims to maximise efficiency and avoid unnecessary consumption of resources. This WMP seeks to implement the waste hierarchy to minimise waste disposal and promote waste reduction in order of preference:

- Reduce or avoid waste through selection of items and design;
- Reuse materials without further processing;
- Recycle and process waste for reuse as a new product;
- Recover energy through combustion of materials where acceptable and in accordance EPA regulations;
- Treat waste to stabilise the waste product for disposal or reuse; and
- Dispose of waste when no other management options are appropriate.

4. Construction

4.1 Waste Streams and Classification

4.1.1 EPA Waste Classification

The NSW EPA Waste Classification Guidelines (EPA 2014) provides for the classification of wastes into groups that pose similar risks to the environment and human health, which are defined in the POEO Act. Classes of waste described in the guideline are described in **Table 4.1**.

Table 4.1: Summary of NSW EPA Waste classifications

Waste Classification	Description
Special waste	Special wastes are wastes that pose specific regulatory requirements due to the risks of harm to the environment and human health. These wastes include clinical and related waste, asbestos waste, waste tyres, and anything classified as special waste under an EPA gazettal notice.
Liquid waste	Liquid waste is classified as any waste (other than special waste) that meets the following criteria: • Has an angle of repose of less than 5 degrees above horizontal; • Becomes free flowing at or below 60 degrees Celsius or when it is transported; • Is generally not capable of being picked up by a spade or shovel; and/or • Is classified as liquid waste under an EPA gazettal notice.
Pre-classified waste: • Hazardous waste • Restricted solid waste • General solid waste (putrescible) • General solid waste (non-putrescible).	Where the waste is neither liquid nor special waste; the EPA has pre-classified other commonly generated waste types, as defined in Schedule 1 of the POEO Act. This includes hazardous waste, restricted solid waste, general solid (putrescible) and general solid (non-putrescible) waste. Putrescible waste is the component of the waste stream that is liable to become putrid, and usually refers to vegetative, food and animal products. A list of all currently gazetted waste classifications is provided on the EPA website at: www.epa.nsw.gov.au/waste/wastetypes.htm. Where material is classified as hazardous waste, it is noted that such materials cannot be directly disposed of and must be treated prior to disposal by an appropriately licensed facility/operator.
Wastes classified via chemical assessment: • Hazardous waste • Restricted solid waste • General solid waste (putrescible) • General solid waste (non-putrescible).	Where the waste does not fall into one of the above categories, chemical assessment of the material is required to finalise a waste classification as per the procedures outlined in detail in EPA (2014) and/or consideration of General or Specific Waste immobilisation approvals as approved under the Protection of the Environmental Operations (Waste) Regulation 2014.

4.1.2 Potential Waste Streams and Classification

It is understood that the batteries, inverters and transformers (which form a majority of the infrastructure to be installed on site) will be manufactured off site. This means the waste generated during the construction phase will be minimal.

Even though a majority of the site infrastructure will be manufactured off site, a variety of waste types are still expected be generated during the site preparation and construction parts of the project as summarised in **Table 4.2**.

Table 4.2: Potential Waste Types and Classification – Construction

Waste Type	EPA Classification	Generated	Project Phase
Excavated Soil	Subject to Waste Classification as per EPA 2014 following excavation	Potential	Excavation and Construction
Rock and excavated stone	General solid waste (non-putrescible)	Potential	Excavation and Construction
Green waste (Garden Organics)	General solid waste (non-putrescible)	Potential	Excavation (site preparation)
Metals (including roofing)	General solid waste (non-putrescible)	Potential	Excavation and Construction
Wood waste	General solid waste (non-putrescible)	Potential	Construction
Blockwork	General solid waste (non-putrescible)	Potential	Construction
Glazed bricks	General solid waste (non-putrescible)	Potential	Construction
Concrete (Building frames, cores & roof; external works; slab)	General solid waste (non-putrescible)	✓	Construction
Glass	General solid waste (non-putrescible)	Potential	Construction
Plastic (non-packing)	General solid waste (non-putrescible)	Potential	Construction
Plastic and foam packaging	General solid waste (non-putrescible)	Potential	Construction
General refuse	General solid waste (putrescible), and General solid waste (non-putrescible)	✓	Excavation and Construction
Electrical (HV and LV)	General solid waste (non-putrescible)	✓	Construction
Optic fibre wiring	General solid waste (non-putrescible)	Potential	Construction
Light bulbs	Hazardous waste	Potential	Construction
PVC pipes (stormwater, electrical, optic fibre, sewer)	General solid waste (non-putrescible)	Potential	Construction
Sewage	Liquid waste	Potential	Construction
BESS-scale batteries	Hazardous waste	Potential	Construction

4.1.3 Waste Quantities

As previously identified, a majority of the site infrastructure (batteries, inverters and transformers) are prefabricated off site. Therefore, waste production during construction will be low.

