Prepared for
Ausgrid
ABN: 78 508 211 731

AECOM

Land Use Conflict Risk Assessment

Rothbury Battery Energy Storage System

24 Feb 2026

aecom.com

Delivering a better world

Land Use Conflict Risk Assessment

Rothbury Battery Energy Storage System

Client: Ausgrid

ABN: 78 508 211 731

Prepared by

AECOM Australia Pty Ltd
Gadigal Country, Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 1800 868 654 www.aecom.com
ABN 20 093 846 925

24-Feb-2026

Job No.: 60757361

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Table of Contents

List of Tables

List of Figures

1.0 Introduction

1.1 Background

Ausgrid is seeking development consent to construct, operate, and maintain a Battery Energy Storage System (BESS) adjacent to the existing Ausgrid Rothbury Zone Substation located in Rothbury, NSW (the Project). The regional setting of the site is shown in **Figure 1-1**.

The Project would be located in Lots 1 and 2 of Deposited Plan (DP) 1318566 at 1309 Wine Country Drive, Rothbury, NSW 2320 (the site). The boundary of the site and the Project Area (the area that will be physically disturbed for construction and operation of the Project) is shown in **Figure 1-2**.

The Project would have a capacity to provide up to 135 megawatts (MW) over a four-hour duration (i.e. up to 540 megawatt hours (MWh) energy capacity).

The Project is considered State Significant Development (SSD) on the basis that is has an estimated development cost (EDC) of more than $30 million as per the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

AECOM Australia Pty Ltd (AECOM) was commissioned by Ausgrid to prepare a Land Use Conflict Risk Assessment (LUCRA) to support the Environmental Impact Statement (EIS), prepared as part of the State Significant Development Application (SSDA) for the Project.

Figure 1-1: Regional setting

Figure 1-2: Project location

1.2 Purpose and scope of assessment

This LUCRA forms part of the Environmental Impact Statement (EIS) for the Project and has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the Project issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) on 3 July 2025.

Table 1-1 sets out the SEARs relevant to this LUCRA and where the requirements have been addressed in this report.

Table 1-1: Relevant SEARs – land use compatibility

Relevant SEARs	
Land	**Where addressed**
An assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: • consideration of the zoning provisions applying to the land, including subdivision (if required); and • completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industries *Land Use Conflict Risk Assessment Guide* (if required).	• Land zoning provisions that apply to the land are discussed in **Section 4.3**. • This document comprises a LUCRA and has been prepared in accordance with the *Land Use Conflict Risk Assessment Guide* (NSW DPI, 2011).

This LUCRA aims to:

- Identify potential land use conflicts between the Project and neighbouring land uses
- Assess the potential impacts of the Project on neighbouring land uses, including the likelihood of such conflicts occurring, to minimise the likelihood of dispute arising
- Understand potential land use conflicts to inform and support Project design, development control and buffer requirements
- Identify and recommend appropriate conflict avoidance and mitigation measures and strategies to minimise the potential for land use, and to support the negotiation, implementation and evaluation of land use conflict management strategies.

1.3 Report structure

This report contains eight sections. Section 1.0 provides background information on the Project and outlines the scope and purpose of this LUCRA. The remainder of the report is structured as follows:

- **Section 2.0** provides an overview of the Project
- **Section 3.0** outlines the assessment methodology
- **Section 4.0** describes the existing environment within the Project Area and surrounding land, based on a detailed desktop investigation
- **Section 5.0** describes the proposed land use changes resulting from the Project and assesses the potential for these changes to give rise to land use conflicts within the Project Area and surrounds
- **Section 6.0** presents the detailed LUCRA for the Project, including the identification of potential land use conflicts and the associated mitigation and management measures
- **Section 7.0** summarises the findings and conclusions of the LUCRA
- **Section 8.0** lists the references cited throughout the report.

2.0 Project description

2.1 Overview

As described in **Section 1.0**, Ausgrid proposes to construct, operate and maintain a BESS with a maximum power output capacity of up to 135 megawatts (MW) over a four-hour duration (i.e. up to 540 MWh energy capacity), located adjacent to the existing Rothbury Zone Substation, in Rothbury, NSW.

The Project would comprise battery units that would store energy from the grid, releasing it during high demand periods. The Project would also perform other ancillary services for the grid.

Key features of the Project are summarised in **Table 2-1** and shown in **Figure 2-1**.

Table 2-1: Overview of the Project

Feature	Description
The Project	• Construction, operation, and maintenance of a BESS with a maximum power output capacity of up to a 135 MW over a four-hour duration (i.e. up to 540 MWh energy capacity) • Containerised battery units and associated infrastructure, including inverters and MV transformers • RMUs • One auxiliary transformer • 33 kV underground cable connection to the existing Rothbury Zone Substation • A combined switch room and control room building • An operation and maintenance building • A warehouse to store equipment and other materials or plant related to maintaining the BESS • A backup diesel generator • Onsite car parking spaces • Other ancillary infrastructure including fire suppression, stormwater management, boundary security fencing, noise barriers, lighting, and CCTV.
The site	The site is located in Lots 1 and 2 of Deposited Plan (DP) 1318566 at 1309 Wine Country Drive, Rothbury, NSW 2320. The Project would be located in the central portion of the site.
Disturbance area	The total area of disturbance within the site (i.e. the Project Area) would be approximately 4.56 ha.
Access	Access to the Project Area is proposed via an existing driveway on Old North Road. Old North Road is a council managed, single laned, unmarked road with line marking at the intersection of Wine Country Drive.
Noise barrier	An 8 m high noise barrier is proposed to be positioned around the east, south and west perimeter of the battery units.
Grid connection	The Project would be connected to the National Electricity Market (NEM) through the existing Rothbury Zone Substation via a 33 kV underground cable.
Construction activities	Construction would involve: • Enabling works • Civil, structural, mechanical and electrical works • Testing and commissioning • Demobilisation. Construction laydown areas would be provided within the Project's Construction Footprint.

Feature	Description
Plant and equipment	The indicative plant and equipment that would be used include: **Enabling works:** • Front end loaders • Dump trucks • Road trucks • Water trucks • Excavators • Graders • Compactors • Light vehicles. **Civil, structural, mechanical and electrical works:** • Front end loaders • Road trucks • Graders • Concrete trucks and pumps • Dump trucks • Excavators • Bobcats • Compactors and rollers • Elevated work platforms • Cranes • Concrete saws and grinders • Water trucks • Light vehicles • Backhoe • Generators. **Testing and commissioning:** • Elevated work platforms • Cranes • Generators • Light vehicles. **Demobilisation:** • Water trucks • Compactors • Backhoe • Light vehicles.
Construction duration	It is anticipated that construction of the Project would commence in late 2027 and be completed by mid-2029 (approximately 22 months). However, these dates are subject to change pending planning approvals, equipment lead times and availability.
Construction workforce	Up to 100 full-time equivalent (FTE) construction workers (at peak) would be required. These workers would be preferentially sourced locally where appropriate skill sets are available.
Construction hours	Construction would occur during standard working hours as outlined in the *Interim Construction Noise Guideline* (NSW Department of Environment and Climate Change, 2009) (ICNG), being: • Monday to Friday 7.00 am to 6.00 pm • Saturday 8.00 am to 1.00 pm • No works on Sundays and Public Holidays.

Feature	Description
	Some activities may be required to be completed outside of standard hours. These would be completed in accordance with an Out of Hours Work procedure and may include (but not be limited to): • Electrical commissioning and testing • Emergency situations where work is required to prevent harm to persons or property.
Construction traffic volumes	Up to 120 light vehicles and 70 heavy vehicles are expected per day during the peak construction period.
Operation	
Operational life expectancy	The Project is intended to operate for 50 years, with some component replacements expected during this period. At the end of this period, the battery units would either be replaced or decommissioned. When the Project is decommissioned, the site would also be rehabilitated. Any extension to the life of the battery units beyond the proposed 50-year period would be subject to the relevant approval regime at the time.
Operational workforce	The Project would operate 24 hours a day, seven days a week primarily as an unmanned facility. The Project would provide up to five part-time roles, equating to two FTE positions, during operation. Staff activities onsite would primarily consist of scheduled inspections and maintenance of battery units, along with occasional planned or unplanned maintenance of other equipment.

