

KINGSWOOD BATTERY ENERGY STORAGE SYSTEM

Environmental Impact Statement

June 2024

SSD-63207219

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Declaration

EIS declaration		
Project details		
Project name	Kingswood Battery Energy Storage System	
Application number	SSD-63207219	
Address	744 Burgmanns Lane, Kingswood 2340 The legal description (i.e. Lot and Deposited Plan (DP) references) of the Project includes Lot 43 DP1064582, Lot 3 DP244399, Lot 4 DP244399 and Lot 6 DP21993.	
Applicant details		
Applicant name	Iberdrola Australia Development Pty Ltd	
Applicant address	Governor Phillip Tower Level 22, 1 Farrer Place, Sydney, NSW 2000	
Details of person by whom this EIS was prepared		
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Professional qualifications	Bachelor of Science (Hons), Environmental Science	Bachelor of Science, Marine Science
Address	Level 16, 580 George Street Sydney NSW 2000	
Declaration by registered environmental assessment practitioner		
Name	Javier Valderrama	
Registration number	8157	
Organisation	Planning Institute of Australia	
Declaration	The undersigned declares that this EIS: • Has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021 • Contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates • Does not contain information that is false or misleading • Addresses the Planning Secretary’s Environmental Assessment Requirements for the Project • Identifies and addresses the relevant statutory requirements for the Project, including any relevant matters for consideration in environmental planning instruments • Has been prepared having regard to the Department’s State Significant Development Guidelines - Preparing an Environmental Impact Statement • Contains a simple and easy to understand summary of the Project as a whole, having regard to the economic, environmental and social impacts of the Project and the principles of ecologically sustainable development • Contains a consolidated description of the Project in a single chapter of the EIS • Contains an accurate summary of the findings of any community engagement • Contains an accurate summary of the detailed technical assessment of the impacts of the Project as a whole.	
Signature		
Date	26 June 2024	

Acronyms and Abbreviations

Acronym	Definition
AA Company	Australian Agricultural Company
AAQ NEPM	National Environmental Protection (Ambient Air Quality) Measure
ABS	Australian Bureau of Statistics
AC	Alternating Current
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents
AEMO	Australian Energy Market Operator
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AOBV	Area of Outstanding Biodiversity Value
APZ	Asset Protection Zone
ARI	Average Recurrence Interval
BAM	Biodiversity Assessment Methodology
BC Act	<i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BMS	Battery management system
BOM	Bureau of Meteorology
BOSCAR	NSW Bureau of Crime Statistics and Research
BSAL	Biophysical Strategic Agricultural Land
CoPC	Contaminants of Potential Concern
CTMP	Construction Traffic Management Plan
DC	Direct Current
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DCP	Development Control Plan
DoP	Department of Planning (now DPHI)
DP	Deposited Plan
DPE	Department of Planning and Environment (now DPHI)
DPHI	Department of Planning, Housing and Infrastructure
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement

Acronym	Definition
EMF	Electric and Magnetic Fields
EMS	Environmental Management Strategy
EPA	NSW Environmental Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
FCAS	Frequency Control Ancillary Services
FFDI	Forest Fire Danger Index
FTE	Full time equivalents
GDE	Groundwater Dependant Ecosystem
ha	Hectare
HAZID	Hazard Identification
HHAR	Historic Heritage Assessment Report
HIAP	<i>Hazardous Industry Planning Advisory Paper</i>
HVAC	Heating Ventilation Air Conditioning
Iberdrola / Proponent	Iberdrola Australia Development Pty Ltd
IBRA	Interim Biogeographic Regionalisation of Australia
ICNG	Interim Construction Noise Guideline
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IPA	Inner Protection Area
IPC	Independent Planning Commission
ISP	Integrated System Plan
LALC	Local Aboriginal Land Council
LCZ	Landscape character zone
LEP	Local Environmental Plan
LETS	Low Emissions Technology Statements
LGA	Local Government Area
LOS	Level of service
LSBS	Large Scale Battery Storage
LSC	Land and Soil Capability
LUCRA	Land Use Conflict Risk Assessment
LVIA	Landscape and Visual Impact Assessment
MLRA	<i>Multilevel Risk Assessment Guideline</i>

Acronym	Definition
MNES	Matter of National Environmental Significance
MW	Megawatt
MWh	Megawatt Hours
NCC	National Construction Code
NEM	National Electricity Market
NEPC	National Environment Protection Council
NEPM	<i>National Environmental Protection (assessment of Site Contamination) Measure 1999</i>
NHVR	National Heavy Vehicle Regulator
NML	Noise Management Level
NPI	National Pollutant Inventory
NPfl	<i>Noise Policy for Industry</i> (NSW EPA, 2017)
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
OEH	Office of Environment and Heritage
OSOM	Oversize or Overmass
PBP	<i>Planning for Bushfire Protection 2019</i>
PCB	Polychlorinated Biphenyls
PCS	Power conversion system
PCT	Plant Community Type
PFAS	Per and Poly-Fluoroalkyl Substances
PHA	Preliminary Hazard Analysis
Planning Systems SEPP	<i>State Environmental Planning Policy (Planning Systems) 2021</i>
PMF	Probable Maximum Flood
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PSI	Preliminary Site Investigation
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
R&H SEPP	<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>
SA2	Statistical Area Level 2
SCADA	Supervisory Control and Data Acquisition
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 33	<i>Applying State Environmental Planning Policy No. 33 Hazardous and Offensive Development</i>
SIA	Social Impact Assessment
SISD	Safe intersection sight distance

Acronym	Definition
SSD	State Significant Development
SSD guidelines	<i>State significant development guidelines – preparing a scoping report (DPE, 2022)</i>
SWMP	Soil and Water Management Plan
TEC	Threatened Ecological Community
TIA	Traffic Impact Assessment
T&I SEPP	<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i>
The Proponent	Iberdrola Australia Development Pty Ltd
TMS	Thermal management system
TRC	Tamworth Regional Council
VIS	Vegetation Information System
WAL	Water Access Licence
WIA	Water Impact Assessment
WMP	Waste Management Plan
ZVI	Zone of Visual Influence

Executive Summary

Project overview

Iberdrola Australia Development Pty Ltd (the Proponent) is seeking development consent for the construction, operation and maintenance of a large-scale Battery Energy Storage System at 744 Burgmanns Lane, Kingswood, New South Wales 2340 (Lot 43 DP1064582). The Battery Energy Storage System would have a capacity of up to 270 Megawatts and provide up to 1,080 Megawatt-hours of battery storage capacity.

The Project Site is within the Tamworth Regional Local Government Area, around six kilometres southeast of Tamworth and two kilometres west-south-west of Calala town centre and borders the suburb of Calala. The Project would involve construction and operation of the following:

- Battery Energy Storage System including battery enclosures, inverters, transformers, switch gear and control building
- Onsite 33/330 kilovolt substation to convert electricity from the medium voltage Battery Energy Storage System to the high voltage transmission network
- High voltage transmission connection (above ground and/or below ground) between the Battery Energy Storage System and the Tamworth substation
- Ancillary infrastructure and mitigative features including:
 - Site access to the Battery Energy Storage System from Ascot-Calala Road
 - Internal site access road and parking
 - Permanent office and staff amenities
 - Operations and maintenance building
 - Stormwater management infrastructure
 - Services and utilities
 - Lighting, fencing and security devices
 - Noise acoustic barriers
 - Asset protection zone
 - Landscaping and screening vegetation.

The Battery Energy Storage System would operate 24 hours a day, seven days a week and would be monitored remotely, with infrastructure maintenance occasionally undertaken on-site.

Project need and objectives

Over the last 10-15 years, there has been a steady increase in the number of renewable projects which have come online and are generating electricity for use in the National Energy Market, while more of the older traditional coal fired power stations have been retired and decommissioned. This transition from thermal generation to renewable generation is expected to continue into the future. To support this transition, energy storage will be required to support the intermittent nature of generating electricity from renewable energy sources and to provide a reliable and secure source of electricity to consumers and the local population.

The Federal, State and Local Governments have put in place a number of plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. These include:

- *2020 Integrated System Plan for the National Electricity Market (2020 ISP)* (Australian Energy Market Operator (AEMO), 2020)
- *The Transmission Infrastructure Strategy* (Department of Planning, Industry and Environment (DPIE), 2018)
- *The Electricity Strategy* (DPIE, 2019)
- *Electricity Infrastructure Roadmap* (DPIE, 2020)
- *NSW Climate Change Policy Framework* (NSW Office of Environment and Heritage (OEH), 2016).

Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, i.e. firm generation (such as gas and battery storage), dispatch electricity into the grid. This energy generation and supply system can satisfy electrical demand so long as there is sufficient firm generation capacity to meet the system's electricity demand.

Without the development and operation of short and long-term dispatch infrastructure to support increasing investment, there is the potential for future deficit in capacity and reliability of the NSW power supply system. In a worst-case scenario, this can lead to load shedding or blackout events.

The Project involves the development of a large-scale Battery Energy Storage System. Such facilities, as that by the Project, would provide short duration storage, frequency control ancillary services (to provide a fast injection of energy, to manage supply and demand) and help firm variable renewable energy generation.

Overall, the objectives of the Project are to:

- Increase firming infrastructure and the potential for additional renewable energy assets to be built in New South Wales
- Improve the security, resilience and sustainability of the New South Wales electricity grid
- Help reduce the direct carbon emission of the New South Wales electricity grid (by not relying on traditional fossil fuel firming assets)
- Minimise adverse impacts on the environment and community during the Project lifecycle
- Support the locality through social and economic enhancement.

The Proponent

The Proponent is Iberdrola Australia Development Pty Ltd, a subsidiary of Iberdrola Australia Limited (ABN 32 137 258 470) (formerly trading as Infigen Energy Limited).

Iberdrola Australia Limited are an entity owned by the Iberdrola Group. Iberdrola S.A. is the ultimate parent company of the entire Iberdrola Group and owns 100% of Iberdrola Australia Limited.

The Iberdrola Group is the number one producer of wind power by volume globally, and one of the world's largest electricity utilities by market capitalisation. Iberdrola Group's global expertise spans renewable energy, electricity networks, smart grids, large-scale energy storage, energy innovation and digitisation, and advanced customer products. They own and operate 53 Gigawatts of installed generating capacity, including over 40 Gigawatts of owned installed renewables capacity, with a further seven Gigawatts contracted.

Iberdrola Australia Limited is a leader in renewable energy and has been operating renewable energy assets locally for over 15 years. Iberdrola Australia Limited is a long-term developer, operator and owner, and manages all aspects of the project lifecycle. It currently has a 1.4 Gigawatt portfolio of renewable assets under operation or construction in Australia, which is supported by 320 Megawatts of firming capacity. Iberdrola Australia Limited has strong growth ambitions in supporting Australia in meeting its various clean energy targets and continues to provide reliable and affordable clean energy to its customers. Iberdrola Australia Limited will be investing \$2 billion in Australia by 2025.

Planning approval process

The Project is considered to meet the definition of State Significant Development under Clause 2.6 of the *State Environmental Planning Policy (Planning Systems) 2021*. The Project would be for electricity generating works on land that is permitted with development consent under Clause 2.35 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* and would have a capital investment value greater than \$30 million.

The Proponent is seeking State Significant Development approval for the Project under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979*. Chapter 4 provides more information on the planning and assessment process for the Project.

The Project is not expected to result in a significant impact on any Matters of National Environmental Significance and therefore approval for the Project is not required under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. As such, the Project has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water.

Community and stakeholder engagement

Community and stakeholder engagement for the Project is being undertaken in accordance with *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022) and Iberdrola Australia's Community and Stakeholder Engagement Policy (Iberdrola Australia, 2023). Community and stakeholder engagement activities regarding the Project commenced in 2023.

Engagement with stakeholders has been important for developing the Project. Stakeholders were identified as those that may be interested in, or who may be affected by, the Project and included government and technical stakeholders, landowners and the wider community.

Government and technical stakeholders were consulted during the preparation and assessment of the Project via meetings, telephone conversations, email and/or letter correspondence.

Community consultation activities undertaken to date include:

- Development of a dedicated website (<https://www.iberdrola.com.au/our-assets/owned-renewable-energy-assets/kingswood-battery>)
- Community newsletters
- Community drop in sessions
- Face to face door knocks and one on one meetings
- Provision of enquiry lines (for phone and email).

Local issues were raised by various stakeholder groups during the preparation of the Scoping Report and the Environmental Impact Statement. These issues generally focused on impacts to neighbouring receptors, including the risk of fire, traffic, noise, visual and water.

Stakeholders will continue to be identified and consulted during the approvals and response to submission phase, and if approved, during the construction, operation, and decommissioning and rehabilitation phases of the Project.

Environmental assessment

A summary of the environmental issues, as identified within the Secretary's Environmental Assessment Requirements is provided in Table ES-1.

Table ES-1 Environmental assessment summary

Environmental issue	Summary of potential impacts
Traffic and transport	A Traffic Impact Assessment (TIA) was undertaken by Arcadis (Appendix D). The TIA assessed the potential traffic, transport and access impacts associated with the Project. Construction The TIA assessed the impact of Project related and potential cumulative traffic volumes on the road network to determine whether there is sufficient road network capacity and to ensure the existing road network will be adequate to accommodate the additional traffic movements generated by the Project. Peak construction traffic movements are anticipated to comprise: • Up to 80 light vehicles per day (80 in and 80 out) • Up to 60 heavy vehicles per day (60 in and 60 out), inclusive of oversize or overmass vehicles up to 35 metres with 14 axles. Heavy vehicle access to and from the Project would use Ascot-Calala Road via Whitehouse Lane to minimise the potential for traffic impacts through the urban portion of Calala. The TIA identified the existing road network would accommodate Project related traffic within the capacity of the surrounding road network. In the event concurrent nearby developments were constructed at the same time, the cumulative traffic volume was identified to be below the level of service (LOS) D threshold. Construction related traffic impacts from the Project would be temporary (up to 15 months), with peak Project impacts anticipated to be largely limited to a few months. As per the <i>Ausroads Guide to Road Design Part 4A</i>, property accesses should comply to the requirements of safe intersection sight distance (SISD), minimum gap sight distance and approach sight distance. Based on the 2D sight line assessment, the longest required SISD adopted (assuming a 60 kilometre per hour design speed), a minimum of 123 metres from the horizontal curve on Ascot-Calala Road is achieved. A vehicle swept path assessment was carried and determined that the proposed access layout would allow for the largest design vehicle (35 metres long, 14 axles oversize or overmass vehicle) to enter and exit the Project Site without impacting any of the street furniture. As such, the proposed site access arrangement off Ascot-Calala Road is considered suitable as part of the development. A review of the potential oversize or overmass route from the Port of Newcastle identified locations where minor traffic management and / or modification of existing traffic furniture would be required to accommodate vehicle manoeuvres. This would be confirmed during detailed design upon confirmation of the required oversize or overmass vehicle, however no road upgrades were identified as being required. Traffic generated during construction of the Project is not expected to compromise safety or function of the surrounding road network and impacts are expected to be mitigated. Operation The Project would result in negligible impacts to the surrounding road network performance during operation. The Project would be remotely operated throughout operations and would utilise around two full time equivalent staff. Vehicles entering and exiting the Project Site would be primarily for scheduled maintenance activities. Mitigation measures Measures to manage traffic during construction of the Project would be included in the Construction Traffic Management Plan (CTMP). The CTMP would outline how construction vehicles would move in and out of the Project Site, as well as a process for managing oversize and /or overmass vehicles. The Environmental Management Strategy (EMS) will include measures for managing potential traffic impacts (if required) during operation of the Project, including a process for managing complaints.

Environmental issue	Summary of potential impacts
Noise and vibration	An assessment of the potential construction and operational noise and vibration impacts associated with the Project was undertaken by Resonate (Appendix E). Noise management levels and vibration criteria were developed in accordance with the relevant NSW guidelines and policies. Construction Construction activities are proposed to take place during standard construction hours. A review of potential construction noise impacts was undertaken in accordance with the Interim Construction Noise Guidelines. It was determined that construction works would result in exceedances at multiple receivers, particularly during clearing and during the earthworks phase of construction. The modelling approach conservatively assumed the high-range sound power levels and all plants operating simultaneously in one location. The largest exceedance is predicted to occur at receiver R2. No receivers are predicted to be highly noise-affected. The potential for vibration impacts on residents and vibration sensitive structures near construction has been assessed. This assessment at identified residential locations concluded that the plant likely to be used would be able to maintain acceptable human response and structural vibration levels, therefore vibration impacts from construction at residential assessment locations are therefore highly unlikely. The potential for road traffic noise impacts on public roads due to Project traffic has been assessed in accordance with the NSW Road Noise Policy for traffic movements during the construction period. The worst case 1-hour traffic flows during daytime are predicted to increase the existing traffic noise levels by more than 2 dB(A) at the nearest residential buildings. This is due to very low existing traffic flow. However, construction road traffic noise is predicted to be within the NSW Road Noise Policy criteria and would be a temporary impact. Operation Operational noise has been assessed under adverse weather conditions and conservatively considering 100 percent fan duty utilisation of the Battery Energy Storage System (BESS). The maximum utilisation for a BESS is typically 80 percent of peak system capacity during day and evening periods, and usually 40 percent during the night-time period. However, to undertake a conservative operational noise impact assessment the worst case 100 percent operational utilisation has been assessed for all periods. Noise mitigation measures have been included in the modelling following the outcome of preliminary noise modelling where noise exceedances were predicted. Following the implementation of all feasible and reasonable mitigation options, the modelling has demonstrated noise compliance can be achieved for all assessment locations during day and night Noise Policy for Industry assessment periods. A range of design solutions would be verified during detailed design upon selection of the preferred BESS supplier and would include consideration of silencers, layout refinements and noise acoustic barriers. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight. Mitigation measures A draft Construction Noise and Vibration Management Plan (CNVMP) has been prepared for the Project and included in Appendix E. This CNVMP will be reviewed and updated prior construction to identify the feasible and reasonable approaches to reduce noise and vibration impacts during construction of the Project. Works would be programmed to occur during standard working hours only. If works must occur out of hours for justified reasons, the out of hours works would be separately assessed with appropriate noise mitigation and community consultation implemented as necessary based on the level of predicted impact. The EMS will include measures and processes for managing noise resulting from the operation of the Project, including a process for managing complaints.
Biodiversity	A Biodiversity Development Assessment Report (BDAR) was undertaken by Arcadis (Appendix F). The BDAR assessed the potential biodiversity impacts associated with the Project. Construction Construction of the Project would result in the removal of 0.16 hectares of native vegetation (PCT 3396). The areas of PCT 3396 forms part of the White Box- Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney

Environmental issue	Summary of potential impacts
	Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregion Critically Endangered Ecological Community (CEEC) listed under the <i>Biodiversity Conservation Act 2016</i>. Most of the development envelope is made up of Category 1 land which is vegetation not conforming to any plant community type and containing less than five percent native understory composition. As such no impacts to threatened native flora or fauna are expected to occur and no threatened species were recorded during the field survey. The BDAR identified that the Project would not adversely impact upon any of the identified Matters of National Environmental Significance (MNES) and would not represent a Controlled Action under the <i>Environment Protection and Biodiversity Conservation (EPBC) Act 1999</i>. Operation There is some potential for edge effects during maintenance activities during operation. Trampling of adjacent native vegetation, rubbish dumping, soil disturbance and weed spread could occur, though this is likely to be minor and localised. No further impacts on biodiversity are anticipated during operation of the Project. Mitigation measures Under the Biodiversity Assessment Method (BAM), the Project requires two ecosystem credits to offset impacts on PCT 3396. The EMS will include measures and processes for managing potential impacts to biodiversity.
Hazard and risk	A Preliminary Hazard Analysis (PHA) was prepared by Sherpa Consulting to identify potential hazards and risks during construction and operation of the Project. The Preliminary Hazard Analysis (PHA) for the Project is provided in Appendix G and was prepared in accordance with the relevant guidelines. Potential hazards associated with operation of the project were identified through a hazard identification process involving a review of controls detailed in the brochures, product specification and fire safety design documents for prospective technology providers. Further, a literature review of past incidents involving similar BESS systems and previous risk assessments for similar BESS systems completed by Sherpa was undertaken, in consultation with Iberdrola. The assessment identified numerous scenarios/events with potential for off-site impacts, which were subject to qualitative risk analysis in accordance with the Multi-level Risk Assessment Guideline. A total of 14 hazardous events were identified, with six events determined to have potential for off-site impact resulting from a BESS enclosure. A risk assessment was undertaken for the events with off-site impacts. All were identified to be of 'Low' risk. Based on the study risk acceptance criteria, the risk profile for the Project is considered to be tolerable. The analysis found that the project is compliant with the <i>Hazardous Industry Planning Advisory Paper (HIPAP) No.4</i> qualitative risk criteria. Mitigation measures Hazard and risk impacts associated with the Project would be managed through mitigation measures outlined in Appendix C. This would be verified in consultation with Fire and Rescue NSW with the preparation of a Fire Safety Study.
Bushfire	A Bushfire Assessment Report was undertaken Bushfire Consulting Services Pty Ltd and is provided in Appendix N. The assessment identified hazard vegetation formations, slope of the land and fire weather relevant to the Project. The assessment concluded that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable, including the aims and objectives of <i>Planning for Bush Fire Protection 2019</i>. Mitigation measures This assessment concluded that the development satisfies the aim and objectives of <i>Planning for Bush Fire Protection 2019</i> subject to implementation of a range of mitigation measures as outlined in the design and Appendix C. These recommendations include safe access, asset protection zones, minimum 20,000 litre water supply, measures related to electricity and gas services, and emergency and evacuation planning.

Environmental issue	Summary of potential impacts
Heritage (Aboriginal and historic)	An assessment of the potential impacts to Aboriginal and historic heritage associated with the Project was undertaken by OzArk (Appendix H and Appendix I respectively). The assessments were undertaken in accordance with the relevant guidelines and Codes of Practice. Construction Construction of the Project would require earthworks and disturbance to the ground surface, which would have the potential to impact on previously recorded sites of Aboriginal heritage significance. No sites of Aboriginal heritage significance or Commonwealth, State or Local historic heritage items were identified to be within or adjacent to the Project, and as such impacts are not expected to occur. There is however a potential for previously unrecorded items of Aboriginal heritage significance to be present within the development envelope. Operation Impacts to Aboriginal and historic heritage are not expected to occur during operation of the Project, as ground disturbance/excavation would be restricted to the construction phase. The introduction of new infrastructure is not expected to impact the setting or value of Aboriginal items or sites, or historic items. Mitigation measures In the unlikely event that Aboriginal objects, human remains or historic heritage items are discovered during construction or operation of the Project, they will be managed by the appropriate unexpected finds protocol. These protocols would be included in the EMS.
Visual	A Landscape and Visual Impact Assessment (LVIA) was undertaken by Moir Landscape Architecture Pty Ltd and is included Appendix J. The assessment was undertaken with regard to the <i>Guideline for Landscape Character and Visual Impact Assessment</i> (TfNSW, 2020) and <i>Technical Supplement – Landscape & Visual Impact Assessments for Large Scale Solar Projects</i> (DPHI, 2023). Construction Construction activities would be visible, however due to their temporary nature it is considered unlikely that they will result in significant visual impacts on passing motorists or nearby receptors. Operation The LVIA assessed impacts from representative viewpoints surrounding the Project. Viewpoints are selected to illustrate a combination of areas of high landscape or scenic value, visual composition, range of distances, varying aspects, various elevations, various extent of development visibility (full and partial visibility) and views from major routes. The representative viewpoints were assessed to demonstrate the potential visual impacts of the Project. Sixteen viewpoints were selected. Two viewpoints (VP05, VP06) were assessed as having a low visual impact rating. The assessment identified that due to existing electrical infrastructure in the landscape including the Tamworth substation and its associated infrastructure, these views will not significantly alter from the existing character of the landscape. The remaining fourteen viewpoints were assessed as having a very low visual impact due to existing screening, topography and the electrical infrastructure in the landscape. Visual impacts on public land were assessed to be limited to a few nearby roads including Ascot-Calala Road, Calala Lane, Marsden Park Road and Burgess Lane. Visual impacts on non-associated receivers was assessed without and with mitigation. Due to the distance and scale of the Project, the Project would not be visible from the regional centre of Tamworth. Partial views of the Project would likely be viewed as an extension of the existing electrical infrastructure. Six receivers or cluster of receivers were identified to have moderate impacts without mitigation. With mitigation, all receivers or cluster of receivers were identified to have a low or very low visual impact. Light sources are limited to low level lighting for security, night time maintenance and emergency purposes, and would be designed in accordance with AS4282-1997 (The Australian Standard for control of the obtrusive effects of outdoor lighting). It is unlikely the proposed night lighting associated with the ancillary infrastructure would create a noticeable impact on the existing night time landscape.

Environmental issue	Summary of potential impacts
	Mitigation measures Landscape screening is proposed around along the north, south and east of the BESS facility to mitigate visual impacts. A conceptual landscaping plan has been prepared for the Project to mitigate potential visual impacts. Development of the Project design has included and will continue to include general measures to reduce the degree of contrast between Project infrastructure and the surrounding rural landscape, having regard to the form, scale, height, colour and texture of materials incorporated as part of the Project. Visual impacts measures associated with the Project are outlined in Appendix C.
Land	An assessment of potential impacts of the development on the existing land uses on the site and adjacent sites was undertaken. The assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning was undertaken. A Preliminary Site Investigation (PSI) was undertaken by Arcadis to identify potential contamination impacts during construction and operation of the Project. The PSI for the Project is provided in Appendix K. The PSI was prepared in accordance with the relevant guidelines. The Project Site is zoned RU4 – Primary Production Small Lots under the Tamworth Regional <i>Local Environmental Plan (LEP) 2010</i> and consists of mostly cleared rural land, existing electrical infrastructure and local council roads. The Project Site is incidentally used for cattle grazing but has otherwise not been used for the grazing of livestock for a commercial purpose or for cropping. Construction Construction of the Project would require earthworks and disturbance to the ground surface, which has the potential to result in erosion and sedimentation if not properly managed. This disturbance also has the potential to encounter acid sulfate soils or contamination. The PSI states that the potential to encounter acid sulfate soils or contamination during construction are low. Contamination, if present, would be limited to localised soil impacts, and is not considered likely to pose a groundwater risk. Potential erosion hazard would be further assessed via investigations during detailed design, however based on the size and scale of the development, potential erosion and subsequent sedimentation risks are expected to be manageable with standard construction techniques. Operation As ground disturbance/excavation would be restricted to the construction, operation is not expected to result in any impacts associated with acid sulfate soils or contamination. Runoff on the Project Site would be directed toward installed catchment drains and stormwater management infrastructure. Surfaces beneath the BESS and switchyard would be gravelled which would stabilise the soil and reduce the movement of sediment. Impacts to the surrounding land uses and the Project was assessed using the <i>Land Use Conflict Risk Assessment Guide</i> (NSW Department of Primary Industries, 2011). A range of potential conflicts were identified including operational noise, visual amenity, livestock, surface water, hazards, agricultural expansion, property values and Tamworth Agriculture Institute activities. All aspects following revision of the risk ratings, through controls outlined in the Project form and Appendix C, were considered able to meet an acceptable risk ranking. Mitigation measures Land impacts associated with the Project would be managed through mitigation measures outlined in Appendix C. This would include unexpected contaminated land finds protocols, measures to manage spills during both construction and operation of the Project and measures to manage potential erosion and sedimentation. A soil survey would be undertaken prior to construction to ensure construction risks are mitigated. A Rehabilitation and Decommissioning Management Plan would also be prepared.
Social and economic	A Social and Economic Impact Assessment (SEIA) for the Project was undertaken by HillPDA and is provided in Appendix L. The assessment was undertaken in accordance with the requirements of the <i>Social Impact Assessment Guideline 2023</i> (DPE, 2023).

Environmental issue	Summary of potential impacts
	Construction and operation Social impact was defined as the net effect (positive or negative) of an activity on a community and the wellbeing of individuals and families, across a range of aspects of an individual's and a community's life. Moderate or high potential impacts were identified to include those related to access (additional demand for accommodation during construction), culture (potential impacts to heritage), health and wellbeing (construction dust and operational fire hazards), surroundings (change to surroundings), livelihood (employment opportunities and impacts on property values) and decision-making systems (lack of input on Project). The Project would generate and support economic activity at the regional (Tamworth Local Government Area LGA) and State level. The Project is expected to require up to 100 construction personnel (or 271 job years based on the estimated development cost for the Project) and is estimated to directly increase Tamworth LGA's economic output by around \$124.9 million. The Project will provide a range of long-term economic benefits contributing to a more resilient, efficient, and sustainable energy system including grid stability, grid deferral and infrastructure savings, backup power and resilience and job creation and economic growth. Mitigation measures Mitigation and management strategies have been proposed for each of the identified potential social impacts to minimise negative consequences and to enhance social benefits for the local community. These measures are outlined in Appendix C. This would include a Local Procurement Strategy to prioritise local jobs and businesses and to reduce the potential for adverse impacts on local accommodation availability, ongoing engagement with local business / tourism bodies, a Community and Stakeholder Management Plan and community enhancement fund to support very localised and meaningful community and environmental initiatives.
Water	An assessment of the potential construction and operational water related impacts associated with the Project was undertaken by Arcadis (Appendix M). Construction Construction activities, if not managed properly, could result in increased mobilisation of soil and increased surface water runoff (e.g. sediment laden "dirty" water) into the downstream receiving waters. This could also include pollutants (such as oil, hydraulic fluids and fuels) from spills or leaks from equipment. During construction the key risks to surface water are associated with clearing, ground disturbance, earthworks, compaction of soils and installation of infrastructure. Prior to construction, temporary soil and water management measures would be implemented to address temporary risks to water quality and drainage during the construction phase and will also reflect industry best practice. It is not anticipated that the Project would intercept groundwater. The Project is not expected to have any requirements for surface water licensing and a variety of options are being explored with water sourcing, with stormwater reuse likely to be undertaken during construction and an agreement with Tamworth Regional Council for potable water. Providing the existing landholder's bore is sufficient to supply water potentially required to supplement construction and operation, a water supply work approval (WA) will be required to change the approved usage of the bore from stock and domestic use to water supply use. Operation During operation the key risks to surface water are associated with an increase in site runoff potential and stormwater pollutant load. This may lead to an increase in peak flow rates leaving the site and reduction in water quality in receiving watercourses. However, a range of measures to mitigate potential increases in peak flow rates and pollutant loads form part of the proposed water management approach for the Project. The existing stormwater management infrastructure within and immediately downstream of the Project Site would be maintained where feasible. This includes the small surface channels/bunds, roadside swales and minor cross drainage culverts. Additional channels/bunding would be used to divert stormwater runoff around the operational areas to the downstream as needed. Level spreaders and/or scour protection measures would be employed where required to manage impacts of concentrated flows. Within the operational area of the

Environmental issue	Summary of potential impacts
	Project, stormwater runoff would be collected in surface drains and conveyed to a surface stormwater basin/s for retention, detention and water quality treatment. Where appropriate, the stormwater basin/s may function as temporary sediment basins during the construction period. During operation, no interaction with groundwater is anticipated. The Project was not identified as being subject to flood-related development controls or within the flood planning area in the Floodplain Risk Management Study (HydroSpatial, 2023) or Tamworth City Wide Flooding Investigation (Lyll & Associated, 2019). Mitigation measures Water and hydrology impacts arising from the construction of the Project are considered minor and manageable for a Project of this scale with implementation of the standard mitigation measures and the short term and temporary nature of construction works. A Soil and Water Management Plan and Erosion and Sediment Control Plan (ESCP), or equivalent, would be incorporated into the EMS. These plans would be developed and implemented in accordance with the principles and requirements of the Landcom 2004 <i>Managing Urban Stormwater: Soils and Construction – Volume 1</i> (commonly known as the ‘Blue Book’). The ESCP will be progressively updated to reflect the changing nature of the Project site as construction activities progress. The design and development of infrastructure during detailed design will include ongoing consultation with Tamworth Regional Council on required water control controls to manage general risks associated with increases in impervious areas. Oil-water management controls within the BESS substation will be designed to consider relevant Australian Standards, as well as any requirements of electricity distributors and the stormwater infrastructure will be designed to include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge.
Waste	An assessment was undertaken by Arcadis to identify the quantity and potential impact of the waste generated by the Project during construction and operation (Section 6.11). The construction and operation of the BESS would generate waste from a variety of sources and activities. Construction Waste generated through construction is likely to include construction waste (like packaging, scrap metal), excavated material, green waste, and recyclables from the construction compound. Operation Waste would be generated from BESS replacement and maintenance, offices, amenities, lunchrooms, stormwater systems, and maintenance of plant and equipment. Mitigation measures Waste will be managed using the hierarchy of priorities for the efficient use of resources, which is consistent with the objectives of the <i>Waste Avoidance and Resource Recovery (WARR) Act 2001</i>. The Lithium-ion batteries are expected to be returned to the supplier or a suitably licenced processing facility for recycling, re-purposing or appropriate disposal at a licenced facility. Measures to manage waste streams during construction and operation would be incorporated into the Project’s EMS and would include measures such as those included in Appendix C.

Justification and conclusion

The Project has been assessed in accordance with the *Environmental Planning and Assessment Act 1979* and the Secretary’s Environmental Assessment Requirements. The Project satisfies the requirements of the Secretary’s Environmental Assessment Requirements (Appendix A) and is consistent with the principles of ecologically sustainable development (Chapter 7).

The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this Environmental Impact Statement. The assessment concluded that no significant environmental impacts would occur as a result of the Project. It is considered that any potential impacts can be satisfactorily mitigated through a range of measures that have been identified within the Environmental Impact Statement. In addition, the Project has been assessed against, and has been found to be consistent with, the priorities and targets adopted in relevant published and draft State plans, as well as Government policies and strategies.

Overall, the Project is considered critical in supporting the New South Wales Government's electricity strategy for a reliable, affordable, and sustainable electricity future that supports a growing economy.

Next steps

The Environmental Impact Statement will be placed on public display for a minimum 28 days in accordance with Schedule 1, Division 2 (Part 9, SSD applications) of the *Environmental Planning and Assessment Act 1979*. This public display period will provide an opportunity for all stakeholders to comment on the Project. On completion of the public display period, all submissions received will be considered in a response to the Department of Planning, Housing and Infrastructure.

Opportunities are also provided for the community to provide feedback as well as for the dissemination of up to date information on the Project via the Project website (<https://www.iberdrola.com.au/our-assets/owned-renewable-energy-assets/kingswood-battery>) and email feedback system with the Proponent (kingswoodbattery@iberdrola.com.au).