Based on a review of the activities needed for construction of the BESS, the main source of waste is most likely from soil.

Table 4.3 provides a summary of potential waste streams during construction and how they should be managed.

4.2 Waste Management during Construction

Site specific waste management measures have been developed in line with the waste hierarchy outlined in **Section 3.3** and in accordance with the relevant legislative requirements and guidelines. These measures are applicable to the construction phase of the project.

4.2.1 Avoidance and Reduction of Waste

The excavation and construction contractor will be required to avoid waste generation, and endeavour to reuse materials where possible, thereby minimising waste generation.

During the construction phase, waste generation will be avoided through strategic selection of materials during design and purchasing, considering options to reduce waste generation for the project. This includes consideration of procurement of materials which are prefabricated, use minimal packaging, and are suitable for reuse across the site. Selection of construction materials will also consider the use of recycled items where practicable.

Opportunities to avoid wastes generated by construction include:

- Develop a procurement policy which considers waste avoidance measures such as:
    - Order site specific or prefabricated items where practicable to minimise surplus material;
    - Consider packaging material provided by suppliers during purchasing and reduce this requirement where possible, or consider returnable packaging;
    - Material selection to consider recycled items;
- Refine waste stream estimates to ensure adequate on-site storage and segregation; and
- Refine estimated volumes of materials for construction.

4.2.2 Reuse and Recycling

For waste materials onsite, measures to separate waste streams will be implemented. This includes segregating wastes into appropriate dedicated bins or areas for reclamation on site or transportation to a designated recycling facility.

Concrete waste and waste rinse water are not to be disposed of at the site and rinse waters are required to be prevented from entering surface waters, including natural and artificial watercourses.

If material containing asbestos is identified and cannot be safely removed/encapsulated, off-site disposal is the most appropriate option. The construction contractor will then liaise with a licensed asbestos removalist to determine a suitable disposal facility. Measures for dealing with hazardous waste (asbestos) are discussed in **Table 4.3**.

Procedures to manage the reuse and recycling of waste materials during construction include:

- Incorporation of waste management into development staging to promote reuse of materials across the site;

- Ensure areas for waste segregation are easily accessible and clearly defined;
- Ensure contractors are familiar with onsite waste storage areas for appropriate waste segregation; and
- Consider opportunities for materials reuse in areas in proximity to the site or local construction activities where practicable.

4.2.3 Treatment and Disposal

Project wastes may require treatment to stabilise them for appropriate disposal to reduce the risk of harm to human health or the environment. These materials are not suitable for reuse or recycling and must be segregated and disposed of via a suitably qualified contractor.

Wastes will only be sent to landfill or disposal facilities where the prioritised management methods in the hierarchy cannot be effectively implemented. The construction contractor will liaise with the local council to determine appropriate disposal locations for potential waste streams.

Measures to manage the treatment and disposal of waste materials during construction include:

- Ensure wastes which cannot be reused or recycled and require disposal are clearly segregated from those which have the potential to be reused.
- Provide segregated bins for subcontractors to dispose of construction waste (i.e., metal, plastics and cardboard).
- Contractors and staff to be inducted into site waste management practices.
- Hazardous materials including asbestos (if identified) to be disposed of in accordance with the handling and disposal requirements of SafeWork NSW and NSW EPA.
- General wastes to be disposed of in accordance with NSW EPA/local council requirements.
- Toilet facilities must be regularly serviced and emptied by a licensed contractor.

Concrete waste and waste rinse water are not to be disposed of at the site and rinse waters are required to be prevented from entering surface waters, including natural and artificial watercourses.

4.2.4 Waste Stream Management Options

The waste management measures outlined in **Table 4.3** will be implemented for each waste stream generated as part of the project. Key waste streams identified for this project have been discussed in more detail in this section to ensure appropriate waste handling for each type of waste.

Each waste stream will be separated and stored appropriately to ensure each type of waste is handled in the most appropriate and efficient way. The numbers and size of waste storage bins, containers, stockpile areas and loading zones on site will be determined by the excavation and construction contractor.