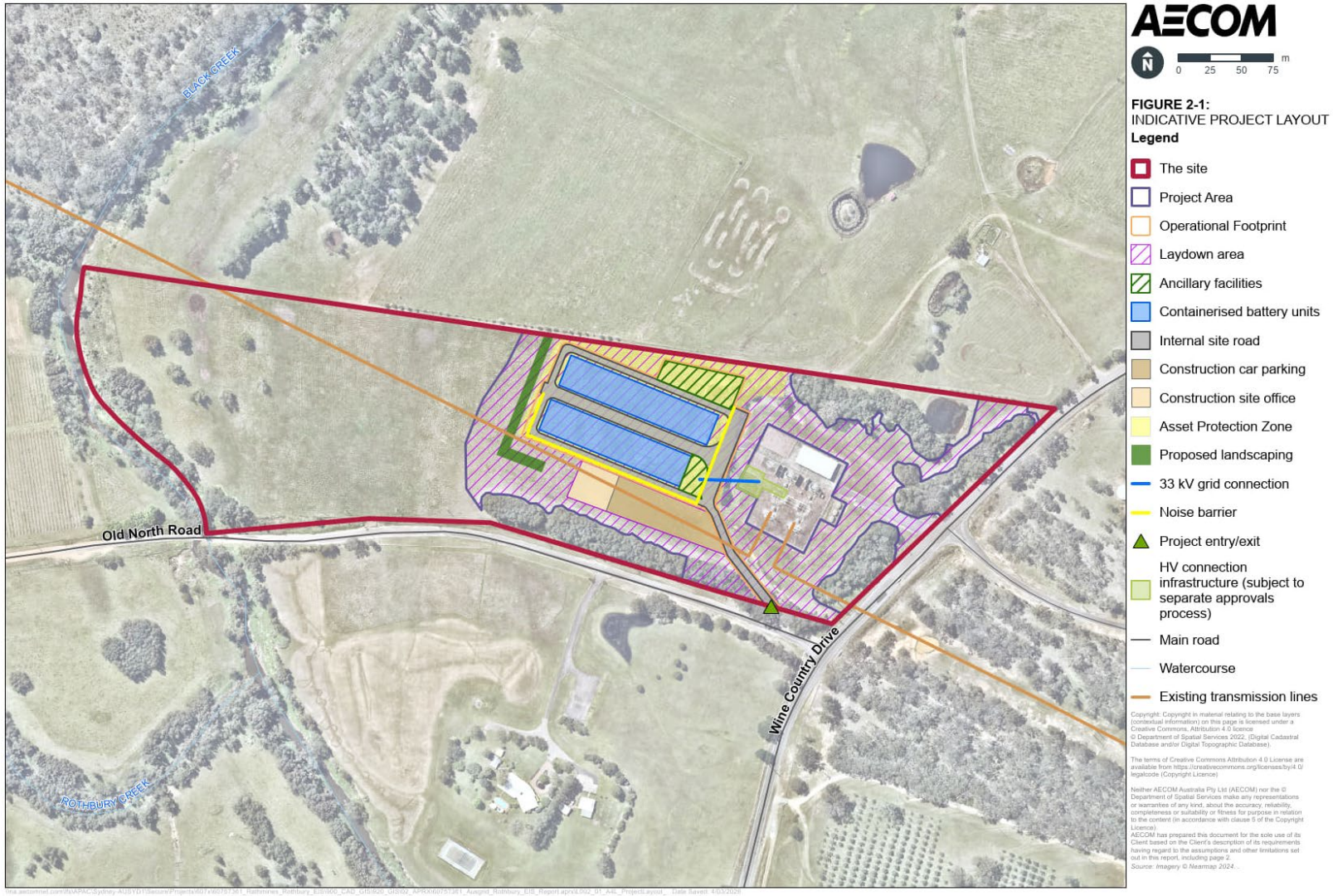

Figure 2-1: Indicative Project layout

3.0 Methodology

The methodology adopted to prepare this LUCRA is consistent with the approach outlined in the *Land Use Conflict Risk Assessment Guide* (NSW DPI, 2011).

The LUCRA was undertaken using a staged, risk-based framework, as described below.

Step 1: Information gathering

Information was collected to characterise the existing environment within the Project Area and surrounding lands, including current land uses and relevant environmental characteristics. In addition, the proposed land uses changes and activities associated with the Project were identified.

Information sources used to inform this step included:

- Observations recorded during field investigations
- Review of historical and current aerial photography
- Review of publicly available spatial datasets, including but not limited to:

Land use zoning and planning mapping

Vegetation mapping

Soil mapping

Hydrology and flooding maps

Topographic mapping

- Review of relevant, publicly available reports and planning documentation.

As part of this step, a screening of environmental matters was undertaken to identify those environmental considerations, which if impacted by the Project, have the potential to give rise to land use conflict. This screening considered the results of the environmental assessments in **Chapter 6.0 (Assessment of impacts)** of the EIS.

Step 2: Risk level evaluation

Each proposed activity associated with the Project was reviewed to identify potential land use conflicts with surrounding land uses. The level of land use conflict risk was then evaluated in accordance with the risk assessment framework set out in the NSW DPI (2011) Guide. The assessment process used to determine risk levels is described in detail in **Section 6.0** of this LUCRA.

Step 3: Identification of risk mitigation strategies

Where potential land use conflicts were identified, appropriate conflict avoidance and mitigation measures were developed. These measures are aimed at reducing the likelihood and/or consequence of land use conflicts and improving land use compatibility between the Project and surrounding land uses.

Step 4: recording of results

The outcomes of the LUCRA, including identified land use conflicts, assessed risk levels, and recommended management and mitigation measures, have been documented and summarised within this report.

4.0 Information gathering

4.1 Site context

4.1.1 Regional context

The Project is located within the Cessnock City Council Local Government Area (LGA), approximately 190 kilometres (km) north of Sydney's CBD and around 13 km from Cessnock. **Figure 1-1** shows the location of the Project within its broader regional context.

The Cessnock City Council LGA has an area of approximately 1,950 km^2 and is bordered by Maitland City Council LGA to the north, Newcastle City Council LGA and Lake Macquarie City Council LGA to the east, Central Coast Council LGA and Hawkesbury City Council LGA to the south, and Singleton Council LGA to the west. The Cessnock City Council LGA has an estimated population of 63,632 (Australian Bureau of Statistics, 2021).

Major transport routes within the local area include Wine Country Drive (B82), which borders the site to the east, and the Hunter Expressway (M15), which passes approximately 6 km to the north of the site at its nearest point. Public transport nearby the site includes Branxton Railway Station, approximately 6 km to the north. There are no routine public transport services within the vicinity of the site. Four school bus routes operate along Wine Country Drive and pass the site.

4.1.2 Topography and landform

The Project is located within an area consisting of flat to gently undulating agricultural land within the Black Creek and Rothbury Creek floodplain, situated in a low-lying valley between nearby ridgelines and several local peaks. Elevation across the broader landscape ranges from 0 m to 301 m AHD.

4.1.3 Water environment

Regionally, the Project is located within the Black Creek catchment. part of the broader Hunter River catchment. Black Creek is situated approximately 205 m west of the Project Area and is classified as a sixth-order watercourse under the Strahler Stream Classification System (Strahler, 1952). It flows south to north before joining the Hunter River approximately 16.5 km downstream. NSW Riverstyles mapping (NSW DCEEW, 2026) indicates Black Creek is in poor geomorphic condition with moderate recovery potential, reflecting extensive catchment disturbance.

The Project is not located within 40 m of waterfront land, which collectively comprises rivers, lakes, and estuaries.

A small dam is present in the northern portion of the Project Area, and a second farm dam is located adjacent to the Project Area to the north-east of the site.

The site is subject to flooding due to overland flow drainage from the local catchment and from regional (riverine) flooding of Black Creek. The existing flood environment at the site is characterised by shallow localised flooding during more frequent events and deep, high-hazard inundation during rare extreme floods, reflecting the site's location within a low-lying area of the Black Creek floodplain.

4.1.4 Climate

The Project is located within a temperate climatic region, with hot summers and no distinct dry season (BOM, 2026).

Rainfall is relatively uniform across the year, with slightly higher totals from November to March. Average annual rainfall is 762.2 mm.

4.1.5 Bushfire prone land

Bush fire prone land mapping identifies that the Project Area is designated as bushfire prone land.

The Project Area is mapped as Vegetation Category 3, representing a medium bush fire risk vegetation. Vegetation associated with Black Creek, located within the site to the west of the Project Area, is mapped as Vegetation Category 1, which represents highest bushfire risk due to its high combustibility and potential for intense fire behaviour and ember attack. The surrounding landscape is predominantly

grassland categorised as Category 3, with smaller localised areas of Category 1 vegetation comprising woodland and forested areas.

4.1.6 Environmental hazards

The Project is located in an area with limited environmental hazards. The most notable of these is the existing Rothbury Zone Substation and its associated transmission infrastructure located adjacent to the Project Area.

The preliminary risk screening undertaken as part of the Preliminary Hazard Analysis (PHA) (Sherpa Consulting, 2026) for the Project (Appendix N of the EIS) identified potential hazardous events involving a battery unit or transformer fire. These events were assessed as having the potential to generate off-site effects.