1 Introduction

1.1 Project overview

Iberdrola Australia Development Pty Ltd (Iberdrola) (the Proponent) is seeking development consent for the construction, operation and maintenance of a large-scale Battery Energy Storage System (BESS) at 744 Burgmanns Lane, Kingswood, New South Wales (NSW) 2340 (Lot 43 DP1064582) (the Project Site). The BESS would have a capacity of up to 270 Megawatts (MW) and provide up to 1,080 Megawatt-hours (MWh) of battery storage capacity (the Project).

The Project is considered to meet the definition of State Significant Development (SSD) under Clause 2.6 of the *State Environmental Planning Policy (Planning Systems) 2021*. The Project would be for electricity generating works on land that is permitted with development consent under Clause 2.35 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* and would have a capital investment value greater than \$30 million.

The Proponent is seeking SSD approval for the Project under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Chapter 4 provides more information on the planning and assessment process for the Project.

The Project Site is within the Tamworth Regional Local Government Area (LGA), around six kilometres southeast of Tamworth and two kilometres west-south-west of Calala town centre and borders the suburb of Calala. The regional setting is presented in Figure 1-1.

The Project would involve construction and operation of the following:

- BESS including battery enclosures, inverters, transformers, switch gear and control building
- Onsite 33/330 kV substation to convert electricity from the medium voltage BESS to the high voltage transmission network
- High voltage transmission connection (above ground and/or below ground) between the BESS and the Tamworth substation
- Ancillary infrastructure and mitigative features including:
 - Site access to the BESS from Ascot-Calala Road
 - Internal site access road and parking
 - Permanent office and staff amenities
 - Operations and maintenance (O&M) building
 - Stormwater management infrastructure
 - Services and utilities
 - Lighting, fencing and security devices
 - Noise acoustic barriers
 - Asset protection zone
 - Landscaping and screening vegetation.

The BESS would operate 24 hours a day, seven days a week and be monitored remotely, with infrastructure maintenance undertaken on-site. A detailed description of the Project is provided in Chapter 3 of this Environmental Impact Statement (EIS) and an overview of the Project is shown in Figure 3-1.

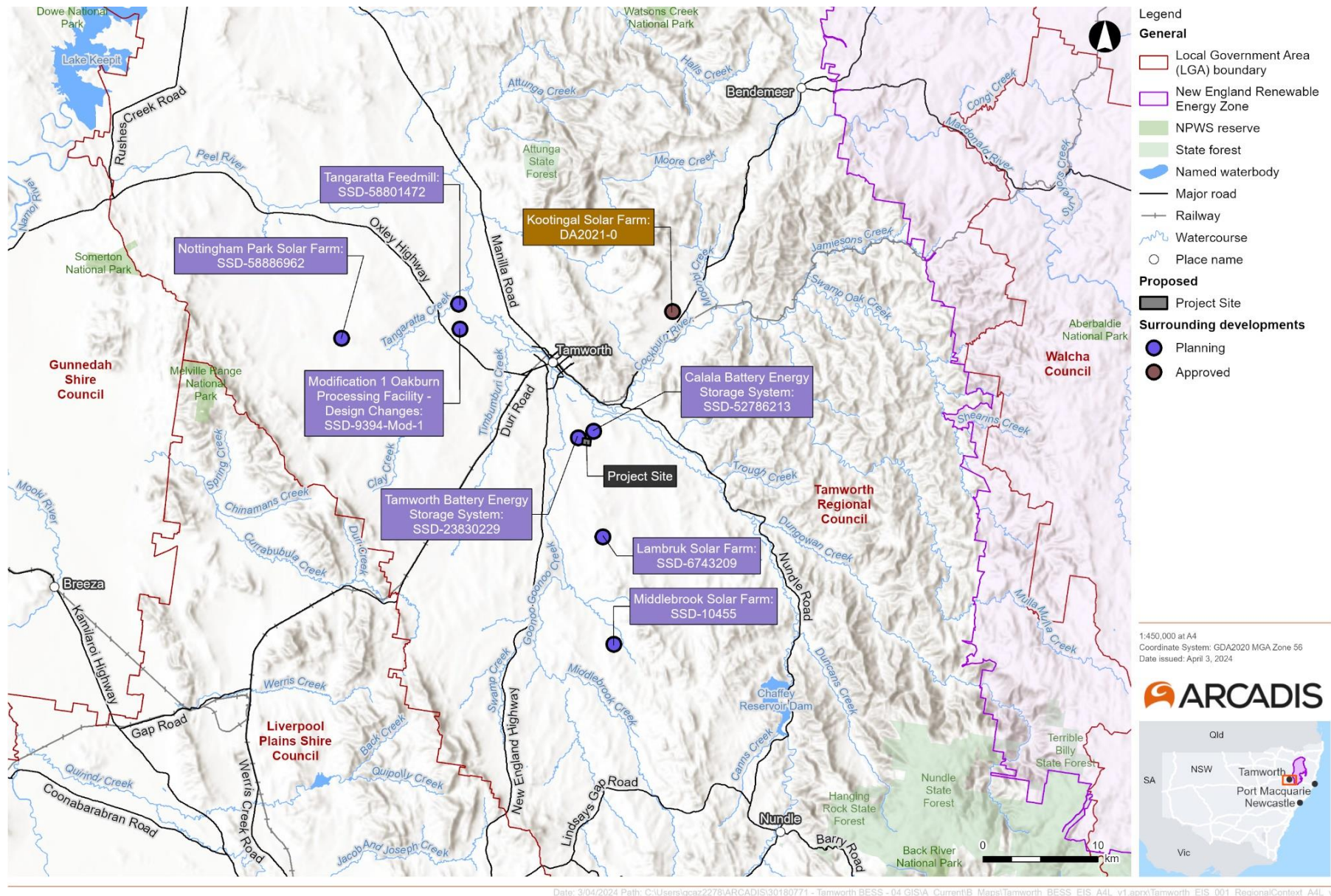


Figure 1-1 Regional context

1.2 Project objectives

The objectives of the Project are to:

- Increase firming infrastructure and the potential for additional renewable energy assets to be built in NSW
- Improve the security, resilience and sustainability of NSW's electricity grid
- Help reduce the direct carbon emission of the NSW's electricity grid (by not relying on traditional fossil fuel firming assets)
- Minimise adverse impacts on the environment and community during the Project lifecycle
- Support the locality through social and economic enhancement.

1.3 The Proponent

The Proponent is Iberdrola Australia Development Pty Ltd (ABN 32 137 258 470), a subsidiary of Iberdrola Australia Limited (ABN 39 105 051 616) (formerly trading as Infigen Energy Limited).

Iberdrola Australia Limited are an owned entity of the Iberdrola Group. Iberdrola S.A. is the ultimate parent company of the entire Iberdrola Group and owns 100% of Iberdrola Australia Limited.

The Iberdrola Group is the number one producer of wind power by volume globally, and one of the world's largest electricity utilities by market capitalisation. Iberdrola Group's global expertise spans renewable energy, electricity networks, smart grids, large-scale energy storage, energy innovation and digitisation, and advanced customer products. The Iberdrola Group owns and operates 53 GW of installed generating capacity, including over 40 GW of installed renewables capacity owned, with a further 7 GW contracted.

Iberdrola Australia Limited is a leader in renewable energy and has been operating renewable energy assets locally for over 15 years. Iberdrola Australia Limited is a long-term developer, operator and owner, and manages all aspects of the project lifecycle. It currently has 1.4 GW portfolio of renewable assets under operation or construction in Australia, which is supported by 320 MW of firming capacity. Iberdrola Australia Limited has strong growth ambitions in supporting Australia in meeting its various clean energy targets and continue to provide reliable and affordable clean energy to its customers. Iberdrola Australia Limited will be investing \$2 billion in Australia by 2025.

The details of the Proponent are provided in Table 1-1.

Table 1-1 Proponent details

Proponent details	
Name	Iberdrola Australia Development Pty Ltd
Postal address	Governor Phillip Tower, Level 22, 1 Farrer Place, Sydney, NSW 2000
ABN	32 137 258 470
Nominated contact	Jose Opazo Iberdrola Australia Development Pty Ltd
Contact details	Jose.opazo@iberdrola.com.au
EIS	Prepared by Arcadis Australia Pty Limited

1.4 Related development

Related development includes any:

- Existing or approved development that would be:
 - Incorporated into the Project
 - Operated in conjunction with the Project under a separate development consent or approval
- Development that is required for the Project but would be subject to a separate assessment.

The Project would connect into the existing Transgrid Tamworth substation (Tamworth substation). Any related works needing to be undertaken to the Tamworth substation or existing transmission lines would be undertaken under a separate approval (under Part 5 of the EP&A Act).

Two 330kV aboveground transmission lines transect the Project Site. The BESS, BESS substation and ancillary infrastructure are located outside of these easements. The proposed transmission corridor running towards the Tamworth substation crosses a 330kV aboveground transmission line easement.

1.5 Project background

Iberdrola has been investigating the potential to develop a BESS near the Tamworth substation since 2023. Iberdrola undertook an internal screening review to determine the suitability of the Project to progress through the planning approval process. Specific consideration was given to:

- Estimated electrical supply and demand, including grid connectivity
- Commercial viability, including consideration of constructability and operability
- Applicable Commonwealth, State and local legislation and guidelines to identify the relevant regulatory and permitting requirements
- Environmental and planning constraints that would influence the design and development
- The social acceptability by the local community and stakeholders.

Arcadis Australia Pacific Pty (Arcadis) subsequently prepared and submitted the Scoping Report to the then Department for Planning and Environment (DPE – now the Department of Planning, Housing and Infrastructure, or DPHI) in October 2023 to obtain Secretary's Environmental Assessment Requirements (SEARs) for the EIS. DPE issued the SEARs for the Project on 30 October 2023.

The Project has been sited to avoid and / or minimise environmental impacts whilst minimising distances to the Tamworth substation. The key strategies adopted include:

- Siting of the BESS to maximise distance from non-associated receivers
- Suitable asset protection zones and separation distances
- Planted landscaping around Project infrastructure
- Noise acoustic barriers and silencers
- Siting of BESS outside of existing easements.

These strategies and the identified mitigation are discussed throughout Chapter 6 of this EIS.

1.6 Purpose of this Report

This EIS has been prepared by Arcadis on behalf of the Proponent to support an application for the approval of the Project. It has been prepared in accordance with the SEARs, the EP&A Act and the Environmental Planning and Assessment Regulations 2000 (EP&A Regulations).

This EIS has been prepared in accordance with the following guidelines:

- *State significant development guidelines – preparing an environmental impact statement* (the SSD EIS Guideline) (DPE, 2022a)
- *Undertaking engagement guidelines for state significant projects* (the Engagement Guideline) (DPE, 2022b)
- *Cumulative impact assessment guidelines for state significant projects* (the CIA Guideline) (DPE, 2022c)
- *Social impact assessment guideline for state significant projects* (the SIA Guideline) (DPE, 2023a).

1.7 Structure of this EIS

The structure of the EIS is detailed in Table 1-2. The SEARs are attached in Appendix A, with a reference to where each requirement has been addressed within this EIS.

Table 1-2 Structure of this EIS

Section No.	Section title	Content
-	Executive summary	Provides a brief overview of the Project, key environmental assessment results and an outline of the proposed environmental and social mitigation measures.
1	Introduction	Introduces the Project and the EIS, including Project objectives, and Proponent details.
2	Strategic context	Explains the strategic need for the Project, benefits, consistency with government plans, policies and guidelines, and outlines the alternatives considered during development of the Project.
3	Project description	Provides a detailed description of the Project. This includes a description of the Project area, the physical layout and design, uses and activities, and timing of the Project.
4	Statutory context	Describes the statutory context of the Project, including an outline of the relevant legislation and environmental planning instruments applicable to the Project.
5	Engagement	Discusses engagement undertaken with the community and outlines how the community engagement aims have been addressed, the key issues raised by the community, and the proposed future approach to community engagement. Engagement with the government agencies has also been addressed.
6	Environmental assessment	Provides an assessment of environmental impacts and mitigation measures during construction, operation, and decommissioning including: • Traffic and transport • Noise and vibration • Biodiversity • Hazard and risk • Bushfire • Heritage • Visual amenity • Land • Social and economic • Water • Waste • Air quality • Cumulative impacts

Section No.	Section title	Content
7	Justification and conclusion	Provides an overview of the conclusions from the environmental impact assessment and discusses the Project's justification on balance of environmental, social and economic considerations, including ecologically sustainable development (ESD).
8	References	Lists the references used throughout the EIS.

The following Appendices are included in the EIS.

Table 1-3 Appendices

Appendix	Description	Author
A	Consolidated SEARs compliance table	Arcadis
B	EP&A regulation checklist	Arcadis
C	Compilation of mitigation measures	Arcadis
D	Traffic Impact Assessment	Arcadis
E	Noise and Vibration Impact Assessment	Resonate
F	Biodiversity Development Assessment Report	Arcadis
G	Preliminary Hazard Analysis	Sherpa Consulting
H	Aboriginal Cultural Heritage Assessment Report	Ozark
I	Historic Heritage Impact Assessment	Ozark
J	Landscape and Visual Impact Assessment	Moir Landscape Architecture
K	Preliminary Site Investigation	Arcadis
L	Social and Economic Impact Assessment	HillPDA
M	Water Impact Assessment	Arcadis
N	Bushfire Impact Assessment	Bushfire Consulting Services
O	Engagement Report	WSP

1.8 Key terms

Table 1-4 provides a summary of the key terms used within this EIS.

Table 1-4 Key terms of the EIS

Terminology	Description
Associated receiver	These receivers are associated with the Project and therefore are accepting of impacts.
Development envelope / subject land	Broader area that may be disturbed by the Project during construction, operation and decommissioning (including all activities and temporary and permanent impact areas). This includes Lot 43/DP1064582, Lot 3/DP244399, Lot 4/DP244399 and Lot 6/DP219993. The development envelope is the maximum extent within which the disturbance footprint can move to allow the final siting of infrastructure through the detailed design process (in particular the transmission corridor).
Project / development footprint	The development footprint is 21.68 ha The development footprint is currently indicative. This development footprint would be finalised after the competitive tender procurement process, Transgrid connection process and detailed design (pending Project approval) and would be located within the development envelope.
Project Site	Where the BESS would be located, which is at 744 Burgmanns Lane, Kingswood 2340 (Lot 43 DP1064582).
The Project	The Project for which approval is being sought, namely the construction, operation and maintenance of a BESS known as the “Kingswood Battery Energy Storage System”. This includes the BESS, on-site 33/330 kV substation, ancillary infrastructure, and high voltage transmission line connection.
Non-associated receiver	These receivers are not associated with the Project. All relevant Project impacts have been assessed in accordance with best practice guidelines.
Tamworth substation	The existing 330/132kV substation operated by Transgrid and located at Burgmanns Lane, Kingswood (Lot 6, DP 219993).

2 Strategic context

2.1 Project need and strategic justification

The Project is needed to support the NSW Government's strategy for a reliable, affordable and sustainable electricity future that supports a growing economy. The National Energy Market (NEM) is rapidly moving away from reliance on thermal generation facilities towards renewable energy generators. Grid-scale battery energy storage is essential in providing infrastructure enabling the expansion of renewable energy in NSW and in ensuring firm capacity is met. As such, the Proponent considers that the Project will play a role in the transformation of the NSW energy sector.

The Federal, State and Local Governments have put in place several plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. These include:

- *2020 Australia's Long Term Emissions Reduction Plan* (DCCEW, 2021)
- *2022 Integrated System Plan for the National Electricity Market* (2022 ISP) (Australian Energy Market Operator (AEMO), 2020)
- *NSW Transmission Infrastructure Strategy* (Department of Planning, Industry and Environment (DPIE), 2018) (the Transmission Infrastructure Strategy)
- *NSW Government's Electricity Strategy* (DPIE, 2019) (the Electricity Strategy)
- *NSW Electricity Infrastructure Roadmap* (DPIE, 2020) (Electricity Infrastructure Roadmap)
- *NSW Climate Change Policy Framework* (NSW Office of Environment and Heritage (OEH), 2016)
- *New England North West Regional Plan 2041* (DPE, 2022).

A high-level overview of each of these plans, strategies and roadmaps is provided below.

2.1.1 2020 Australia's Long Term Emissions Reduction Plan (National)

Australia's whole-of-economy Long-Term Emissions Reduction Plan is focussed on technology and sets out how Australia will achieve net zero emissions by 2050. One of the key principles of the plan is keeping energy prices down, while providing affordable and reliable power. The plan identifies low emissions technology solutions, including energy storage for firming, as a priority technology to achieving clean, cheap electricity.

The Technology Investment Roadmap is the cornerstone of the Long-Term Emissions Reduction Plan and sets a process to develop and deploy low emissions technologies. The Technology Investment Roadmap requires the preparation of Low Emissions Technology Statements (LETS) which review, refine and evaluate the government's investments in low emissions technologies. The current LETS (LETS 2021) identifies energy storage as an existing priority technology for government investment.

LETS 2021 indicates that broad deployment of electrical energy storage will facilitate further integration of low-cost solar and wind electricity into the grid. Energy storage will provide system security services, be a source of reliable, dispatchable electricity, and will reduce pressure on electricity prices by meeting peaks in consumer demand.

The Project would be consistent with the high priority technologies outlined in the Long-Term Emissions Reduction Plan as it which would provide increased transmission capacity and a reliable source of power at affordable prices for customers.

2.1.2 2022 Integrated System Plan

The *2022 Integrated System Plan for the National Electricity Market* (2022 ISP) (AEMO, 2022) provides a comprehensive roadmap for the NEM by supporting a once-in-a-century transformation in the way electricity is generated and consumed in eastern and south-eastern Australia.

The 2022 ISP and its optimal development path support Australia's complex and rapid energy transformation towards net zero emissions, enabling low-cost firm renewable energy and essential transmission to provide consumers in the NEM with reliable, secure and affordable power.

Development opportunities for an optimal energy system identified in 2022 ISP acknowledges that to firm up the inherently variable nature of distributed and large-scale renewable energy generation, new flexible, dispatchable resources, including BESS (as proposed by the Proponent), will be needed.

New utility-scale battery and pumped hydro storage, located at appropriate parts of the network, will enable more effective dispatch of clean electricity on demand, increase resilience by shifting energy through time to manage weather variations, and provide critical system security services.

As the Project would primarily involve the development of a BESS system that connects to existing power supply transmission networks, it is considered to align with, and support the intent of, the 2022 ISP.

2.1.3 NSW Transmission Infrastructure Strategy

The *NSW Transmission Infrastructure Strategy* (DPIE, 2018) (the Transmission Infrastructure Strategy) acknowledges that NSW is undergoing an energy sector transformation which will change how energy is generated and used throughout the State.

The Transmission Infrastructure Strategy forms part of the NSW Government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure and ensure new technologies deliver benefits for customers.

By increasing transmission capacity and low-cost generation, the strategy aims to support an orderly transition of the energy sector over the next two decades.

As the Project would primarily involve the development of a large-scale BESS system that connects to existing power supply transmission networks, it is considered to complement the Transmission Infrastructure Strategy.

2.1.4 NSW Electricity Strategy

The *Electricity Strategy* (DPIE, 2019) is the NSW Government's Plan for a reliable, affordable and sustainable electricity future. The Electricity Strategy acknowledges the challenges that exist in achieving the Government's objectives for the electricity system. This includes reliability risks from the retirement of some traditional coal-fired power stations combined with congestion within the existing transmission system. Both these risks reduce the attractiveness of investment in the new generation required to reduce electricity prices, improve reliability, and protect the environment.

The Electricity Strategy sets out actions to address the specific needs of NSW while long term national reforms are developed and implemented. Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, i.e. firm generation (such as gas and battery storage) dispatch electricity into the grid. This energy generation and supply system identifies electrical demand so long as there is sufficient firm generation capacity to meet the system's electricity demand.

As noted in the Electricity Strategy, as of October 2019, there are 17,700 MW of large-scale renewable energy projects that have received planning approval or are progressing through the NSW planning system, representing about \$24 billion in investment. In addition to these renewable projects, there are 1,410 MW of large-scale non-renewable energy projects with planning approval, worth around \$1.5 billion. This includes 1,250 MW of gas projects, worth \$1.25 billion, and 160 MW of coal efficiency upgrades, worth \$209 million.

Batteries, as a form of electrical storage, also provide multiple grid services such as frequency regulation. The cost of batteries has fallen in recent years and is expected to continue to trend downwards making batteries a more feasible, commercial firming option for wind and solar farms. The principles guiding the development of the Electricity Strategy comprise four propositions. Principle 1: New generation, delivered by competitive markets should reduce electricity prices and protect the environment, notes that renewables, firmed by dispatchable technologies such as gas and storage, are the lowest cost form of new reliable electricity generation. Accordingly, a good investment environment will deliver new generation, reduce electricity prices, and ensure reliability while protecting the environment.

The Project is consistent with the goals of the Electricity Strategy, given the Project's ability to provide firm generation infrastructure able to support and complement future development of renewable energy projects.

2.1.5 NSW Electricity Infrastructure Roadmap

The *Electricity Infrastructure Roadmap* (DPIE, 2020) recognises that NSW has some of the best renewable energy resources in the world and as the global economy moves to reduce carbon emissions, NSW can attract investment in new, low carbon industries and can benefit from some of the lowest electricity prices in the Organisation for Economic Co-operation and Development. The Electricity Infrastructure Roadmap also acknowledges that to take advantage of these opportunities, substantial investment into modernising the existing electricity system, including by building transmission, generation and long duration storage and firming infrastructure is required.

The purpose of the NSW Electricity Infrastructure Roadmap is to deliver this infrastructure and secure NSW's future as an energy superpower. The Roadmap is expected to attract \$32 billion of timely and coordinated private sector investment in large-scale generation, storage and transmission by 2030 to maintain a reliable, secure and affordable supply.

The Electricity Roadmap notes that investment in large-scale storage and firming capacity, including battery storage (long and short duration) will be required to balance the supply of variable renewable energy.

Recently, as a part of the NSW Electricity Infrastructure Roadmap, the Consumer Trustee (AEMO Services) commenced a competitive tender for firming infrastructure which aligns with the Consumer Trustee's 10 Year Tender Plan for built energy infrastructure in NSW released in its 2022 Infrastructure Investment Objectives Report. This competitive tender round is for an indicative amount of 380 MW of firming infrastructure.

2.1.6 NSW Climate Change Policy Framework

The aim of the *NSW Climate Change Policy Framework* (OEH, 2016) is to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change.

The long-term objective of the Climate Change Policy Framework is:

- To achieve net-zero emissions by 2050
- That NSW is more resilient to a changing climate.

As the Project would include the provision of a BESS that would assist in the development of a renewable energy power supply network for NSW that would increase capacity and resilience, the Project is considered complementary to the Climate Change Policy Framework.

2.1.7 New England North West Regional Plan 2041

The *New England North West Regional Plan 2041* (DPE, 2022) provides an overarching framework to guide development proposals, land use plans and infrastructure funding decisions for the New England North West. Of the 22 objectives laid out by the Regional Plan, the following are relevant to the Project:

- Objective 1: Coordinate land use planning for future growth, community need and regional economic development
- Objective 2: Protect the viability and integrity of rural land
- Objective 8: Adapt to climate change and natural hazards and increase climate resilience
- Objective 9: Lead renewable energy technology and investment
- Objective 10: Support a circular economy
- Objective 11: Sustainably manage and conserve water resources
- Objective 12: Protect regional biodiversity and areas of High Environmental Value
- Objective 13: Understand, respect and integrate Aboriginal culture and heritage
- Objective 19: Leverage new and upgraded infrastructure

The Project would involve the development of a BESS providing electricity storage and firming capacity for the Tamworth region, supporting the development of intermittent renewable energy generation.

The Regional Plan references the Electricity Infrastructure Roadmap which sets out a plan for five Renewable Energy Zones (REZs), including one in the New England region, which will prioritise funding and support for the development of renewable energy projects. The New England REZ is expected to provide a network capacity of 8 GWs. The Project's strategic positioning around 35 kilometres west of the New England REZ would provide firm generation infrastructure to support the New England REZ by balancing the supply of variable renewable energy.

2.1.8 Tamworth Regional Blueprint 100

The *Tamworth Regional Blueprint 100* (Figure 2-1) is an overarching strategy that provides a roadmap to take the Tamworth Region towards its vision of a prosperous economy and high living standards with a population of 100,000 people. It encompasses the Tamworth Regional Council Local Strategic Planning Statement 2020, the Growth Management Strategy and other council initiatives, aligning with a range of regional and local plans. The construction phase of the Project would provide jobs within the area and the opportunity for upskilling of the regional population, which is in alignment with the core strategies of the Tamworth Regional Blueprint 100 of 'More Jobs' and 'More Skills'

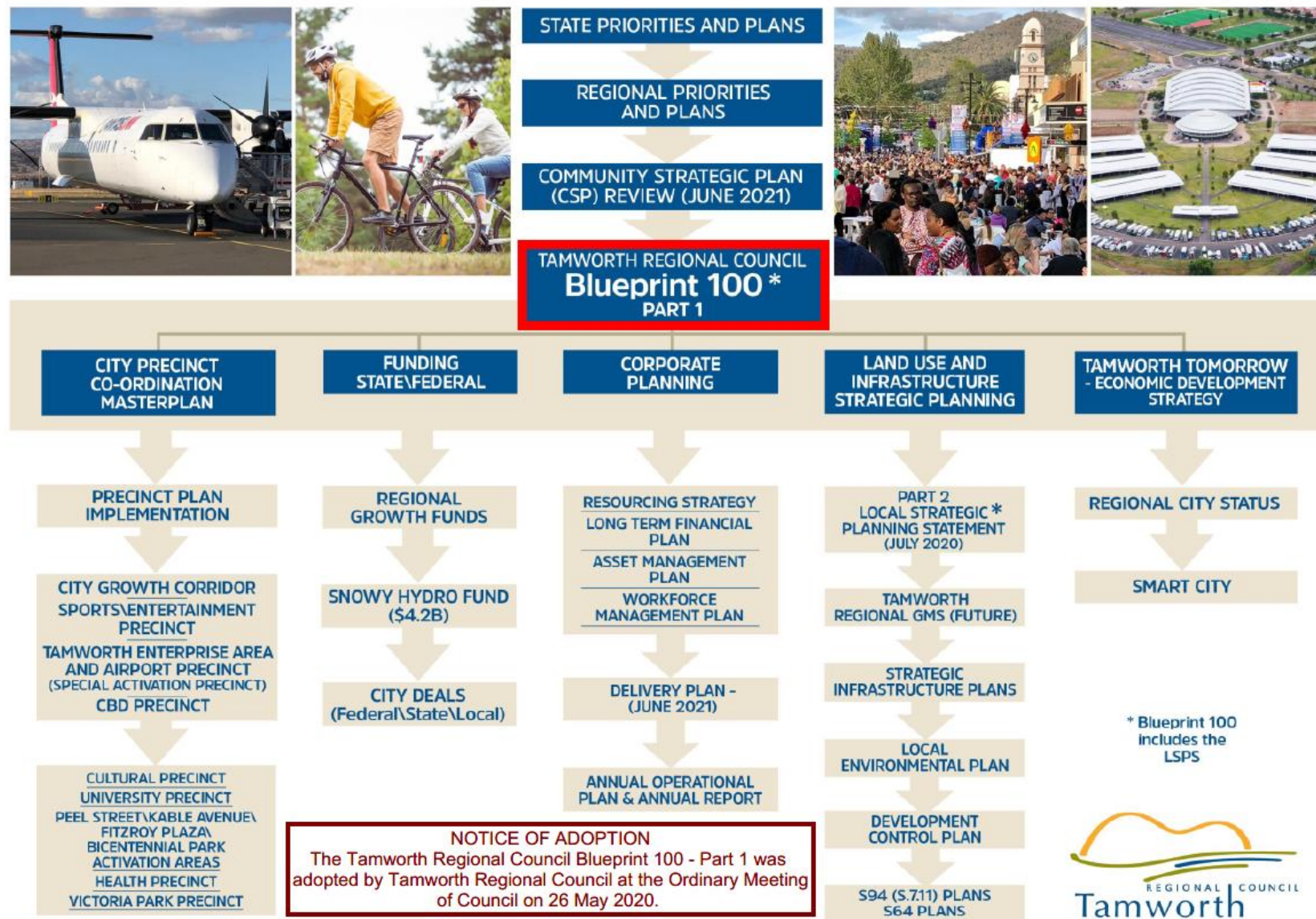


Figure 2-1 Tamworth Regional Council Blueprint 100 – plan and policies (Tamworth Regional Council, 2020)

2.2 Site setting and features

Tamworth is a rural region dominated by agricultural land uses, particularly cattle and sheep grazing for slaughter, and hay and cereal cropping (ABS, 2021). Consistent with the regional setting and its immediate surrounds, the Project Site is zoned RU4 Primary Production Small Lots and has been extensively cleared. The Project Site is not used for commercial farming but is used for cattle grazing.

The Project Site is roughly rectangular in shape, covering around 40 hectares and located 400 metres southeast of the Tamworth substation.

The Project Site is bounded by Ascot-Calala Road to the east and Burgmanns Lane to the north, and is 3.2 kilometres from the New England Highway / Goonoo Goonoo Road. The Project Site is located within the Namoi River Catchment and has a low gradient sloping northeast towards Calala Creek 800 metres to the east. Calala Creek feeds into the Peel River. The nearest residential zoned land is located in Calala around 470 metres north. Isolated receptors are present in adjacent properties on Burgmanns Lane and Ascot-Calala Road. Receptors located within one kilometre of the Project Site are included in Table 2-1 and shown in Figure 2-2.

Within the Project Site, a dwelling occupied by the existing landowner is located in the southwest corner. Wire fencing extends around the Project Site, dividing the lot internally into three paddocks, the dwelling, and the stables. Access to the Project Site is currently via Burgmanns Lane. The topographic high point of the Project Site is in the southwest corner at 460 metres, with land sloping to the northeast and southwest away from the Project Site. Electrical infrastructure transects and surrounds the Project Site due to the nearby Tamworth substation. Two overhead 330 kV transmission lines (including towers) transect the Project Site and other 330 kV and 132 kV electrical transmission lines are present within one kilometre of the Project Site.

The Project Site is not considered Biophysical Strategic Agricultural Land as it is not land with high quality soil and water resources capable of sustaining high levels of productivity. The Project Site is identified as Category 3 bushfire prone land.

The local context of the Project Site and key environmental and land use constraints of the Project are shown in Figure 2-2.

Table 2-1 Receivers

Direction	Receiver type	Receiver ID	Location	Indicative distance (m) from BESS
	Residential	Associated	744 Burgmanns Lane Kingswood 2340	250
N	Residential	R2	795 Burgmanns Lane Calala 2340	440
N	Residential	R3	781 Burgmanns Lane Calala 2340	540
W	Residential	R4	696 Burgmanns Lane Kingswood 2340	550
N	Residential	R5	111 Burgess Lane Calala 2340	910
NNW	Residential	R6	59 Falcon Drive Calala 2340	1,000
NNW	Residential	R7	57 Falcon Drive Calala 2340	1,050
N	Residential	R8	99 Burgess Lane Calala 2340	1,000
SE	Residential	R9	910 Ascot-calala Road Calala 2340	630
NNW	Residential	R10	55 Falcon Drive Calala 2340	1,100
NNW	Residential	R11	51 Falcon Drive Calala 2340	1,140

Direction	Receiver type	Receiver ID	Location	Indicative distance (m) from BESS
N	Residential	R12	93 Burgess Lane Calala 2340	1,070
NNW	Residential	R13	68 Falcon Drive Calala 2340	1,110
NNW	Residential	R14	66 Falcon Drive Calala 2340	1,150
N	Residential	R15	94 Burgess Lane Calala 2340	1,130
S	Residential	R16	877 Ascot-calala Road Kingswood 2340	730
NNW	Residential	R17	49 Falcon Drive Calala 2340	1,210
NNW	Residential	R18	64 Falcon Drive Calala 2340	1,230
N	Residential	R19	87 Burgess Lane Calala 2340	1,180
NNW	Residential	R20	47 Falcon Drive Calala 2340	1,260
W	Residential	R21	652 Burgmanns Lane Kingswood 2340	1,090
NW	Residential	R22	9 Whipbird Street Calala 2340	1,330
NNW	Residential	R23	62 Falcon Drive Calala 2340	1,290
NW	Residential	R24	633 Burgmanns Lane Calala 2340	1,300
SE	Residential	R25	198 Marsden Park Road Calala 2340	900
N	Residential	R26	69 Burgess Lane Calala 2340	1,280
N	Residential	R27	68 Burgess Lane Calala 2340	1,290
NW	Residential	R28	7 Whipbird Street Calala 2340	1,380
NW	Residential	R29	651 Burgmanns Lane Calala 2340	1,310
NNW	Residential	R30	45 Falcon Drive Calala 2340	1,390
NW	Residential	R32	10 Whipbird Street Calala 2340	1,430
NW	Residential	R31	5 Whipbird Street Calala 2340	1,420
NW	Residential	R33	625 Burgmanns Lane Calala 2340	1,410
NNW	Residential	R34	60 Falcon Drive Calala 2340	1,400
N	Residential	R35	57 Burgess Lane Calala 2340	1,370
N	Residential	R36	62 Burgess Lane Calala 2340	1,391
NW	Residential	R37	8 Whipbird Street Calala 2340	1,470

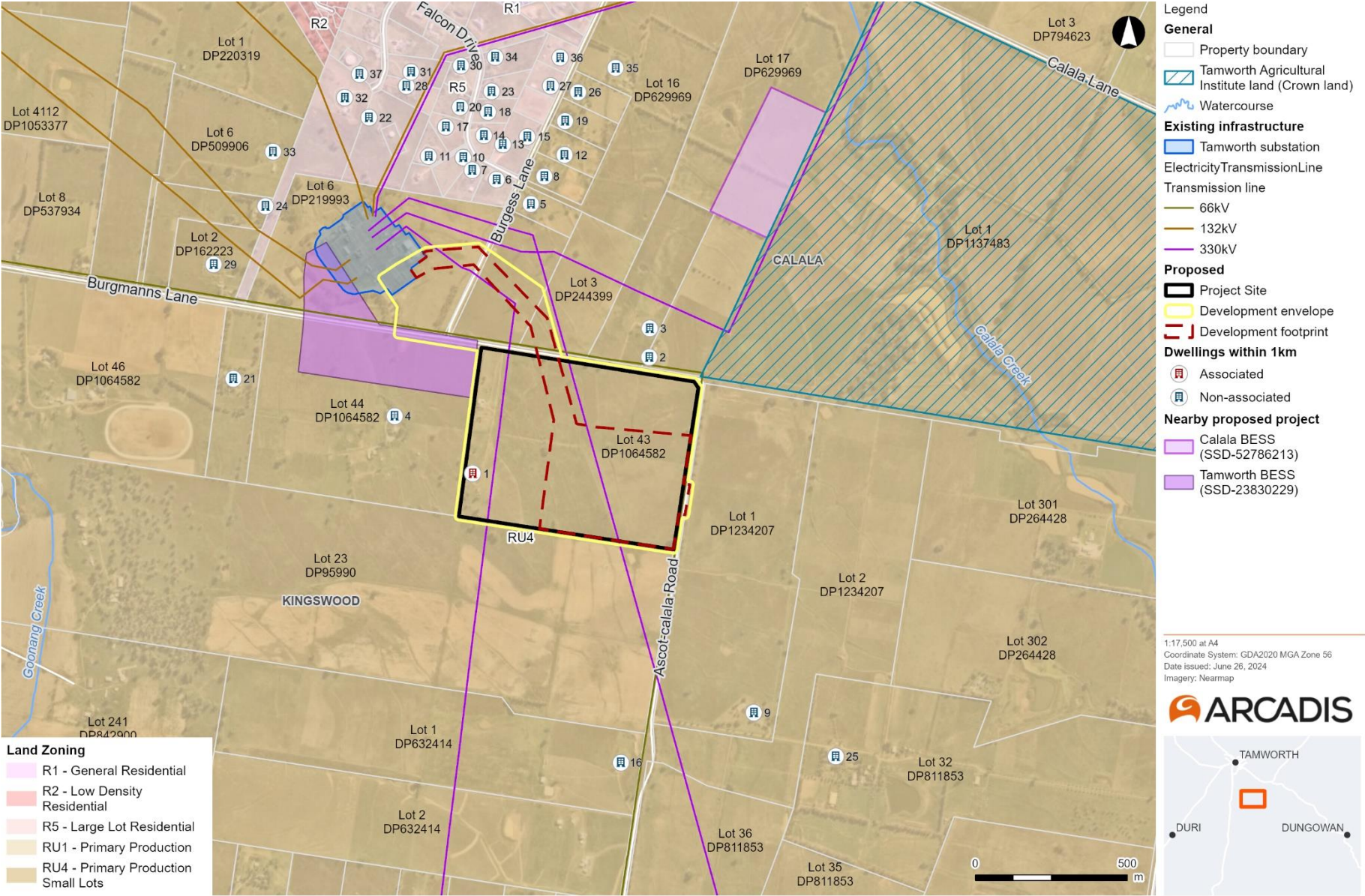


Figure 2-2 Local context

2.3 Agreements with other parties

2.3.1 Landowners

The land to which the Project relates, and the agreements which have been made, are identified in Table 2-2.