The Principal Contractor appointed by the client will implement its own waste management systems in accordance with this plan to ensure any existing waste management systems are not impacted by the redevelopment works.

4.2.5 Other Considerations

To ensure waste is not unintentionally tracked off-site, the vehicles or trailers used to transport waste or excavated spoil from the site will be covered before leaving the subject site, to prevent spillage or escape of dust, waste or spoil from the vehicle or trailer. Any mud, splatter, dust and other material that is likely to be released from the wheels, underside or body of vehicles, or plant leaving the site will also be removed through a shaker bay or wash down area prior to leaving the subject site.

Table 4.3: Construction Waste Stream Management

Waste Stream	Project Phase	Management
Concrete	Construction	Concrete waste is likely to be generated during the construction of the new BESS and associated facilities. There is also a possibility that concrete waste may be generated from excess concrete poured during construction, although this will be minimised wherever possible using the methods outlined in **Section 4.2.1**. Concrete can be reprocessed and may, in some instances, be reused across the subject site, however, the general practice is to break up/crush the concrete and arrange for disposal to a recycling facility or disposal offsite. Options may include disposal of excess concrete to a HDPE lined pit on site, to allow for regular reprocessing or disposal to a recycling facility. Wet supply may be placed back into supply trucks to return to the producer.
Soil	Excavation and Construction	Soil is likely to be generated during establishment activities, removal of trees, potential excavation to establish required site levels and other construction activities. Soil surplus to the site requirements will be sampled, analysed and classified in accordance with NSW EPA Waste Classification Guidelines (EPA 2014) prior to for offsite disposal at a facility that is licensed to accept that class of waste. As no previous environmental reports were provided by the Client, whilst a 90% recycled and re-used target has been set for the project, it is anticipated that the excavated materials that meet the relevant site reuse criteria will, where possible be reused to establish the required site levels during construction works. A soil management plan (as part of a Construction Environmental Management Plan) will be developed to provide guidance for all soil testing, excavation, reuse and disposal works. In general, it is expected that assessment of relevant material will identify that undisturbed natural soil and bedrock at the site will meet the definition of VENM for off-site disposal or re-use purposes. VENM is considered suitable for re-use on-site, or alternatively, may be suitable for beneficial reuse at another site as fill material. In accordance with Part 1 of the Waste Classification Guidelines (EPA 2014), the VENM is pre-classified as general solid waste and may also be disposed of accordingly to a facility that is licensed to accept it. Where stockpiling is required prior to redistribution, control measures to avoid sediment and erosion will be implemented where appropriate. This may include establishing a bund or lining of the base with an impermeable HDPE plastic liner. Where excess soil cannot be redistributed or has been situated in proximity to asbestos containing materials, the soil is required to be treated and/or disposed of, potentially as low-level contaminated waste via a licensed removalist to a disposal facility.
Rock and excavated stone	Excavation and Construction	Rock and excavated stone may be generated during potential excavation and construction of new structures for footing and foundation construction. Depending upon the quantities and properties of the materials generated, materials may be used as aggregate or sub-base for other works across the site as described in the **Soil** section above.

Waste Stream	Project Phase	Management
Metals	Construction	There is a possibility that metal waste may be generated from excess materials purchased for the site as part of construction work, although this will be minimised wherever possible using the methods outlined in **Section 4.2.1**. Principal Contractor appointed by the client will investigate and determine appropriate storage and recycling of metals to reduce waste, including location and signage of skip bins onsite. Where recycling of metal is not feasible, for example distribution to salvage yards for reuse, the contractor will organise disposal of the timber to a licensed waste facility.
Green Waste/ Wood Waste	Excavation and Construction	Green/wood waste is likely to be generated during removal of trees and excavation of topsoil (mulch) for site grading purposes. It is likely that wood waste (timber) may be generated from excess materials purchased as part of building construction works, although this will be minimised wherever possible using the methods outlined in **Section 4.2.1**. Principal Contractor appointed by the client will investigate and determine appropriate storage and recycling of timber to reduce waste, including location and signage of skip bins onsite.
Plastics	Construction	Plastic wastes associated with packaging for construction materials can be recycled or in some cases returned to the supplier of the materials for reuse. Where possible, plastic (non-durable) wastes will be reduced using the methods outlined in **Section 4.2.1**.
BESS-scale Batteries	Construction	There is the possibility that the batteries that make up the BESS may fail during commissioning. Any failed batteries will be returned to the supplier for maintenance, recycling and/or disposal. All possible care will be taken during the transportation of the batteries to ensure the chance of battery failure is as low as possible prior to and during BESS construction. Contractor appointed by the client will ensure failed batteries are returned to the supplier and not directed to nearby waste facilities.
General Waste	Excavation and Construction	Wastes such as food waste, organics and biodegradable material will be created as a result of worker activity on site. Non-putrescible wastes are generally inert, or solid, and are not able to be composted, recycled, reprocessed or reused. Principal Contractor appointed by the client will ensure adequate bins are provided on site for putrescible waste. This is particularly important around worker congregation areas, site office areas and toilet facilities. It is likely that general waste will increase at times of internal and service fit out during construction, primarily associated with excess packaging materials and workers on site. Principal Contractor will determine the location of skip bins and specify waste stream separation measures across the site. Where possible, co-mingled recycling bins will be provided in common areas at work sites for plastic and glass bottles, soft drink cans, aluminium and tin cans to avoid these items being disposed to landfill. Specialised bins for cigarette butts will also be provided in designated smoking areas.