4.1.7 Aboriginal heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) (Apex Archaeology, 2026) (Appendix G of the EIS) prepared for the Project identified that the Project Area forms part of a broader cultural landscape that holds high cultural significance for local Aboriginal people.

Although an Aboriginal Heritage Information Management System (AHIMS) search did not identify any registered Aboriginal sites within the site, a pedestrian survey identified a potential archaeological deposit (PAD) in the western portion of the site, and subsequent excavation confirmed the presence of Aboriginal cultural material. This area was assessed as having moderate to high archaeological significance. The central portion of the site, where the Project would be located, is more disturbed and has lower archaeological sensitivity; however, full avoidance of Aboriginal cultural material is unlikely. Construction activities involving ground disturbance, such as excavation or trenching, have the potential to impact archaeological materials and stratigraphy.

4.2 Site history

The Project Area is part of the Wonnarua language group, with neighbouring groups including Geawegal, Darkinung, Worimi, Awabakal, Wiradjuri and Kamilaroi. Historical accounts describe shifting relationships between these groups, with conflict often associated with Kamilaroi expansion, which was eventually limited by European settlement. Before colonisation, Aboriginal communities in the central Hunter Valley lived in close connection with the land, with their cultural practices and social structures shaped by both tradition and environmental conditions.

The environment played a vital role in traditional life. Coastal groups relied on marine and estuarine resources, while inland communities such as those in the Hunter Valley depended on freshwater systems and terrestrial plants and animals. The region supported a variety of edible plants and animals, which were central to diet and cultural practices. Trade networks extended across large distances, with goods such as tools, fur, shells and glass exchanged between groups. Archaeological findings, including ground-edged axes made from materials sourced from Mount William in Victoria and Mount Isa in Queensland, highlight the reach of these cultural connections.

European settlement in the Rothbury area began in 1826 when Scottish settler John Campbell was granted land in the valley of Black Creek. The construction of the Great North Road between 1826 and 1836 played a key role in opening the Hunter Valley to further settlement by connecting Sydney with inland regions. From the 1820s, settlers established cattle and sheep farms, taking advantage of fertile river flats and surrounding grazing land. Vineyards began to appear in the 1860s.

The discovery of coal in the late 1800s transformed Rothbury's development. In 1892, coal was found on the former Campbell estate, leading to the opening of the Rothbury Colliery in 1910. A village was established in 1912 to house mine workers, followed by a public school in 1916. Rothbury's most notable historical event occurred in 1929 during an industrial dispute, when police fired on protesting miners, killing Norman Brown and injuring others. Known as the Rothbury Riot, it remains a significant moment in Australian labour history. By the 1920s, Rothbury had grown rapidly, supported by rail infrastructure and coal mining, reflecting the broader shift in colonial Australia from agriculture to industry.

4.3 Land use context

4.3.1 Land zoning

The Project is located on land that is zoned as 'RU2 Rural Landscape' under the Cessnock LEP, as shown in **Figure 4-1**. The objectives of the 'RU2 Rural Landscape' land use zone, as stated in the LEP are to:

- *Encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *Maintain the rural landscape character of the land.*
- *Provide for a range of compatible land uses, including extensive agriculture.*
- *Enable other compatible forms of development that are associated with rural activity and require an isolated location or support recreation.*
- *Ensure the type and intensity of development is appropriate in relation to the rural capability and suitability of the land.*
- *Maintain and enhance the scenic character of the land.*
- *Ensure development does not create unreasonable or uneconomic demands for the provision or extension of services or infrastructure by public authorities.*
- *Minimise disturbance to the landscape from development caused by vegetation clearing, earthworks, access roads and construction of buildings.*
- *Ensure development does not intrude into the skyline when viewed from a road or other public place.*

Land adjoining the Project Area is zoned predominantly for rural and infrastructure purposes. Land to the north is zoned 'RU2 Rural Landscape', while land to the east is zoned 'SP2 Infrastructure – Classified Road' (Wine Country Drive), with areas of 'RU2 Rural Landscape' beyond the road corridor.

Land to the south and west of the Project Area is zoned 'RU4 Primary Production Small Lots', which extends south from Old North Road and represents the prevailing zoning in that direction. Further south, a substantial area is zoned 'SP3 Tourist', while areas zoned 'R5 Large Lot Residential' are located to the west of the site. Bushland to the north-west is zoned 'C1 National Parks and Nature Reserves' and 'C3 Environmental Management'. Surrounding land use zones are shown on **Figure 4-1**.

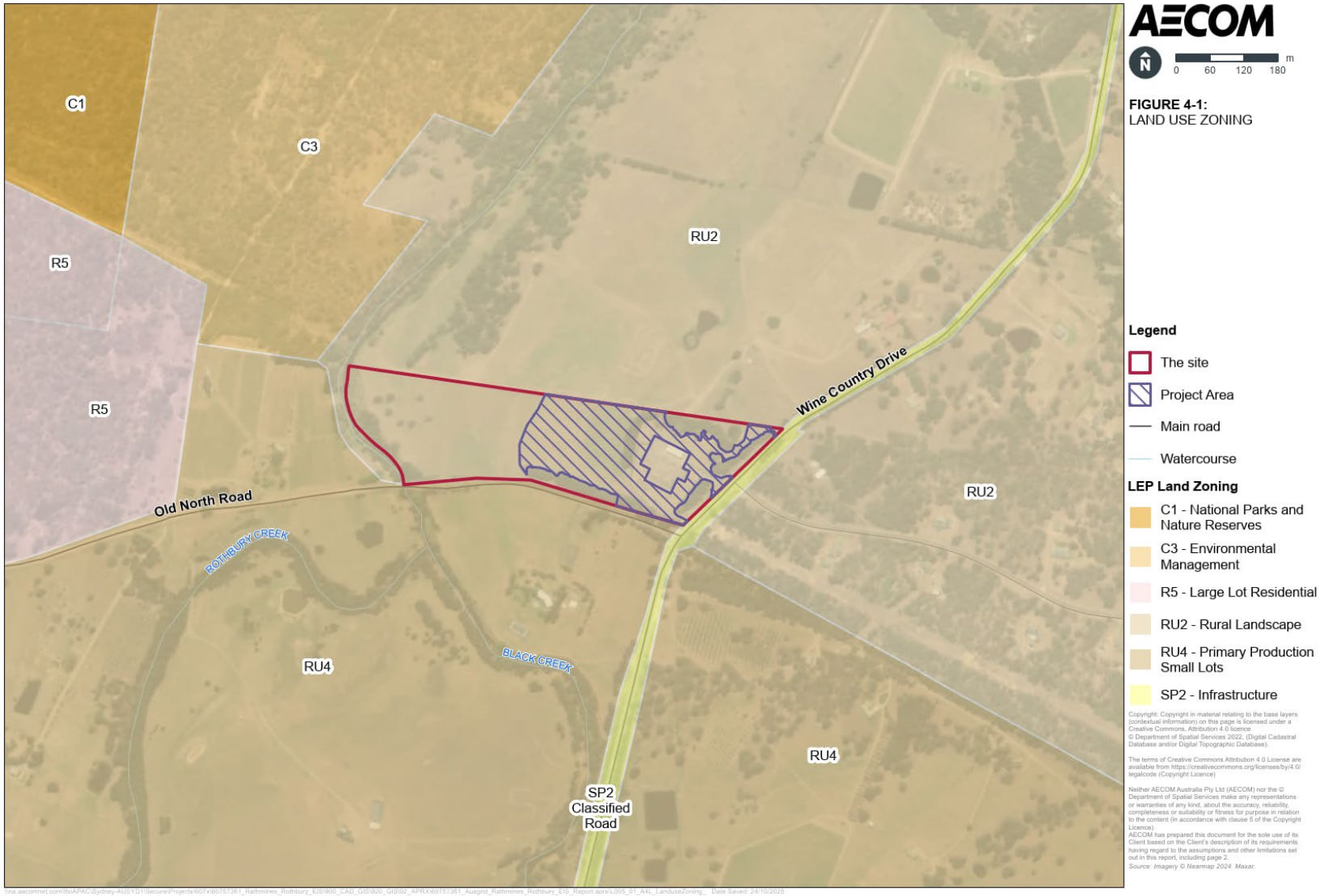

Figure 4-1: Land use zoning

4.3.2 Land use

4.3.2.1 Historic land use

Historical aerial imagery shows that the site has predominantly comprised cleared rural land since at least 1961, with limited and intermittent development over time. Early use included small dams and scattered vegetation, followed by periods of apparent agricultural use (likely vineyard rows) and the construction of a rural dwelling and associated outbuildings in the eastern portion of the site during the 1980s and 1990s. From the mid-2000s, the site transitioned to electricity infrastructure use with the construction and subsequent operation of Ausgrid's Rothbury Zone Substation, after which the remainder of the land has largely remained unchanged aside from vegetation growth, landscaping around the substation, and minor vegetation condition changes.