Table 2-2 Land schedule and agreements

Lot / DP	Land owner	Agreement
Lot 43 DP1064582	Freehold	Option to purchase agreement is in place between Iberdrola and the owner of Lot 43 DP1064582.
Lot 3 DP244399 Lot 4 DP244399 Lot 6 DP219993	Transgrid (Electricity Transmission Ministerial Holding Corporation (ETMHC))	Iberdrola has provided ETMHC with a copy of this EIS, ETMHC has reviewed the EIS and provided landowner consent to lodge the development application.
Ascot-Calala Road	Tamworth Regional Council (TRC)	Iberdrola has consulted with TRC during the development of the EIS and will obtain landowners consent in relation to the site access prior to Project determination.

2.3.2 Planning agreement

Iberdrola has engaged with TRC throughout the development of the EIS and are committed to entering into a planning agreement to ensure there are further local benefits as a result of the Project. Iberdrola will continue to consult with TRC through the planning process to define the planning agreement. This planning agreement would be separate and in addition to any benefit sharing scheme.

2.3.3 Benefits sharing scheme

Iberdrola is committed to establishing a community benefit fund which would allocate funds for community-based projects. The details of the fund are yet to be determined but would likely be managed through a committee comprising representatives from Iberdrola, TRC and the local community. This has been discussed with TRC but requires further development in partnership with the community and key stakeholders.

Iberdrola is committed to prioritising local jobs and businesses wherever possible to achieve positive local employment and business outcomes for the region. The Local Procurement Strategy will:

- Encompass considerations regarding local employment and procurement (with a specific focus on First Nations participation) and the associated accommodation of the construction workforce
- Target people and businesses within Tamworth LGA and regional surrounds
- Continue to consult with stakeholders such as the TRC, Department of Regional NSW, Tamworth Business Chamber and other economic development or local social service agencies.

2.4 Cumulative impacts

A cumulative impact assessment for the Project has been undertaken in accordance with the CIA Guideline (DPE, 2022c). Projects that have the potential generate cumulative impacts are provided in Table 2-3.

Notably, there are two other BESS projects seeking development approval within one kilometre of the Project Site, including the Calala Battery Energy Storage System (SSD-52786213) and the Tamworth Battery Energy Storage System (SSD-23830229). The location of these renewable projects is shown on Figure 1-1. There is potential for the Project to generate cumulative impacts with these BESS proposals should they proceed, particularly in relation to visual, noise

and construction impacts. This has been assessed and is discussed in the cumulative impact assessment in Section 6.13.

Table 2-3 Cumulative impact screening

Project	Application	Status	Indicative distance from Project Site
Local renewable projects			
Calala Battery Energy Storage System	SSD-52786213	Planning – Response to Submissions	Within 1 km
Tamworth Battery Energy Storage System	SSD-23830229	Planning – Prepare EIS	Within 1 km
Lambruk Solar Farm	SSD-67436209	Planning – Prepare EIS	8 km
Kootingal Solar Farm	DA2021-0	Unknown	13 km
Middlebrook Solar Farm	SSD-10455	Planning – Response to Submissions	17 km
Nottingham Park Solar Farm	SSD- 58886962	Planning – Prepare EIS	23 km
Other projects			
Tamworth substation upgrade	Transgrid (Part 5 of the EP&A Act)	Status unknown	Within 1 km
Burgmanns Lane causeway replacement	TRC (Part 5 of the EP&A Act)	Status unknown	2 km
Goonoo Goonoo Road duplication	TfNSW (Part 5 of the EP&A Act)	Early works underway (Jan 2023) (TfNSW, 2023)	4 km
Tangaratta Feedmill	SSD-58801472	Planning – Prepare EIS	16 km

2.5 Strategic alternatives

2.5.1 ‘Do nothing’

The do-nothing approach would not support the NSW Government’s broader plans and strategies to make energy more affordable, secure investment in new power sources and network infrastructure and ensure new technologies deliver benefits for customers.

For these reasons, the ‘do nothing’ scenario is not the preferred or considered a suitable option.

2.5.2 Alternative site

Following an assessment of electricity needs across NSW, relevant planning and policy considerations, and forecasted demands, Iberdrola identified the Tamworth region, and more specifically land close to the Tamworth substation, as a suitable location for the development of a BESS.

No alternative sites were identified. The key limiting factors to the identification of an alternative site included the potential increased costs and environmental impacts associated with the acquisition of a suitable property and increased extent of connection infrastructure between the BESS and the Tamworth substation.

2.5.3 Alternative configurations

Alternatives were investigated within the Project Site and are shown on Figure 2-3. The alternatives included:

- Access to the Project Site via the existing driveway off Burgmanns Lane
- Locating the BESS in the north of the Project Site
- Locating the BESS in the west of the Project Site (including earth noise mounds)
- Utilising the existing overhead 330 kV transmission infrastructure
- Constructing a BESS of up to 500 MW capacity (as described in the Scoping Report).

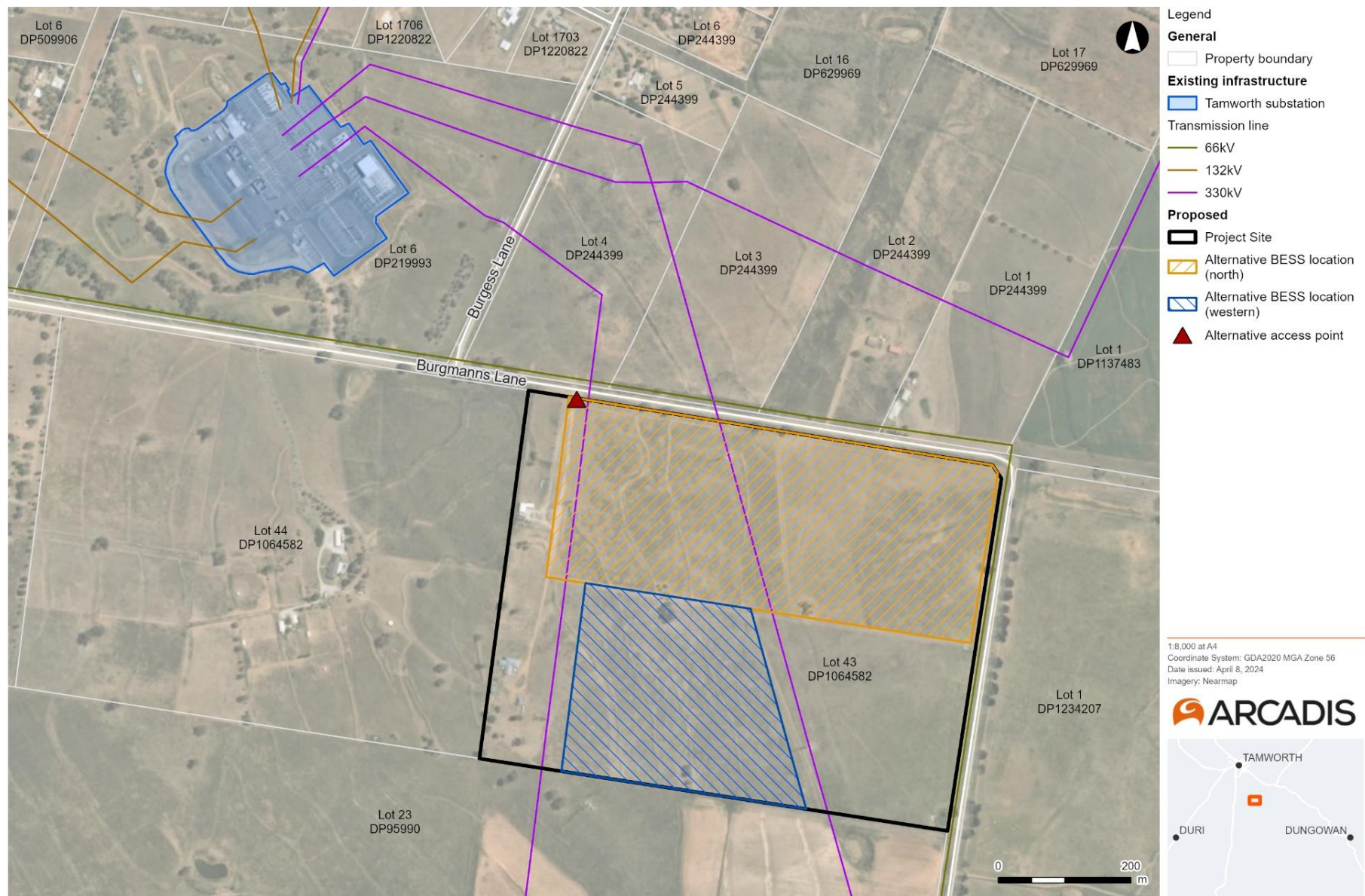
Access to the Project Site via the existing driveway off Burgmanns Lane was considered less suitable following feedback from the community and TRC. The use of heavy vehicles during construction in proximity to the Calala town centre was not supported.

Locating the BESS in the front of the Project Site was considered to reduce the connection infrastructure distance between the BESS and the Tamworth substation. However, this was considered less suitable due to potential increased noise and visual impacts to receivers north of the Project Site.

Locating the BESS in the west of the Project Site was considered less suitable due to the elevation and associated visual risks and / or earthworks required (including increased spoil and traffic).

Opportunities to utilise the existing overhead 330 kV infrastructure to connect to the Tamworth substation were investigated. Based on a preliminary review of the network and the Transgrid engagement undertaken to date, a new transmission alignment is required. The alignment of this connection is subject to the Transgrid connection process. For these reasons, a development envelope has been identified for the Project. This is described in Section 3.2.3.

The Project considered a BESS of up to 500MW capacity (as identified in the Scoping Report). This was reduced to a BESS of up to 270MW to reduce Project impacts identified through the EIS investigations and engagement.



Date: 8/04/2024 Path: C:\Users\lgasz2278\ARCADIS\30180771 - Tamworth BESS - 04 GIS\A_Current\B_Maps\Tamworth BESS_EIS_A4L_v1.aprx\Tamworth_EIS_003_AlternativesConsidered_A4L_v2 - Figure 2-3 Alternatives Considered

Figure 2-3 Alternatives considered

2.5.4 Alternative technology

Battery chemistry and associated technology options are rapidly evolving and combined with decreasing costs, are increasingly being investigated and pursued. Battery chemistries / technologies that were considered are discussed in Table 2-4.

Table 2-4 Battery chemistry overview

Battery chemistry	Overview
Lithium-ion	Lithium-ion chemistries are diverse. Nickel-Manganese-Cobalt and Iron Phosphate formulations are commonly used within BESS facilities. These batteries are established in the marketplace and can be developed to comply with a range of Australian and international standards. This technology has been selected for the Project.
Lithium-ion polymer battery	This alternative is being investigated as certain formulations are quoted to achieve greater safety (e.g., reduction or elimination of thermal runaway), increased energy density, material stability within a greater operating envelope, and an enhancement in overall performance. This technology has not been selected for the Project.
Vanadium redox flow battery (flow battery)	This alternative is capable of long-duration discharge. It is quoted to achieve greater safety (e.g., reduction or elimination of thermal runaway), greater temperature operating envelope and longer operational design life. This technology has not been selected for the Project.
Sodium-ion battery	This alternative technology was considered given its environmental abundance, non-flammable nature, and reduced susceptibility to temperature changes relative to Lithium-ion batteries This technology has not been selected for the Project.

2.6 Site suitability

The Project at 744 Burgmanns Lane, Kingswood 2340 was considered as the preferred option. Underpinning factors for this decision is that Project:

- Is located close to existing grid infrastructure (Tamworth substation)
- Is compatible with the existing land use zoning
- Is consistent with the existing electricity infrastructure setting
- Minimises the need to remove high quality native vegetation
- Minimises impact on surrounding privately or publicly owned land
- Minimises environmental impacts
- Is located on land with no known contamination issues
- Is located on relatively flat ground that would require minimal excavation and/or levelling.

The Project would leverage its strategic proximity to the Tamworth substation to provide for future capacity and resilience of the NSW energy network through the delivery of a large-scale dispatchable energy storage system. The Project aligns with Federal, State and Local Governments plans, strategies and roadmaps. A land use conflict risk assessment has been undertaken to identify potential conflicts with existing activities or land uses in the local area as detailed in Section 6.8. The assessment identified a range of potential conflicts and has recommended numerous management strategies and performance targets for the Project.

3 Project description

3.1 Project overview

The Project involves the construction and operation of a grid-scale battery near to the Tamworth substation. The Project would use lithium-ion technology and would have up to 270 MW / 1,080 MWh of storage capacity. A new above ground and/or below ground transmission line would connect the Tamworth substation to the Kingswood BESS. A summary of the key project components and functionality is provided in Table 3-1.

Table 3-1 Project overview specifications

Project component	Details
Site details	
Application lots	- Lot 43, DP1064582 - Lot 3, DP 244399 - Lot 4, DP 244399 - Lot 6, DP 219993
Zoning	RU4 – Primary Production Small Lots
Development footprint	- The development footprint is 21.68 ha - The development footprint would be contained within the development envelope which represents all areas that may be disturbed by the Project during construction, operation and decommissioning (including all activities and temporary and permanent impact areas)
Subdivision	The Project does not propose to subdivide the lot which it is situated on
Access	- New access driveway via Ascot-Calala Road - The heavy vehicle route to the Project is proposed via Goonoo Goonoo Road/New England Highway, Whitehouse Lane and Ascot-Calala Road
Project design and built form	
Layout	The Project would generally comprise the following key built form features: - BESS including battery enclosures, inverters, transformers, switch gear and control building - On-site 33/330 kV BESS substation - High voltage transmission connection (above ground and/or below ground) between the BESS and the Tamworth substation - Ancillary infrastructure and mitigative features
BESS capacity	- Up to 270 MW active power - Up to 1,080 MWh battery storage capacity
BESS	The BESS would comprise the following components: - Lithium-ion battery technology consisting of pre-assembled battery enclosures housing lithium-ion type battery cells, associated control systems and HVAC (heating, ventilation and air conditioning) units - Power conversion system (PCS) incorporating inverters and transformers - Ancillary infrastructure (electrical switchroom, control and office building, security fencing)

Project component	Details
33/330 kV substation	The on-site substation would comprise: • Four high voltage (HV) and two low voltage (LV) switch bays • 33 kV indoor switchgear housed in portable substation containers
Transmission connection	• A 330 kV transmission line (either above ground and/or below ground) of approximately 800 metres would extend from the BESS substation to the Tamworth substation
Ancillary infrastructure	• Site access from to the BESS from Ascot-Calala Road • Internal site access road and parking • Operational and maintenance (O&M) building • Permanent office and staff amenities • Stormwater management infrastructure • Lighting, fencing and security devices • Noise acoustic barriers • Water tank • Landscaping and screening vegetation
Design mitigation	The Project has been sited to avoid and / or minimise environmental impacts whilst minimising distances to the Tamworth substation. Key mitigation measures considered in the Project design include: • Siting of the BESS to maximise distance from non-associated receivers • Suitable asset protection zones and separation distances incorporated into the design of proposed infrastructure and disturbance footprint • Planted landscaping around project infrastructure to minimise visual impacts • Noise acoustic barriers and silencers • Siting of Project infrastructure outside of existing easements
Design elements subject to change during detailed design	• Detailed design for the Project has yet to be completed. The following design elements may be amended through the detailed design process: – Layout of the battery enclosures and infrastructure within the development envelope – Transmission line alignment and arrangement – Location and height of attenuation features (noise acoustic barriers) and fencing
Construction	
Capital investment value (CIV)	• Greater than \$30 million.
Activities	Construction of the Project is expected to comprise: • Civil and enabling works • Structural, mechanical and electrical works • Commissioning • Demobilisation
Program and staging	• Construction is expected to commence in Quarter 2 of 2025 • The Project is anticipated to take approximately 12–15 months to construct. • Construction of the Project would be undertaken as a single stage (no staging is proposed)

Project component	Details
Hours	- Standard working hours: 7am to 6pm Monday to Friday 8am to 1pm Saturdays - No works on Sundays or public holidays. - Some work outside of these hours (e.g., oversize deliveries, emergencies) as required.
Workforce	Up to approximately 100 full-time equivalents (FTE) would be required for construction during the Project peak
Vehicle movements	- The following maximum vehicle movements are predicted (subject to detailed design): - Up to 80 light vehicles per day (80 in and 80 out) during the construction works phase - Up to 60 heavy vehicles per day (60 in and 60 out) during the construction works phase (inclusive of oversize overmass (OSOM) vehicles movements) - Average daily heavy vehicle movements during the construction phase would be significantly lower than outlined above
Transport	- It is anticipated that the majority of the BESS infrastructure (eg batteries, enclosures, PCS components and substation components) would be transported from Sydney/Newcastle via approved B-double routes. - Construction materials would be sourced from surrounding concrete batching plants and hard rock quarries. - Construction labour, equipment and plant would likely be sourced from Tamworth and other surrounding regional centres.
Water	- Water for the Project would primarily be used for dust suppression and construction activities. - Water sources would be confirmed during detailed design but are likely to include a combination of bore water to be sourced and located on the participating landholder's land, captured stormwater, municipal water supply (in agreement with the relevant authority) and/or imported water in portable tanks.
Operation	
Life of BESS	- The estimated life of the initial BESS equipment is 20 years - At the end of operational life, this may be extended subject to the replacement and/or refurbishment of components and market conditions.
Workforce	- The Project would contribute to the employment of up to two FTE employees during operation. - The Project would be managed remotely, with two to four employees required to attend the Project Site periodically for maintenance activities.
Operational hours	24 hours, 7 days a week
Vehicle movements	Vehicle movements to and from the Project Site would occur infrequently during operations, primarily for scheduled maintenance.

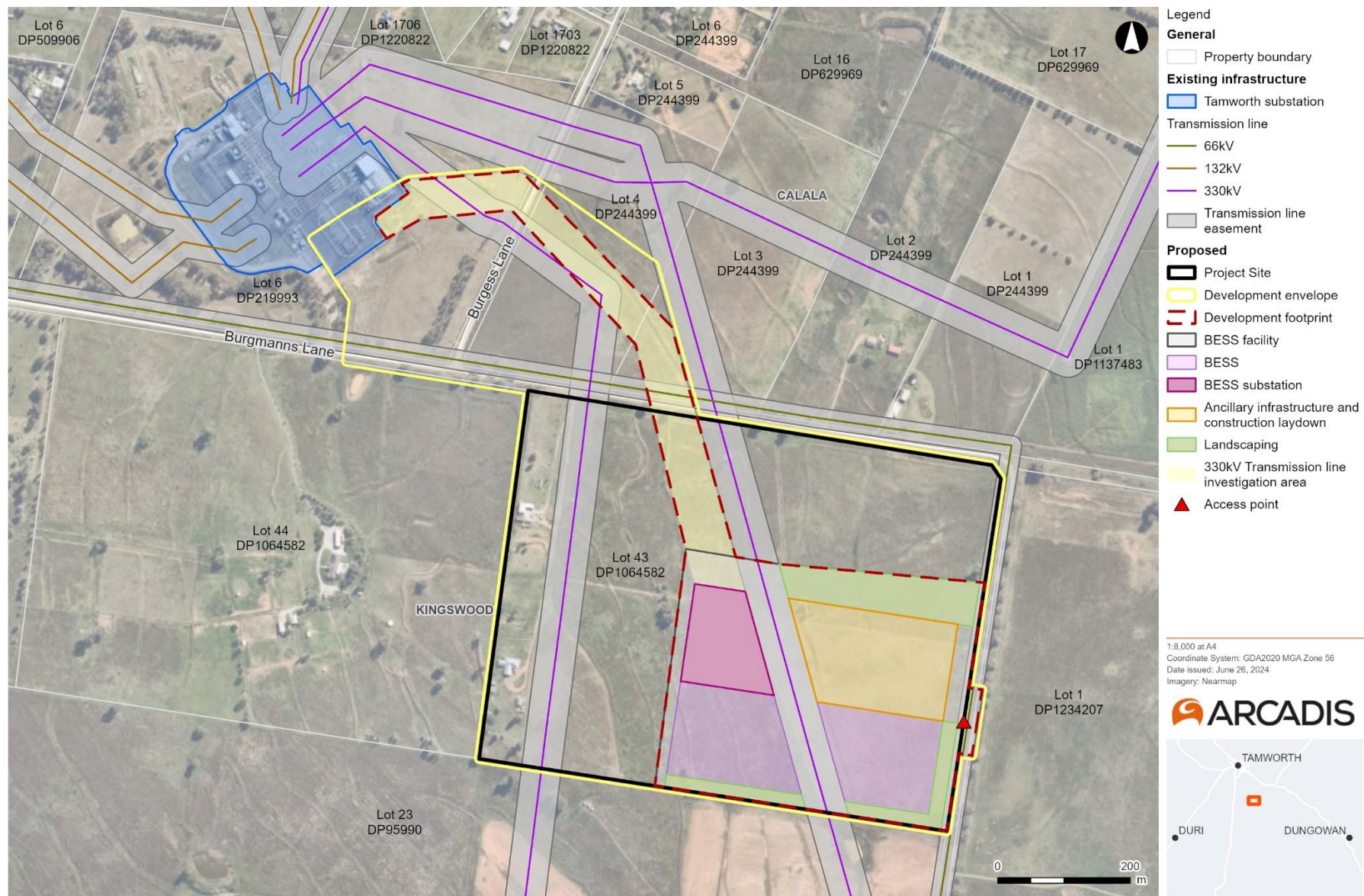
3.2 Project design and built form

An indicative overview of the Project layout is shown on Figure 3-1. The number and location of the Project components are subject to refinement through detailed design. It will be subject to commercial tendering and procurement processes to ensure the Project is optimised in terms of yield and efficiency, within the parameters of the approval.

As the final specifications and location of infrastructure are subject to change during detailed design, where required in this section, upper limit quantities and power level estimates are provided to ensure the assessment and any subsequent approval maintains the flexibility required in the detailed design stage following Project approval. Similarly, while an indicative design is provided to provide a clearer understanding of what would be constructed, the delineation of the development envelope provides the assessment and flexibility of minor layout changes in the final design.

Together this 'upper limit' or 'worst case' approach ensures that all impacts of construction, as well as operation and decommissioning, are captured in the environmental assessment section of this EIS and that any recommendations and mitigation strategies would be appropriate for the final detailed design.

This approach would allow the Project to maximise potential benefits from the rapid technology advancements currently underway in the BESS industry.



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Figure 3-1 Overview of the Project

3.2.1 BESS

The BESS is proposed to be located in the southeast corner of the Project Site and would comprise the following components:

- Lithium-ion (Li-ion) battery technology consisting of pre-assembled battery enclosures housing li-ion type battery cells, associated control systems and HVAC units
- PCS incorporating inverters and transformers
- Ancillary infrastructure (electrical switchroom, control and office building, security fencing).

Each battery enclosure would contain a group of Li-ion batteries, housed within weather-proof enclosures. Battery enclosures would be arranged in rows and comprise:

- Racks of Li-ion type batteries
- A battery management system to protect cells from harmful excesses of voltage, temperature, and current
- An energy management system that is responsible for system power flow control
- A thermal management system that controls all functions related to the HVAC of the enclosure system.

The size of the individual battery enclosure would be dependent on the selected supplier. Each battery enclosure would be mounted on concrete footings, built foundations, compacted gravel, plinths or piles. The layout and spacing would be designed in accordance with appropriate standards to ensure integrity of the system.

Battery enclosures may be integrated with a PCS, which would contain equipment such as inverters and transformers and would function to convert the power flow between battery and grid. The PCS and control room would also house the required control and monitoring components such as voltage sensing units, thermal management of power electronics components and battery integrity. A fault detection and shut-off function for the Project will enable the immediate response to any faults (such as chemical leaks) or equipment malfunction.

The BESS would use equipment that has been tested for fire safety and fire protection systems and would be installed according to suppliers' recommendations and the Fire Safety Study. All fire safety systems would be detailed in a Fire Safety Study prepared in consultation with Fire and Rescue NSW.

A control and office building would include control facilities and would be established to enable remote operation and facility management. The control building would not be permanently manned but would be available for use during site visits. The supervisory control and data acquisition (SCADA) system would be located within the control and office building. The dimensions of the building are expected to be approximately 12 metres long by five metres wide.

3.2.2 33/330 kV substation

A substation would be established to convert the medium voltage (MV) power produced by the BESS to high voltage (HV) power to enable connection to the Tamworth substation (and subsequently the grid). The location of the substation is shown on Figure 3-1 and would be located adjacent to the BESS. The substation would be fenced and would include transformer switch bays and switchgear housed in portable substation containers. The substation would connect to the BESS by underground 33 kV cables.

3.2.3 Transmission connection

A 330 kV transmission line (either above ground and/or below ground) of approximately 800 metres would extend from the BESS substation to the Tamworth substation. The final alignment of the transmission connection is subject to the connection process with Transgrid (refer to Section 5.4.1) but would be located within the development envelope (refer to Figure 3-1).

The disturbance area for the connection would be in accordance with Transgrid requirements for 330 kV lines. If overhead, this would be a 60 metre easement, and narrower if underground. This easement has been used for the disturbance area for the Project and an indicative alignment is indicated on Figure 6-7.

If above ground, the transmission line would be strung on 330 kV steel lattice tension structures with 330 kV steel pole terminal structures, as shown in Figure 3-2.



Figure 3-2 Example of steel lattice structure (currently present on the Project Site).

3.2.4 Ancillary infrastructure

To support operation of the Project several ancillary elements are proposed. These are described in Table 3-2.

Table 3-2 Ancillary infrastructure

Ancillary infrastructure	Description
Site access, internal roads and parking	The proposed site access would be via Ascot-Calala Road on the eastern side of the Project Site. A perimeter track would be constructed around the BESS facility and within the BESS facility to provide access to the battery enclosures. Internal tracks would also provide access to onsite 33/330 kV substation, buildings and other ancillary infrastructure. The internal tracks will be constructed of an all-weather gravel surface. The exact position of access tracks will be determined during the detailed design phase. A car parking area for staff would be provided adjacent to the control and office building and would accommodate up to around ten spaces for operational and maintenance staff and visitors.
O&M building	An O&M building would be used to support the Project. The dimensions of the building are expected to be approximately 20 metres long, 25 metres wide and five metres high. The building is expected to be constructed using neutral Colorbond™-style materials. Alternatively, shipping containers may be used instead of a building. The O&M building would house materials and equipment for the upkeep and maintenance of the BESS and a small workshop.
Fencing	Security fencing (eg chain link or palisade) would be installed along the perimeter of the Project. Fencing would also be utilised to separate operational areas within the Project (i.e. the BESS and the BESS substation) to maintain operational safety.

Ancillary infrastructure	Description
Signage	Signs would be situated at several locations. These signs would be for the purposes of way finding, safety and building identification
Lighting	Standard lighting would be located around the Project, including the BESS, BESS substation, office and control building and internal roads and car park. Lighting would be used to maintain safety and security and to allow for out of daylight hours maintenance, as required. External lighting design would be consistent with <i>AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace, Part 5: Outdoor workplace lighting</i> and <i>AS 4282-1997 Control of the obtrusive effects of outdoor lighting</i>.
Lightning mast	Lightning protection masts would be installed with the final number and siting to be determined during detailed design and dependent on meteorological conditions at the Project Site. The lightning protection masts are typically thin, tubular structures, and approximately 15 metres tall, with a concrete base and earthing.
Stormwater infrastructure	The Project would include the installation of stormwater management infrastructure, incorporated into the design of the Project to manage water quality during operation of the Project. Drainage and stormwater treatment measures are detailed in Appendix M.
Services and utilities	Proposed service and utility connections to the Project include: - On-site security system including but not limited to, CCTV and an integrated telecommunication system - Connections to telecommunications infrastructure via fibre optic cable for high-speed internet 330 kV back fed supply for SCADA system - Water tanks for offices and amenities. Water sources appropriate for the specific water usage and demand volumes would be employed. - Sewage would be managed via on-site septic tank or transported for management off-site via tanker.
Fire management	Firefighting water tanks would be located on the Project Site for fire suppression. These would be filled via water tankers and refilled as required.
Noise acoustic barriers	The Project would include the installation of noise acoustic barriers to manage noise during operation of the Project. These will be incorporated into the design of the Project. The noise acoustic barrier would have a minimum surface density of 15 kg/m². Typical options include steel, timber, glass, perspex, polycarbonate, brick and concrete. The height of noise acoustic barriers would be refined following selection of the preferred supplier and would be located around the BESS. Noise mitigation measures are detailed in Appendix D
Landscaping and screening vegetation	The Project would include the installation of landscaping to manage visual impacts during operation of the Project. Landscaping will be incorporated into the design of the Project. Visual mitigation measures are detailed in Appendix I.



Figure 3-3 Illustration of Project from Burgmanns Lane highlighting existing transmission infrastructure and proposed screening vegetation, noise walls, ancillary infrastructure, BESS substation and transmission tower (if overhead)

3.3 Construction

3.3.1 Construction activities

Key construction activities are expected to include:

- Civil and enabling works:
 - Establishment of temporary environmental and safety controls (such as water management infrastructure and fencing)
 - Establishment of temporary construction compound and laydown areas
 - Establishment of site access point and construction of an internal access road and car park. The internal access road would become the permanent operational access road at the completion of construction
 - Surveying and investigations of on-site condition to implement final design
 - Environmental investigations or protection works
 - Clearing and grubbing to accommodate proposed infrastructure and asset protection zones
 - Earthworks (cut and fill), levelling, compaction and other civil and ground preparation activities to desired design levels (including the removal of spoil)
- Construction of concrete pads / hardstand areas to support the BESS and associated infrastructure
- Delivery, installation and electrical fit-out for the Project, including control building, battery enclosures, inverters, transformers and associated cabling and infrastructure (BESS components are largely prefabricated and would be lifted directly into place from the delivery vehicle)
- Installation of overhead or underground cabling from the BESS substation to the Tamworth substation, including construction of foundation piles for transmission tower structures (if overhead)
- Construction of ancillary elements including, offices and amenities, installation of services, water and sewage management, fire systems and signage
- Installation of permanent fencing and security system
- Landscaping
- Testing and commissioning
- Removal of construction equipment and rehabilitation of construction areas

3.3.2 Construction program

Construction of the Project would begin after all relevant approvals are obtained. The Project would be constructed and commissioned in line with battery supply availability, labour and equipment availability and increasing demand in the network. The Project would be developed in a single stage and anticipated to take approximately 12-15 months to construct.

Construction would be undertaken in phases, as follows:

- Enabling works
- Construction works (civil works, structural works, and electrical works)
- Commissioning
- Demobilisation.

3.3.3 Construction hours

Construction of the Project would be undertaken during standard construction hours:

- Monday to Friday: 7.00 am to 6.00 pm
- Saturday: 8.00 am to 1.00 pm
- No works of Sunday and public holidays.

Certain activities may be required outside of the standard construction hours. Key stakeholders would be informed prior to out of hours activities. These activities potentially include:

- Delivery of plant and equipment for safety reasons (e.g. OSOM vehicles)
- Commissioning and testing activities that must align with demands on the grid
- Emergency work to avoid damage to persons or property and/or to prevent environmental harm
- Construction works where it can be demonstrated and justified that these works are required to be undertaken outside of standard construction hours.

3.3.4 Construction compound

A temporary compound would be required to support construction of the Project. The compound would be established at the Project Site as detailed in Figure 3-1.

It is anticipated that the compound would contain the following:

- Site office and amenities
- Staff parking areas
- Fabrication area
- Equipment and vehicle storage areas
- Laydown areas for construction materials (e.g. cable drums, fittings, gravel roadbase)
- Stockpiling of excavated materials and soil
- Bunded fuel storage areas.