4.3 Roles and Responsibilities during Construction

This WMP forms the basis of waste management on site for the excavation and construction phase of the Calala BESS development works.

It is expected that all construction personnel will commit to the WMP and be responsible for their own actions in adhering the waste management objectives. Waste management criteria (such as those contained in this report) is to be contractually binding for all contractors working on the site.

A Construction Site Manager will be the key person responsible for implementation of the WMP and adherence to applicable legislation, guidelines, licensing and project conditions outlined herein.

Table 4.4 presents suggested responsibilities for waste management during construction.

Table 4.4: Roles and Responsibilities

Role	Responsibility
Environmental Management Representative	• Compliance with applicable environmental licences, legislation and project conditions. Ensure environmental management plan(s) across the site are adhered to and accurate to site conditions. • Undertake inspections to ensure compliance.
Construction Site Manager	• Ensuring workers and subcontractors are inducted into the WMP along with other applicable management plans. • Responsible for undertaking procurement of construction materials in accordance with the waste management hierarchy. • Segregation of waste streams where required to ensure appropriate use, treatment and/or disposal.
Health and Safety Manager	• Safety inductions for all staff, workers and visitors. • Work with Construction Site Manager to determine safe handling of asbestos waste in compliance with regulatory requirements.
Site Workers	• Responsible for acting in accordance with the WMP and site inductions. • Informing the Construction Site Manager of any waste management incidences and Health and Safety Manager of any safety issues associated with on-site activities.

4.4 Training and Awareness

Staff present on site during the construction stage of the project will be required to undertake induction and awareness training inclusive of the WMP and site-specific waste management. This includes:

- Induction to the waste management hierarchy and use across the site; and
- Details of responsibilities for waste management and key personnel;
- Site specific waste management practices relevant to the project stage such as:
    - Waste storage and stockpiling locations;
    - Waste disposal requirements;
    - Hazardous or special wastes;
    - Record of waste disposal details and receipts; and

- Knowledge of emergency response procedures and contacts; and
- Asbestos Awareness Training.

Signage will be provided on site to ensure waste management measures are communicated across the subject site, particularly for contractors and visitors who are not regularly on site. Signage will highlight correct procedures for separating wastes where required, locations of bins and waste storage areas, labelling of designated bins, potential hazards associated with the waste streams and handling, and contact details should any issues be encountered.

Signage will be prepared and located on site in accordance with the Australian Standard (AS 1319) for safety signs, and the NSW EPA and Australian Standard for recycling signage.

4.5 Monitoring and Reporting

The following activities will be undertaken to inform future onsite waste management and to determine the success of the WMP:

- Ensure waste quantities generated are recorded, including tracking of receipts from waste recycling or disposal via the appointed waste contractor;
- Record waste classification and testing results;
- Review the WMP in light of any changes to construction activities or further information which may alter waste management practices;
- Undertake auditing of waste management across the site as a component of broader environmental site audits;
- Undertake visual inspections daily to ensure waste management controls are implemented and maintained across site; and
- Undertake final review of the WMP upon project completion to ensure information accurately reflects site activities, and to assist future waste management.

Outcomes of audits and waste tracking will be reported to the client or the Principal Contractor, potentially through weekly or monthly reporting to ensure waste management objectives are adhered to.