The surrounding area has historically comprised a mix of cleared rural land and commercial agricultural uses, particularly vineyards, with dispersed rural dwellings to the north, west and south. Over time, agricultural activity has fluctuated, and rural residential development has gradually increased, including additional dwellings, local roads and supporting infrastructure to the east and south-east of the site. While residential and commercial development has continued to expand in the broader locality, surrounding land uses remain characterised by a combination of rural, agricultural and electricity infrastructure uses.

4.3.2.2 Current land use

The Project would be located in land entirely owned by Ausgrid. The main existing land use of the site is the existing Rothbury Zone Substation and associated infrastructure in the eastern portion of the site. In addition, an existing 132 kV overhead transmission line connecting to the Rothbury Zone Substation also crosses the site. The Project would be located in the central portion of the site, to the west of the existing substation. The remainder of the site comprises undeveloped cleared rural grassland with planted trees and vegetation along the perimeter of the site and surrounding the Rothbury Zone Substation. Review of the NSW land use spatial dataset (DPE, 2017) identified that the land uses within the site are classified as "Residential and Farm Infrastructure" and "Grazing Modified Pastures", as shown in Figure 6.5-1.

Surrounding land uses comprise a mix of rural, agricultural, infrastructure, tourism and low-density residential activities, reflecting the established rural character of the locality. The NSW land use spatial dataset identifies that land immediately adjoining the site includes "River" (Black Creek) to the west, "Perennial Horticulture" to the north, and "Transport and Communications" to the south and east, comprising Old North Road and Wine Country Drive.

Land uses surrounding the site are predominantly rural and agricultural in nature. Rural land and small lot primary production uses are prevalent to the south and west of the Project Area, with vineyards and other agricultural activities occurring throughout the locality. Wine Country Drive forms a key regional transport corridor along the eastern boundary of the site. Tourism and wine related activities, including viticulture and visitor accommodation, are present to the south, while low density residential development occurs to the north and west. Bushland areas to the north-west contribute to the broader landscape setting.

5.0 Review of proposed land use change

5.1 Proposed land use

The Project involves the construction and operation of a BESS, which are defined as 'electricity generating works' under State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP). Under section 2.36 of this policy, electricity generating works may be carried out by any person with consent on any land in a prescribed non-residential zone.

The Project is located in land zoned as 'RU2 Rural Landscape' under the Cessnock LEP, which is one of the prescribed non-residential zones defined in section 2.35 of the Transport and Infrastructure SEPP. On this basis, the Project would be permissible with development consent.

The Project would extend and intensify the existing electricity infrastructure use within the 'RU2 Rural Landscape' zone through the introduction of a permanent energy storage system and associated ancillary infrastructure on land immediately west of the Rothbury Zone Substation.

The Project would operate primarily as an unmanned, long term electricity infrastructure use in close physical and functional association with the existing substation and electrical infrastructure.

Accordingly, the Project represents a continuation of electricity related use on the site, rather than the introduction of a new or unrelated land use. The site would remain as land zoned 'RU2 Rural Landscape'.

5.2 Compatibility with surrounding land uses

The Project is compatible with the surrounding land uses due to its infrastructure-based function, low intensity operational requirements, and proximity to the existing Rothbury Zone Substation and associated infrastructure.

The operation of the Project does not introduce sensitive land uses or intensive human activity and would operate largely unattended, with interactions limited to periodic maintenance and monitoring activities.

As outlined in **Table 1-1**, the surrounding land uses comprise a mix of rural, agricultural, infrastructure, tourism and low density residential uses, many of which already coexist with electricity infrastructure in the locality. The Project aligns with this established land use pattern, particularly given its location within an existing electricity infrastructure corridor. Its operational characteristics are consistent with surrounding rural and infrastructure uses and would not require changes to how neighbouring land is currently used.

As the Project extends an existing electricity related land use rather than introducing a new or incompatible activity, it is considered compatible with the surrounding land use context.

Potential interactions with neighbouring land uses are further considered within this LUCRA with respect to matters such as local amenity, environmental protection and operational safety. Further details are provided in **Table 5-1**.

Table 5-1: Potential conflicts with neighbouring land uses

Environmental topic	Interaction during construction	Interaction during operation	Summary
Biodiversity	Construction activities have the potential to indirectly affect adjoining land through disturbance to vegetation and habitat near the site boundary. Activities such as vegetation clearing, earthworks and vehicle movements may result in localised soil disturbance, erosion or sediment mobilisation, which could extend onto neighbouring properties where remnant vegetation occurs close to the boundary. Short-term noise, dust and light spill may also temporarily disturb fauna habitat on adjacent land. These impacts could influence local environmental quality and increase land management considerations for neighbouring rural landholders, although effects are expected to be localised and minor given the limited extent of vegetation removal and the modified landscape context.	During operation, indirect impacts on neighbouring land uses are expected to be limited. The Project affects only edge vegetation and does not involve areas important for habitat connectivity; therefore, no reduction in landscape-scale connectivity is anticipated. Ongoing edge effects on remnant vegetation on adjacent land may occur, such as increased exposure to weed invasion or gradual changes in vegetation condition, but these would be minor and consistent with existing land use patterns in the surrounding fragmented landscape. Operational noise, lighting and activity levels are not expected to materially alter habitat condition or land use on neighbouring properties.	Potential indirect biodiversity impacts on neighbouring land primarily relate to localised vegetation disturbance during construction and minor edge effects during operation. These impacts will be addressed through standard construction and operational mitigation measures, including clearly defined disturbance limits, vegetation protection, weed and biosecurity controls, and management of noise, dust and lighting. With these measures in place, impacts are expected to remain localised and low in magnitude and are unlikely to impose constraints on adjoining rural land uses. Overall, the risk of land use conflict associated with indirect vegetation and habitat impacts is considered low.
Aboriginal heritage	Aboriginal cultural heritage impacts, if they occur, would be confined to ground-disturbing construction activities within the Project Area. The Aboriginal Cultural Heritage Assessment Report (ACHAR) (Appendix G of the EIS) identified an area of moderate to high archaeological significance within the western portion of the site; however, any disturbance within the Project Area would not extend into this area. Construction impacts would not alter the existing or approved land use of neighbouring properties, nor would they impose constraints on the ongoing use of surrounding land for rural, residential, agricultural or infrastructure purposes. Accordingly, construction-related Aboriginal heritage impacts are not expected to result in land use conflict with adjoining land.	No impacts on Aboriginal cultural heritage values are expected during operation, as operational activities do not involve ground disturbance. There would be no ongoing heritage-related restrictions or requirements affecting neighbouring land uses, and no changes to land management or use of adjacent properties would be required during the operational phase.	Potential Aboriginal cultural heritage impacts are limited to construction and confined to the Project Area. An Aboriginal Cultural Heritage Management Plan (ACHMP) will be implemented in consultation with Registered Aboriginal Parties to manage impacts, including avoidance measures, unexpected finds procedures and cultural heritage awareness training. With these measures in place, impacts will not extend to neighbouring land or constrain surrounding land uses. The overall risk of land use conflict associated with Aboriginal cultural heritage is considered low.
Soils and contamination	Construction activities involving vegetation removal, earthworks, excavation, soil handling and vehicle movements have the potential to destabilise and expose soils within the Project Area. Disturbed soils may be susceptible to erosion, sediment mobilisation and dust generation, which could, if unmanaged, extend beyond the site boundary via wind or stormwater runoff and affect soils on neighbouring properties or adjacent drainage features. There is also a potential for localised soil contamination associated with accidental spills or leaks of fuels, oils or other hazardous substances during construction. However, no existing soil contamination has been identified in the surrounding area, and underlying low-permeability geology limits the potential for contaminant migration to adjoining land uses.	During operation, no excavation or routine soil disturbance is proposed, and the potential for erosion or sediment mobilisation affecting neighbouring land is negligible. Operational activities involve limited handling of fuels, oils and other potentially contaminating substances within a largely hardstand area. While accidental spills could occur, the likelihood of contaminants migrating to adjoining properties is low, and operational activities are not expected to alter soil conditions or land management requirements on neighbouring land.	Potential soil erosion, sedimentation and contamination impacts are primarily associated with construction and would be localised to the Project Area. Mitigation and management measures will be implemented during construction and operation, including soil handling protocols, erosion and sediment controls, and spill prevention and response procedures. With these measures in place, impacts on soils beyond the site boundary are unlikely, and the Project is not expected to impose constraints on surrounding land uses. Overall, the risk of land use conflict associated with soils and contamination is considered low.
Visual amenity	Construction activities, including temporary infrastructure, plant and machinery, will be visible from nearby sensitive visual receptors, including neighbouring residential dwellings, tourist accommodation and winery uses. In some locations, views of construction works will be direct and not fully screened by existing vegetation. The scale of construction activity and temporary vegetation removal will result in a high magnitude of visual change in the short term, which may temporarily affect visual amenity, rural character and the visitor experience associated with surrounding land uses. These construction-related visual impacts have the potential to give rise to short-term land use conflict due to the importance of scenic quality and landscape character to nearby residential and tourism-related uses.	During operation, visual impacts on neighbouring land uses are expected to be low. Existing vegetation surrounding the site will substantially screen and filter views of operational infrastructure, limiting visibility from adjacent properties and public viewing locations. While some infrastructure elements are taller and visually distinct, they are consistent with the scale and character of existing rural infrastructure in the broader landscape. Operational visual impacts are not expected to be visually intrusive or to disrupt landscape character, amenity or the ongoing function of surrounding residential, rural or tourism-related land uses.	Visual amenity impacts are primarily associated with the construction phase and are temporary, localised and confined to the duration of construction. A range of mitigation measures, including retention of existing vegetation and landscape screening and planting, will be implemented to minimise visual impacts and reduce the potential for land use conflict. Over time, these measures will further soften views of the Project and reinforce visual separation from surrounding land uses. On balance, while short-term construction impacts may occur, operational impacts will be low, and the overall risk of ongoing land use conflict associated with visual amenity is considered low.