The construction compound would be temporary in nature and removed / decommissioned at the completion of construction. Where the construction compound is not situated within the footprint of the operational area it would be rehabilitated to the pre-construction standard upon completion of the works.

Should other compounds be required, the following site selection criteria would be applied to their location:

- Within the construction footprint
- Access to the local road network

- Relatively level land
- Greater than 50 metres from a watercourse
- Greater than 50 metres from threatened species and endangered ecological communities
- Greater than 100 metres from a residential dwelling
- No requirement to remove any native vegetation beyond that otherwise being undertaken for the Project
- No requirement to undertake any significant ground disturbing works
- No impact on any heritage items (Indigenous or non-Indigenous)
- Not unreasonably affect the land use of adjacent properties.

Consideration of all the above factors would be undertaken prior to the establishment of any additional or alternative construction compound or stockpiles for the purpose of the Project.

3.3.5 Construction plant and equipment

Most of the plant and equipment would be delivered to Project Site on rigid and semi-trailer low-loaders, while construction materials would be delivered on rigid concrete agitators, truck and dog, and semi-trailer dump trucks. The plant and equipment that are likely to be used during the construction include:

- | | |
|-------------------------|---|
| • Front end loaders | • Concrete trucks and pumps |
| • Dump trucks | • Franna cranes |
| • Road trucks | • Manitou forklift |
| • Excavators | • Scissor lifts |
| • Graders | • Elevated work platforms |
| • Compactors and roller | • Elevated work platforms |
| • Water trucks | • Concrete saws and grinders |
| • Scrapers | • Cable laying machine and/or cable winch |
| • Welding equipment | • Backhoe |
| • Compressors | • Generators |
| • Air track drill | • Light vehicles. |

3.3.6 Construction traffic, access and parking

3.3.6.1 Construction traffic

Vehicles associated with construction works would include light vehicles (workers travelling to and from the Project at the start and finish of shifts) and heavy vehicles delivering / removing construction materials and battery components. Heavy vehicle movements, particularly those associated with the delivery of materials and equipment would generally be evenly spread throughout construction hours.

During construction, battery enclosures, HV transformers, control room, switch room and transmission supporting structure may be delivered to the Project Site via OSOM vehicles. The size and number of OSOM vehicles would be confirmed during construction phase and included in the CTMP.

The following peak construction vehicle movements are anticipated:

- An average of up to 100 passenger vehicles per day (100 in and 100 out) during the construction works phase
- An average of up to 60 heavy vehicles per day (60 in and 60 out) during the construction works phase (inclusive of OSOM vehicle movements).

3.3.6.2 Access

A new site entrance off Ascot-Calala Road would be constructed during the enabling and civil phase. This access point would also be used as the main operational entry point for vehicles. The proposed construction access would be wide enough to accommodate OSOM into the Project Site and minimise potential for tracking dust and sediment offsite onto Ascot-Calala Road.

3.3.6.3 Parking

A construction parking area suitable to accommodate the anticipated construction staff would be provided adjacent to the main construction compound. The parking area would be a cleared, demarcated area but would not be a formalised carpark. A designated area for delivery trucks would be located within the laydown area and would be regulated by the construction contractor.

3.3.7 Construction workforce

The construction phase of the Project is expected to require up to 100 construction personnel, the majority of which are expected to be sourced from the Tamworth region. Preference would be made for contractors utilising a regional workforce. A Local Procurement Strategy will be implemented to prioritise this outcome and reduce the potential for adverse impacts on local accommodation availability.

The construction workforce would include (but not be limited to) the following:

- Tradespeople and construction personnel
- Sub-contractor construction personnel
- Engineers
- Functional and administrative staff.

3.4 Operation

The Project would be operational 24 hours, seven days a week. The Project would generally be managed and monitored remotely apart from periodic site maintenance which would require two to four maintenance staff to access the site. The Project is anticipated to contribute to the employment of up to two FTE.

Over the operational life of the Project components may be upgraded. These works, if required, would not be intensive and are likely to be significantly lower than the construction works assessed in this EIS. These upgrade works may also provide additional generation capacity without increasing the disturbance area/impacts associated with the Project.

During operation, activities on-site would generally comprise:

- Storage of electricity and provision to the broader electricity grid as required to meet the strategic objectives of the Project
- Routine inspections
- Repair and maintenance of the Project ancillary infrastructure including fencing, roads, water infrastructure and environmental controls.
- Management of vegetation and pests

- Repair and maintenance of Project infrastructure such as battery enclosures, inverters, transformers and cables (including replacement of BESS components)
- Ongoing security monitoring.

3.4.1 BESS replacement and decommissioning

The battery enclosures have a design life of 20 years. At the end of operational life, this may be extended subject to the replacement and/or refurbishment of components and market conditions. It is expected that with improved technology, the battery enclosures could be upgraded and be maintained to extend the life of the BESS. Any wholesale repowering would seek to make use of the existing foundations, connections and substation and would generally comprise swapping out and recommissioning BESS modules.

If a battery enclosure faults and is beyond repair, the unit would be removed and recycled for materials, where practicable.

In the case of a full decommissioning of the BESS, the Project would be repurposed for other industrial uses as determined by the Proponent (and subject to separate approvals being obtained for those uses).

4 Statutory context

4.1 Commonwealth legislation

4.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas.

Under the EPBC Act, a referral to the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) is required for proposed 'actions' that have the potential to significantly impact on any Matter of National Environmental Significance (MNES) or the environment of Commonwealth land (including leased land).

Current matters of MNES are:

- World heritage properties
- National heritage places
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- Nationally listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act also requires Commonwealth approval for any activity that would, or is likely to have, a significant impact on Commonwealth land. The land on which the Project would be constructed is not Commonwealth land, and there is no Commonwealth land within close proximity to the Project that could be impacted by the construction or operation of the Project.

A search of the EPBC Act Protected Matters Search Tool was undertaken on 23 May 2023 using a five-kilometre buffer around the Project Site. The search identified four threatened ecological communities (TEC), 42 threatened species and 10 migratory species with the potential to occur within five kilometres of the Project Site. The results of a Protected Matters search for MNES are provided in Table 4-1.

A streamlined Biodiversity Development Assessment Report (BDAR) (refer Appendix F), Aboriginal Cultural Heritage Assessment Report (Appendix H) and Historic Heritage Impact Assessment (Appendix I) have been carried out for the Project and identify that the Project would not adversely impact upon any of the identified MNES and would not represent a Controlled Action under the EPBC Act.

Table 4-1 Protected Matters within 5 kilometres of the Project Site

Protected Matters within 5 Kilometres of the Project Site (EPBC Act)	Count
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance (Ramsar wetlands)	3
Listed Threatened Species	None

Protected Matters within 5 Kilometres of the Project Site (EPBC Act)	Count
Listed Threatened Ecological Communities	None
Listed Migratory Species	4
The Great Barrier Reef Marine Park	42
Nuclear actions (including uranium mining)	10

4.1.2 Native Title Act 1993

An objective of the Commonwealth *Native Title Act 1993* is to recognise and protect native title. Section 8 states that the *Native Title Act 1993* is not intended to affect the operation of any law of a State or a Territory that is capable of operating concurrently with the Act.

Searches of the registers maintained by the National Native Title Tribunal identified the Gomeroi People Native Title Claim (NC2011/006) which encompasses the Tamworth Regional LGA. Australian law does not recognise native title over places where people have exclusive possession of the land, like privately owned freehold land. As such there are no applicable native title claims or any indigenous land use agreements registered with respect to land within the Project Site.

4.2 New South Wales legislation

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) are the primary pieces of legislation that regulate land use planning and development assessment in NSW. This legislation is supported by a range of environmental planning instruments, including State environmental planning policies and local environmental plans.

4.2.1 New South Wales Legislation

4.2.1.1 Permissibility

Division 4 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) applies to development for the purposes of electricity generating works or solar energy systems.

Electricity generating works are defined in Clause 2.35 as

‘a building or place used for the following purposes, but does not include a solar energy system –

- a. making or generating electricity,*
- b. electricity storage’*

Development permitted with consent is defined in Clause 2.36(1) as

‘development for the purpose of electricity generating works may be carried out by any person with consent on the following land –

- a. in the case of electricity generating works comprising a building or place used for the purpose of making or generating electricity using waves, tides or aquatic thermal as the relevant fuel source – on any land*
- b. in any other case—any land in a prescribed rural, industrial or special use zone.’*

The Project Site (Lot 43 DP1064582) is located within the Tamworth Regional LGA on land zoned as RU4 Primary Production Small Lots. In accordance with Clause 2.36(1)(b), the Project is therefore permissible with development consent under the provisions of the T&I SEPP.

4.2.1.2 State Significant Development

Section 4.36 of the EP&A Act provides for the declaration of a Project as SSD. The declaration of a project as SSD under Section 4.36 of the Act can be by meeting the requirements of a SEPP or by the Minister for Planning.

Clause 2.6 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) states that development is declared to be SSD for the purposes of the EP&A Act if:

- a. *The development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
- b. *The development is specified in Schedule 1 or 2.*

As described in Section 4.2.1.1, the Project is not permissible without development consent.

Clause 20 of Schedule 1 of the Planning Systems SEPP declares development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) to be SSD if it either –

- a. *Has a capital investment value of more than \$30 million, or*
- b. *Has a capital investment value of more than \$10 million and is located in an environmentally sensitive area of State significance.*

The Project is expected to have a capital investment value of more than \$30 million.

The Project is considered to meet the definition of SSD under Clause 2.6 of the Planning Systems SEPP, as the Project would be for electricity generating works on land that is permitted with development consent under Clause 2.36(1)(b) of the T&I SEPP, and would have a capital investment value greater than \$30 million.

Development consent for the Project is therefore being sought in accordance with Part 4, Division 4.7 of the EP&A Act.

4.2.1.3 Planning approval process under Division 4.7 of the EP&A Act

The assessment and approval process for an SSD project is established under Part 4, Division 4.7 of the EP&A Act. The Project requires an SSD application is to be accompanied by an EIS prepared by or on behalf of the applicant in the form prescribed by the regulations, in accordance with Section 4.12(8) of the EP&A Act.

The EIS for the Project would be informed by the SEARs. The Proponent submitted its Scoping Report to the DPE (now DPHI) on 5 October 2023 to seek the SEARs, as required by Section 4.12(8) of the EP&A Act. The SEARs were issued on 30 October 2023. This EIS has been prepared in accordance with the SEARs and the requirements of Schedule 2 of the EP&A Regulation. Appendix A provides a summary of all the SEARs and Appendix B summarises the requirements of Schedule 2 of the EP&A regulation. Where each of these requirements has been addressed in the EIS is also provided.

The DPHI will place the EIS on public exhibition for a minimum of 28 days (as per Schedule 1, Division 2, Clause 9 of the EP&A Act). During the exhibition period, the community, stakeholders and government agencies will have an opportunity to review the EIS and provide a written submission to DPHI for consideration in its assessment of the Project.

At the completion of the public exhibition period, DPHI will provide the Proponent with a copy of all submissions received during the exhibition period. After reviewing the submissions, the Proponent will prepare a Submissions Report that responds to the relevant issues raised. If changes are required to the Project as a result of the issues

raised or to minimise environmental impacts, the Proponent would prepare a report to address these changes and submit this for review by the DPHI, after which it would be made available to the public.

The Minister for Planning is the consent authority for SSD projects. The Minister for Planning has issued a general delegation of the consent authority function for SSD projects to the Independent Planning Commission in instances where more than 50 public objections are received on the application, the applicant has made a reportable political donations disclosure and/or Tamworth Regional Council object to the Project.

4.2.2 NSW Environmental Planning Instruments

Consideration and discussion of State Environmental Planning Policies which are considered relevant to the Project are summarised in Table 4-2.

Table 4-2 Environmental Planning Instruments

Environmental Planning Instrument	Considerations	Relevance to the Project	Relevant section(s) in EIS
<i>State Environmental Planning Policy (Planning Systems) 2021 (Planning SEPP)</i>	The Planning SEPP identifies development that is SSD.	As the Project is electricity generating works and has a capital investment value of over \$30 million, it is considered SSD.	Section 4.2.1
<i>State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)</i>	The T&I SEPP aims to facilitate the effective delivery of infrastructure across NSW.	Division 4 of the T&I SEPP applies to the Project, as it is considered to be development for the purposes of electricity generating works or solar energy systems.	Section 4.2.1
<i>State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)</i>	Section 2.48 of the T&I SEPP requires that development within or adjacent to an electricity easement or adjacent to a substation be referred to the relevant electricity supply authority.	There is a transmission line easement within the Project Site, and the proposed transmission line easement crosses multiple transmission line easements and connects to the Tamworth substation. As such, the application must be referred to the electricity supply authority.	Section 5.5
<i>State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP)</i>	The B&C SEPP provides a framework for the regulation of the clearing of native vegetation in NSW.	The BDAR finds that consideration has been given to avoiding and minimising impacts to biodiversity where possible during the assessment and preliminary and concept design. Mitigation measures will be put in place to adequately address impacts associated with the Project, both direct, indirect and prescribed.	Section 0 Appendix F
<i>State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP)</i>	The R&H SEPP applies to any projects that fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. Certain activities may involve handling, storing or processing a range of substances which in the absence of locational, technical or operational controls may create a risk or offence to people, property or the environment. Such activities would be defined as potentially hazardous or potentially offensive.	The Project is not considered to be a 'potentially hazardous industry' or 'potential offensive industry' under the R&H SEPP. Nonetheless, the EIS includes an assessment of potential hazards and risks associated with the construction and operation of the Project. A Preliminary Hazard Analysis (PHA) has been undertaken to assess the potential hazards and risk associated with the Project. The assessment concluded the risks at the site boundary are not likely to exceed the acceptable risk criteria.	Section 6.4 Appendix G

Environmental Planning Instrument	Considerations	Relevance to the Project	Relevant section(s) in EIS
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i> <i>Chapter 4 (Remediation of land)</i>	The R&H SEPP provides a state-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. In accordance with Chapter 4 (Remediation of land) of the R&H SEPP, a consent authority must not consent to the carrying out of development on any land unless: • It has considered whether the land is contaminated. • If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out. • If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied the land would be remediated before the land is used for that purpose.	A review of potential contamination issues for the Project has been carried out in accordance with the contaminated land planning guidelines to inform the design and EIS. The assessment concluded the Project is suitable for the proposed use.	Section 6.8 Appendix K

4.2.3 Approvals or Authorisations that are not required or cannot be refused

In accordance with Section 4.41 and 4.42 of the EP&A Act, some environmental planning legislation does not apply to SSD projects or must be applied consistently with an approval for SSD.

Environmental approvals or authorisations that are not required or cannot be refused for SSD, but which have been considered in the preparation of this EIS are listed in Table 4-3.

Table 4-3 Relevant approvals considered but not required under Section 4.41 of the E&A Act

Approval	Comment
A permit under section 201 of the <i>Fisheries Management Act 1994</i>	The Project would not involve dredging or reclamation works.
A permit under section 205 of the <i>Fisheries Management Act 1994</i>	No works are proposed in waterways. The Project would not impact on any marine vegetation that is protected under this section.
A permit under section 219 of the <i>Fisheries Management Act 1994</i>	No works are proposed in waterways. The Project would not result in the blockage of fish passage
An approval under Part 4, or an excavation permit under section 139, of the <i>Heritage Act 1977</i>	No non-Indigenous items were identified to occur at or surrounding the Project Site based on a review of the Tamworth Regional LEP 2010 and the NSW heritage register.
An Aboriginal heritage impact permit under section 90 of the <i>National Parks and Wildlife Act 1974</i>	The Project would not result on the impact of Aboriginal heritage objects. Details of the ACHAR are provided in Appendix G.
A bushfire safety authority under section 100B of the <i>Rural Fires Act 1997</i>	The Project is located on land designated as Vegetation Category 3 and is therefore considered bushfire prone. The Project would be designed in accordance <i>Planning for Bushfire Protection</i> (NSW Rural Fire Service 2019).
A water use approval (Section 89), a water management work approval (Section 90) or an activity approval (other than an aquifer interference approval) (Section 91) of the <i>Water Management Act 2000</i> (WM Act)	A water supply work approval may be required (depending on confirmed water sources) to convert the existing groundwater bore (GW055998) to a water supply bore (from domestic and stock purposes). The Project would not involve the carrying out of any water management work as defined in Section 90 of the WM Act, which means a water management works approval under that section would not be required for the Project. The Project is not located on or under waterfront land, which means a controlled action approval under Section 91 of the WM Act would not be required for the Project.

Section 4.42 of the EP&A Act identifies approvals or authorisations that cannot be refused if they are necessary for carrying out approved SSD and must be substantially consistent with the Part 4, Division 4.7 approval.

The statutory approvals or authorisations of potential relevance to the Project include:

- A consent under Section 138 of the *Roads Act 1993*
- Water Access Licence. Water extracted from the participating landholder's existing bore may be utilised to supplement potable water and imported water for construction use and operational irrigation. To use water from bores on-site, a Water Access Licence would need to be obtained.

4.2.4 Consideration of other NSW legislation

Environmental planning related legislation and regulations that may still be applicable to approved SSD projects and their consideration in the context of the Project, are identified in Table 4-4.

Table 4-4 NSW Legislation and regulations of potential relevance

Legislation	Requirement	Relevance to the Project	Relevant section(s) in EIS
<i>Biosecurity Act 2015</i>	This Act aims to protect natural resources from the adverse impact of pests, disease, weeds and contaminants on agricultural land and parks and reserves (such as those near to the Project Site). All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose.	During construction of the Project, any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.	Section 0
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	The BC Act seeks to: • Conserve biological diversity at the bioregional and State scale • Maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations • Assess the extinction risk of species and ecological communities and identify key threatening processes through an independent and rigorous scientific process • Establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity.	The BDAR finds that consideration has been given to avoiding and minimising impacts to biodiversity where possible during the assessment and preliminary and concept design. Mitigation measures will be put in place to adequately address impacts associated with the Project, both direct, indirect and prescribed.	Section 0 Appendix F
<i>Contaminated Land Management Act 1997 (CLM Act)</i>	This CLM Act outlines the circumstances in which notification to the Environment Protection Authority is required in relation to the contamination of land. This may become relevant during construction of the Project if contamination is encountered. A public register of notifications under this Act is maintained.	A review of potential contamination issues for the Project has been carried out in accordance with the contaminated land planning guidelines to inform the design and EIS.	Section 6.8 Appendix K

Legislation	Requirement	Relevance to the Project	Relevant section(s) in EIS
<i>Heritage Act 1977 (Section 146)</i>	If a relic is discovered or located, the Heritage Council must be notified 'of the location of the relic, unless he or she believes on reasonable grounds that the Heritage Council is aware of the location of the relic'.	No heritage items have been identified within the Project Site and as such this risk is considered low. An unexpected finds protocol is proposed.	Section 6.6 Appendix H Appendix I
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	The POEO Act is the key piece of environment protection legislation administered by the Environment Protection Authority. - Section 120 of the Act prohibits the pollution of waters - Air pollution-related Sections 124 to 126 (Chapter 5, Part 5.4, Division 1) of the Act require activities to be conducted in a proper and efficient manner, while Section 128 (Chapter 5, Part 5.4, Division 1) of the Act requires that all necessary practicable means are used to prevent or minimise air pollution - Pollution of land and waste is covered by Part 5.6 of the Act. It defines offences relating to waste and sets penalties and establishes the ability to set various waste management requirements via the Protection of the Environment Operations (Waste) Regulation 2014.	The activities listed in Schedule 1 to the Act (broadly, activities with potentially significant environmental impacts) require an EPL. The operation of the BESS does not constitute any of the scheduled activities and therefore does not require an EPL.	Section 5.5
<i>Rural Fires Act 1997 (RF Act)</i>	Sections 63(1) and 63(2) of the RF Act require public authorities and owners/occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires on or from, that land.	The Project Site is located on land designated as Vegetation Category 3 and is therefore considered bushfire prone. The Project would be designed in accordance <i>Planning For Bushfire Protection</i> (NSW Rural Fire Service 2019).	Section 6.5 Appendix N
<i>Roads Act 1993</i>	Under Section 138 of the Roads Act, approval is required before any works can be undertaken within a public road reserve.	Access to and egress from the Project Site during construction would be via the existing access point off Burgmanns Lane until a new site entrance off Ascot-Calala Road is constructed. The Ascot-Calala-Road access point would be used as the operational entry point for vehicles.	Section 6.1 Appendix D

4.3 Local environmental planning legislation

4.3.1 Tamworth Regional Local Environmental Plan 2010

The Project Site is located within the Tamworth Regional LGA and is subject to the provisions of the Tamworth Regional LEP 2010. The Project Site located on land zoned as RU4 Primary Production Small Lots and electricity generating works (which includes facilities for electricity storage) are permitted with consent in the RU4 zone.

An overview of the land use zone objectives of the Tamworth Regional LEP 2010 is provided in Table 4-5. The Project is consistent with the objectives of the land use zones within which it is located.

Table 4-5 Land use objectives

Land use zone	Land use objectives	Consistency
RU Primary Production Small Lots	- To enable sustainable primary industry and other compatible land uses. - To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature. - To minimise conflict between land uses within this zone and land uses within adjoining zones.	The Project would align with the land use objectives of the land use zone as: - It is a compatible land use, with 'electricity generating works' being permissible with consent - Would provide employment opportunities for the local community during the construction phase, and does not impact on the land uses of adjoining properties within the area

A number of additional local provisions contained in the Tamworth Regional LEP 2010 have been considered where relevant, as part of the EIS.

Table 4-6 Tamworth Regional LEP local provisions

Provision	Description	Compliance
Land use	The Project is development permitted with consent, being development for the purposes of "electricity generating works" in Zone RU4 Primary Production Small Lots.	Yes
5.21 Flood planning	The Project Site is not located on land identified within the Flood Planning Area as per the Flood Planning Map in the LEP.	Yes
7.1 Earthworks	As described in Section 3.3.1, the Project would involve minor earthworks. The detailed design for these earthworks would ensure that there are no detrimental effects on drainage patterns, soil stability or any surrounding properties.	Yes

4.3.2 Tamworth Regional Development Control Plan

The Tamworth Regional Development Control Plan 2010 (DCP) contains the key criteria for specific types of development that commonly occur in the Tamworth Regional LGA and for specific locations within the region. The Tamworth Regional DCP came into operation on 12 October 2010. The DCP supports the Tamworth Regional Council LEP 2010 by providing more detailed controls that apply to the Tamworth Regional LGA.

The aims of the DCP are to:

- Define development standards that deliver the outcomes desired by the community and Council
- Provide clear and concise development guidelines and desired future character statement for various forms of development and site-specific precincts
- Encourage innovation in design and development by not over-specifying development controls
- Expedite development approvals by providing clear direction on Council's intent and criteria
- Provide certainty of development outcomes for developers and the community.

As the Project is SSD, the provisions of the Tamworth Regional DCP do not apply. However, consideration has been given to the aims of the Tamworth Regional DCP throughout the EIS, to demonstrate consistency of the Project with the overarching aims of Tamworth Regional Council for the Project. Tamworth Regional DCP *Step 5: Discretionary Development Standards (Industrial Standards)* is considered relevant to the Project.

5 Engagement

5.1 Overview

Community and stakeholder engagement for the Project is being undertaken in accordance with:

- *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022)
- Iberdrola's Community Engagement Policy
- Australian Energy Infrastructure Commissioner – Best Practice
- Clean Energy Council – Best Practice Charter
- International Association for Public Participation – Quality Assurance Standard 2015
- International Association for Public Participation – Code of Ethics.

Iberdrola is a signatory of the Clean Energy Council's Best Practice Charter for Renewable Energy Projects and commits to honouring the Charter in renewable energy projects and associated transmission infrastructure.

An Engagement Report (Appendix O) has been prepared for the Project which outlines the community engagement activities undertaken to date. The report provides a summary of the key outcomes of these activities and how community input has informed the Project.

The Engagement Report provides the framework (Figure 5-1) for ongoing engagement through a six-phase approach which align with each of the lifespan stages of the Project (if approved).

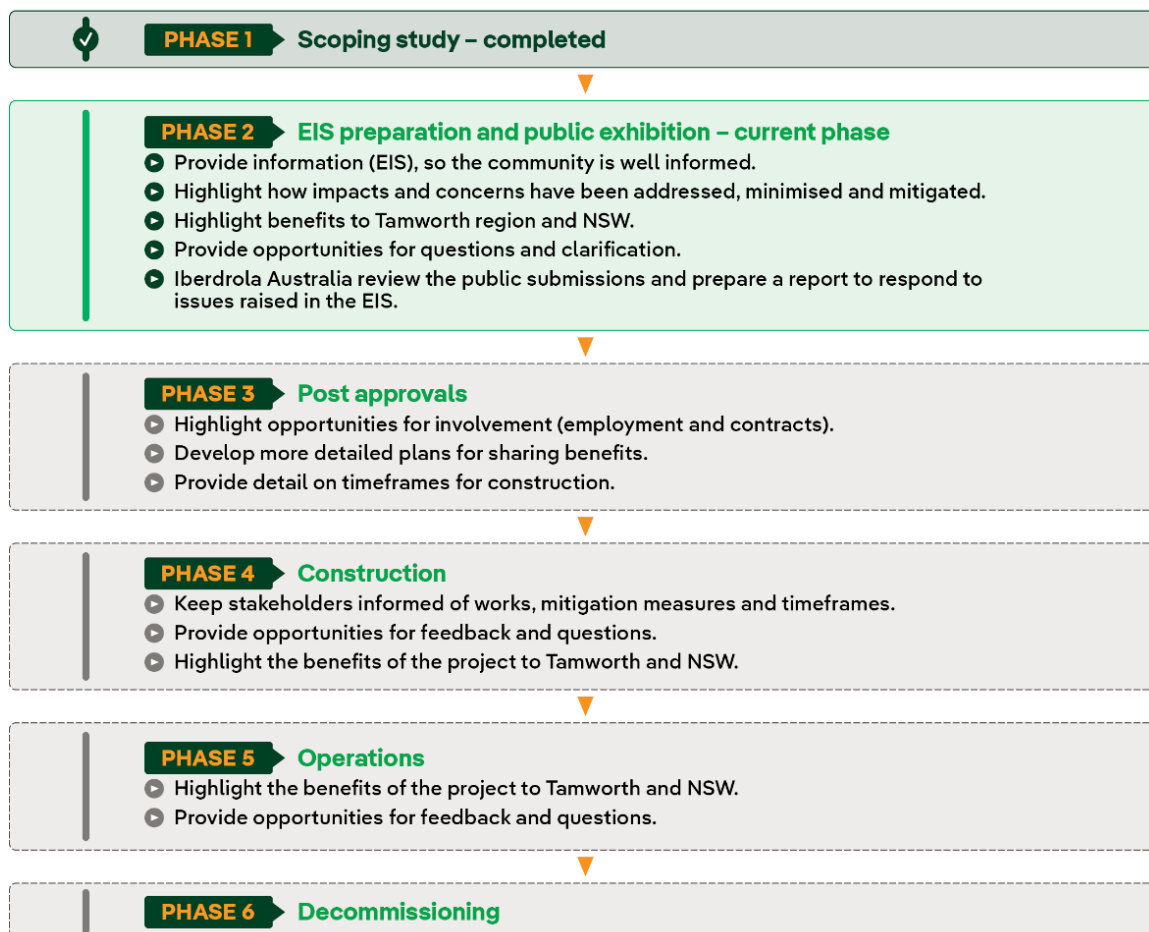


Figure 5-1 Engagement framework

5.2 Consultation objectives

The communication and engagement objectives for the Project are to:

- Inform interested and potential impacted businesses, communities and stakeholders about the design, development and potential impacts of the Project
- Build and develop community and key stakeholder relationships
- Encourage stakeholder participation
- Obtain government, community and stakeholder input for consideration in development of the Project
- Provide information about the planning approval process
- Understand community and stakeholder priorities and concerns so they can be considered in the ongoing development and delivery of the Project.

5.3 Identification of stakeholders

Stakeholders were identified as those that may be interested in, or who may be affected by, the Kingswood BESS. Stakeholders are listed in Table 5-1 and categorised into three main groups. These were:

- Government and technical stakeholders
- Traditional owners
- Neighbouring landowners and the wider community.

Stakeholders will continue to be identified and consulted during all project phases, including if approved, the construction, operation, and decommissioning and rehabilitation phases of the Kingswood BESS.

Table 5-1 Stakeholder consultation

Stakeholder group	Stakeholders
Government and technical stakeholders	
State government	• DPHI including the following groups: – Water – Hazards – Biodiversity, Conservation and Science • NSW Environment Protection Authority (EPA) • Transport for NSW • Heritage NSW • Fire and Rescue • NSW Rural Fire Service • Department of Primary Industries (DPI) Agriculture • Department of Regional NSW
Local government	• Tamworth Regional Council
Utility providers	• Transgrid

Stakeholder group	Stakeholders
Traditional owners	
Registered Aboriginal Parties	• Tamworth Local Aboriginal Land Council • Gomeroi Applicant • Gomery Cultural Consultants • AT Gomilaroi Cultural • DFTV Enterprises • Didge Ngunawal Clan • Long Gully Cultural Services • Konanggo Aboriginal Cultural Heritage Services • Thomas Dahlstrom • Cacatua General Service (Catacua Cultural Consultants) • AGA Services • Bawurra • Bill Trewlynn • Barraby Cultural Services • Galamaay Cultural Consultants
Neighbouring landowners and community	
Neighbouring landowners	Landholders adjacent to the Project, including • 795 Burgmanns Lane Calala 2340 (R2) • 781 Burgmanns Lane Calala 2340 (R3) • 696 Burgmanns Lane Kingswood 2340 (R4) • 156C Roberts Road Kingswood 2340 • 910 Ascot-Calala Road Calala 2340 (R9)
Organisations	• Tamworth Business Chamber • Farrer Memorial Agricultural High School • Tamworth TAFE • Tamworth Agricultural Institute
Community	• Wider community within the Tamworth Regional LGA

5.4 Engagement approach

5.4.1 Government and technical stakeholders

The consultation mediums adopted differed depending on the agency engaged with and the nature and level of their interest in the Project. Consultation mediums included virtual meetings, face to face meetings, telephone conversations and email correspondence.

A summary of the consultation activities and outcomes is provided in Table 5-2.

Table 5-2 Government and technical stakeholder consultation

Stakeholder group	Stakeholder	Overview
DPHI	Jai Reid Pragya Mathema	Pre-scoping virtual meeting held on 29 June 2023 to provide overview of the Project and the Proponent. DPHI provided guidance in relation to relevant guidelines that the application should reference.

Stakeholder group	Stakeholder	Overview
	Jai Reid Pragya Mathema Nestor Tsambos	Email and phone correspondence during preparation of Scoping Report and EIS lodgement.
	Nestor Tsambos	Project update and discussion (23 January 2024) of Project changes. The Project considered a BESS of a 500MW capacity (as identified in the Scoping Report) which has been reduced to a BESS of 270MW to reduce Project impacts identified through the EIS investigations and engagement (refer to Section 2.5.3).
Tamworth Regional Council (TRC)	Sam Lobsey Jessica Allen Steven Brake	In person meetings (11 August 2023 and 22 February 2024) to introduce the Project, provide updates of the technical assessment findings and discuss potential planning agreements and benefit sharing schemes. Council raised concerns with regards to: - Cumulative impacts associated with multiple renewable projects in the Tamworth region, particularly in relation to the Tamworth BESS and Calala BESS - Temporary workers accommodation, particularly during key Tamworth events such as the Country Music Festival - Access and traffic impacts on the urban portion of Calala
	Steven Brake	On-site meeting with traffic specialists and council engineer on 6 December 2023 to discuss heavy vehicle routes to the Project Site. TRC identified they would support the heavy traffic use of Whitehouse Lane and Ascot-Calala Road as it would avoid the urban portion of Calala.
	Judy Coates	Judy Coates (TRC Deputy Mayor) attended the community drop-in session on 24 February 2024. Items discussed are summarised in Section 5.5.
NSW EPA	Stuart Gibson	Email and phone correspondence during EIS development. The NSW EPA confirmed no further engagement was required as they are not the regulatory authority (letter dated 15 December 2023)
Transport for NSW	Alexandra Power Tim Mitchell	Virtual meeting (28 March 2024) to discuss pre-SEARs advice, OSOM route analysis and findings of the TIA. Transport for NSW reiterated the need for a concept OSOM route analysis with swept path analysis showing the proposed OSOM vehicle able to travel to / from the Project Site and along the route without any significant changes to the existing infrastructure.
DPHI – Biodiversity, Conservation and Science	Liz Mazzer	Virtual meeting (26 July 2023) to discuss survey requirements and the guideline <i>Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme (DPE, 2023)</i> .
DPHI – Hazard	Doris Yau	Virtual meeting (20 June 2023) to confirm whether there were any pre-SEARs advice or expectations regarding the PHA assessment from DPHI Hazard.
Fire and Rescue	Aaron Ross	Email correspondence during EIS development (23 November 2023). Fire and Rescue provided link to relevant guidelines and identified that formal feedback would be provided during exhibition of the EIS.
NSW Rural Fire Service	Alex Bawden	Email correspondence during EIS development (16 December 2023). NSW Rural Fire Service identified that the Project may contain grassland fire hazard and requested the EIS identify measures to address the risk such as provision of suitable asset protection zones, access, water and emergency response protocols.

Stakeholder group	Stakeholder	Overview
Transgrid	Jamie Sleiman Kasun Fernando	Email and phone correspondence through EIS development, including connection process, land access requests for surveys required for the preparation of the EIS and general updates on the Project. Iberdrola has provided the Electricity Transmission Ministerial Holding Corporation (EYMHHC) with a copy of this EIS. ETMHC has reviewed the EIS and provided landowner consent to lodge the development application.
Department of Regional NSW	Sara Abberton	In person meeting (23 February 2024) with Aboriginal Partnership Manager to discuss potential Aboriginal social and economic opportunities attached to the Kingswood BESS.
DPI – Agriculture	Paul Garnett	Email and phone calls (23 May 2024) to provide Project update and invite any specific feedback from the Tamworth Agriculture Institute. DPI requested that the assessment of potential land conflict risk assessment consider the Tamworth Agriculture Institute.
Heritage NSW	Barry Gunther	Email (17 October 2023) feedback from Heritage NSW about potential Aboriginal stakeholders who may be interested in the Project (refer Section 5.4.2).