4.6 Corrective Action

Where formal auditing, daily visual inspections or incident reporting identify incorrect storage or disposal procedures, or maintenance or waste management issues, observations will be promptly reported to the Construction Site Manager and recorded. The Construction Site Manager will determine appropriate measures to rectify the issues in a timely manner in consultation with the Environmental Management Representative and Health and Safety Manager where required.

5. Operation

5.1 Potential Waste Stream and Classification

Potential waste types and corresponding EPA classifications for the operation of facilities constructed on the site are summarised in **Table 5.1**.

Table 5.1: Potential Waste Types and Classifications - Operation

Waste Type	EPA Classification	Waste Stream
Cardboard, excluding waxed cardboard.	General solid waste (non-putrescible)	Cardboard recycling
Metals (steel, aluminium, stainless steel, and copper piping or wire)	General solid waste (non-putrescible)	Co-mingled recycling, specific recycling or general waste
Wood (timber, wooden pallets)	General solid waste (non-putrescible)	Specific recycling or general waste
Plastics (recyclables)	General solid waste (non-putrescible)	Co-mingled recycling
Plastics (non-recyclables)	General solid waste (non-putrescible)	General waste
Light bulbs, batteries, e-waste	Potentially hazardous waste	Specific recycling
BESS scale batteries	Hazardous Waste	Specific recycling

5.2 Estimated Waste Quantities Generated during Operation

As no staff will be present onsite full-time during the operation of the BESS, there are no staff facilities (offices, bathrooms etc.) included in the design. This eliminates general operational waste produced by staff including food waste, paper waste etc.

Waste expected to be produced during the operational life of the BESS is limited to materials required in the upkeep and maintenance of the BESS components. These materials will be transported to site by outside contractors and any waste produced during the maintenance of the BESS components will be removed from site by the contractors on completion of their task.

Much of the waste produced by maintenance activities onsite will be related to the batteries used in the BESS.

Any batteries removed from the site will likely be returned to the supplier for reuse or recycling.

Since all waste will be removed from the site as its generated, no waste bins are required to be stored.

5.3 Waste Management during Operation

Section 5.2 identified that no full-time staff are planned to occupy the site during occupation, therefore the amount of waste generation will be negligible and the only waste likely to be generated will be from maintenance activities. As there are no defined waste storage areas, all site users (operational staff and contractors) are to remove their waste at the end of each day.

In general, site users should consider the principles of the waste hierarchy (outlined in **Section 3.3**) during operation which is summarised in the following sections.

5.3.1 Avoidance and Reduction of Waste

The ongoing site users (operational staff and contractors) will be required to minimise waste generation, and endeavour to reuse waste where available.

Waste should be avoided through strategic selection of materials during purchasing which takes into account options which may reduce waste generation during ongoing operation of the site. This includes considering procurement of materials which use minimal packaging and are suitable for reuse. Selection of operational materials will also consider the use of recycled items where practicable.

Opportunities to avoid waste generated by operation include:

- Develop a procurement policy which considers waste avoidance measures such as:
    - Order site specific or prefabricated items where practicable to minimise surplus material.
    - Consider packaging material provided by suppliers during purchasing and reduce this requirement where possible or consider returnable packaging.
    - Material selection to consider recycled items.

5.3.2 Reuse and Recycling

Measures to separate waste streams should be implemented off site to maximise re-use and recycling.

Procedures to manage the reuse and recycling of waste materials during operation include:

- Incorporate waste management into site management procedures to promote reuse and/or recycling of materials.
- Consider opportunities for materials reuse and/or recycling where practicable.

5.3.3 Treatment and Disposal

Operational wastes may require treatment to stabilise them for appropriate disposal to reduce the risk of harm to human health or the environment (for example chemicals). These materials may not be suitable for reuse or recycling and will be segregated and disposed of via a suitably qualified contractor off site.

Waste will only be sent to landfill or disposal facilities where the prioritised management methods in the hierarchy cannot be implemented in a cost effective or practical manner.

Measures to manage the treatment and disposal of waste materials during operation include:

- Ensure waste which cannot be reused or recycled and require disposal are clearly segregated from those which have the potential to be reused.
- Maintenance staff to be inducted into site waste management practices.
- Hazardous materials to be disposed of in accordance with the handling and disposal requirements of SafeWork NSW and NSW EPA.
- General wastes to be disposed of in accordance with local council requirements.