Environmental topic	Interaction during construction	Interaction during operation	Summary
Noise and vibration	Construction noise and vibration have the potential to temporarily affect amenity for nearby noise-sensitive land uses, including rural residences, vineyards and accommodation uses, through nuisance, disturbance to daily activities and changes to the local sense of place. The Noise and Vibration Impact Assessment identified a small number of residential receivers that may experience noise levels above relevant management levels during certain construction scenarios. These impacts would be temporary and confined to the construction period. Construction traffic noise increases are predicted to be minimal, with relative increases of less than 2 dB(A), which are generally barely perceptible and unlikely to give rise to land use conflict.	Operational noise modelling indicates that, without controls, Project noise could exceed relevant trigger levels at some nearby noise-sensitive receivers. With the inclusion of a permanent noise barrier around the battery units, only minor night-time exceedances of up to 2 dB(A) are predicted at a small number of receivers, which are considered barely perceptible and negligible in terms of amenity impact. Operational traffic noise is not expected to exceed relevant criteria, and no vibration impacts are predicted during operation. Operational noise is therefore not expected to materially affect amenity or constrain surrounding land uses.	Noise and vibration impacts are primarily associated with the construction phase and are temporary in nature. Mitigation measures, including construction noise management and permanent operational noise controls such as a noise barrier, have been incorporated to minimise impacts. Residual operational noise effects are minor, localised and unlikely to affect amenity or land use function. On this basis, the Project is not expected to result in unacceptable noise or vibration impacts on neighbouring properties, and the overall risk of land use conflict is considered low.
Traffic and transport	Construction of the Project will result in a temporary increase in vehicle movements on roads surrounding the site, including heavy vehicles accessing the Project Area. These movements have the potential to interact with neighbouring rural residential, agricultural and tourism-related land uses through short-term increases in traffic noise, temporary changes to local road conditions, and altered access arrangements. Construction traffic may also result in minor delays and reduced travel efficiency on local roads, which could temporarily affect access to adjoining properties and nearby land uses. These impacts have the potential to give rise to short-term land use conflict during the construction period.	During operation, traffic generated by the Project will be minimal and limited to infrequent vehicle movements associated with routine maintenance and monitoring. Operational traffic volumes will be negligible in the context of the surrounding road network and are not expected to affect access, traffic conditions or amenity for neighbouring properties or surrounding land uses. As a result, no ongoing traffic-related land use conflicts are anticipated during operation.	Traffic and transport impacts are primarily associated with the construction phase and are temporary and localised. Mitigation measures identified in the Traffic Impact Assessment (Appendix K of the EIS), including traffic management controls and scheduling of vehicle movements, will be implemented to minimise disruption to surrounding land uses. With these measures in place, construction-related impacts are not expected to impose lasting constraints on neighbouring properties, and operational impacts will be negligible. Overall, the risk of land use conflict associated with traffic and transport is considered low.
Surface water, groundwater and flooding	The Project is located near Black Creek and within mapped flood-prone land, meaning that changes to runoff behaviour, flood conveyance or sediment movement could, if they occurred, give rise to land use conflict with adjoining rural properties through increased flood risk, altered drainage patterns or off-site impacts during flood events. Temporary earthworks and soil exposure during construction have the potential to increase runoff and sediment mobilisation, which could affect neighbouring land or downstream environments associated with Black Creek. No groundwater extraction or deep excavation is proposed, and construction will not intercept groundwater or alter groundwater levels relied upon by surrounding land uses. As a result, construction is not expected to adversely affect neighbouring properties or impose constraints on surrounding rural land uses.	During operation, the Project will not extract groundwater, discharge operational wastewater, or introduce contaminants to surface water or groundwater systems. Permanent drainage infrastructure will manage stormwater runoff to maintain pre-development flow conditions, and the Project design avoids interference with flood behaviour, conveyance or storage. The Project will not increase flood risk or alter drainage conditions on adjacent properties or land use zones. Accordingly, no adverse surface water, groundwater or flooding impacts on neighbouring land uses are anticipated during operation, and no land use conflict is expected.	Surface water, groundwater and flooding impacts have been considered due to the site's proximity to Black Creek and flood-prone land. Construction and operation have been designed to avoid obstruction of flood conveyance, flood storage areas and existing overland flow paths. With standard erosion, sediment and stormwater controls during construction and permanent drainage infrastructure during operation, the Project is not expected to increase flood risk or result in adverse water-related impacts on neighbouring land uses. Overall, the risk of land use conflict associated with surface water, groundwater and flooding is considered low.
Hazards and risk	Construction activities for the Project do not involve the storage or operation of hazardous materials at a scale that would pose a risk to surrounding land uses. Standard construction activities would not generate off-site hazard impacts capable of affecting neighbouring properties, sensitive receptors or land use function. As a result, construction is not expected to give rise to land use conflict associated with hazards or risk.	A Preliminary Hazard Analysis (PHA) prepared for the Project (Appendix N of the EIS) identified credible hazard scenarios associated with operation of the Project, primarily relating to battery unit or transformer fire. In a worst-case event, such incidents could result in heat radiation, localised fire spread and the release of toxic or potentially explosive combustion products. The PHA indicates that off-site impacts would be largely contained within the Project Area, with minor irritation effects potentially extending up to approximately 8 m beyond the northern site boundary. Land to the north is zoned RU2 Rural Landscape and does not contain residential or other sensitive receptors within the predicted impact area. The likelihood of such events is assessed as rare, and operational hazards are not expected to adversely affect neighbouring land uses or constrain their ongoing use.	Hazard and risk considerations are primarily associated with operation of the Project and have been assessed through a PHA. The Project has been designed to maintain substantial separation distances from sensitive receptors, and mitigation measures, including fire protection systems, emergency response procedures and compliance with relevant standards, will be implemented. With these measures in place, off-site impacts are expected to be minimal, and surrounding land uses will not be subject to unacceptable risk or land use constraints. Overall, the risk of land use conflict associated with hazards and risk is considered low.

Environmental topic	Interaction during construction	Interaction during operation	Summary
Air quality	During construction, the Project has the potential to generate temporary air quality impacts, primarily from airborne dust associated with earthworks and ground-disturbing activities, as well as exhaust emissions from construction vehicles, plant and equipment. If unmanaged, these emissions could result in short-term amenity impacts on nearby properties through nuisance dust deposition or localised reductions in air quality, particularly affecting sensitive receptors such as nearby residents or individuals with pre-existing respiratory conditions. However, construction-related emissions are expected to be localised, intermittent and short-term, reflecting the temporary nature of construction activities and the separation distance to surrounding land uses.	During operation, air quality impacts are expected to be negligible. Minor and highly localised dust and exhaust emissions may be generated by infrequent vehicle movements associated with routine inspection, maintenance and occasional repair activities. Given the very low level of operational traffic, such emissions are unlikely to be perceptible beyond the site or to affect amenity or health outcomes for neighbouring properties or surrounding land uses. No ongoing air quality constraints on adjacent land are anticipated during operation.	Air quality impacts are primarily associated with the construction phase and are temporary in nature. Mitigation measures, including best-practice dust suppression, management of exposed surfaces, and maintenance of vehicles and equipment, will be implemented to minimise emissions and protect amenity. With these measures in place, construction-related impacts are not expected to result in a measurable deterioration of air quality at neighbouring properties. Operational emissions will be negligible. Overall, the risk of land use conflict associated with air quality impacts is considered low.