5.4.2 Traditional owners

Consultation with Aboriginal communities for the Project was undertaken in accordance with clause 60 of the National Parks and Wildlife Regulation 2019 and following the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010) [ACHCRP]. The ACHAR is provided in Appendix H of the EIS.

Fifteen Aboriginal groups or individuals registered their interest in the Project following Stage 1 of the consultation steps outlined in the ACHCRP guide. A summary of consultation is provided in Table 5-3.

Table 5-3 ACHCRP Stages and consultation undertaken for the Project

Stage	Description	Consultation undertaken	Consultation period
1	Notification of project proposal and registration of interest	- Letters outlining the development proposal and the need to carry an ACHAR were sent to Tamworth Local Aboriginal Land Council (LALC) and various statutory authorities including Heritage NSW, as identified under the ACHCRP. - An advertisement was placed in the <i>Northern Daily</i> on 9 October 2023 seeking registration of interest. - Further letters were sent to other organisations and individuals as identified by the government agencies.	14 days
2	Presentation of information about the proposed project	- The proposed Assessment Methodology for the Project was issued on 16 November 2023 to all Registered Aboriginal Parties (RAPs). - Details of the background to the proposal, a summary of previous archaeological surveys, and the proposed heritage assessment methodology for the Project were included.	N/A

Stage	Description	Consultation undertaken	Consultation period
3	Gathering information about cultural significance	- Comments regarding the proposed methodology and information about known items of Aboriginal culturally significant values associated with the Project area and/or any Aboriginal objects contained therein were encouraged. - Responses from Gomery Cultural Consultants and Long Gully Cultural Services were received - On 5 December 2023 all RAPs were sent an invitation to attend an Aboriginal Focus Group Meeting on 18 December 2023.	28 days
4	Review of draft cultural heritage assessment report	- A draft version of the ACHAR was issued to all RAPs on 10 April 2024. Comments on the results, significance, assessment and recommendations within the ACHAR were encouraged. - No comments were received from the RAPs following the consultation period.	28 days

5.4.3 Landowners and wider community

A summary of the community engagement methods undertaken is provided in Table 5-4.

Table 5-4 Engagement methods

Engagement method	Stakeholder group	Purpose
	Project website	All interested parties
	Newsletter	Residents within 1 km of the Project
	Face to face	Neighbouring and interested landowners
	Advertising	All interested parties

Engagement method	Stakeholder group	Purpose
 Community drop-in sessions	All interested parties	The aim of the community drop-in sessions was to provide information about the Project, and to understand community issues and opportunities to inform the EIS. Two community drop-in sessions were undertaken at the Acacia Function Centre at 559 – 597 Burgmanns Lane, Hillvue on 23 February and 24 February 2024.
 Online survey	All interested parties	To understand community issues, opportunities and preferred ongoing communication channels going forward with interested stakeholders. This survey was open between 9 February 2024 and 9 March 2024.
 Enquiry lines (phone and email)	All interested parties	To provide community stakeholders with lines of enquiry and feedback to the Project team. This was set up in in August 2023 and included in the engagement material.

5.5 Community engagement outcomes

This section summarises the key findings from the community engagement carried out during preparation of the EIS. Community views regarding the Project have been understood through ongoing consultation and engagement activities described in Table 5-4.

Feedback from the community has been varied on a range of topics. For consistency with the SSD Guidelines, community views have been categorised into one of the following categories:

- The strategic context, including identifying the key natural and built features that are valued in the area and could be affected by the Project
- The design of the Project and any alternatives considered
- Any relevant statutory issues
- Community engagement (e.g. the level or quality of engagement carried out during the preparation of the EIS, the community engagement that should be carried out if the Project is approved)
- Economic, environmental and social impacts of the Project
- Justification and evaluation of the Project as a whole (e.g. consistency of project with Government plans, policies or guidelines; merits of the Project)
- Issues that are either beyond the scope of the Project (e.g. broader policy issues) or not relevant to the Project.

Table 5-5 sets out the themes and specific aspects raised from community feedback, and how these have been addressed.

Table 5-5 Community engagement

Category	Theme	Comments/questions from the community	Response	Where addressed
Economic, environmental and social impacts of the Project	Noise	Concerns raised about noise levels impacting nearby residents during construction and operation of the Project.	The Noise and Vibration Impact Assessment (NVIA) included construction and operational noise modelling to estimate potential noise impacts associated with the Project. Noise impacts are predicted to occur during construction, however these impacts would be temporary and minimised through the implementation of the Construction Noise and Vibration Management Plan (CVNMP) (refer Appendix E). To minimise the potential for operational noise impacts, the Project has sited the BESS in the southeast of the Project Site to maximise distance from receivers. Operational noise is predicted to comply with all relevant noise criteria. A range of proposed design mitigation measures would be verified on selection of the preferred supplier. Measures would consider including the use of silencers, refinement of the layout and noise acoustic barriers. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.	Section 6.2, Appendix E
	Traffic and transport (and associated dust)	Concerns about increased dust in the area due to heavy vehicle movements on local roads.	Potential impacts associated with dust generation due to vehicle movements on roads would be primarily limited to the construction phase of the Project. During construction, an EMS will be prepared for the Project. Dust management measures would include the use of water carts during peak traffic period, regular road dust inspections, adherence to speed limits and covering of vehicles transporting materials. During operation, the Project would be remotely monitored, with periodic maintenance required. Minimal traffic movements would be associated with these activities and as such the potential for associated dust is considered low.	Section 6.1, Appendix D Section 6.12
	Visual amenity	Concerns raised about visual impacts of the battery on their outlook and light pollution.	The Landscape and Visual Impact Assessment (LVIA) identifies that the Project can avoid night sky impact, reduce the visibility and contrast of the Project in the landscape, minimise the impact to the existing landscape character, retain the existing screening vegetation, and enhance the screening of the Project. The establishment of landscaping buffers comprised of native plants will help the Project integrate with its surroundings and minimise any visual impact to the nearest dwellings. The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for Project infrastructure to minimise visual impacts (including glare/reflectivity), including ancillary	Section 6.6, Appendix J

Category	Theme	Comments/questions from the community	Response	Where addressed
			infrastructure such as the O&M buildings/facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, to better blend in with the local rural landscape.	
	Safety and emergency management	Interest in how the Project would manage flooding and bushfire threats and/or the threat of a battery fire. Some community members have knowledge of previous flooding in the area, particularly along Burgmanns Lane, that they could share with the Project. Concern around 20ML tank being too small for fire safety risk	As part of the EIS process, safety and emergency management has been thoroughly considered and mitigations provided in Chapter 6 and Appendix C and would be available for community feedback during the public exhibition process. Early investigations show that there is a low risk of fire occurring at the site, however consideration has been made for every situation and a fire suppression system and comprehensive emergency management plan would be put in place. The Project would be designed in accordance with the relevant Australian Standards, with appropriate fire suppression incorporated into the design and would be equipped with management systems that monitor the operational and fault status of the system to ensure its safe operation and minimise risk to adjacent properties. The management systems function to prevent potential fires by shutting down battery modules. The Project would be designed to meet the static water supply requirements for firefighting purposes in accordance with the NSW Rural Fire Service Guideline <i>Planning for Bush Fire Protection 2019</i>. This would consist of a minimum 20,000 litre static water supply and may form part of larger water holding structure. If the Project is approved, the Project team would use local knowledge and engage with emergency services and key stakeholders on Emergency and Fire Management Plans to ensure they meet requirements.	Section 6.5, Appendix N
	Water	Concern about the batteries contaminating the local water supply.	Chemical hazards can arise from acid or corrosive components leaking from a BESS. This risk would be mitigated by installing containment measures and through the BESS management and monitoring systems. In the unlikely the event of a fire/spill, the stormwater system has been designed with a closure mechanism on the outlet to detain flows from leaving the site. The stormwater system would be designed to: • Collect all stormwater runoff from operational areas of the Project Site, including access tracks • Sufficiently detain stormwater runoff to ensure post-developed peak flows do not exceed existing peak flows leaving the Project Site for all design events up to the 1% AEP	Section 6.10

Category	Theme	Comments/questions from the community	Response	Where addressed
			• Include a dedicated volume for the collection of sediment • Include a dedicated volume for stormwater reuse purposes Detailed design would include reviewing site hydrology and changes as a result of the development and ensuring sufficient drainage capacity, including the basin are provided to mitigate potential adverse impacts. With the implementation of the recommended mitigation measures, the Project is not anticipated to result in unacceptable impacts to water.	
	Property value	Concerns about negative impacts to property values and loss of future land use opportunities, such as the ability to subdivide on their land.	As grid-scale battery projects are relatively new in Australia, there is limited evidence to suggest any changes to property values or impacts on future land use opportunities. The Project is committed to ongoing discussions with neighbouring residents regarding any demonstrated future changes to property values as a direct result of being adjacent to the Project.	Section 6.9, Appendix L
	Cumulative impacts	Impacts of multiple battery projects in a localised area	The EP&A Act plays a central role in the NSW Government's statutory framework for managing cumulative impacts across NSW. The NSW Government has a comprehensive framework in place for assessing and managing cumulative impacts to communities. State significant projects are subject to a comprehensive assessment under the Act in proportion to the scale and impacts of the Project combined with other relevant projects. A cumulative impacts assessment has been undertaken in Section 6.13.	Section 6.13
Justification	Technology	The effectiveness of the technology was raised by community members.	One of the key benefits of the Project is the flexibility it delivers compared to conventional energy sources. By enabling a balance of energy production and consumption between day and night, battery energy storage can support sustainability goals by supporting renewable energy generation. Unlike other forms of energy storage and generation, batteries' response time is fast. They respond to peak demand, build grid resilience, and provide backup power when you need it. They can also be used to enable access to Frequency Control Ancillary Services.	Section 2
	Competition	Query as to whether all battery projects in the area could go ahead (particularly in relation to grid connection)	NSW has an ambitious target of net zero emissions by 2050 – to meet this target, NSW will require a transformation. This means that large amounts of new energy are required to power regions and cities. By investing in multiple renewable energy production and storage solutions in the Tamworth region, the community will enjoy more secure, reliable, clean, and affordable energy during the transition and into the future The Project is needed to support the NSW Government's strategy for a reliable, affordable, and sustainable electricity future that supports a growing economy. The National Energy	Section 2

Category	Theme	Comments/questions from the community	Response	Where addressed
			Market is rapidly moving away from reliance on thermal generation facilities towards renewable energy generators. Grid-scale battery energy storage is essential in providing infrastructure enabling the expansion of renewable energy in NSW and in ensuring firm capacity is met. As such, Iberdrola considers that the Project will play a role in the transformation of the NSW energy sector. Iberdrola will continue to consult with TransGrid around the physical infrastructure required to connect the Project to the Tamworth substation and is progressing this workstream with no issues identified to date. Grid modelling studies have indicated that there is sufficient transmission capacity to accommodate multiple battery projects in the region without incurring generation curtailment.	
Design of the Project	Reduction of impacts on local residents	The majority of respondents to the community survey expressed the importance of the Project reducing any potential impacts on local residents.	The Project team understands the uncertainty and concern in the community regarding the potential impacts of the Project., and has been engaging with the immediate neighbours of the property since August 2023 to understand the local context and their views toward the proposal. The Project has embedded measures to reduce impacts on residents based on community feedback, including • The location of the battery within the Project Site, to minimise the distance between the nearest residents • Reduction in the size of the battery to minimise noise impacts • Selection of a potential heavy vehicle route that avoids the urban area of Calala • Inclusion of vegetation screening to minimise visual impacts • Inclusion of recommended asset protection zones and separation distances from neighbouring properties/assets to minimise potential for off-site risks such as fire or other hazards. Should the Project be approved following the EIS process, the Project team will continue to engage with the local community throughout the construction and operation stages of the Project.	Chapter 6
	Hazard and risk	What precautions will the company take to prevent the Lithium-ion batteries from catching fire?	The PHA considers fire risk at the BESS and substation. Controls would be implemented, including protection and suppression systems. The Project will be largely separated from nearby residential dwellings and fire effects are not expected to have an off-site impact. Monitoring equipment would be installed to detect fire risk and initiate an emergency	Section 6.4, Appendix G

Category	Theme	Comments/questions from the community	Response	Where addressed
			response. An asset protection zone would be established around project infrastructure in accordance with guideline requirements. Other measures to minimise fire risks, include: • Complying with guidelines, standards, and conditions to operate in accordance with the applicable legislations as set out by government and regulating bodies • Adopting an Emergency Response Management Plan to outline the protocols and requirements for fires and other risks • Implementing a Fire Safety Study (developed in consultation with Fire and Rescue NSW) to identify, assess, and outline controls to manage on-site and off-site risks at a BESS facility In its procurement process, Iberdrola will ensure that Project equipment complies with all relevant Australian and international standards, and will be subject to quality assurance testing (such as Factory Acceptance Testing) where relevant prior to commissioning.	
	Hazard and risk	Have alternative options to Lithium-ion (Li-ion) batteries been explored that could be safer?	Battery chemistry and associated technology options are rapidly evolving and combined with decreasing costs, are increasingly being investigated and pursued. Battery chemistries / technologies that were considered are discussed in Section 2.5.4. Li-ion batteries are established in the marketplace and can be developed to comply with a range of Australian and international standards. For these reasons, this technology has been selected for the Project.	Section 2.5.4

Category	Theme	Comments/questions from the community	Response	Where addressed
	Project functionality	What will the BESS look like and how and to whom will the battery provide power too?	The detailed design would be worked out through the EIS process, however typically, battery enclosures contain a group of Li-ion batteries, housed within weather-proof enclosures. Battery enclosures will be arranged in rows and comprise: • Racks of lithium-ion type batteries • Battery management system to protect cells from harmful excesses of voltage, temperature, and current • Energy management system that is responsible for system power flow control • Thermal management system that controls all functions related to the HVAC of the enclosure system. The Australian Energy Market Operator (AEMO) manages electricity systems and markets across Australia. They monitor supply and demand, voltage and frequency, manage planned and unplanned outages and emergencies and would determine when electricity stored in the battery is required to be dispatched to the grid by staff on site.	Chapter 3 Section 5.6
Strategic context	Rural character	The industrial nature of the BESS will contrast with the rural character of the area. The Project will impact on residents and communities' sense of place (noting the rural lifestyle and quality of life).	Land Use Conflict Risk Assessment (LUCRA) A LUCRA has been undertaken for the Project and is detailed in Chapter 6.8. The potential noise and visual impacts were identified as having the greatest potential for land use conflict. Measures for noise and visual have been adopted as part of the Project design to minimise potential conflicts of the Project on surrounding properties. Landscape and Visual Impact Assessment (LVIA) The LVIA identifies that the Project can avoid night sky impact, reduce the visibility and contrast of the Project in the landscape, minimise the impact to the existing landscape character, retain the existing screening vegetation, and enhance the screening of the Project. The establishment of landscaping buffers comprised of native plants will help the Project integrate with its surroundings and minimise any visual impact to the nearest dwellings. The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for Project infrastructure to minimise visual impacts (including glare/reflectivity), including ancillary infrastructure such as the O&M buildings/facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming	Section 6.8 Section 6.2, Appendix E Section 6.7, Appendix J

Category	Theme	Comments/questions from the community	Response	Where addressed
			landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, to better blend in with the local rural landscape. Noise and Vibration Impact Assessment (NVIA) To minimise the potential for operational noise impacts, the Project has sited the BESS in the southeast of the Project Site to maximise distance from receivers. The NVIA identifies that operational noise is predicted to comply with all relevant noise criteria. A range of the proposed design mitigation measures would be verified during upon selection of the preferred supplier including the use of silencers, refinement of the layout and noise acoustic barriers. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.	
Community engagement	Level of engagement	There has been limited community consultation and opportunities for feedback.	Community and stakeholder engagement activities regarding the Project commenced in Quarter 3 of 2023. The initial engagement focused primarily on notifying neighbouring land owners and government agencies of Iberdrola's intention to lodge the Scoping Report. This included newsletters to nearby landowners. As part of EIS consultation, a range of methods and tools have been used to talk to the community. This has included newsletters, face to face meetings, advertising, online survey, community drop-in sessions and enquiry lines (i.e., website, phone and email). Further detail is provided in Section 5.4.3. Iberdrola is committed to open, transparent and ongoing consultation. Communication channels will continue to be updated to provide Project updates and ongoing opportunities for feedback.	Section 5.4.3

5.6 Ongoing engagement

5.6.1 Public exhibition of the EIS

Public exhibition of the EIS will be for a minimum of 28 days as stated in the EP&A Act. Advertisements will be placed in newspapers to advise of the public exhibition and where the EIS can be viewed, and details of proposed community consultation activities and information sessions.

Consultation activities during public exhibition of the EIS may include:

- Community information/drop-in sessions
- Newsletter letterbox drops and emailed
- Information updated on the project webpage
- Newspaper advertising
- Information available at local council offices
- Stakeholder meetings
- Local business engagement
- Government stakeholder engagement.

The extent and form of this consultation would be determined prior to the exhibition of the EIS.

5.6.2 Consultation during construction/operation

Iberdrola would continue to carry out consultation after the completion of the planning phase of the Project and into its construction and operational phases. Ongoing consultation would include, but not be limited to:

- Pre-commencement “job-fairs” or “meet the contractor sessions” to source local labour, suppliers and subcontractors and maximise local content
- Consultation in accordance with statutory requirements
- Ongoing consultation with key stakeholders, local council and other government agencies
- Provision of regular updates to nearby businesses and the community.

6 Assessment of impacts

A risk assessment was undertaken to identify the potential environmental, social, and economic matters that are likely to be impacted by the construction, operation, decommissioning and rehabilitation of the Project during development of the Kingswood BESS EIS.

The key issues identified (and confirmed by the SEARs) that have been assessed in detail in this EIS include:

- Traffic and transport
- Noise and vibration
- Biodiversity
- Hazard and risk
- Bushfire
- Heritage
- Visual amenity
- Land
- Social and economic
- Water
- Waste
- Cumulative impacts

Air quality was also identified as a potential impact by the risk assessment.

The above issues are addressed in Section 6.1 through Section 6.13. A compilation of mitigation measures (excluding mitigation measures that are built into the physical layout and design of the Project) is provided in Appendix C.

6.1 Traffic and transport

This section provides a summary of the potential traffic and transport impacts of the Project. The Traffic Impact Assessment (TIA) for the Project has been prepared by Arcadis and is provided in Appendix D of this EIS. Appendix A provides a summary of the relevant SEARs which relate to traffic and where these have been addressed in this EIS.

6.1.1 Methodology

6.1.1.1 Government plans, policies and guidelines

The TIA was prepared with reference to the following plans/policies/guidelines:

- Tamworth Regional DCP 2010
- *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods* (Austroads, 2020)
- Traffic summary reports for the following locations from Tamworth Regional Council:
 - Ascot-Calala Lane – north of Whitehouse Lane (2017)
 - Burgmanns Lane – east of Goonoo Goonoo Road (2018)
 - New England Highway – north of Spains Lane (2023)
 - Whitehouse Lane – east of New England Highway (2023)
- Tamworth BESS Scoping Report (Accent Environment, 2021)
- Calala BESS Transport Impact Assessment Report (Stantec, 2023).

6.1.1.2 Traffic survey

Traffic volumes for the surrounding road networks were sourced from traffic summary reports provided by TRC. Traffic counts were collected at Ascot-Calala Road (2017), Whitehouse Lane (2018), New England Highway / Goonoo Goonoo Road (2023) and Burgmanns Lane (2023).

6.1.1.3 Site visit

A site visit and consultation with the TRC Development team was undertaken on Wednesday 6 December 2023 to understand existing traffic conditions, context of the nearby development application and potential traffic access routes that can minimise / mitigate the impacts to the Calala community.

TRC supported the use of Whitehouse Lane onto Ascot-Calala Lane for site access to avoid the heavy vehicle traffic through the urban portion of Calala.

6.1.1.4 Background traffic growth and cumulative impacts

To assess impacts of the Project in future years, the future background traffic volumes have been established using a 0.42 percent annual traffic growth rate. The linear growth rate was sourced from the Transport for NSW (TfNSW) Traffic Volume Viewer and determined using 2021 and 2023 average daily traffic volumes recorded from a permanent traffic classifier located on the Oxley Highway (Station 6168).

For the purposes of analysing the 'worst' case scenario for the cumulative traffic impact assessment, it has been assumed the construction of the Calala BESS (SSD-52786213) and Tamworth BESS (SSD-23830229) would coincide with the construction of the Project.

6.1.2 Existing environment

6.1.2.1 Road network

The Project Site is bounded by Ascot-Calala Road to the east, Burgmanns Lane to the north and is 3.2 kilometres east of the New England Highway / Goonoo Goonoo Road. Figure 6-1 shows the location of the Project Site and surrounding road network.

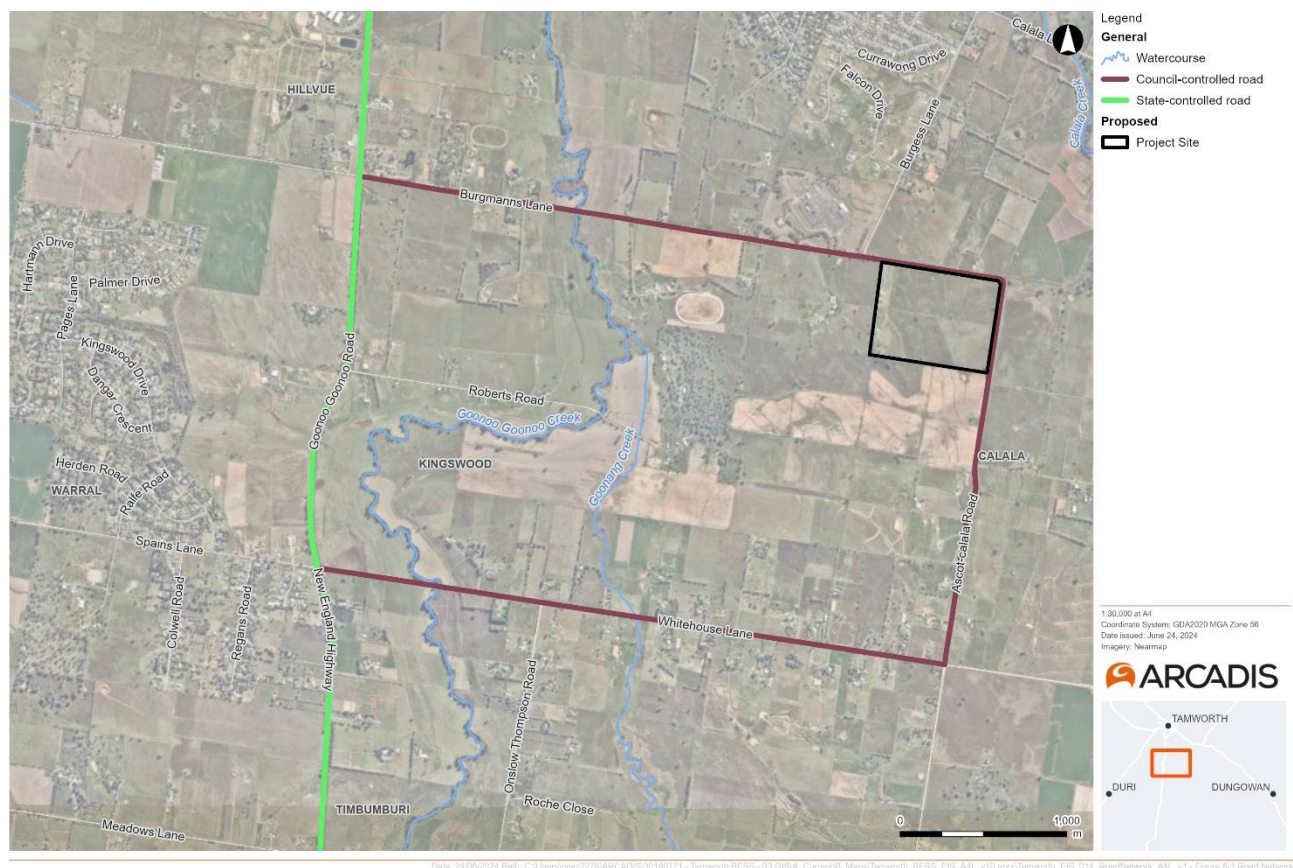


Figure 6-1 Road network

Goonoo Goonoo Road / New England Highway is a two-way, major state-controlled highway which runs from Hexham near Newcastle at its southern end to the Queensland border at its northern end. The road runs in a north-south direction. Informal unrestricted kerbside parking is mostly permitted on both sides of the road.

Ascot-Calala Road and Burgmanns Lane fronting the Project are both two-way unsealed local roads controlled by TRC, with a speed limit of 60 kilometres per hour. Ascot-Calala Road has north-south orientation and intersects with Burgmanns Lane to the north and Whitehouse Lane to the south. Whitehouse Lane is a two-way sealed local road with a speed limit of 100 kilometres per hour.

The Project Site provides high accessibility to the broader road network and in particular access to and from the New England Highway. Goonoo Goonoo Road / New England Highway and Whitehouse Lane surrounding the Project Site are designated heavy vehicle routes for B-double up to 26 metres long. Figure 6-2 shows the restricted access vehicle (RAV) map within Tamworth, Kingswood and the surrounding area.

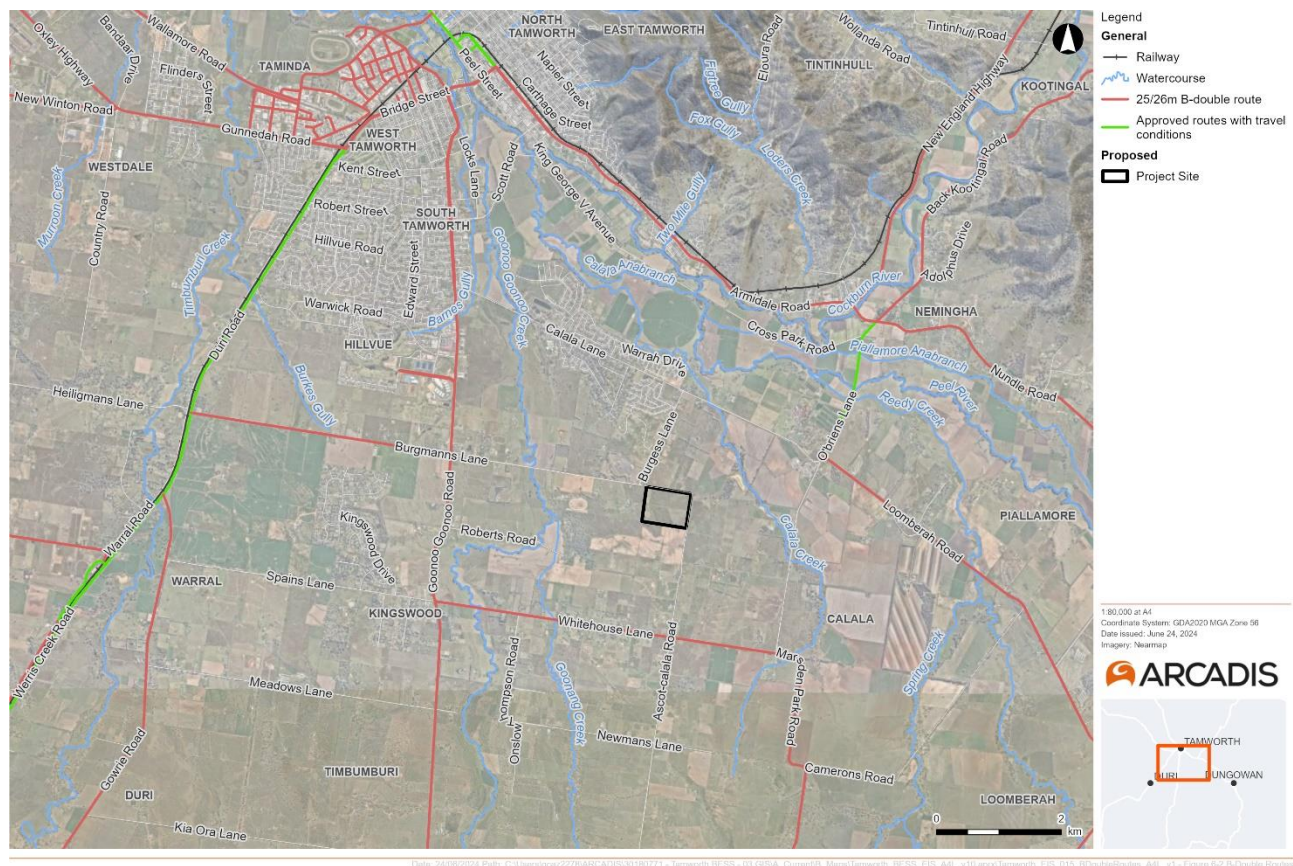


Figure 6-2 RAV Map

6.1.2.2 Crash analysis

Five-year crash data between 2018 and 2022 has been analysed to understand the severity of crashes located within the general vicinity of the Project. The data is available from the NSW Centre for Road Safety which was provided by TfNSW.

Analysis of the data indicates that crashes that occurred within the vicinity of the Project across the five-year period did not indicate any specific safety concerns with the surrounding road network, rather, they were considered to be minor in terms of crash severity.

6.1.2.3 Public and active transport

A summary of the existing public (rail and bus) and active (pedestrian and cycling) transport network surrounding the Project is provided in Table 6-1.

Table 6-1 Existing public and active transport

Mode	Existing environment
Rail	The closest train station is Tamworth Station providing a service between Sydney and Armidale. The station is about 11 kilometres north of the Project.
Bus	There are limited bus infrastructure and services available for construction workers and employees to access the Project. The two closest bus stops servicing bus routes 435 and 436 running between Tamworth, Tamworth Sports Dome and Calala are located approximately two kilometres north of the Project.
Pedestrian	The pedestrian network is limited in the vicinity of the Project as there are no major pedestrian attractors or generators warranting formal footpaths or bicycle rider facilities due to the rural area dominated by agricultural land uses.
Cycling	There are no cycling provisions near the Project. Some shared paths are provided on Calala Lane and Goonoo Goonoo Road connecting to Tamworth.

6.1.2.4 Traffic volumes

Analysis of the traffic count data indicates that the AM and PM (commuter) peak hours at Goonoo Goonoo Road / New England Highway, Ascot-Calala Road, Burgmanns Lane and Whitehouse Lane are:

- AM peak: 8:00am to 9:00am
- PM peak: 3:00pm to 4:00pm

The construction peak hours for the Project are:

- AM peak: 6:00am to 7:00am
- PM peak: 6:00pm to 7:00pm

Traffic volumes for the surrounding road network are provided in further detail within the TIA (Appendix D).

6.1.3 Traffic generation

6.1.3.1 Construction

Overview

The anticipated average and peak construction traffic volumes are provided in Table 6-2 and discussed further below.

Table 6-2 Construction traffic

Vehicle	Average vehicles per day	Peak vehicles per day
Light	40	80
Heavy	30	60
Total	70	140

The highest hourly traffic generation for the Project under the peak construction scenario is assumed to be up to 140 vehicle trips in total, which would comprise the following in the AM and PM peak hours:

- 10 inbound heavy vehicle movements
- 10 outbound heavy vehicle movements
- 80 inbound light vehicle trips.

Vehicle movements for the Project are discussed below.

Light vehicles

For the majority of the construction program, the Project is expected to generate up to 40 light vehicles (one-way) per day. During the construction peak of the Project, it is expected that up to 100 FTE personnel would be employed. Most of the construction workforce is likely to be based in the Tamworth and surrounding region. It is expected that workers would typically access the Project Site in the morning and depart the Project Site in the afternoon. It is expected that there would be opportunities for workers to carpool and opportunities for a shuttle bus would also be explored in consultation with TRC to reduce the need for private vehicle use.

An average occupancy rate of 1.25 workers per vehicle (i.e., one in four cars has an occupancy of two workers) has been considered. Accordingly, during construction, 80 light vehicles would be expected to access the Project Site in the morning, and 80 light vehicles would be expected to egress in the afternoon. It is unlikely that workers would access or egress the Project Site in a single hour. Accordingly, the assumption of 80 worker trips in a single hour provides a conservative analysis of the construction impacts of the Project.

Heavy vehicles

Heavy vehicles would be used to move goods and other plant equipment to and from the Project Site and are likely to include:

- | | |
|-----------------------------------|---|
| • 6.4 metre small rigid vehicles | • 20 metre semi-trailers |
| • 8.8 metre medium rigid vehicles | • 26 metre B-doubles |
| • 12.5 metre heavy rigid vehicles | • Oversize or Overmass vehicles (OSOM). |
| • 19 metre side loader | |

For the majority of the construction program, the Project is expected to generate around 30 heavy vehicles (one-way) per day. It is expected that during peak construction period, construction activity would result in up to 60 heavy vehicles (one-way) per day. On average, this equates to approximately five heavy vehicle movements per hour. To be conservative, it has been assumed that 10 trucks would access / egress the Project Site in a single hour including allowance for OSOM which may be required to travel outside of the peak load network periods.

Heavy vehicles and Oversize/Overmass vehicles (OSOM)

Heavy vehicular access to the Project will use Ascot-Calala Road via Whitehouse Lane (Figure 6-3).

During construction, battery modules, HV transformers, control room, switch room and transmission supporting structure may be delivered to the Project Site via over OSOM.

The likely OSOM vehicles for the construction phase are presented in Table 6-3. The size and number of OSOM vehicles would be confirmed during construction phase and included in the CTMP.

Table 6-3 Likely OSOM vehicles

Plant and/or equipment	Vehicle	Qty of OSOM vehicles	Width (m)	Mass (tonnes)	OSOM class
HV 330 kV transformers	35 metre long 14-Axle OSOM vehicle	2	4.3	130	Class 1
Buildings	35 metre long 14-Axle OSOM vehicle	2	4.3	<45	Class 1
Battery modules	Prime Mover and Low Loader	184	<3.2	50	Class 1

Battery components are anticipated to be brought in from Port of Newcastle using the Hunter Expressway and New England Highway. The largest heavy vehicle anticipated during construction would be for the transport of the HV transformer (Table 6-3). Ministerial Orders, Class 1 National Notices or permits with the National Heavy Vehicle Regulator (NHVR) would be obtained prior to OSOM movements. The permit would undergo a separate approval process and a suitable contractor would be engaged for transportation and development of a OSOM Transport Management Plan.