5.4 Waste Storage Systems and Waste Collection

There is no designated waste storage area located onsite. Any waste produced by maintenance activities associated with the BESS will be removed from site by the maintenance worker(s) on a daily basis.

Therefore, there is no need for waste collection from site by a waste contractor.

5.5 Ongoing Management

Having suitable waste management systems in place requires compliance by staff to ensure the efficacy of the system. As such roles and responsibilities should be defined.

5.5.1 Roles and Responsibilities

It is expected that all personnel attending the site (operational staff and contractors) will commit to the WMP and be responsible for their own actions in adhering to the waste management objectives. Operation of the BESS will not require any staff to be a constant presence at the BESS location. As the site will be largely unattended, implementation of this WMP will be managed by the site asset managers.

Table 5.2 below presents suggested responsibilities for waste management.

Table 5.2: Roles and Responsibilities

Role	Responsibility
Asset Managers	Implement the WMP during operation and update as needed. Review WMP procedures regularly and incorporate improvements when identified.
Contractors	Adhere to the WMP. Inform Equis contacts of any waste management incidences.
Staff	Adhere to the WMP. Inform Equis management of any waste management incidences.

5.5.2 Training and Awareness

All staff and contractors will undertake awareness training of the WMP and site-specific waste management. This includes:

- Induction to the waste management hierarchy and use across the site.
- Details of responsibilities for waste management and key personnel.
- Site specific waste management practices such as:
    - Waste disposal requirements;
    - Hazardous or special wastes; and
    - Record of waste disposal details and receipts.
- Knowledge of emergency response procedures and contacts.

5.6 Monitoring and Reporting

The following activities will be undertaken to inform future onsite waste management and to improve the efficiency in achieving the outcomes of the WMP:

- Review the WMP in light of any changes to operational activities or further information which may alter waste management practices.
- Undertake auditing of waste management across the site as a component of broader environmental site audits.
- Undertake visual inspections to ensure waste management controls are implemented and maintained across site.

- Undertake annual review of the WMP to ensure information accurately reflects site activities, and to assist future waste management.

Where formal auditing, general inspections or incident reporting identify incorrect storage or disposal procedures, or maintenance or waste management issues, observations will be promptly reported to Equis management and recorded. Equis management will determine appropriate measures to rectify the issues in a timely manner.