6.0 Land use conflict risk assessment

6.1 Risk evaluation methodology

The risk ranking matrix provided in the *Land Use Conflict Risk Assessment Guide* (NSW DPI, 2011) and reproduced in **Table 6-1**, has been used to rank identified potential land use conflicts. It assesses the environmental, public health and amenity impacts according to the probability of occurrence and consequence of the impact.

Table 6-1: Risk ranking matrix

Probability	A	B	C	D	E
Consequence					
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

The risk ranking matrix provides a risk ranking from 25 to 1. It covers each combination of five levels of 'probability' (a letter A to E as defined in **Table 6-2** and five levels of 'consequence' (a number 1 to 5 as defined in **Table 6-3**) to identify the risk ranking of each impact. For example, an activity with a 'probability' of D and a 'consequence' of 3 creates a risk rank of 9.

Table 6-2: Probability definitions

Level	Descriptor	Description
A	Almost certain	Common or repeating occurrence
B	Likely	Known to occur, or 'it has happened'
C	Possible	Could occur, or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically impossible

Table 6-3: Consequence table descriptions

Level	Descriptor	Description
1	Severe	• Severe and/or permanent damage to the environment Irreversible • Severe impacts on the community • Neighbours are in prolonged dispute and legal action involved.
2	Major	• Serious and/or long-term impact to the environment • Long-term management implications • Serious impact on the community • Neighbours are in a serious dispute.
3	Moderate	• Moderate and/or medium-term impact to the environment and community • Some ongoing management implications • Neighbour disputes occur.

Level	Descriptor	Description
4	Minor	• Minor and/or short-term impact to the environment and community • Can be effectively managed as part of normal operations • Infrequent disputes between neighbours.
5	Negligible	• Very minor impact to the environment and community • Can be effectively managed as part of normal operations • Neighbour disputes unlikely

6.2 Initial risk evaluation

This section presents the initial land use conflict risk evaluation for the Project, based on the potential conflicts identified in **Table 5-1**. It identifies the Project activities with the potential to give rise to land use conflicts, describes the nature of the potential conflicts associated with each activity, and assigns an initial risk rating assuming no mitigation or management measures are implemented.

Potential sources of land use conflict associated with the Project have been identified and are outlined in **Table 6-4**.

6.3 Risk reduction controls

In accordance with the *Land Use Conflict Risk Assessment Guide* (NSW DPI, 2011), risk reduction focuses on identifying management strategies that lower either the likelihood or the consequence of potential conflict.

Measures that reduce likelihood may include improved procedures, adoption of new technologies or implementation of operational controls. Measures that reduce consequences may involve providing mechanisms to limit the scale or duration of impacts, enhancing communication processes, or establishing protocols that support early response.

The aim of applying risk reduction controls is to reduce the overall risk ranking to a score of 10 or below.

A revised risk evaluation for the potential sources of conflict associated with the Project is provided in **Table 6-4**.

Table 6-4: Initial and revised risk rankings

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
Construction	Off-site disturbance to vegetation and habitat on adjoining land	D	4	5	**Site selection:** • Locating the Project in already disturbed or cleared areas • Avoiding creeks, waterbodies, conservation reserves and sensitive aquatic habitats • Avoiding TECs, important habitat areas, connectivity corridors and dense remnant vegetation • Positioning Project infrastructure outside buffers to breeding habitat features (e.g., nest trees, caves) • Prioritising areas where vegetation is in the poorest condition. **Project design and layout:** • Minimising the overall vegetation clearing footprint • Confining vegetation removal to lower-value edge areas • Co-locating infrastructure next to existing facilities, such as the Rothbury Zone Substation • Placing ancillary facilities in areas without biodiversity values • Use the existing access point and track off Old North Road to avoid new disturbance areas. **Rehabilitation and maintenance:** • Rehabilitating disturbed areas after construction • Implementing ecological restoration of retained vegetation • Maintaining retained vegetation to stabilise edges and reduce off-site degradation risks.	D	5	2
Construction	Edge effects on remnant vegetation on neighbouring properties	D	4	5	**Minimising disturbance at vegetation edges:** • Limiting clearing to lower-value edge vegetation only • Maintaining buffers between construction areas and higher-value adjacent vegetation • Avoiding unnecessary disturbance beyond the Project Area. **Weed and pest management:** • Implementing a Weed Management Plan targeting edge areas with higher weed susceptibility • Conducting pre-construction weed control to reduce existing seed sources • Implementing clean-down protocols for vehicles, plant and equipment entering/exiting the Project Area. **Erosion and sediment control:** • Installing erosion and sediment controls to stabilise exposed soil near boundaries in accordance with a Soil and Water Management Plan as part of a CEMP • Using mulch or temporary groundcover to protect newly exposed edges. **Vegetation protection and restoration:** • Fencing or flagging sensitive vegetation edges to prevent accidental encroachment • Rehabilitating disturbed edges to improve vegetation structure and resilience • Undertaking ongoing maintenance of retained vegetation to limit decline in condition.	D	5	2
Construction	Indirect degradation of adjacent land from weed/pathogen spread and incidental disturbance (e.g., trampling, rubbish dumping, bush rock removal)	D	4	5	**Biosecurity measures:** • Implementing a Weed Management Plan as part of the CEMP, including measures to prevent the introduction and spread of weeds, pests and pathogens. These measures will include ensuring all machinery and equipment arrive onsite clean, implementing hygiene and wash-down protocols, inspecting all incoming materials, and undertaking ongoing weed monitoring, control and reporting programs	D	5	2

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
					• Appropriately storing and handling soil and imported materials to prevent contamination of adjoining land **Access management:** • Installing boundary fencing and signage to prevent unauthorised access into adjoining vegetated areas • Clearly delineating work zones and restricting movement of personnel and machinery • Providing designated internal access tracks to avoid trampling of groundcover or informal tracks forming. **Site management during construction:** • Manage spoil, waste and construction materials in line with the Waste Management Plan to prevent off-site transport • Prohibiting bush rock removal and implementing controls to stop incidental habitat disturbance • Implementing dust suppression to reduce deposition on adjacent vegetation. **Rehabilitation and containment:** • Stabilising and revegetating disturbed areas promptly to reduce ongoing weed establishment • Maintaining boundary areas to prevent off-site spread of weeds or materials.			
Construction	Temporary disturbance to vegetation and fauna habitat on neighbouring properties from construction-related noise, dust and light spill, causing short-term displacement of fauna	C	4	8	**Site management during construction:** • Managing noise by using quieter equipment, maintaining machinery, installing temporary barriers where required, and limiting noisy works to standard hours. Measures will be included in a Construction Noise and Vibration Management Plan (CNVMP) • Implementing dust suppression (water carts, covered stockpiles, avoiding works in high winds) • Directing lighting away from adjacent vegetation and using low-spill or motion-activated fittings • Staging works to minimise prolonged disturbance and allow fauna to temporarily relocate • Undertaking pre-clearing/fauna checks and having an ecologist available if needed • Incorporating controls into the CEMP and adjusting measures if excessive noise, dust or light spill occurs.	D	4	5
Construction	Potential disturbance of Aboriginal cultural material within the Project Area during construction activities.	B	4	12	**Project design and layout:** • Project Area located to avoid area identified as having moderate-high sensitivity for Aboriginal finds. **Site management during construction:** • An Aboriginal Cultural Heritage Management Plan (ACHMP) will be prepared in consultation with the RAPs • Implementing avoidance strategies where feasible • Applying unexpected finds procedures during all ground-disturbing works • Providing cultural heritage awareness training for construction personnel.	C	4	8
Construction	Construction activities involving fuels, oils and other hazardous materials present a risk of accidental spills or leaks, which could lead to contamination migrating onto adjoining properties	C	4	8	**Site management during construction:** • Project CEMP to include Emergency Response Procedures consistent with relevant regulations to protect personnel, public and environment • Spill kits kept in all site vehicles; spills to be contained and made safe immediately, with the site environmental representative notified • Hazardous materials (chemicals, fuels, oils) to be handled and stored in accordance with Australian Standards and *Storing and Handling of Liquids: Environmental Protection – Participants Handbook* (DECC 2007) • Diesel stored on an impermeable, bunded surface sized to 110% of tank volume to prevent leaks entering stormwater systems.	D	5	2