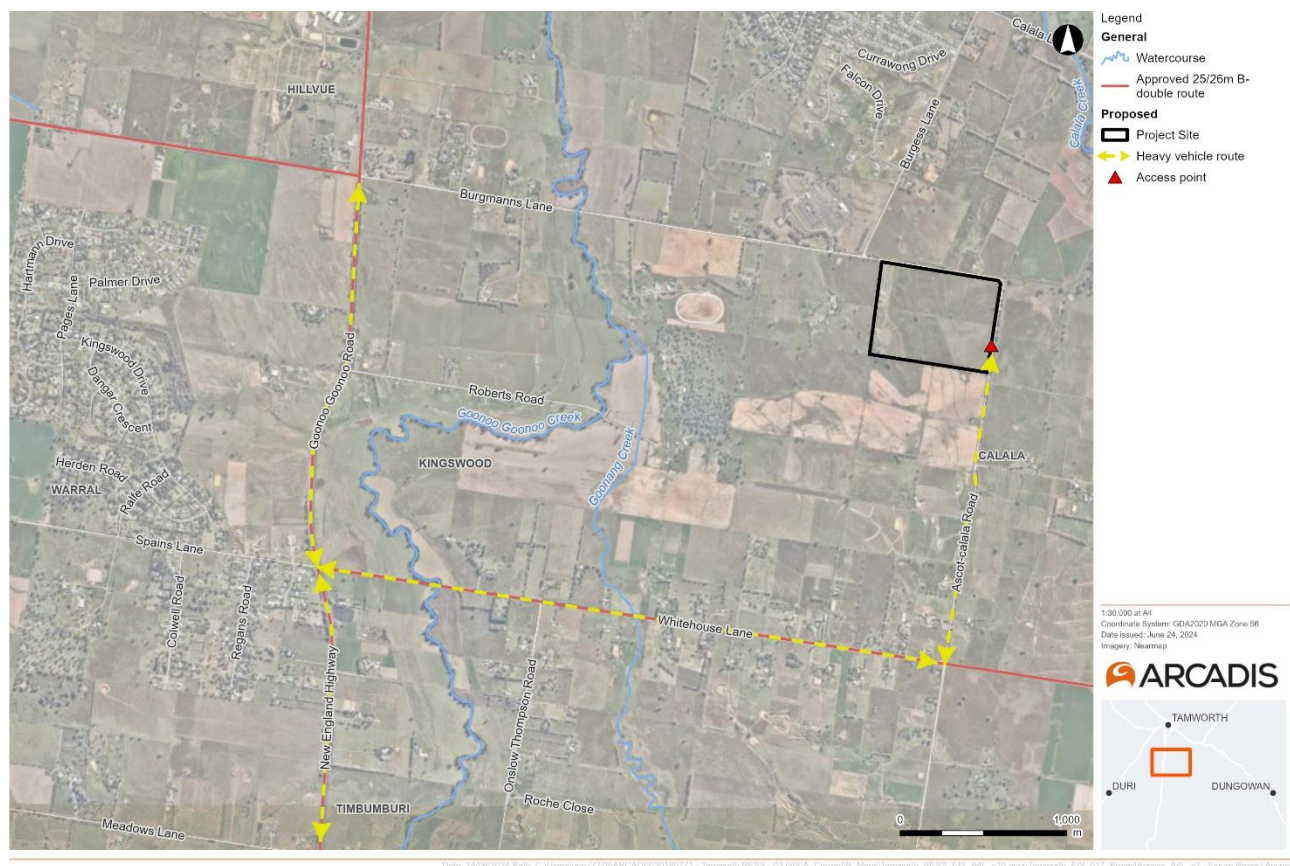


Figure 6-3 Project heavy vehicle access route via Whitehouse Lane and Ascot-Calala Road

6.1.3.2 Operation

The Project would be operational 24 hours, seven days a week. The BESS would be operated remotely except for site maintenance on an as-needs basis. Typically, there would be no requirement for heavy vehicles to regularly access the Project Site when the battery is operational. Therefore, without permanent on-site staff, it would generate very low traffic volumes as part of the daily operations. The Project is anticipated to be operational in 2026 with a design life of around 20 years.

6.1.4 Potential impacts

6.1.4.1 Construction

Site access

To minimise the impact to the Calala community and impact from potential flooding events, heavy vehicle traffic through the urban portion of Calala using Calala Lane and Burgmanns Lane is not proposed. These lanes are regularly cut off from vehicular traffic for short periods of time due to flooding at Goonoo Goonoo Creek causeway. Additionally, the two proposed BESS projects in proximity to the Project are proposing to access their sites via Calala Lane and Burgmanns Lane.

As such, all heavy vehicle access to and from the Project would use Ascot-Calala Road via Whitehouse Lane. A dilapidation survey would be undertaken on Ascot-Calala Road prior to construction and would be monitored throughout construction.

The site entrance off Ascot-Calala Road would be formalised during the Project Site preparation to safely accommodate construction traffic generated by the Project. The access would be designed in accordance with the *Australian Standard for Off Street Car Parking* (AS2890) and the TRC's DCP 2010.

As per the *Ausroads Guide to Road Design Part 4A*, property accesses should comply to the requirements of safe intersection sight distance (SISD), minimum gap sight distance and approach sight distance. Based on the 2D sight line assessment and the longest required SISD adopted (assuming a 60 kilometre per hour design speed), a minimum of 123 metres from the horizontal curve on Ascot-Calala Road is achieved.

Based on the proposed layout, a vehicle swept path assessment was carried and determined that the proposed access layout would allow for the largest design vehicle (35 metres long, 14 axles OSOM vehicle) to enter and exit the Project Site without impacting any of the street furniture.

As such, the proposed site access arrangement off Ascot-Calala Road is considered suitable as part of the development.

Impacts to the road network

For rural roads, the *RTA Guide to Traffic Generating Developments* (October 2002) recommends an assessment of road capacity rather than intersection capacity, as the level of service is determined by average travel speeds and the percentage of time spent delayed. The RTA Guide suggests rural roads should not exceed service volumes at Level of Service (LOS) C.

For roads with a design speed of 80 kilometres per hour and greater than 15 percent heavy vehicles, this equates to around 827 vehicles in the peak hour (as detailed in Section 4.2.4 of the RTA Guide). The impact of the cumulative traffic demand generated by the Project and the surrounding developments on the road network is summarised in Table 6-4.

Table 6-4 Traffic movements

Road	Existing	The Project	Calala BESS	Tamworth BESS	Goonoo Goonoo Road Upgrade	Cumulative volume	Level of service
New England Highway / Goonoo Goonoo Road	628	100	102	5	20	855	~LOS C
Whitehouse Lane	59	84	102	5	0	250	LOS A
Burgmanns Lane	135	16	102	5	0	258	LOS A

During construction of the Project, the existing road network would accommodate Project related traffic within the capacity of the surrounding road network. The additional traffic generated during construction would be relatively minor compared to the existing daily traffic volumes in the road network. With consideration of the above, Whitehouse Lane, Burgmanns Lane and New England Highway / Goonoo Goonoo Road are considered to operate at an acceptable LOS throughout the construction period.

In the event all three BESS projects are constructed at the same time, the cumulative traffic volume is estimated to be slightly higher than the LOS C threshold, but well below the LOS D threshold of 1,340 vehicles. Construction related traffic impacts from the Project would be temporary (up to 15 months), with peak Project impacts (and from neighbouring BESS proposal) anticipated to be largely limited to a few months and unlikely to concurrently align. Given this, cumulative impacts are considered to be conservative.

OSOM route assessment

The proposed OSOM route from the Port of Newcastle to the Project is shown in Figure 6-4 and has been identified with the aim of minimising the impact of construction traffic on the surrounding road network.



Figure 6-4 OSOM route between Port of Newcastle and the Project (Source: NHVR Route Planner Tool)

The route is as follows:

- Newcastle City Council Roads (approved OSOM route): Parker Street → Elizabeth Street →
- State-controlled Roads (approved OSOM route): Industrial Drive → Maitland Road →
- State-controlled Roads (conditional OSOM route): New England Highway (from Hexham to John Renshaw Drive) →
- State-controlled Roads (approved OSOM route): John Renshaw Drive →
- State-controlled Roads (conditional OSOM route): Hunter Expressway → New England Highway (to Singleton side of the traffic lights at Magpie Street) →

- State-controlled Roads (approved OSOM route): New England Highway → Maitland Street → Sydney Street → Bridge Street → New England Highway → Aberdeen Street → New England Highway → Macqueen Street → New England Highway →
- Tamworth Regional Council Roads: Whitehouse Lane (OSOM approved route) → Ascot-Calala Road (not on OSOM route network).

A review of the potential route highlights several key locations where traffic management and / or modification of existing traffic furniture would be required to accommodate OSOM vehicle manoeuvres is summarised in Table 6-5.

The route is subject to confirmation of items such as bridge heights, intersection/road widths and powerline clearances which would be undertaken as part of the detailed design stage and during development of the CTMP.

Table 6-5 Pinch points of the potential route

Location	Potential works required / comments
Parker Street / Elizabeth Street	Minor works to central median may be required
Elizabeth Street / Industrial Drive	No modification works required
Industrial Drive / Maitland Road	No modification works required
John Renshaw Drive / Hunter Expressway	No modification works required
Maitland Street / Sydney Street (5.2 metre height restriction under railway overbridge)	Route detour via New England Highway, Bell Street and Victoria Street
New England Highway / Bell Street	Minor works to median may be required
Bell Street / Victoria Street	No modification works required, opposing traffic lane utilised to facilitate manoeuvre
New England Highway / Market Street	Existing mountable kerb utilised to facilitate manoeuvre
New England Highway / Whitehouse Lane	The assessed OSOM can safely enter Whitehouse Lane with current road configuration
Whitehouse Lane / Ascot-Calala Road	The assessed OSOM can safely enter Ascot-Calala Road with current road configuration

Impacts to public transport and active transport

No changes to bus and train services would be required as a result of construction or operation of the Project. Furthermore, given the industrial land use and the minimal pedestrian movements around the Project, impacts to pedestrians and cyclists are anticipated to be limited. Therefore, minimal impacts to existing public and active transport are expected during the construction phase.

To minimise potential impacts associated with OSOM vehicles movements into and out of the Project Site, traffic wardens would be used to manage safe movement and avoid traffic conflicts.

Impacts to parking

During peak construction period, up to 100 workers are anticipated. Opportunities for the shuttle buses would be explored in consultation with TRC to reduce the need for private vehicle use. Details of the shuttle bus arrangement would be documented in the CTMP.

It is proposed that temporary workforce parking would be provided during construction at the temporary laydown area. It is recommended that parking opportunities be recorded within the CTMP which also designates parking locations to be used during construction. As such, minimal impacts to parking are expected from the construction of development.

6.1.4.2 Operation

Site access

Access to the Project Site has been designed to minimise impacts to the Calala community. As with construction of the Project, road furniture would not be impacted by vehicles accessing the Project Site during the operation of the Project.

Impacts to public transport and active transport

Due to the minimal nature of traffic operations, impacts on public and active transport networks are not expected to occur.

Impacts to parking

Operational impacts associated with parking are not expected to occur, with formal off-street parking to be provided for the maintenance workforce. This would be in accordance with relevant planning scheme standards as well as design requirements contained in *Australian Standard for off-street car parking* (AS2890.1 and AS2890.2), as well as the TRC DCP 2010.

6.1.5 Mitigation measures

Table 6-6 summarises the mitigation measures for managing traffic impacts

Table 6-6 Traffic mitigation measures

ID	Mitigation Measures
Detailed design and pre-construction	
T1	A CTMP will be prepared to mitigate potential construction traffic impacts. The CTMP will include the following: • Consultation outcomes with the relevant road authorities during preparation of the CTMP • A process for ongoing consultation with relevant road authorities, stakeholders and nearby developments to understand any overlap in construction programs and ensure appropriate coordination of construction activities • Measures to minimise potential traffic movement during key events in Tamworth (such as the Tamworth Country Music Festival) • Primary and secondary routes to be used by heavy construction-related vehicles • Traffic dust management measures • Notification requirements prior to the movement of hazardous / dangerous or oversize construction material and equipment • Measures to manage and facilitate the ingress/egress of the vehicles to ensure safety for all users along Ascot-Calala Road, including, as required regulatory and direction signposting, variable message signs, traffic management personnel and all other traffic control devices necessary for the implementation of the CTMP • Monitoring objectives to review the performance of traffic management
T2	A dilapidation survey of Ascot-Calala Road will be undertaken prior to the commencement of construction.
T3	Opportunities for the use of a shuttle buses during construction will be explored in consultation with TRC to reduce the need for private vehicle use. The outcomes of this review will be documented in the CTMP.
T4	A detailed route assessment will be completed prior to OSOM deliveries for all OSOM vehicles used during construction.

ID	Mitigation Measures
T5	A process for managing OSOM vehicle deliveries will be developed and implemented (obtain either a Ministerial Orders, Class 1 National Notices or permits with the National Heavy Vehicle Regulator depending on the size and loads of the vehicles).
Construction and operation	
T6	A Driver Code of Conduct will be implemented to maintain safety within and around the Project and will be included in the CTMP. The Code of Conduct will be communicated to all site workers during site induction and will be reminded of the requirements of the code regularly in toolbox meetings. The Code of Conduct will be revised prior to commencement of on-site works and when required during construction works. The Code of Conduct will include but not be limited to: • All vehicles associated with the Project are required to travel within the posted speed limits on public roads • All large vehicles associated with the Project are required to follow the designated heavy and OSOM vehicle routes and minimise impact on school bus routes • All operators of the vehicles associated with the Project should maintain a high level of awareness and respect for all other road users • Safe driving practice training will be provided prior to start-up of any traffic and access related management tasks, and provide updates if the tasks, equipment or procedures are expected to, or have changed.
T7	Fatigue management measures will be introduced and enforced for all workers including the standard hours of operation.
T8	All vehicles associated with the Project will be compliant with relevant State legislation in relation to roadworthiness and modifications, and maintained regularly by way of vehicle checks and maintenance.
T9	Site access management will be implemented to maintain the safety of the general public and the employees. This will include measures such as advisory truck turning signage and mandating heavy vehicles come from south via Whitehouse Lane.

6.2 Noise and vibration

This section provides a summary of the potential noise and vibration impacts of the Project. Resonate has undertaken a Noise and Vibration Impact Assessment (NVIA) to assess the potential noise and vibration impacts associated with the Project to address the SEARs issued by DPHI.

The NVIA for the Project is provided in Appendix E of this EIS. Appendix A provides a summary of the relevant SEARs which relate to noise and vibration and where these have been addressed in this EIS.

6.2.1 Methodology

6.2.1.1 Government plans, policies and guidelines

The NVIA was prepared with reference to the following plans/policies/guidelines:

- *Interim Construction Noise Guideline (ICNG)* (DECC, 2009)
- *Noise Policy for Industry (Npfi)* (EPA, 2017)
- *NSW Road Noise Policy (RNP)* (DECCW, 2011)
- *Assessing Vibration: A Technical Guideline* (DEC, 2006).

6.2.1.2 Approach

Noise and vibration modelling was undertaken to estimate the potential noise and vibration impacts associated with the Project. The assessment included:

- Noise monitoring to identify existing background noise levels and establishment of noise criteria
- Review of potential construction methodology and noises sources
- Review of proposed operational layout and noise sources
- Development of a noise model to predict changes to the existing noise environment from construction and operation of the Project
- Vibration impact assessment
- Identification of environmental management measures required to avoid, minimise and/or mitigate any potential noise and vibration impacts identified.

6.2.1.3 Background noise monitoring

To identify the existing noise environment around the Project Site and formulate construction and operational noise criteria, unattended noise monitoring was conducted between 31 October 2023 and 22 November 2023. The location of the noise monitoring equipment is shown in Figure 6-5.

The measured noise data was filtered to remove data affected by inclement weather conditions obtained from the Bureau of Meteorology (BoM) automative weather station at Tamworth Airport (055325), located about 11 kilometres north-west of the Project.

Noise data was excluded from the processed results if:

- Rainfall occurred during a measurement period
- Wind speed exceeded five metres per second at the measurement height of 1.5 metres above ground.

Further detail on noise logging data, including the data that has been excluded due to adverse weather conditions, is included in Appendix E of the EIS.

6.2.2 Existing environment

The Project Site is located within a rural area, with the nearest residential receiver (R2) to the Project located to the north of the Project Site on Burgmanns Lane. The nearest noise sensitive receivers in the vicinity of the Project are listed in Table 2-1 and shown in Figure 6-5. The receiver located at 744 Burgmanns Lane within the Project Site is associated with the Project.

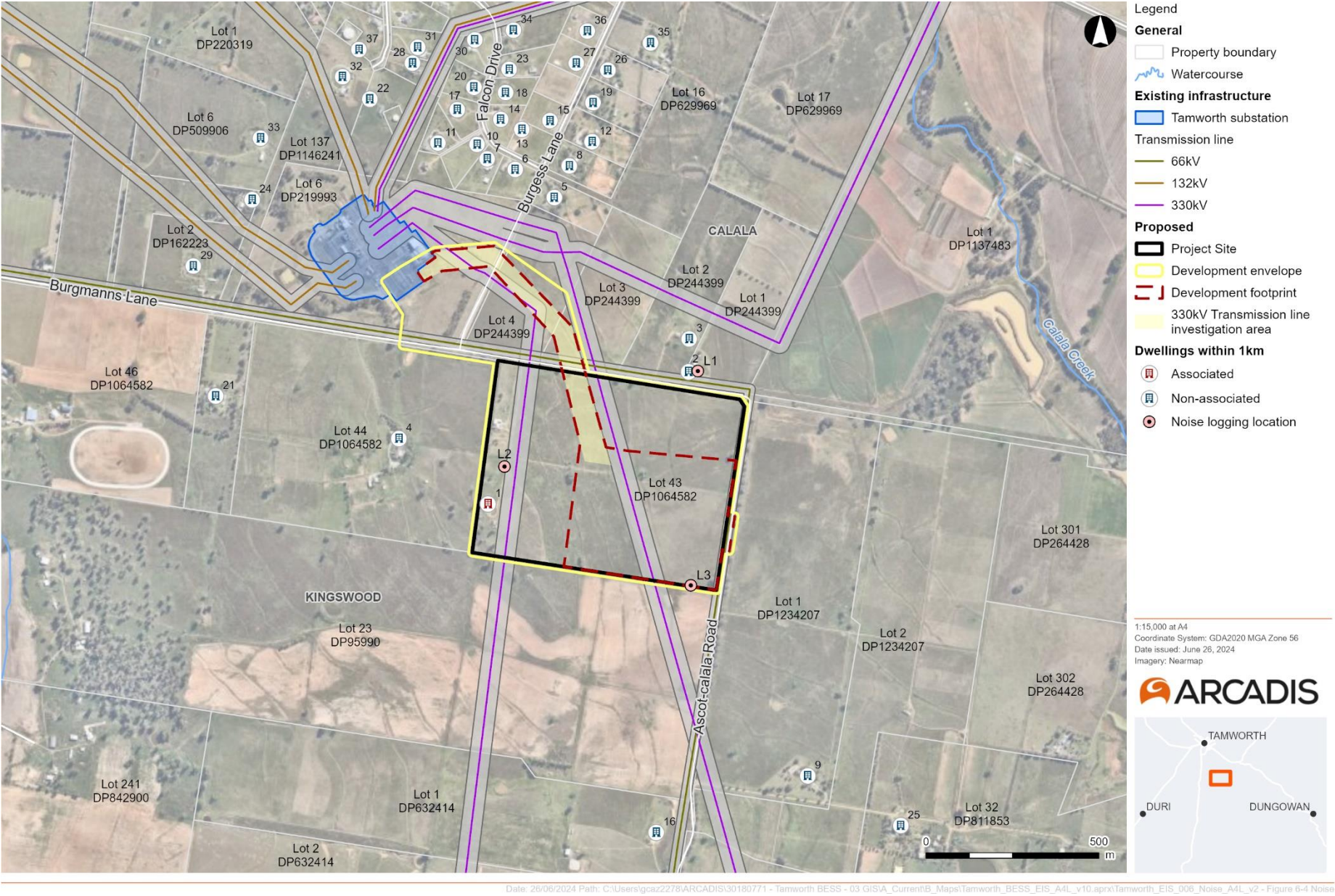


Figure 6-5 Noise monitoring location and surrounding sensitive receivers

Background noise levels for the assessment locations have been identified based on noise monitoring as described in Section 6.2.1. The results of the unattended noise monitoring are detailed in Table 6-7.

Table 6-7 Unattended noise monitoring results

Location	Measurement	Measured Noise Level – dB(A)		
		Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
L1	L _{Aeq}	47	47	41
	RBL (L _{A90})	35	31	30
L2	L _{Aeq}	49	54	47
	RBL (L _{A90})	35	30	30
L3	L _{Aeq}	44	48	42
	RBL (L _{A90})	35	30	30

6.2.3 Potential impacts

6.2.3.1 Construction

Noise

Construction noise levels have been predicted at sensitive receivers with consideration to the requirements of the ICNG. The assessment is based on the expected construction scenarios which would occur during standard working hours. Typical plant and equipment for each scenario used in the modelling is summarised in Appendix E.

It should be noted that the modelling approach is conservative in that the scenarios assume high-range sound power levels and all plants operating simultaneously and in one location. In reality, plant and equipment would move around the Project Site and would not be used simultaneously at the same time and location.

Specific details of the construction program and the number, type, and duty of the construction plant to be used would be determined when a construction contractor has been selected. The predicted noise levels and noise management levels (NML) for each receiver are presented in Table 6-8.

Table 6-8 Standard hours construction noise level summary

Scenario	# of receivers exceeding standard hours NML	Average exceedance of standard hours NML dB(A)	Maximum exceedance of standard hours NML dB(A)	Receiver with maximum NML exceedance
Mobilisation and site establishment	3	5	9	R2
Clearing and bulk earthworks ¹	36	5	18	R2
Establishment of hardstand areas ¹	24	4	16	R2
Permanent environmental management measures ¹	10	4	13	R2
Delivery and installation and BESS substation	10	4	13	R2
Construction of BESS facility	10	4	13	R2
Connection to BESS substation	10	4	13	R2

Scenario	# of receivers exceeding standard hours NML	Average exceedance of standard hours NML dB(A)	Maximum exceedance of standard hours NML dB(A)	Receiver with maximum NML exceedance
Roadside works	10	4	13	R2
Landscaping	5	6	12	R2
Installation of cabling to the Transgrid substation	20	4	8	R5, R6, R7

¹ Denotes “annoying” item of equipment as defined in the ICNG (i.e. contains characteristics such as impulsiveness, tonality etc.), and as such includes a +5 dB(A) penalty adjustment to predictions

Based on the assessed exceedances of potential construction activities at receivers, a range of noise mitigation measures are provided in Section 6.2.4 and a draft Construction Noise and Vibration Management Plan (CNVMP) is presented in Appendix E. No receivers are predicted to be highly noise affected. Potential cumulative construction noise impacts are discussed in Section 6.13.

Road traffic noise

The NSW Road Noise Policy (RNP) provides guidance, criteria and procedures for assessing noise impacts from existing, new and redeveloped roads and traffic generating developments. The assessment of road traffic noise impacts on public roads is assessed under the RNP. As per the RNP, a detailed assessment is required if the noise levels increase by more than 2 dB(A) or if the overall level exceeds the RNP criteria at the nearest sensitive receiver.

A detailed assessment was undertaken for Ascot-Calala Road due to the low existing traffic volume and anticipated construction traffic which will likely exceed the 2 dB(A) increase threshold. No other roads were identified as potentially exceeding the 2 dB(A) increase threshold or the overall RNP criteria at the nearest receiver.

Table 6-9 details the existing and proposed construction traffic on Ascot-Calala Road, with the *TfNSW Road Traffic Noise Estimator* used to undertake construction road traffic noise predictions.

Table 6-9 Construction road traffic noise predictions

Road name	Road type	Daytime criteria dB(A)	Period (Hour)	Existing daytime traffic volume		Daytime construction traffic volume		Predicted noise level dB(A)	
				Light	Heavy	Light	Heavy	Existing	Future
Ascot-Calala Road	Local Road	55	1	7	1	10	8	40	48

(1) Traffic volume derived and interpolated from Traffic Impact Assessment (Appendix D)

(2) Heavy vehicle volumes assumed to be 15% of the hourly traffic volumes.

Based on the traffic noise predictions, proposed construction traffic along Ascot-Calala Road during the worst case 1-hour traffic flows during the daytime period is predicted to increase the existing traffic noise levels by more than 2 dB(A) at the nearest residential buildings. This is due to very low existing traffic flow. However, construction road traffic noise is predicted to be within the RNP criteria and would be a temporary impact.

Vibration

No vibration intensive activities are proposed to occur near any receiver. Therefore, no impacts are expected to occur given the significant distance to the nearest receiver building, which is approximately 300 metres from the BESS facility.

6.2.3.2 Operation

Noise

Noise modelling was undertaken to predict the noise levels during operation of the Project.

Operational noise source levels were developed based on a review of available manufacturer data noting that the preferred battery technology supplier has not been confirmed. These manufacturer data sheets and the number of noise sources (i.e. number of BESS enclosures and inverters) associated with the selected supplier would be verified during detailed design.

Noise levels have been calculated under the assumption of 100 percent duty during both neutral weather conditions and noise enhancing meteorological conditions. The noise modelling indicates compliance is predicted at all sensitive receiver locations for all periods of the day (day, evening and night) (including sleep disturbance) with the implementation of design noise mitigation measures.

The design noise mitigation measures identified to achieve compliance include:

- Silencers on the inverters (reducing sound power level)
- Optimisation of the BESS layout based on exact footprint
- Noise barriers (or other path controls) with a minimum surface mass of 15 kilogram per metre.

The details of the design noise mitigation measures (for example noise acoustic barrier heights) would be verified during detailed design upon confirmation of the selected supplier. At this concept stage, the noise acoustic barriers range between three metres and eight metres in height. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.

The results of the noise modelling with the design noise mitigation during noise enhancing meteorological conditions is presented in Table 6-10 and displayed on Figure 6-6. Further detail of the operational noise modelling results is provided in Appendix E. Potential cumulative operational noise impacts are discussed in Section 6.13.

Road traffic noise

The Project would be primarily operated remotely, with on-site maintenance occurring on an as-needs basis. Maintenance activities would only require a few vehicle movements, similar to what currently occurs at the existing Transgrid substation. Due to the infrequent traffic movements during the operational phase in comparison to the existing traffic on local roads, impacts from road traffic noise associated with the Project is not expected to occur.

Vibration

No vibration intensive plant/equipment or activities are proposed to occur during standard operation on-site, therefore no vibration impacts are anticipated.

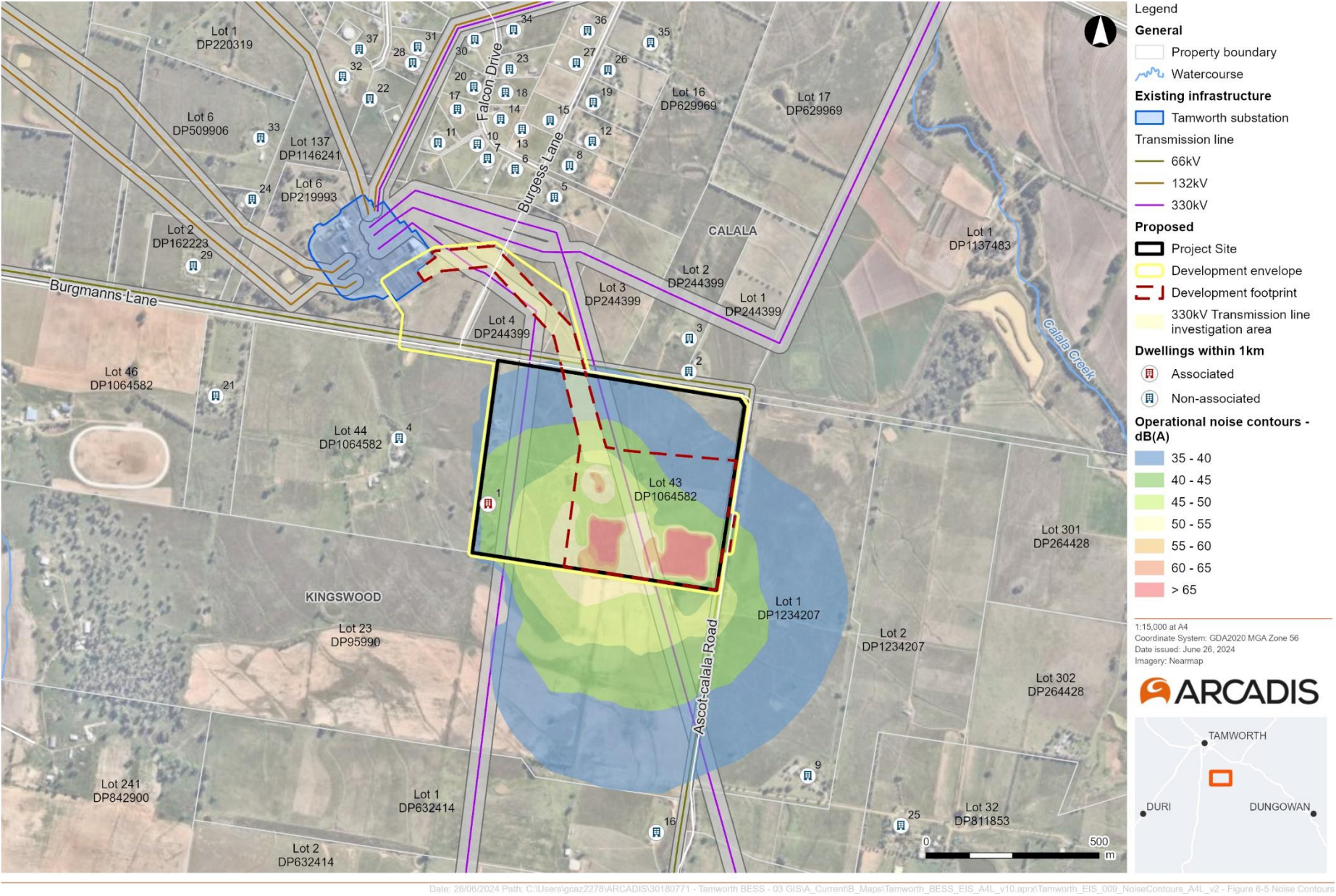


Figure 6-6 Predicted operation noise contours during noise enhancing meteorological conditions (with design noise mitigation measures)

Table 6-10 Predicted operational noise level

Receiver ID	Daytime period				Evening period				Night-time period			
	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)
R2	34	40	0	Yes	34	35	0	Yes	34	35	0	Yes
R3	32	40	0	Yes	32	35	0	Yes	32	35	0	Yes
R4	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R5	27	40	0	Yes	27	35	0	Yes	27	35	0	Yes
R6	26	40	0	Yes	26	35	0	Yes	26	35	0	Yes
R7	26	40	0	Yes	26	35	0	Yes	26	35	0	Yes
R8	26	40	0	Yes	26	35	0	Yes	26	35	0	Yes
R9	33	40	0	Yes	33	35	0	Yes	33	35	0	Yes
R10	25	40	0	Yes	25	35	0	Yes	25	35	0	Yes
R11	25	40	0	Yes	25	35	0	Yes	25	35	0	Yes
R12	25	40	0	Yes	25	35	0	Yes	25	35	0	Yes
R13	25	40	0	Yes	25	35	0	Yes	25	35	0	Yes
R14	25	40	0	Yes	25	35	0	Yes	25	35	0	Yes
R15	24	40	0	Yes	24	35	0	Yes	24	35	0	Yes
R16	33	40	0	Yes	33	35	0	Yes	33	35	0	Yes
R17	24	40	0	Yes	24	35	0	Yes	24	35	0	Yes
R18	24	40	0	Yes	24	35	0	Yes	24	35	0	Yes
R19	24	40	0	Yes	24	35	0	Yes	24	35	0	Yes
R20	24	40	0	Yes	24	35	0	Yes	24	35	0	Yes
R21	15	40	0	Yes	15	35	0	Yes	15	35	0	Yes

Receiver ID	Daytime period				Evening period				Night-time period			
	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)	Predicted dB(A)	Criteria dB(A)	Exceedance dB(A)	Compliance? (Yes / No)
R22	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R23	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R24	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R25	28	40	0	Yes	28	35	0	Yes	28	35	0	Yes
R26	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R27	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R28	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R29	21	40	0	Yes	21	35	0	Yes	21	35	0	Yes
R30	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R31	23	40	0	Yes	23	35	0	Yes	23	35	0	Yes
R32	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R33	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R34	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R35	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R36	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes
R37	22	40	0	Yes	22	35	0	Yes	22	35	0	Yes

6.2.4 Mitigation measures

Table 6-11 summarises the mitigation measures for managing noise and vibration impacts during construction and operation of the Project.

Table 6-11 Noise and vibration mitigation measures

ID	Mitigation Measures
Detailed design	
NV1	Noise modelling will be undertaken for the preferred supplier to verify: - Compliance with the Project specific noise criteria in accordance with the <i>Noise Policy for Industry</i> (EPA, 2017) - Design noise mitigation measures to be implemented such as silencers, layout refinements and noise path controls. Other approaches include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.
Construction	
NV2	All nearby receivers (including those along the primary heavy traffic route on Whitehouse Lane and Ascot-Calala Road) will be notified about works and expected duration in accordance with the community consultation plan developed and implemented for the Project.
NV3	The draft CNVMP will be reviewed and updated prior to the commencement of construction. The Plan will identify feasible and reasonable approaches to reduce noise and vibration impacts during construction of the Project.
NV4	Works will occur during standard working hours only. These hours are: 7 am to 6 pm, Monday to Friday 8 am to 1 pm, Saturday - No work on Sundays or public holidays. If works must occur out of hours for justified reasons (e.g. worker safety or reduction of impact on traffic), preference will be given to day and/or evening time works (i.e. between 7 am and 10 pm). Out of Hours works will be separately assessed with appropriate noise mitigation and community consultation implemented as necessary based on the level of predicted impact.
NV5	Worksite induction training and 'toolbox talks' will include education for workers on noise issues related to the site (e.g. workers will be advised to avoid shouting or whistling on-site near sensitive receivers).
Operation	
NV6	The EMS will include measures and processes for managing noise resulting from the operation of the Project, including a process for managing complaints.

6.3 Biodiversity

This section provides a summary of the potential biodiversity impacts of the Project.