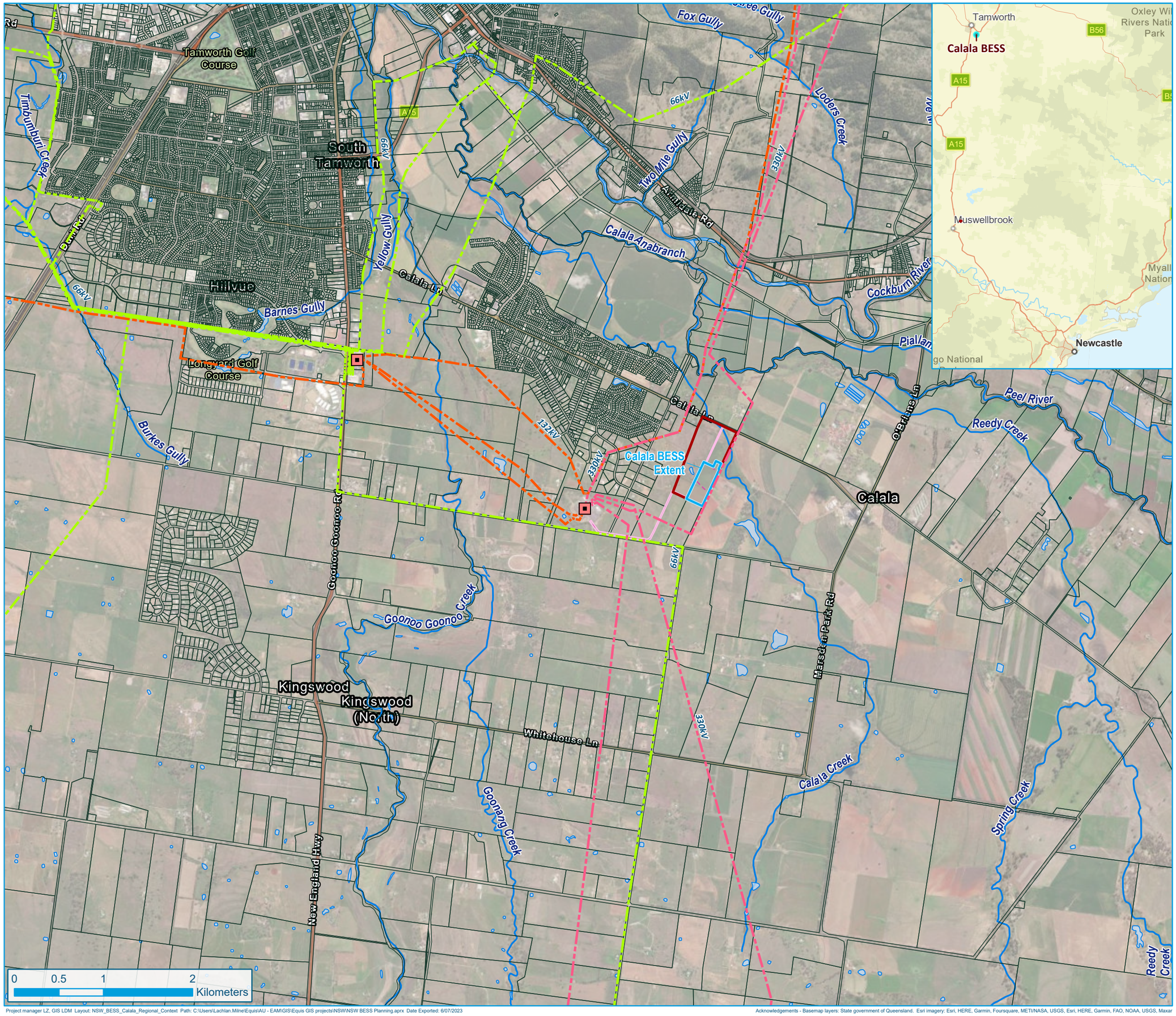
6. Decommissioning

At the end of life of the proposed facility, if it is not to be upgraded or expanded, the BESS and site will be decommissioned. The BESS lifespan is currently calculated to be approximately 25 years. During decommissioning, all infrastructure will be removed with key elements including:

- Removal of all above-ground BESS site infrastructure, including the perimeter fencing, noise attenuation walls and control room
- Removal of concrete foundations with rehabilitation of the land suitable for resumption of agricultural use, or other use as agreed with the landowner; and
- Internal cabling and connection to the nearby substation will be removed, although some infrastructure below ground may be left in place subject to agreement with the landowner.

The majority of infrastructure removed during decommissioning is expected to be able to be recycled or repurposed, to be determined at the time of decommissioning and in accordance with statutory requirements at that time. A decommissioning specific WMP must be prepared prior to the commencement of the BESS decommissioning.

Figures



Calala BESS

300MW - 1200MWh

Regional context

Part of Lot: 17/DP629969

A-100

Legend

- Calala BESS extent
- Electricity substation
- Subject site
- Property parcel
- Development footprint

Existing transmission line - Capacity (kV)