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
Construction	Direct views of construction activities by nearby sensitive receivers resulting in temporary reduced visual amenity and landscape character valued by neighbouring land uses	B	4	12	**Project design and layout:** • Retaining existing trees and vegetation that provides boundary screening as far as practicable during design development • Limiting the Construction Footprint as far as practicable. **Site management during construction:** • Limiting removal of boundary-screening vegetation • Protecting retained trees through exclusion zones and TPZs in accordance with *AS 4970:2009 Protection of Trees on Development Sites*, including exclusion fencing. • Installing well-presented site fencing with shade cloth (or similar) during construction to reduce visual impacts. Shade cloth to be removed upon completion of construction • Incorporating all landscape and visual controls into the final Landscape Plan and CEMP for implementation during construction • Rehabilitating all non-operational disturbed areas in accordance with the final landscape plan.	C	4	8
Construction	Exposure of nearby noise sensitive receivers to construction noise and vibration resulting in potential nuisance and disruption to daily activities	B	4	12	**Site management during construction:** • Limiting high-noise activities to standard construction hours and sequencing works to minimise prolonged disturbance at nearby sensitive receivers • Selecting quieter plant and equipment, maintaining machinery regularly, and fitting effective noise suppression (e.g., mufflers) • Stationary noise sources will be enclosed or shielded as far as practicable • Installing temporary noise barriers or site hoarding in locations where exceedances are predicted or observed • Locating stationary plant away from sensitive receivers and maximising separation distances where practicable • Implementing vibration-minimising construction methods and avoiding high-vibration activities near sensitive structures unless necessary • Monitoring noise and vibration at site boundaries and adjusting work methods if management levels are approached or exceeded • Providing advance notification to nearby receivers of upcoming high-noise activities and expected durations • Including all controls in a Construction Noise and Vibration Management Plan, forming a sub-plan to the CEMP, with regular review of effectiveness during construction	C	4	8
Construction	Exceedance of noise management levels during construction at noise sensitive receivers	B	4	12	**Site management during construction:** • Limiting high-noise activities to standard construction hours and sequencing works to minimise prolonged disturbance at nearby sensitive receivers • Selecting quieter plant and equipment, maintaining machinery regularly, and fitting effective noise suppression (e.g., mufflers) • Installing temporary noise barriers or site hoarding in locations where exceedances are predicted or observed • Locating stationary plant away from sensitive receivers and maximising separation distances where practicable • Monitoring noise at site boundaries and adjusting work methods if management levels are approached or exceeded • Providing advance notification to nearby receivers of upcoming high-noise activities and expected durations • Including all controls in a Construction Noise and Vibration Management Plan, forming a sub-plan to the CEMP, with regular review of effectiveness during construction.	C	4	8

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
Construction	Temporary increase in construction traffic, including heavy vehicle movements, may affect neighbouring land uses through a change in road conditions, altered access arrangements and short-term delays on local roads	C	4	8	**Traffic management during construction:** • Preparing and implementing a CTMP in accordance with *AS 1742.3:2019*: *Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and *Work Health and Safety Regulation 2017* to include: - Construction traffic volumes, vehicle types, work staging, and haulage routes (including light vehicles, heavy vehicles and OSOM movements) - Mapping of primary haulage routes and identifying critical locations - Traffic management controls for B-double movements and any shuttle bus services for workers - Road maintenance contribution procedures and complaints management processes. - Local climatic conditions affecting road safety (e.g. fog, wet or dusty conditions) - Onsite traffic controls (speed limits, driver behaviour, dust suppression, access track maintenance). - Controls for loading/unloading activities and material storage areas. • Implementation of road upgrades on Old North Road and intersection upgrades at Old North Road/Wine Country Drive intersection in consultation with Cessnock City Council and Transport for NSW.	D	4	5
Construction	Altered surface water runoff and flow paths during construction, with potential off-site drainage impacts on adjoining land	D	4	5	**Project design and layout:** • Incorporating stormwater management infrastructure sized to manage altered runoff volumes and flow paths • Designing earthworks and drainage features to maintain existing overland flow directions where practicable and avoid redirecting flows toward neighbouring properties • Integrating temporary and permanent erosion and sediment control measures into the design to minimise downstream impacts. **Site management during construction:** • Maintaining existing drainage paths where possible and installing temporary diversion drains, bunds and check dams to control runoff during works • Ensuring construction stormwater is captured, treated and discharged in a controlled manner to prevent off-site impacts • Monitoring runoff and drainage conditions at site boundaries and adjusting controls if flow towards adjoining properties is observed.	D	5	2
Construction	Earthworks and temporary soil exposure may increase erosion and sediment mobilisation, causing potential sedimentation or water quality impacts in Black Creek and downstream environments, with associated effects on neighbouring properties reliant on these watercourses	D	4	5	**Site management during construction:** • Implementing an Erosion and Sediment Control Plan (ESCP) as part of a Soils and Water Management Plan (SWMP) in accordance with the “Blue Book” (Landcom, 2004), including regular inspection and maintenance of controls after rainfall events • Ensuring construction stormwater is captured, treated and discharged in a controlled manner to prevent off-site impacts • Monitoring runoff and drainage conditions at site boundaries and adjusting controls if flow towards adjoining properties is observed.	D	5	2
Construction	Dust generation causing reduced amenity and potential health impacts for neighbouring properties	D	4	5	**Site management during construction:** • Modifying dust-generating activities during adverse weather (hot, dry, windy conditions) • Minimising exposed surfaces and covering stockpiles where practicable • Minimising spoil handling during excavation and loading • Suppressing dust on stockpiles, unsealed areas and exposed surfaces using water carts, sprinklers or stabilisation methods during dry conditions • Prohibiting burning of material onsite • Undertaking visual dust monitoring to verify control effectiveness and enable early intervention	D	5	2

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
					• Covering all vehicle loads during transport • Using wheel washes or shaker grids to minimise tracking of dirt onto public roads • Maintaining plant and equipment in good condition and turning off vehicles and machinery when not in use • Including all air quality controls in a CEMP which will be implemented during construction.			
Operation	Handling and storage of fuels, oils and other hazardous substances may result in spills or leaks, creating a potential pathway for contamination to move off-site	D	4	5	**Site management during operation:** • Handling and storing hazardous materials (chemicals, fuels, oils) in accordance with Australian Standards and *Storing and Handling of Liquids: Environmental Protection – Participants Handbook* (DECC, 2007) • Including Emergency Response Procedures in an Operation Environmental Management Plan (OEMP) to be implemented during operation.	E	5	1
Operation	Visibility of operational infrastructure resulting in reduced visual amenity for nearby sensitive receivers	D	4	5	**Site management during operation:** • Using a neutral colour palette for operational structures (e.g., noise barriers and buildings) to minimise visual prominence • Maintaining retained trees and boundary vegetation to preserve long-term screening and reduce visibility of operational infrastructure • Maintaining landscaping established during construction in accordance with the final Landscape Plan, including replacement planting where required • Ensuring perimeter planting matures to provide effective ongoing visual screening for adjoining properties • Maintaining site fencing and operational infrastructure in a tidy, well-presented condition to reduce visual clutter • Including all measures in the final landscape plan and OEMP to be implemented during operation.	D	5	2
Operation	Exceedance of noise management levels during operation, resulting in reduced amenity at nearby noise sensitive receivers	C	4	8	**Site management during operation:** • Installing a permanent 8 m high noise barrier around the battery units to minimise noise impacts • Undertaking attended operational noise measurements at commencement of operation in accordance with *AS 1055:2018 Acoustics – Description and measurement of environmental noise* and the *NSW Noise Policy for Industry* to verify compliance • Conducting attended noise monitoring in response to any noise-related complaints • Preparing and implementing an Operational Noise Management Plan outlining measures to achieve compliance with Project noise trigger levels, including ongoing operational noise monitoring and management actions.	C	5	4
Operation	Contamination, erosion or sedimentation of Black Creek resulting in a degradation of watercourse health and quality, in-turn affecting the health of neighbouring livestock or licensed users using nearby watercourses as a water source	D	4	5	**Site management during operation:** • Installing and maintaining a stormwater quality treatment train to prevent contaminated or sediment-laden runoff entering Black Creek and other nearby waterbodies • Inspecting and maintaining erosion and sediment controls, especially after rainfall • Storing hazardous materials in bunded, weather-protected areas to prevent spills reaching waterways • Stabilising surfaces and maintaining vegetation to minimise erosion • Monitoring water quality at discharge points and responding to any exceedances • Implementing spill response procedures to contain and clean up incidents before entering Black Creek or other nearby waterbodies • Maintaining access tracks and drainage to reduce sediment transport • Including measures in an OEMP and implementing during operation.	E	5	1