The Biodiversity Development Assessment Report (BDAR) prepared by Arcadis is provided in Appendix F of this EIS. Appendix A provides a summary of the relevant SEARs which relate to biodiversity and where these have been addressed in this EIS.

6.3.1 Methodology

6.3.1.1 Government plans, policies and guidelines

The BDAR was prepared with reference to the following plans/policies/guidelines:

- *Biodiversity Assessment Methodology (BAM)* (DPIE, 2020a)
- *BAM Calculator* (DPE, 2023a)
- *Biodiversity Assessment Method 2020 Operational Manual – Stage 1* (DPIE, 2020b)
- *Biodiversity Assessment Method 2020 Operational Manual – Stage 2* (DPE, 2023b)
- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* working draft (DEC, 2004)
- *Surveying threatened plants and their habitats; NSW survey guide for the Biodiversity Assessment Method* (DPIE, 2020c).

6.3.1.2 Desktop assessment

The desktop assessment was undertaken to identify the extent and condition of biodiversity features within and surrounding the Project. Information sources reviewed included:

- Interim Biogeographic Regionalisation of Australia (IBRA) mapping. Version 7.0 (DAWE, 2012)
- NSW BioNet Wildlife Atlas (DPE, 2023)
- Protected Matters Search Tool (DCCEEW, 2023)
- NSW BioNet Vegetation Information System (Bionet VIS) (DPE, 2023)
- NSW BioNet Threatened Species Data Collection (DPE, 2023)
- NSW Weedwise (DPI, 2023)
- NSW State Vegetation Type Map (DPE, 2023e)
- NSW Soil and Land Information eSPADE (DPE, 2023d)
- Atlas of Groundwater Dependent Ecosystems mapping (GDE) (Bureau of Meteorology (BoM) 2022b).

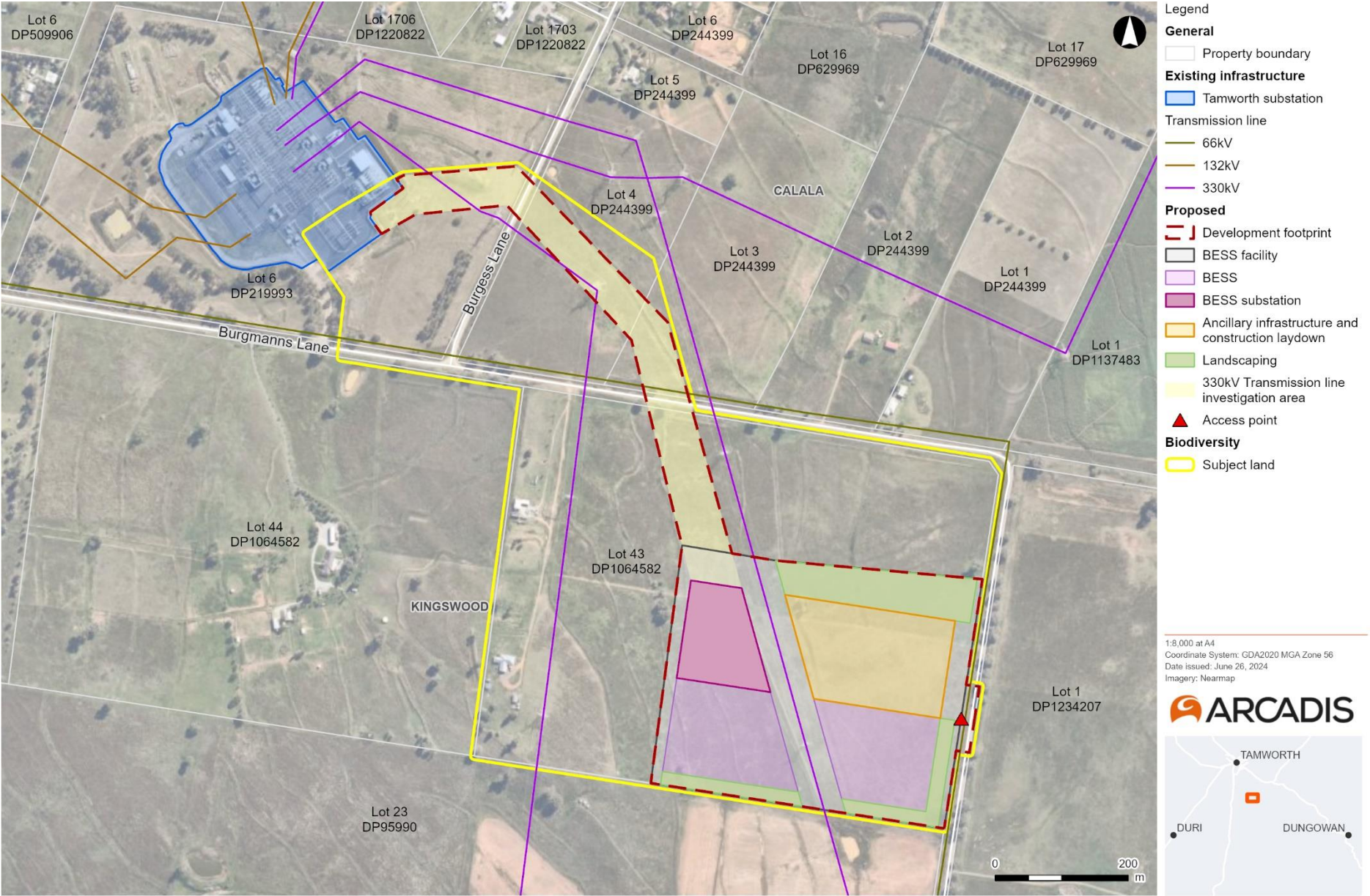


Figure 6-7 Subject land

6.3.1.3 Field surveys

Field surveys were undertaken on 25 and 26 October 2023. This included undertaking:

- Vegetation mapping and plant community type (PCT) identification. This was then compared to recognised and acted PCTs, as described in the BioNet VIS Classification database
- Vegetation integrity plots involving quantitative (quadrat/transect) surveys in accordance with the BAM
- Ground-truthing of one PCT that occurs within the subject land.

For the purposes of the BDAR, the subject land is defined in the BAM (DPIE, 2020) as land subject to a development, activity clearing, biodiversity certification or a biodiversity stewardship proposal.

The subject land encompasses about 54.19 hectares and includes the Project Site and existing Tamworth substation, as well as the proposed transmission connection as shown in Figure 6-7.

6.3.2 Existing environment

6.3.2.1 Landscape features

IBRA bioregions and subregions

The subject land and the 1,500 metre landscape assessment area lie within two IBRA bioregions:

- *The Nandewar Bioregion*
- *The Peel Subregion.*

In accordance with the BAM, separate species and PCTs have been split and assessed according to their IBRA bioregion association.

NSW Landscape region

The subject land is located within the *Tamworth – Keepit Slopes and Plains Mitchell Landscape* (DPIE, 2016). The Mitchell Landscape is characterised by undulating to rolling slopes and plains, with low ranges and low hills that form the western side of the New England plateau.

Rock types of the Tamworth – Keepit Slopes and Plains Mitchell Landscape include slate, Silurian-Devonian chert, schist and Carboniferous conglomerate, sandstone, mudstone, andesite and small areas of limestone. In general, elevation is between 500 metres and 800 metres, with a local relief of 250 metres and peaks reaching 1,100 metres. Subsoils are prone to gully development on lower slopes, with shallow stony soils present on ridges (DECC, 2002).

The lower slopes generally comprise White Box (*Eucalyptus albens*) grassy woodlands, with the following species: Blakely's Red Gum (*Eucalyptus blakelyi*), Yellow Box (*Eucalyptus melliodora*), Cooba (*Acacia salicina*) and Lightwood (*Acacia implexa*).

River Oak (*Casuarina cunninghamiana*) is present along major streams and Rough Barked Apple (*Angophora floribunda*), and Yellow Box (*Eucalyptus melliodora*) are present on flats. Patches of Red Ironbark (*Eucalyptus sideroxylon*) and Red stringybark (*Eucalyptus macrorhyncha*) are present Along steeper slopes in the east (DECC, 2002).

River, streams and wetlands

There are no rivers or streams present within the subject land. The subject land is located within the Namoi River Catchment, which spans 42,000 square kilometres and stretches from Nundo in the east to Walgett in the west.

Within the 1,500 metre assessment area, there are three unnamed first order streams, Calala Creek, about 800 metres north east, and Gooland Creek and Goonoo Goonoo Creek, about 1.3 kilometres west.

The subject land does not support any wetlands, including important wetlands listed in the Directory of Important Wetlands in Australia or wetlands of international importance (Ramsar). The subject land also does not support any aquatic habitat, including human-made dams.

Groundwater dependent ecosystems

Groundwater dependent ecosystems (GDE) are ecological communities that are dependent, either entirely or in part, on the presence of groundwater for their health or survival. No potential terrestrial or subterranean GDEs are located within the subject land.

Two high potential terrestrial GDEs have been identified within close proximity of the subject land, located 635 metres east of the northeastern corner, and 790 metres west. There are also two high potential aquatic GDEs within the vicinity of the subject land. This includes Calala Creek located 800 metres northeast, and Goonoo Goonoo Creek located around 1.3 kilometres west.

Connectivity features

Native vegetation within the subject land is highly limited and exists in scattered paddock trees with a narrow line of vegetation on the eastern side of Ascot-Calala Road (adjacent to the eastern boundary), scattered trees along Burgmanns Lane, a strip of planted native vegetation to the southeast of the Tamworth substation and scattered paddock trees within the southern portion of the subject land. None of this vegetation is sufficiently connected to adjacent vegetation, or sufficiently substantial in its own right, to provide or contribute to connectivity within the area. Additionally, the subject land lies within a highly fragmented and cleared landscape comprising rural and residential development, both of which represent significant barriers to habitat connectivity and likely restrict movement to more mobile fauna (e.g., birds and bats).

Areas of geological significance and soil hazard features

The subject land does not contain any areas of geological significance, including crevices, cliffs, karst, or caves. The nearest areas of geological significance lie approximately seven kilometres to the north of the Project Site, on the Moonbi Range that adjoins the Northern Tablelands. The subject land is situated on the Fullwoods Hill and Duri soil landscapes.

Areas of Outstanding Biodiversity Value

Areas of Outstanding Biodiversity Value (AOBVs), as defined under the BC Act, are currently limited to areas previously declared as critical habitat under the superseded *Threatened Species Conservation Act 1995*. No AOBVs occur within or surrounding the subject land. The closest AOBV to the subject land is the Wollemi Pine declared area (critical habitat of the critically endangered Wollemi Pine in Wollemi National Park), approximately 180 kilometres south of the subject land.

6.3.2.2 Vegetation

Vegetation communities

The vegetation communities identified from the field surveys are listed in Table 6-12 and shown in Figure 6-8. One PCT and one vegetation community that is not equivalent to any PCT were identified.

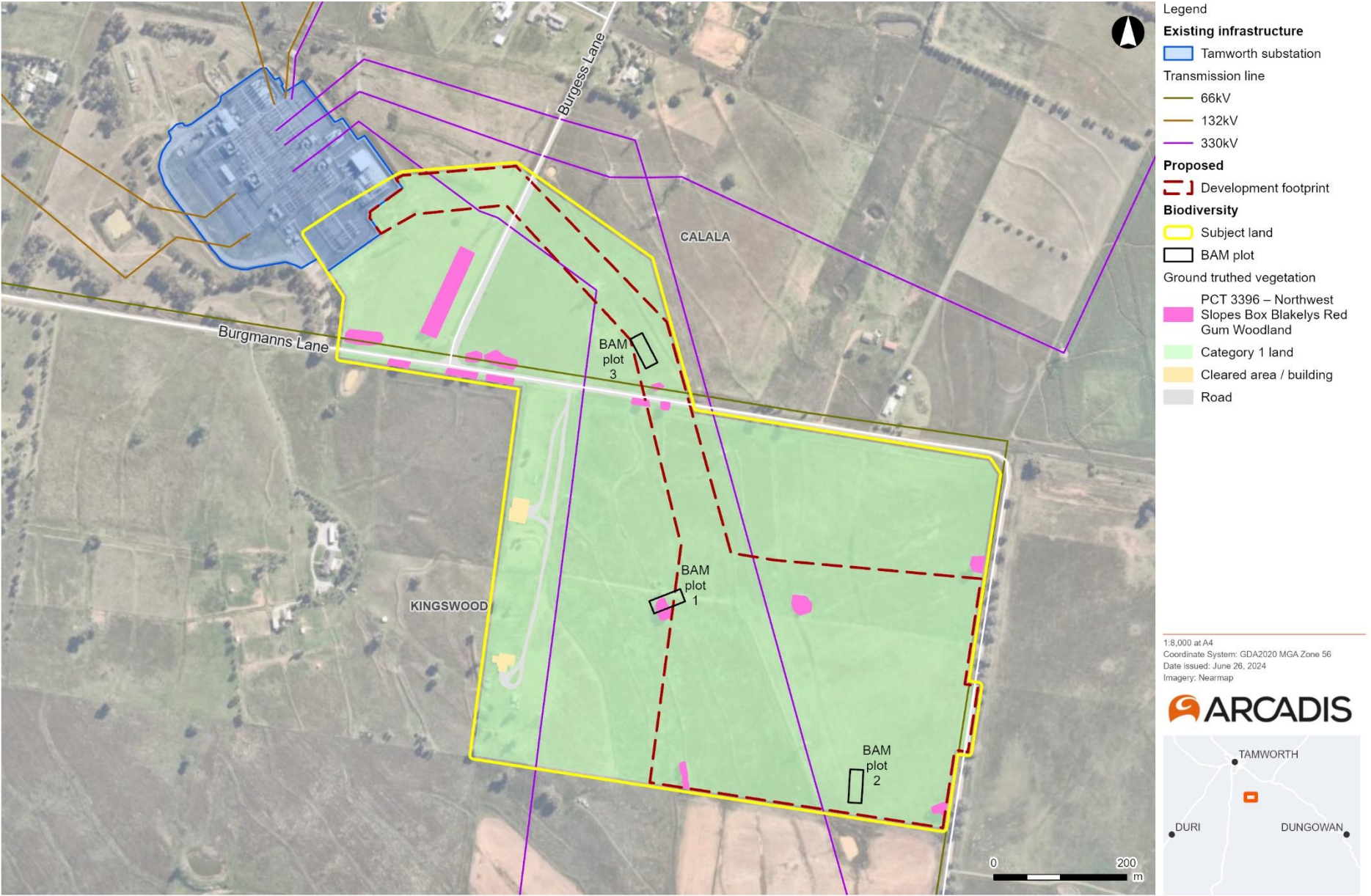


Figure 6-8 Plant community types

PCT 3396 was found in small patches in a highly degraded condition, consisting of trees native to the PCT with an almost entirely exotic understorey. PCT 3396 occupies a total of 0.93 ha within the subject land, and forms part of the White Box- Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregion Critically Endangered Ecological Community (CEEC) listed under the BC Act. It does not meet the minimum condition threshold for inclusion in the equivalent Threatened Ecological Community (TEC) under the EPBC Act.

The other vegetation type that does not conform to the definition of any PCTs contains vegetation in the form of pasture made up of mixed exotic and native grasses, and dominated by exotic grasses. This mixed native/exotic pasture covers a total of 51.58 hectares across the subject land. These areas have been historically cleared and are highly disturbed. A canopy and shrub layer are absent within this vegetation zone. The ground layer of this vegetation zone is dominated by exotic species.

Table 6-12 PCTs within the subject land from ground-truthed vegetation mapping

PCT No.	PCT Name	Area within subject land (ha)
3396	Northwest Slopes Box-Blakelys Red Gum Forest	0.93
n/a	Category 1 land	51.58

Weeds

A total of 23 exotic species were recorded in all vegetation zones across the study area, with particularly high abundance across the Category 1 land. Of the 23 exotic weed species recorded:

- Two are listed as Priority Weeds under the *NSW Biosecurity Act 2015* for the North West region
- Five are recognised as High Threat Weeds (species that are likely to have a significantly detrimental effect on native vegetation and are used to determine vegetation condition)
- One (African Boxthorn) is listed as a Weed of National Significance (WoNS).

6.3.2.3 Threatened species

The assessment did not return any candidate threatened species requiring detailed assessment and as such no targeted surveys were undertaken. Native flora and fauna species were recorded during the field surveys, however none were listed as threatened species. PCT 3396 and Category 1 land are not considered to provide suitable habitat for threatened flora or fauna as the habitat is too degraded.

6.3.3 Potential impacts

Potential impacts from the Project include removal of native vegetation, fauna mortality and indirect impacts. These are described in more detail in the following sections.

6.3.3.1 Direct construction impacts

Direct impacts on native vegetation

The total development footprint covers 21.68 hectares, of which 0.16 hectares has been mapped as native vegetation (PCT 3396), 21.36 hectares has been mapped as Category 1 land (vegetation not conforming to any PCTs and containing less than five percent native understorey composition). Roads and buildings cover 0.16 hectares.

The direct impact of the Project on native vegetation is presented in Table 6-13.

Table 6-13 Direct impacts on native vegetation

PCT ID	PCT Name	Condition	Vegetation integrity score	Extent in the subject land (ha)	Extent in the development footprint (ha)
3396	Northwest Flats Box-Blakelys Red Gum Forest	3396_Low	15.5	0.93	0.16
Category 1 land		N/A	1.6	51.58	21.36
Roads/buildings		N/A	N/A	1.90	0.16
Total area native vegetation				0.93	0.16
Total area				54.41	21.68

Direct impacts on threatened flora and fauna habitat

No threatened flora or their habitat or threatened fauna habitat is being cleared as part of the Project. The 21.36 hectares of Category 1 land and the 0.16 hectares of PCT 3396 are not considered to provide suitable habitat for any threatened flora species or threatened fauna species credit species as the habitat is too degraded.

Direct impacts on threatened species and credit requirements

The impacts of the Project on native vegetation that require offsets are outlined below in Table 6-14.

Table 6-14 Impact summary for PCTs requiring offsets and the associated ecosystem credit requirements

Vegetation Zone	PCT Name	TEC Name	Area to be impacted (ha)	Change in VIS ⁽¹⁾	Ecosystem credits required
3396_Low	Northwest Flats Box-Blakelys Red Gum Forest	White Box- Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.	0.16	-15.5	2

NOTE: ⁽¹⁾ VIS Vegetation Integrity Score

6.3.3.2 Indirect impacts on native vegetation and habitat

Fauna injury and mortality

Fauna injury or mortality may occur during vegetation clearing activities or may result from collisions with work vehicles or plant, or accidental entrapment in plant, trenches or other works.

The majority of fauna species recorded within the Project Site were highly mobile bird and mammal species and these species are likely to be able to move away from vegetation clearing activities quite readily.

Edge effects on native vegetation

Habitat adjacent to the construction area is limited to a small line of native vegetation along Burgmanns Lane. This area of vegetation is already subject to high levels of edge effects and highly fragmented from other areas of native vegetation. Construction and operational activities due to the Project are not likely to exacerbate these edge effects or reduce the viability of these adjacent areas of habitat.

Noise, dust and light spill impacts

The Project would result in temporary standard construction impacts (including noise, dust and visual). The surrounding habitat is already subject to indirect noise, dust and light spill impacts as a result of surrounding developments. Therefore, any increases to noise, dust and light spill are expected to be negligible and would not reduce the viability of adjacent habitat in the context of existing land use practices.

Spread of weeds, pathogens and disease

All areas of adjacent vegetation currently contain an abundance of weeds. However, an increase in the movement of people, vehicles, machinery, vegetation waste and soil during and following construction may facilitate the introduction or spread of weeds and pathogens that currently occur within the subject land into adjacent vegetation. The spread of weeds to adjacent vegetation would be managed as a part of the EMS developed for the Project.

Trampling of threatened flora species

No threatened species were identified to occur within the subject lands. Adjacent native vegetation was not surveyed, but it is unlikely that threatened flora occurs in adjacent areas.

In the unlikely event there is threatened flora adjacent to the subject land, the risk of trampling threatened flora species would be reduced through preparation and implementation of an EMS prepared for the Project.

6.3.3.3 Impacts to aquatic habitats

During the construction phase of the Project, there is the potential for water quality impacts through spills and sedimentation. Impacts are likely to be localised and minor as no works are occurring directly in these watercourses. No impacts to threatened fish or any other entities as listed under the *NSW Fisheries Management Act 1994* are anticipated. No obstruction of fish passage would occur at these waterways. Impacts would be mitigated by the implementation of erosion and sediment controls and spill management, discussed further in Section 6.3.5.

6.3.3.4 Impacts to groundwater dependent ecosystems

As there are no direct impacts expected to groundwater flows as a result of the Project, impacts to the potential GDEs is not expected. Excavation required for the Project, is unlikely to encounter the water table. In the event there are any impacts to the water table this is anticipated to be minor and would not impact upon the nearby GDEs.

6.3.3.5 Impacts to migratory species

No migratory species were recorded or considered to have the potential to occur within the Subject Land. As such impacts to migratory species are not expected to occur.

6.3.3.6 Impacts to Matters of National Environmental Significance

No potential impacts on MNES in accordance with the EPBC Act are expected to occur as part of the proposed Project. No significant impact assessment or offsets are required for MNES for this Project. As such the Project is not considered likely to require referral to the Australian Government Minister for the Environment for impacts to MNES

6.3.4 Operational impacts

There is some potential for edge effects during maintenance activities during operation. Trampling of adjacent native vegetation, rubbish dumping, soil disturbance and weed spread could occur, although this is likely to be minor and localised and would be appropriately managed through the implementation of the EMS.

No further impacts on biodiversity are anticipated during operation of the Project.

6.3.5 Mitigation measures

Table 6-15 summarises the mitigation measures for managing biodiversity impacts during construction and operation of the Project.

Table 6-15 Biodiversity mitigation measures

ID	Mitigation Measures
Pre-construction and Construction	
FF1	Clearing of native vegetation will not occur until the EMS is approved. The EMS will include flora and fauna management measures to be implemented.
FF2	If native clearing occurs during spring nesting season, pre-clearing surveys will be undertaken. No breeding sites or active nests will be disrupted, as far as practical.
FF3	Native vegetation clearing will be minimised as far as is practicable.
FF4	The limits of native vegetation clearing will be marked on plans and on site with signed fencing so that clearing activities are constrained to approved areas only.
FF5	Where fauna species are identified in native vegetation to be cleared, animals will be removed and relocated to adjacent bushland prior to clearing. If this is not possible, the tree will be sectionally dismantled or soft felled under the supervision of a suitably qualified ecologist or wildlife carer, before relocating the animal.
FF6	Pits/trenches adjacent to native vegetation that will remain open overnight, will be securely covered, where possible. Alternatively, fauna ramps (logs or wooden planks) will be installed to provide an escape for trapped fauna.
FF7	Appropriate sediment and erosion controls around the impact area will be installed prior to the commencement of earthworks.
FF8	Where possible, earthworks will be undertaken during dry weather conditions. No clearing of vegetation will occur during overland flow events.

6.4 Hazards and risk

This section provides a summary of the potential hazards and risk impacts associated with the Project.

The Preliminary Hazard Analysis (PHA) for the Project has been prepared by Sherpa Consulting and is provided in Appendix G of this EIS. Appendix A provides a summary of the relevant SEARs which relate to hazards and risks and where these have been addressed in this EIS.

6.4.1 Methodology

6.4.1.1 Government plans, policies and guidelines

The PHA was prepared with reference to the following plans/policies/guidelines:

- *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP)
- *Hazardous Industry Planning Advisory Paper No 4 – risk criteria for land use safety planning* (NSW Department of Planning (DoP), 2011) (HIPAP No. 4)
- *Hazardous Industry Planning Advisory Paper No 6 –guidelines for hazard analysis* (NSW DoP, 2011)
- *Multi-level risk assessment* (NSW DoP 2011) (HIPAP No. 6)
- *Hazardous and Offensive Development Application Guidelines – Applying SEPP No. 33* (NSW DoP, 2011)
- *Guidelines for limiting exposure to time varying electric, magnetic and electromagnetic Fields (1 Hz – 100 kHz)* (International Commission on Non-Ionizing Radiation Protection, 2010)
- UL 9540A – Standard for safety of energy storage systems and equipment, 2021
- AS/ NZS 5139:201– - *Electrical installation– - Safety of battery systems for use with power conversion equipment*
- NFPA 855: Installation of stationary energy storage systems, 2020
- *Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7* (National Transport Commission 2009).

6.4.1.2 Risk screening

The DoP 2011 guideline *Applying State Environmental Planning Policy (SEPP) No. 33 Hazardous and Offensive Development* (SEPP 33) provides a risk screening process to identify whether a PHA is required. The risk screening process involved a review of the type and quantity of hazardous materials to be stored on the site, the distances of the storage area to the nearest boundary, as well as the expected number of transport movements.

The preliminary risk screening found that the Project is not considered as ‘potentially hazardous’ within the meaning of Resilience and Hazards SEPP. A PHA would not be required as the storage of and transport of hazardous materials for the proposed BESS would not exceed the relevant risk screening threshold. Notwithstanding, the SEARS for the Project include a requirement for a PHA to be developed with consideration of other risk factors associated with the Project Site.

6.4.1.3 Assessment methodology

The PHA was carried out in accordance with the *Multilevel Risk Assessment Guideline* (DoP, 2011) (MLRA). The MLRA sets out three levels of risk analysis, including qualitative, partially qualitative, and quantitative. Based on the hazard identification and consequence analysis (refer below) a qualitative approach (i.e. Level 1 analysis) was determined appropriate for the Project.

The PHA was also carried out in accordance with the HIPAP No. 6 (DoP, 2011), with particular regard to potential off-site impacts. The PHA included the following steps:

- Establishment of the study context
- Identification of hazards resulting from the proposed BESS operations and events with the potential for off-site impact (*Hazard Identification*)
- Analysis of the severity of the consequences for the identified events with potential off-site impact, e.g. fires and explosions (*Consequence Analysis*)
- Determination of the level of analysis and risk assessment criteria and analysis of the risk of the identified events with off-site impact (*Risk Analysis*)
- Assessment of the estimated risks from identified events against risk criteria to determine acceptability (*Risk Assessment*).

The PHA assessed the events associated with proposed operation of the BESS. The Project operational footprint (development envelope) was used to define and determine off-site impacts (i.e. impacts extending outside of the operational footprint).

Hazard identification

Hazard Identification (HAZID) was used to identify all reasonably foreseeable hazards and associated events that may arise due to the operation of the facilities through a systematic and structured approach. The HAZID process was completed using the following inputs:

- Review of Li-ion battery system product specification sheets and product brochure
- Review of AS/NZS 5139:2019 *Electrical installations – Safety of battery systems for use with power conversion equipment*
- Literature research of past incidents involving similar BESS systems
- Previous risk assessments for similar BESS systems completed by Sherpa
- Review of satellite and input from EIS provider to understand the potential interactions between the proposed BESS and surrounding land uses
- Consultation and feedback from the Proponent for review and acceptance.

Consequence analysis

The hazard identification of the proposed BESS facility identified a set of scenarios requiring further assessment to determine the potential for off-site impacts. The analysed incidents were:

- Fire involving a battery enclosure (e.g. propagated thermal runaway resulting in a fully developed fire)
- Toxic gas generation from decomposition of battery electrolyte due to fire.

BESS fire and toxic gas modelling was undertaken as detailed below:

- Fire scenario modelling involving the BESS module was undertaken using the Stefan-Boltzmann equation to assess the effect of heat transfer between parallel planes which represent a BESS module fire and a receptor
- Toxic gas modelling involving the BESS module was undertaken using the Gexcon EFFECTS gas dispersion model that accounted for thermal rise (from the fire).

Calculation, assumptions and modelling outputs are detailed in the PHA (Appendix G).

Risk assessment

Risk is defined as the likelihood of a specified undesired event occurring within a specified period or in specified circumstances. It may be either a frequency (the number of specified events occurring in a unit of time) or a probability (the probability of a specified event following a prior event) depending on the circumstances.

The risk assessment was based on the risk matrix shown in Table 6-16. The acceptance criteria used to assess risk are:

- Extreme – Unacceptable; immediate action is required
- High – Unsatisfactory; an action plan is required which includes steps for timely risk prevention or mitigation
- Medium – Tolerable; implement additional controls if reasonably practicable
- Low – Acceptable; no specific action is required.

Table 6-16 Qualitative risk matrix

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost Certain
Catastrophic	Medium	High	High	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Low	Medium	Medium	High	High
Minor	Low	Low	Medium	Medium	Medium
Non-material	Low	Low	Low	Low	Low

6.4.2 Existing environment

As discussed in Chapter 2, Tamworth is a rural region dominated by agricultural land uses, particularly cattle and sheep grazing as well as cropping. Consistent with regional setting and its immediate surrounds, the Project Site is zoned RU4 Primary Production Small Lots and is used as a private farm.

The nearest residential zoned land to the Project Site boundary is located in Calala around 470 metres north of the Project Site. Isolated receptors are present in adjacent properties on Burgmanns Lane and Ascot-Calala Road. Receptors located within one kilometre of the Project Site are shown in Figure 2-2.

The Tamworth Agricultural Institute land boundary is located approximately 400 metres northeast of the BESS, while the buildings on the Institute land are about 1,600 metres from the BESS.

Existing electric and magnetic field (EMF) sources surrounding the Project include the existing Tamworth substation and 330 kV transmission infrastructure.

There are two other BESS projects seeking development approval within one kilometre of the Project Site:

- Calala BESS (SSD-52786213) with a capacity of 300 MW/ 1200 MWh, located 700 metres north of the Project Site
- Tamworth BESS (SSD-23830229) with a capacity of 200 MW/ 400 MWh, immediately adjacent to the west of the Project Site.

Indicative distances from off-site receptors are shown on Figure 6-9.

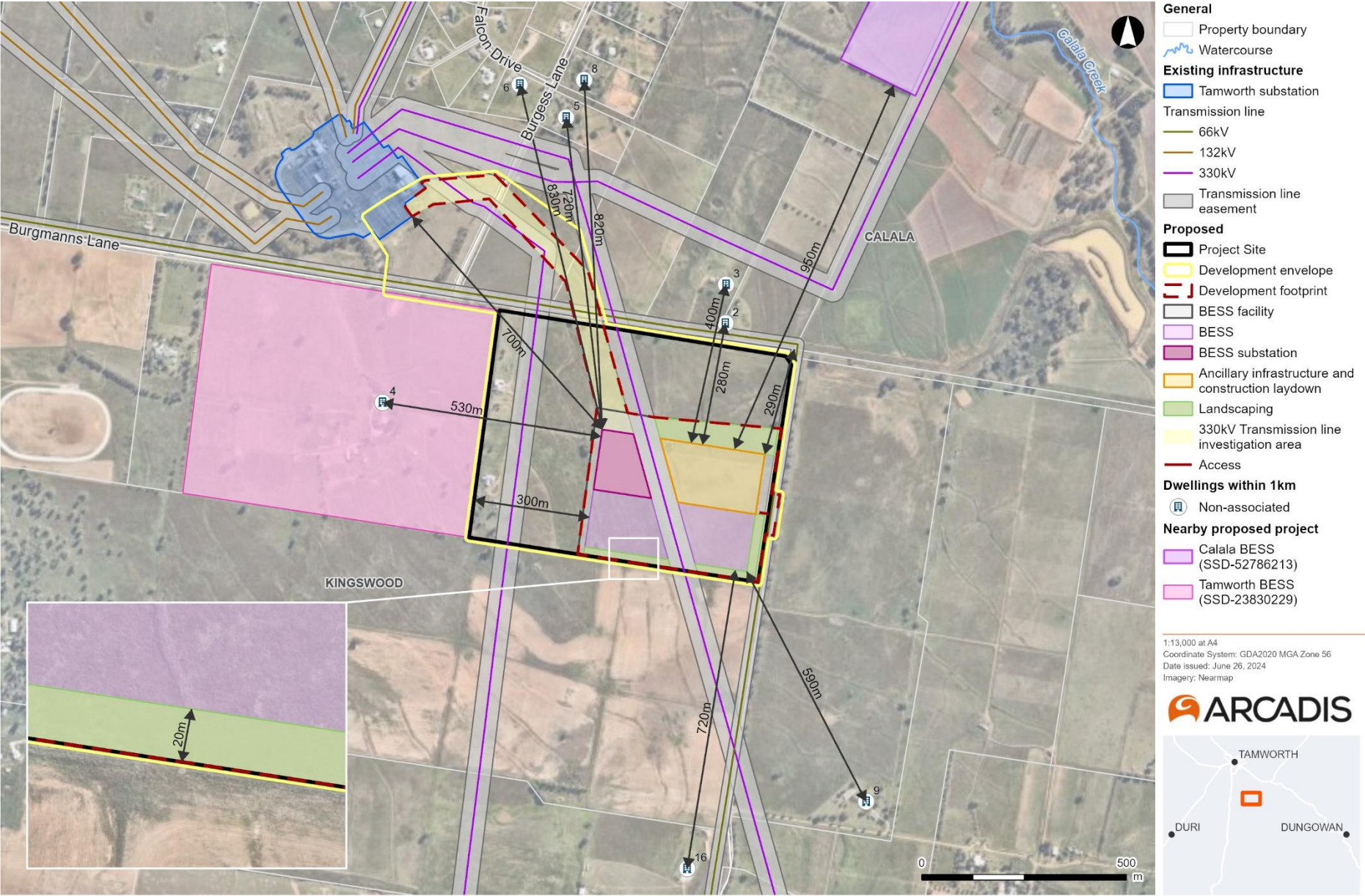


Figure 6-9 Off-site receptors

6.4.3 Potential impacts

6.4.3.1 Construction

Construction of the Project would require the use of chemicals and dangerous goods (e.g. paint, solvents, diesel, general oils and lubricants, cleaning products). Minimal storage of these chemicals is expected. None of the dangerous goods thresholds in the Resilience and Hazards SEPP would be exceeded during construction of the Project.

Potential hazards during the construction include:

- Vehicle interactions on public roads
- Vehicle interactions within the Project Site
- Natural hazards (flooding, earthquake, lightning)
- Loss of containment of chemicals, including dangerous goods
- Contact with chemicals, including dangerous goods.

These hazards are typical for any battery construction project and would be controlled through implementation of the EMS and the mitigation measures detailed in Table 6-19.

6.4.3.2 Operation

Hazard identification and consequence assessment

Events with the potential to result in significant impacts to people (i.e. injury and/ or fatality) were identified. The study excluded hazards related to Occupational Health & Safety, e.g. slips, trips and falls.