- 66
- 132
- 330

Scale: 1:39,000 @ A3
Spatial Reference: GDA2020 MGA Zone 56

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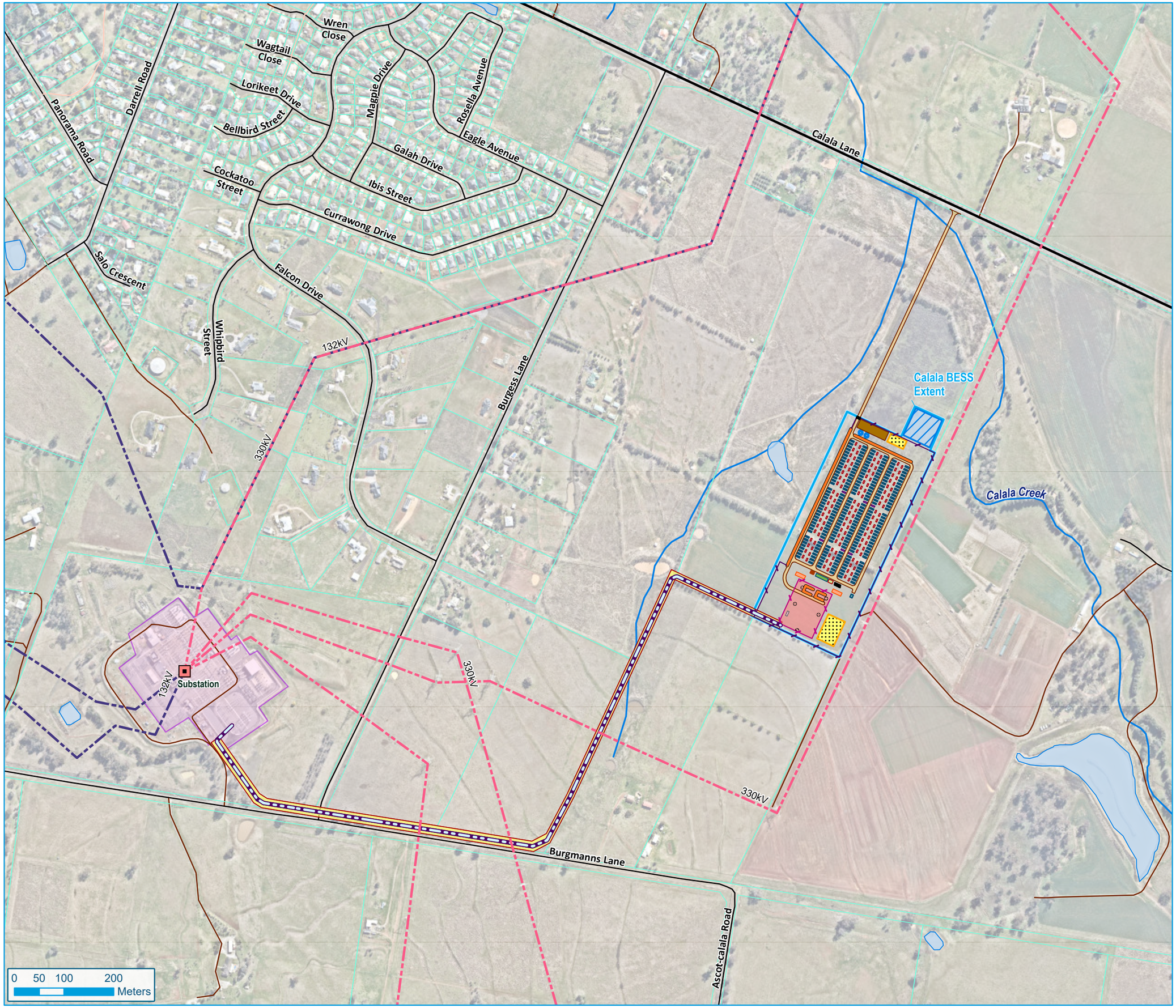

EQUIS

Calala BESS

300MW - 1200MWh

Site plan

Part of Lot: 17/DP629969

A-101

Legend

- Calala BESS extent
- Existing electricity substation
- Proposed easement
- Property (parcel)
- Proposed transmission line

Existing transmission line - Capacity (kV)

- 132
- 330

Proposed design

- Fence
- Fence - High Voltage
- Gate
- Noise wall
- Underground cable (330 kV)
- Access track
- Auxiliary power
- Battery enclosure
- Control room
- Control room - TNSP
- Distribution kiosk (33 kV)
- Harmonic filter - future development
- High voltage connection asset
- Inverter station
- Laydown area
- Lightning mast
- Parking
- Switchroom
- Temporary office
- Warehouse
- Firewater tank
- Stormwater basin
- Transmission line alignment

Scale: 1:7,000 @ A3
Spatial Reference: GDA2020 MGA Zone 56

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Acknowledgements - Basemap layers: Commonwealth and state governments of Australia. Esri imagery:

Appendix A Design Drawings

EQUIS

Calala BESS

300MW - 1200MWh

Site layout

Part of Lot: 17/DP629969

A-102

Legend

- Calala BESS extent
- Subject site
- Property parcel

Existing transmission line - Capacity (kV)

- 330

Proposed design

- Fence
- Fence - High Voltage
- Gate
- Noise wall
- Underground cable (330 kV)
- Access track
- Auxiliary power
- Battery enclosure
- Control room
- Control room - TNSP
- Distribution kiosk (33 kV)
- Harmonic filter - future development
- High voltage connection asset
- Inverter station
- Laydown area
- Lightning mast
- Parking
- Switchroom
- Temporary office
- Warehouse
- Firewater tank
- Stormwater basin
- Transmission line alignment

Scale: 1:2,000 @ A3

Spatial Reference: GDA2020 MGA Zone 56

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0 50 100 200 Meters

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