Activity	Potential conflict	Initial risk rating			Risk reduction control	Revised risk rating		
		Probability	Consequence	Risk rating		Probability	Consequence	Risk rating
Operation	Potential for altered surface water runoff and localised flooding behaviour due to increased hardstanding, which may modify flow paths and create off-site drainage impacts on neighbouring properties	C	4	8	**Site management during operation:** • Installing and maintaining permanent drainage infrastructure including a drainage channel to convey flows west to Black Creek • Regularly inspecting and clearing drainage paths to ensure design flow capacity is retained, particularly after heavy rainfall • Ensuring all hardstand areas drain to designated stormwater controls to avoid uncontrolled overland flow • Stabilising and maintaining surrounding ground surfaces to minimise erosion and prevent sediment from obstructing drainage features • Monitoring site discharge points during significant rainfall events and adjusting controls if off-site drainage impacts are observed • Including all operational drainage and flood-management controls in the OEMP for ongoing implementation and adaptive management.	D	5	2
Operation	Potential off-site effects from a battery unit or transformer fire, including heat radiation and minor dispersion of combustion products, which could temporarily restrict access, disrupt neighbouring activities, or reduce the suitability of adjoining land for its intended use during an incident	D	3	9	**Site management during operation:** • Implementing preventative measures such as inclusion of appropriate asset protection zones, and vegetation management • Operating the Project in accordance with relevant international and Australian standards and approved guidelines • Using certified electrical contractors and trained, authorised personnel for all operation and maintenance activities, in line with approved procedures • Implementing site induction and training for all staff, with restricted access to authorised personnel only; only certified personnel permitted to access battery units • Implementing endorsed electrical safety systems, including switch-in/switch-out protocols and BMS fault detection with automatic safety shut-off • Including hazardous materials and dangerous goods controls in the OEMP, consistent with Australian Standards, including *AS 1940: The storage and handling of flammable and combustible liquids* • Undertaking a condition-monitoring program during equipment maintenance and calibration etc. • Preparing and implementing an Emergency Response Plan and a Pollution Incident Response Management Plan.	E	4	3

6.4 Performance monitoring

The effectiveness of mitigation and management measures will be monitored through internal audits and ongoing consultation with affected receivers and stakeholders. Audits and engagement activities will be undertaken in accordance with the measures outlined in the EIS and the Project's environmental management plans for construction and operation.

The Project's CEMP and OEMP will describe how activities are to be undertaken and specify the controls required to avoid or minimise impacts on the environment and sensitive receivers. Where required, dedicated sub-plans for key environmental aspects will be prepared under each plan. Sub-plans under the CEMP and OEMP may include:

- Biodiversity Management Plan
- Weed Management Plan
- Aboriginal Cultural Heritage Management Plan
- Soil and Water Management Plan, including an Erosion and Sediment Control Plan
- Noise and Vibration Management Plan
- Traffic Management Plan
- Bushfire Management Plan
- Waste Management Plan.

Throughout each phase of the Project, activities will be checked against the conditions of consent and relevant environmental management plans by a suitably qualified environmental practitioner to ensure compliance. This process helps minimise amenity impacts on neighbouring properties and reduces the potential for land-use conflicts.

Ongoing consultation will occur during the exhibition of the EIS to provide the community and relevant agencies with opportunities to comment, seek clarification and receive timely responses, with reasonable efforts made to address enquiries promptly.

Ausgrid proposes the following performance targets for monitoring measures aimed at reducing land-use conflict:

- Compliance with applicable legislation, conditions of consent, mitigation measures and environmental management plans
- Up-to-date contact details available on the Project website
- Contact with relevant stakeholders or community members within five business days of receiving a complaint, with a focus on timely resolution.

7.0 Conclusion

This LUCRA identifies several potential sources of land use conflict during construction and operation of the Project; however, the Project is expected to allow existing and neighbouring land uses to continue largely unaffected.

The Project would be constructed and operated entirely within land zoned **RU2 Rural Landscape**. While the Project is not, in itself, a rural land use, its location immediately adjacent to the existing Rothbury Zone Substation and associated transmission infrastructure places it within an established electrical infrastructure setting rather than intact or productive rural land. This context substantially reduces the potential for land use conflict and supports compatibility with surrounding rural and agricultural land uses.

Construction activities would be confined to the Project Area and would not extend onto land used for grazing or cropping. No access restrictions, easements or temporary occupation of neighbouring properties are required, allowing existing agricultural operations on adjoining land to continue without disruption. Potential construction-related land use conflicts are primarily temporary and amenity-based, and include:

- Disturbance to vegetation and habitat
- Weed or pathogen spread
- Potential disturbance to Aboriginal cultural material
- Spill risks
- Temporary visual impacts
- Construction noise, traffic and dust generation
- Altered runoff and sedimentation.

With the implementation of appropriate mitigation and management measures through the Construction Environmental Management Plan (CEMP) and associated sub-plans, all construction-phase land use conflicts are assessed as low.

During operation, the Project would function as a low-intensity, unmanned facility and would not alter rural land use character, agricultural capability or surrounding land use patterns. No subdivision, changes to lot boundaries or restrictions on neighbouring land uses would occur. Key potential operational impacts include:

- Visual amenity effects
- Minor operational noise exceedances at a small number of sensitive receivers
- Surface water and contamination risks including potential effects on Black Creek and downstream users
- Altered runoff, erosion or contamination affecting Black Creek and downstream users
- Potential off-site effects from a battery unit or transformer fire.

Environmental assessments documented in the EIS indicate that these impacts would be minor, localised and effectively managed through embedded design measures, controls and ongoing environmental management.

With mitigation and management measures in place, the Project would not constrain surrounding agricultural, residential or rural land uses. Ongoing monitoring and environmental management would ensure continued compatibility with neighbouring land uses throughout the operational life of the facility.

Overall, the mitigation and management measures proposed in this LUCRA are practical, readily implementable and drawn directly from the Project EIS. With their implementation, the Project is expected to integrate effectively within the surrounding rural landscape. Accordingly, the impact on land use is assessed as minor, and the likelihood of significant land use conflict is low.

8.0 References

AECOM (2026), *Landscape Character and Visual Impact Assessment – Rothbury Battery Energy Storage System*, AECOM Australia, Sydney.

AECOM (2026), *Noise and Vibration Impact Assessment – Rothbury Battery Energy Storage System*, AECOM Australia, Sydney.

Amber Consulting Pty Ltd (2026), *Traffic Impact Assessment – Rothbury Battery Energy Storage System*, Amber Consulting Pty Ltd, Sydney.

Apex Archaeology (2026), *1309 Wine Country Drive, Rothbury NSW – Battery Energy Storage System (BESS) Site: Aboriginal Cultural Heritage Assessment Report*, Apex Archaeology, Sydney.

Australian Bureau of Statistics (2021), *Census of Population and Housing*, Commonwealth of Australia, Canberra.

Australian Standard (2018), *AS 1055:2018: Acoustics – Description and Measurement of Environmental Noise*, Standards Australia, Sydney.

Australian Standard (2019), *AS 1742.3:2019: Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads*, Standards Australia, Sydney.

Australian Standard (2017), *AS 1940:2017:* The Storage and Handling of Flammable and Combustible Liquids, Standards Australia, Sydney.

Australian Standard (2009), *AS 4970:2009:* Protection of Trees on Development Sites*, Standards Australia*, Sydney.

Australian Standard/New Zealand Standard (2019), *AS/NZS 5139:2019:* Electrical Installations – Safety of Battery Systems for Use with Power Conversion Equipment, Standards Australia, Sydney.

Bureau of Meteorology (2025), *Climate Statistics for Australian Locations – Rothbury Region*, Bureau of Meteorology, Canberra.

Cessnock City Council (2022), *Cessnock Local Environmental Plan 2011 (as amended)*, NSW Government, Sydney.

Cessnock City Council (2025), *Flood Mapping and Bushfire Prone Land Mapping*, Cessnock City Council, Cessnock.

Department of Environment and Climate Change (2007), *Storing and Handling of Liquids: Environmental Protection – Participants Handbook*, NSW DECC, Sydney.

Landcom (2004), *Managing Urban Stormwater: Soils and Construction, Volume 1 – "The Blue Book"*, 4th edn., NSW Government, Sydney.

Niche (2026), *Rothbury Battery Energy Storage System – Biodiversity Development Assessment Report*, Niche, Illawarra NSW.

NSW Department of Environment and Climate Change (2009), *Interim Construction Noise Guideline*, NSW Government, Sydney.

NSW Department of Planning, Housing and Infrastructure (2025), *Secretary's Environmental Assessment Requirements for the Rothbury BESS*, NSW Government, Sydney.

NSW Department of Primary Industries (2011), *Land Use Conflict Risk Assessment (LUCRA) Guide*, NSW DPI, Orange.

NSW Government (2017), *Work Health and Safety Regulation 2017*, NSW Government, Sydney.

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

NSW Government (2021), *State Environmental Planning Policy (Transport and Infrastructure) 2021*, NSW Government, Sydney.

Sherpa Consulting Pty Ltd (2026), *Preliminary Hazard Analysis – Rothbury Battery Energy Storage System*, Sherpa, Sydney.