Table 6-17 summarises the hazards and events identified for the Project using the methodology described in Section 6.4.1. Table 6-17 identifies the specific BESS components which may have a potential for creating hazards and risk impacts.

Table 6-17 Identified hazards and events applicable to BESS components

Hazard	Event	Battery modules	PCS	BMS	TMS	BESS substation	Tamworth substation
Electrical	Exposure to voltage	✓	✓	✓	-	-	-
Energy	Release of energy (i.e. arc flash)	✓	✓	✓	-	-	-
Fire	Infrastructure fire, bushfire	✓	✓	✓	✓	✓	✓
Chemical	Release of hazardous materials	✓	-	✓	✓	-	-
Explosive gas	Generation of explosive gas	✓	-	-	-	-	-
Reaction	Battery thermal runaway	✓	-	-	-	-	-
EMF	Exposure to Electric and Magnetic fields	✓	✓	-	-	✓	✓
External factors	Water ingress (rain and flood), unauthorised access/trespasser, lightning storm, high ambient temperature	✓	-	-	-	✓	✓

Note: PCS (power conversion system), BMS (battery management system), TMS (thermal management system)

The findings of the HAZID identified potential hazards including:

- Fourteen hazardous events were identified. Six events were determined to have potential for off-site impact resulting from a battery enclosure
- Incidents involving the BESS fire (six in total) were further assessed to inform separation distances, and the consequence results were used by the Proponent to minimise potential for off-site impact
- Incidents not involving the BESS fire (eight in total) are expected to be localised and not expected to result in significant off-site impacts as the Project would be situated in a secure area, and there is a large separation distance between BESS development envelope to nearest sensitive receptors.

The HAZID register is provided in Appendix A of the PHA.

Risk assessment

The qualitative risk results for the identified events (taken from the HAZID) are shown in Table 6-18. All of the event types identified with the potential for off-site impacts were identified to be of 'Low' risk. The risk assessment outlines that no additional measures were identified to further reduce potential risks.

Table 6-18 Summary of risk analysis

Hazard/ Event	Incident location	Consequence	Off-site consequence results	Risk analysis (off-site/ public impact)	Mitigation	Risk analysis (off-site/ public impact) – mitigated
BESS fire	Battery units BMS PCS (inverters)	• A battery enclosure fire • Release of toxic (HF) combustion products	No significant off-site impact expected as the battery enclosures and infrastructure have separation distances as per UL-9540A test results. Setback distances from the battery enclosures to the site boundary as per consequence analysis.	Low	No additional measures identified	Low
Release of electrolyte (liquid/vented gas) from the battery cell	Battery units BMS Thermal management system			Low	No additional measures identified	Low
Generation of explosive gas (e.g. hydrogen)	Battery units			Low	No additional measures identified	Low
Thermal runaway in battery	Battery units			Low	No additional measures identified	Low
Lightning strike	BESS BESS substation Tamworth substation			Low	No additional measures identified	Low
BESS overheating	Battery units			Low	No additional measures identified	Low

Assessment against HIPAP No. 4 criteria

The DoP formulated and implemented risk assessment and land use safety planning processes to account for both the technical and the broader locational safety aspects of potentially hazardous industry. These processes are implemented as part of the environmental impact assessment procedures under the EP&A Act. A number of HIPAPs and other guidelines have been published by the Department to assist stakeholders in implementing the process. A partially quantitative assessment against the *HIPAP No. 4 – Risk Criteria for Land Use Safety Planning* risk criteria was undertaken. The Project was found to comply with all the criteria.

Electric and magnetic fields

EMF are naturally present in the environment. They are present in the earth's atmosphere as electric fields, while static magnetic fields are created by the earth's core. EMF are also produced wherever electricity or electrical equipment is in use, meaning people are exposed to them as part of daily life.

Although adverse health impacts have not been established, the possibility of impact due to exposure to EMF cannot be ruled out. As part of a precautionary approach, the PHA assesses the typical exposure levels to EMF for the Project. In this respect, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has produced a publication to establish guidelines for limiting EMF exposure to assist in providing protection against adverse health effects. The PHA outlines the EMFs associated with the different components of the Project as well as controls to limit exposure to EMF.

The PHA concludes that:

- EMF created from the Project would not exceed the ICNIRP occupational exposure reference level
- As the strengths of EMF attenuate rapidly with distance, the ICNIRP reference level for exposure to the general public would not be exceeded and impact to the general public in surrounding land uses would be negligible
- For the risk assessment, consequence from exposure to EMF was assumed to result in no or minor injury ('Non-material').

6.4.4 Mitigation measures

The PHA concluded that the Project would not have significant off-site impacts. The mitigation measures that would be implemented to minimise the potential impacts from hazard and risks of the Project are provided in Table 6-19.

Table 6-19 Hazards and risk mitigation measures

ID	Mitigation Measures
Detailed design	
HR1	The investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) will be reviewed and relevant findings will be implemented for the Project when finalising design and preparing for operations. The publicly available investigation reports include: • Energy Safe Victoria: <i>Statement of Technical Findings on fire at the Victorian Big Battery</i> • Fisher Engineering and Energy Safety Response Group: <i>Report of Technical Findings on Victorian Big Battery Fire</i>.
HR2	A Fire Safety Study will be prepared in accordance with the development conditions to identify measures to eliminate the expansion of any fire incident. These may include: • Type of firefighting or control medium; and • Demand, storage and containment measures for the medium.
Construction	
HR3	The EMS prepared for the Project will include measures to manage the storage of dangerous goods.

6.5 Bushfire

This section provides a summary of the potential bushfire risks associated with the Project.

The bushfire assessment for the Project has been prepared by Bushfire Consulting Services Pty Ltd and is provided in Appendix N of this EIS. Appendix A provides a summary of the relevant SEARs which relate to bushfire risk and where these have been addressed in this EIS.

6.5.1 Methodology

6.5.1.1 Government plans, policies and guidelines

The bushfire assessment was prepared with reference to *Planning for Bushfire Protection 2019* (NSW RFS, 2019) [PBP 2019] and National Construction Code (NCC).

In accordance with Chapter 8 of the PBP, the Project (i.e. this type of development) is classified as ‘other non-residential development’ and therefore the aims and objectives of Chapter 1 and 8 of PBP 2019 are applicable.

The NCC does not provide for any bush fire specific performance requirements for BESS developments. The general fire safety construction provisions of the NCC are taken as acceptable solutions, and AS 3959 and the national association of steel-framed housing standard are not considered as a set of deemed to satisfy provisions for this non-residential proposal.

6.5.1.2 Desktop assessment and field survey

A desktop assessment was undertaken to identify bushfire prone land, the type of development and associated aims of objectives of the PBP, hazardous vegetation formations within 140 metres of the development, the effective slope of the land surrounding the Project and fire weather (i.e. fire danger index (FDI)) relevant to the Project. A site inspection was undertaken on 23 October 2023 to verify the desktop assessment.

The bushfire assessment included an analysis of the hazard, threat and subsequent risk to the Project and recommendations to satisfy the aim and objectives of the PBP 2019.

6.5.2 Existing environment and bushfire attack assessment

6.5.2.1 Bushfire prone land

The Project is located within bushfire-prone land as identified by the Tamworth Regional Council bushfire prone land mapping and as defined by Section 10.3 of the EP&A Act. Based on the NSW RFS bushfire prone land mapping, the Project has been assessed as containing Category 3 Bushfire Prone Vegetation. As per the *Guide for Bush Fire Prone Land Mapping (Version 5b)* (NSW RFS, 2015), Vegetation Category 3 is described as “*Medium bush fire risk vegetation. It is higher in bush fire risk than Category 2 but lower than Category 1. This Category consists of grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands.*”

6.5.2.2 Vegetation formation

The NSW Spatial Services mapping website (NSW Government, 2023) was used along with *Ocean Shores to Desert Dunes, the Native Vegetation of NSW and the ACT* (David Keith, 2004) identification key in determining that the primary hazardous vegetation formation having the potential to affect the Project is grasslands.

6.5.2.3 Slope

The effective slope influences the rate of fire spread, the intensity of the fire and the level of radiant heat flux on an asset. For example, fires tend to race more quickly up a vegetated slope than down a vegetated slope. The effective slope of the land from the new building for a distance of 100 metres is derived from a site assessment combined with the most detailed contour data available.

The effective slope within 100 metres of the Project was measured manually during the site visit where accessible, under the classified vegetation community constituting the hazard. The slope was consistent with topographical information from NSW Spatial Service LIDAR data and is shown in Table 6-20.

Table 6-20 Effective slope

Direction from building footprint	Slope description
Northeast	Downslope > 0-5 degrees
Southeast	All upslope and flat land (0 degrees)
Southwest	All upslope and flat land (0 degrees)
Northwest	All upslope and flat land (0 degrees)

6.5.2.4 Fire weather

The Project is located within the Tamworth LGA, which lies within the Northern Slopes weather district. For the purposes of the bushfire assessment, a Forest Fire Danger Index (FFDI) of 80 is assumed.

6.5.3 Mitigation measures

6.5.3.1 Asset protection zones

An asset protection zone (APZ) is a fuel-reduced area surrounding a built asset or structure which provides a buffer zone between a bush fire hazard and an asset and is an area of reduced bush fire fuel that allows suppression of fire. The APZ also provides an area from which back burning or hazard reduction can be conducted, allows emergency services access and provides a relatively safe area for firefighters and occupants to defend a property.

Minimum PBP 2019 APZ requirements are designed to ensure that buildings would not be expected to experience radiant heat flux levels of greater than 29 kW/m². The recommended APZ to avoid flame contact is provided in Table 6-21. This has been determined based on the relevant Forest Fire Danger Index, vegetation formation and effective slope using Table A1.12.3 of the PBP 2019.

Table 6-21 Minimum distances of APZs

Aspect	Vegetation classification	Slope under classified vegetation	APZ required (m)	APZ available (m)
Northeast	Grassland	Downslope >0-5 degrees	11	11
Southeast		0 degrees	10	10
Southwest		Downslope >5-10 degrees	12	12
Northwest		0 degrees	10	10

The PBP 2019 has minimum specifications for APZs to be established around buildings. These need to be managed as an Inner Protection Area (IPA). The IPA is the area within the APZ closest to the buildings and creates a fuel managed area which can minimise the impact of direct flame contact and radiant heat on the development and can act as a defensible space. This space provides a safe working environment in which efforts can be undertaken to defend the structure, before and after the passage of a bush fire. The IPA must be kept free from surface fuel and elevated fuel with minimum canopy cover.

6.5.3.2 Access arrangements

For industrial developments including BESS facilities, the PBP 2019 guidelines require that safe site access to/from the public road system is provided for firefighters providing property protection during a bushfire and for occupant egress for evacuation. A perimeter road loop providing all-weather access around the BESS would be designed and constructed in accordance with the PBP 2019 guidelines.

6.5.3.3 Water supply

For industrial developments including BESS facilities, the PBP 2019 guidelines requires that adequate services of water be provided for the protection of buildings during and after the passage of bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

A minimum 20,000 litre static water supply for fire fighting purposes with suitable fittings sufficient to enable firefighting will be provided. The tank is required to be concrete or metal and all exposed water pipes external to the building are required to be metal, including any fittings. A static water supply marker should be obtained from the RFS and displayed in a prominent position at the front gate. This supply may form part of larger water holding structure.

6.5.3.4 Emergency management arrangement

An emergency management plan, incorporating bushfire emergency management arrangements would be required for the Project. A Bushfire Emergency Management and Evacuation Plan (BEEP) would be prepared in accordance with the RFS document *A Guide to Developing a Bushfire Emergency Management and Evacuation Plan* for the construction and operation phases of the Project.

6.5.3.5 Summary

The bushfire assessment concluded that the Project would satisfy the aim and objectives of PBP 2019, subject to implementation of the mitigation measures above and summarised in Table 6-22.

Table 6-22 Bushfire mitigation measures

ID	Mitigation Measures
Design	
BR1	An APZ will be implemented for a distance of 12 metres in all directions (unless a performance based solution adequately demonstrates that a smaller APZ would meet the aims and objectives of the PBP 2019 guidelines).
BR2	A vehicular access track around the BESS, consistent with access standards in PBP 2019 will be provided
BR3	A minimum 20,000 litre static water supply for fire fighting purposes with suitable fittings sufficient to enable firefighting will be provided. The tank will be concrete or metal and all exposed water pipes external to the building will be metal, including any fittings. A static water supply marker will be obtained from the RFS and displayed in a prominent position at the front gate. This supply may form part of larger water holding structure.
BR4	Where practicable, electrical transmission lines will be located underground.

ID	Mitigation Measures
Construction and operation	
BR5	A Bushfire Emergency Management and Evacuation Plan will be prepared in accordance with the RFS document <i>A Guide to Developing a Bushfire Emergency Management and Evacuation Plan</i> and will be implemented for construction and operation of the Project.
BR6	Establish a 'hot works management system' for both construction and operation phases to prevent accidental bushfire ignition from hot works on site

6.6 Heritage

This section provides a summary of the potential Aboriginal and historic heritage impacts of the Project.

The Aboriginal Cultural Heritage Assessment Report (ACHAR) and Historic Heritage Assessment Report (HHAR) have been prepared by OzArk and are provided in Appendix H and Appendix I respectively. Appendix A provides a summary of the relevant SEARs which relate to Aboriginal and historic heritage and where these have been addressed in this EIS.

6.6.1 Methodology

6.6.1.1 Aboriginal heritage

The preparation of the ACHAR was carried out in accordance with:

- *Code of Practice for Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010a)
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011)
- *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010b).

The assessment included:

- Consultation with Aboriginal stakeholders
- A review of the history of the Project Site, including a review of previous investigations in the area and heritage databases
- A summary of Aboriginal history and context
- A site inspection to identify the presence of any heritage items or places of value.

Database search

An Aboriginal Heritage Information Management System (AHIMS) extensive search was conducted on 27 October 2023, with a 7.5 kilometre buffer centred around the survey area to identify any Aboriginal sites which may have been previously recorded. DPHI maintains the AHIMS database, which comprises a comprehensive register of Aboriginal sites that have been recorded across NSW.

Consultation process

Consultation with Aboriginal communities for this Project was undertaken in accordance with the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010) (ACHCRP).

A total of 15 Aboriginal groups or individuals registered their interest in the Project. Details of the consultation process are outlined in Section 5.4.2.

6.6.1.2 Historic heritage

The HHAR was prepared in accordance with the following guidelines and publications:

- *The Burra Charter: The Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance* (Burra Charter, 2013)
- *Historical Archaeological Code of Practice* (Heritage Council, 2006)
- *Assessing Significance for Historical Archaeological Sites and 'Relics'* (Heritage Council, 2009)
- *Assessing heritage significance* (NSW Heritage Office, 2001).

Applicable legislation

The primary piece of State legislation protecting environmental heritage items both natural and cultural in NSW is the *Heritage Act 1977*. Items of environmental heritage under the Act are listed on the NSW State Heritage Register and are afforded automatic protection against any activities that may damage an item or its significance under the Act. Under Section 170 of the *Heritage Act*, State agencies and authorities in NSW are required to keep a register of heritage places for which they are responsible.

The EPBC Act applies to those items which are of World, Commonwealth or National heritage accompanied by significance.

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process, with local heritage items being listed under their relevant LEPs. A desktop review of the following heritage registers was carried out on 14 November 2023:

- National Heritage List
- Commonwealth Heritage List
- State Heritage Register
- Tamworth Regional LEP 2010.

In addition to the desktop analysis, a site inspection was undertaken by suitably qualified specialists on 12 February 2024 to determine if any unrecorded heritage items or values were present within the development envelope.

6.6.2 Existing environment

6.6.2.1 Aboriginal heritage

Landscape context

The geology associated with the Tamworth Keepit Slopes and Plains landscape unit includes Silurian-Devonian chert, slate, phyllite, tuff, schist and Carboniferous conglomerate, sandstone, mudstone, andesite and small areas of limestone. Landforms which typically comprise outcropping rock are limited to the hill crest on the southwest of the Project Site. Where materials suitable for stone tool manufacture are present on this landform (i.e. chert, tuff or mudstone), then there is the potential for quarries to be present.

The Project extends across two soil landscapes, Fullwoods Hill and Duri. The majority of the Project Site is in the Fullwoods Hill area, characterised as an erosional landscape located on rocky crests and steeper side slopes of hills and low hills. The Duri soil landscape consists of extensive rolling to undulating hills and low hills. While erosion is an issue in areas utilised for cropping or grazing, deep soil deposits have the potential to preserve in-situ archaeological deposits.

Hydrology

The closest non-perennial watercourse to the Project Site includes Calala Creek located around 800 metres northeast and Goonang Creek located around 1.3 kilometres west.

Calala Creek is a tributary of the Peel River, while Goonang Creek is a tributary of Goonoo Goonoo Creek, both perennial watercourses. Additional perennial watercourses near the Survey Area include the Cockburn River and Piallamore Anabranche, both tributaries of the Peel River.

The Peel and Cockburn Rivers were also a source for raw material. Pebbles and cobbles of chert, cherty argillite, andesitic greywacke, quartz, hornfels, basalt and small amounts of chalcedony and petrified wood could also be sources from the banks of these Rivers (Wilson & McAdam 2000).

Throughout NSW there is a strong correlation between Aboriginal occupation sites and distance to water. The general proximity of the Survey Area to waterways, even minor ephemeral waterways, increases the likelihood of sites being present within the Survey Area, however, as distance to water increases the likelihood of sites being present decreases. This is supported by the lack of registered AHIMS sites within the Project Site.

Vegetation

The Project Site has been previously cleared of most upper and mid stratum native vegetation with only isolated paddock trees remaining. Areas of vegetation to the east of the existing Tamworth substation appear to be more recent plantings. Historical vegetation clearance on the Project Site for the purposes of agricultural activities significantly reduces the potential for culturally mature trees to be present.

Ethnographic setting

The Project Site and surrounding area are located within lands occupied by the Gamilaraay (Kamilaroi) language group. Historical records provide accounts of Aboriginal occupation in the area, supported by 80 Aboriginal sites identified through a search of the AHIMS database. The landforms found at the Project Site were generally less favourable for occupation, due to its distance from surrounding waterways. Of the 80 AHIMS sites, 58 were located within 200 metres of a waterway. Historical land use practices have resulted in significant ground and site disturbances. Disturbed areas may still contain Aboriginal objects and sites, though they are no longer likely to be in-situ.

Archaeological context

A significant number of studies have been undertaken in Tamworth and the wider region which provide a sound archaeological context for the Project Site.

A search of the AHIMS database on 27 October 2023 confirmed that there are no recorded Aboriginal sites within one kilometre of the Project Site. Site surveys were also conducted for the Project on 12 February 2024, which recorded no Aboriginal within the development envelopment. Furthermore, no landforms within the development envelope were assessed to have the potential for subsurface archaeological deposits. This is attributed to the lack of elevated landforms adjacent to permanent and semi-permanent water.

Previous studies have been undertaken for the Calala BESS (Biosis, 2023) and Tamworth BESS (OzArk, 2024), located about one kilometre north and immediately west of the Project respectively. No previously unrecorded Aboriginal cultural heritage sites were identified during site surveys for the Calala BESS, with no areas of archaeological sensitivity identified. Similarly, no Aboriginal sites were identified during the survey for the Tamworth BESS.

Historic land use within the Project Site has resulted in extensive ground disturbance through historical vegetation clearance, cultivation and grazing and infrastructure. This disturbance has resulted in the restructuring of the natural landforms that may have been occupied by Aboriginal people.

6.6.2.2 Historic heritage

Background

The Project Site and the wider Tamworth area has had a long association with pastoralism since exploration of the region during the early 1800s. The extensive well-watered area attracted early settlers and squatting pastoralists seeking open plain grazing resources. The land in the region was later occupied by the Australian Agriculture (AA) Company, with their land occupying about 500,000 acres.

Desktop review

The desktop review identified eight listed historic heritage items within five kilometres of the Project. These are described in Table 6-23 and shown on Figure 6-10. No places or listings were identified with the development envelope.

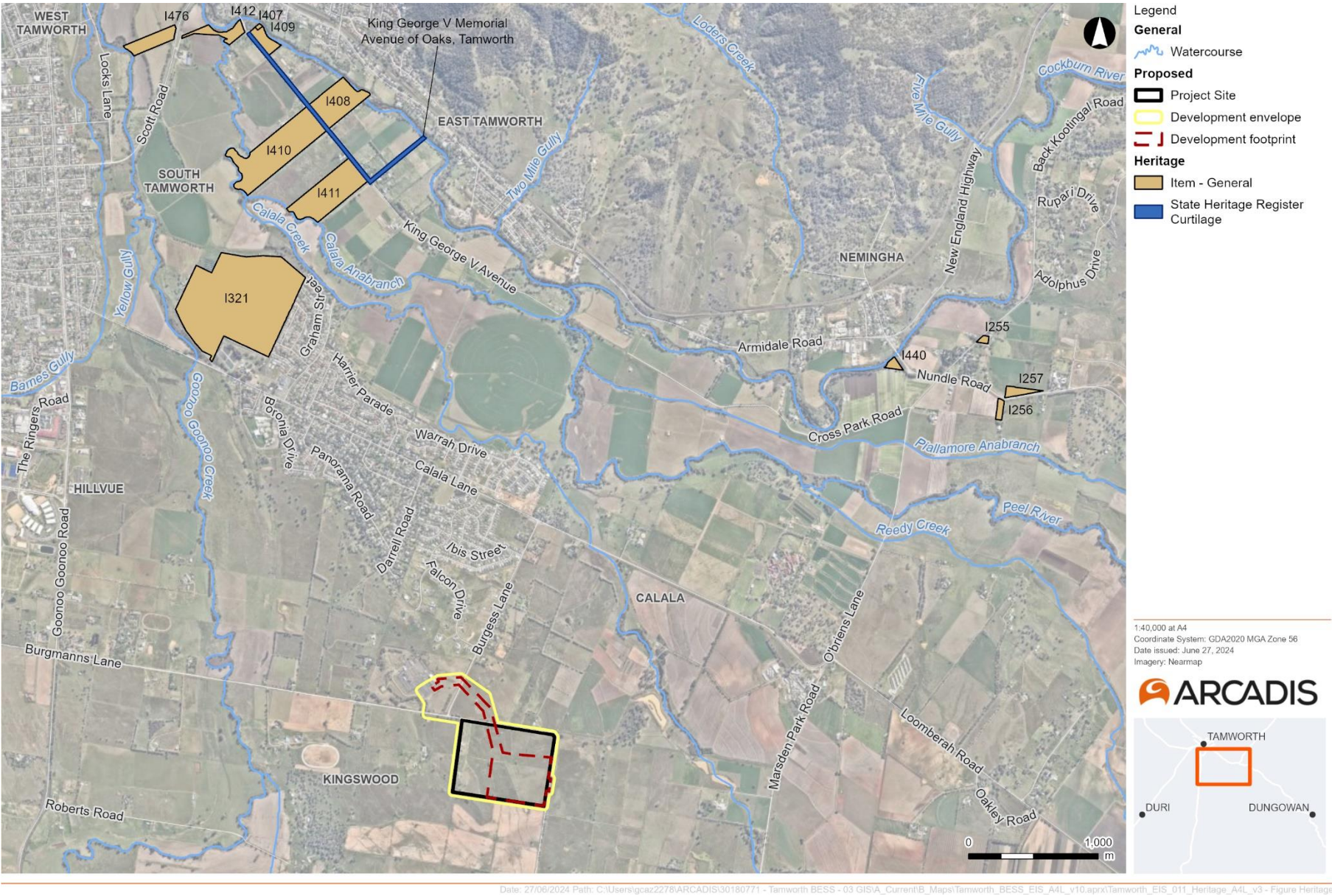


Figure 6-10 Historic heritage

Table 6-23 Historic heritage items within five kilometres of the Project

Item	ID	Significance	Address	Distance from Project (indicative)
Original AA Building Site	I321	Tamworth Regional LEP	Calala Lane, Tamworth	2.7 km
Tobacco Kiln	I411	Tamworth Regional LEP	119-139 King George V Avenue, Tamworth	3.6 km
House "Glenbrook"	I440	Tamworth Regional LEP	28 Nundle Road, Nemingha	3.8 km
House	I408	Tamworth Regional LEP	King George V Avenue, Tamworth	4.2 km
Nemingha School	I256	Tamworth Regional LEP	Nundle Road, Nemingha	4.2 km
Nemingha Hall	I255	Tamworth Regional LEP	Kootingal Road, Kootingal	4.4 km
Nemingha Anglican Church	I257	Tamworth Regional LEP	Nundle Road, Nemingha	4.4 km
King George V Memorial Avenue of Memorial English Oaks	SHR 01922	State Heritage Register	King George V Memorial Avenue, Tamworth	4.4 km

Site inspection

A site inspection was undertaken on 12 February 2024. Standard archaeological field survey and recording methods were employed during the survey. No historic heritage items or historic archaeological deposits were recorded, with limited potential for historic heritage to be present due to the historic land use of the area.

6.6.3 Potential impacts

6.6.3.1 Construction

Aboriginal heritage

No sites of Aboriginal heritage significance have been identified in the Project Site. However, construction of the Project would require earthworks and disturbance to the ground surface, which would have the potential to impact previously unrecorded items of Aboriginal heritage significance within the Project Site.

Any unexpected finds that are encountered are likely to be located within highly disturbed contexts and therefore may not provide any further information about Aboriginal occupation of the area other than their existence within the landscape.

Construction teams and operating staff would receive cultural training to ensure they understand the cultural values of these sites and their connection to the surrounding landscape and the Local Gamilaroi / Kamilaroi Aboriginal community that continue to care for country.

Historic heritage

Construction of the Project would not result in impacts to listed Commonwealth, State or Local heritage items.

The Project would be developed on land subject to previous disturbances associated with development of the existing substation and associated facilities, dwellings, contour banking, road construction and agricultural practices (grazing and cropping).

Construction of the Project would require earthworks and disturbance to the ground surface, however due to the disturbed nature of the Project Site and lack of heritage items previously recorded or identified during the site survey, no impacts to historic heritage are expected to occur as a result of construction.

6.6.3.2 Operation

Neither Aboriginal heritage nor historic heritage would be directly impacted during operation of the Project, as ground disturbance / excavation would be restricted to construction. Additionally, the introduction of new infrastructure is not expected to impact the setting or value of local Aboriginal items or sites or historic items.

6.6.4 Mitigation measures

Table 6-24 summarises the mitigation measures for managing Aboriginal and historic heritage during construction and operation of the Project.

Table 6-24 Aboriginal heritage mitigation measures

ID	Mitigation Measures
Construction and Operation	
H1	Construction teams and operations staff will receive cultural training to ensure they understand the cultural values of these sites and their connection to the surrounding landscape and the Local Gamilaroi / Kamilaroi Aboriginal community that continue to care for country.
H2	The EMS will include an unexpected finds protocols which will be implemented in the unlikely event that Aboriginal objects, human remains, or items of heritage are discovered during construction or operation.

6.7 Visual amenity

This section provides a summary of the potential impacts to visual amenity associated with the Project.

The Landscape and Visual Impact Assessment (LVIA) for the Project has been prepared by Moir Landscape Architecture Pty Ltd and is provided in Appendix J of this EIS. Appendix A provides a summary of the relevant SEARs which relate to visual amenity and where these have been addressed in this EIS.

6.7.1 Methodology

6.7.1.1 Government plans, policies and guidelines

The LVIA was prepared with reference to the following plans/policies/guidelines:

- *Guideline for Landscape Character and Visual Impact Assessment* (TfNSW, 2020)
- *Technical Supplement – Landscape & Visual Impact Assessments for Large Scale Solar Projects* (DPHI, 2023).

6.7.1.2 Landscape character assessment

The landscape character within two kilometres of the Project Site was assessed at regional, local and site scale using existing topographic maps, site imagery and land use maps. Landscape character refers to the distinct and recognisable pattern of elements that occur consistently in a particular landscape. The Landscape character of an area is generally defined by the most dominant landscape element or unique combination of elements that occur within that landscape.

Following categorisation of the landscape character, scenic quality, which refers to the 'relative scenic, cultural or aesthetic value of the landscape within the viewshed based on the presence or absence of key landscape features'

(DPHI, 2022), was quantified for each landscape character zone. This was based on a rating system of high, moderate or low.

Receptor sensitivity relates to the relative importance of receptors and the value that the community or visitors may place on landscapes viewed from public use areas, public travel ways and private receptors such as receivers. The sensitivity of each viewpoint is classified into one of four sensitivity ratings ('Very Low', 'Low', 'Moderate', 'High'). The intent is to classify the viewer sensitivity on the landscape character zone in which the Project is being viewed and assessed based on the landscape character assessment.

6.7.1.3 Visual impact assessment

Zone of Visual Influence

An initial visibility assessment was undertaken utilising Zone of Visual Influence (ZVI) mapping. The ZVI for the Project assists in defining the 'Visual Catchment' for the Project and represents the area which a development can theoretically be seen. It is noted that existing screening, including structures or vegetation were not considered during preparation of the ZVI. This form of mapping is acknowledged as providing a worst case scenario and is used purely as a desktop assessment tool to determine areas for further investigation. The key Project infrastructure and associated heights used in the ZVI included:

- Battery modules – 3 metres
- Noise walls ranging – 3 to 8 metres
- O&M building – 5 metres
- Substation height – 9.2 metres
- Transmission tower – 60 metres.

The ZVI mapping for the Project is included in Appendix J.

Viewpoint analysis

The viewpoint analysis considers the likely visual impacts of the Project on the existing landscape character and visual amenity by selecting prominent sites, otherwise referred to as viewpoints. The visual impact of the viewpoint is then assessed both on site and with the topographic and aerial information to ensure accuracy. For each viewpoint, the potential visual impacts are analysed through a combination of the 3D terrain modelling, topographic maps and on-site analysis. A total of 16 viewing points were selected from publicly accessible locations to represent a range of views surrounding the Project as shown in Figure 6-11. Viewpoints were selected to illustrate a combination of the following:

- Areas of high landscape or scenic value
- Visual composition (e.g. Focused or panoramic views, simple or complex landscape pattern)
- Range of distances
- Varying aspects
- Various elevations
- Various extent of development visibility (full and partial visibility)
- Views from major routes

In addition to the viewpoint analysis, public land and non-associated receivers were assessed. Non-associated receivers within 1km were assessed in clusters defined by similar locations, views and intervening visual elements (Clusters 1 to 4). Receivers determined to not have visibility to the BESS facility as assessed by the ZVI were grouped into Cluster 5 (and are therefore spatially variable). Receivers not grouped into clusters have been assessed individually.

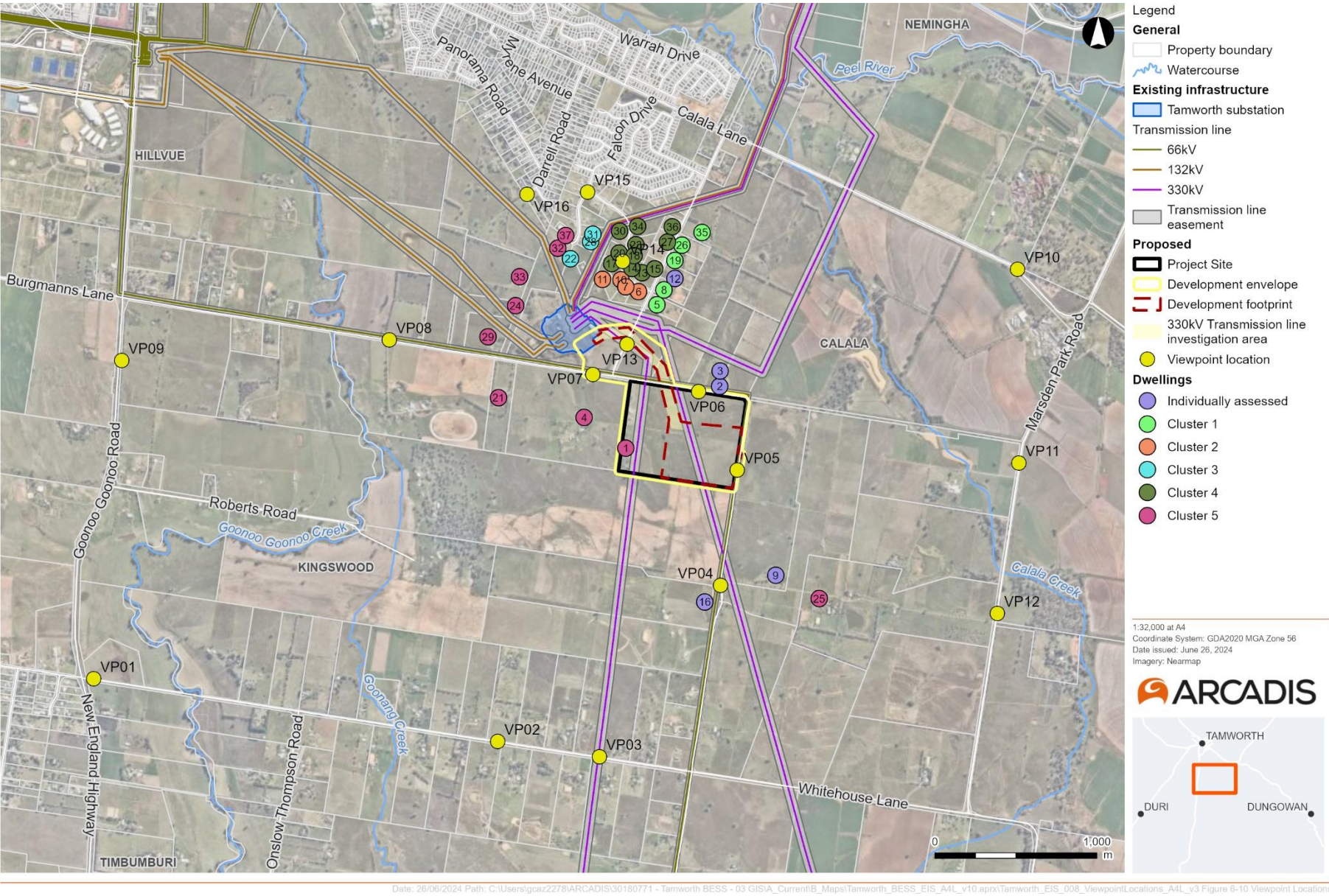


Figure 6-11 Viewpoints and clusters

Visual impact

The potential impact on visual amenity is based on the relationship between the visual sensitivity and magnitude of visual change. This is summarised in Table 6-25.

Table 6-25 Visual impact assessment criteria

Criteria	Description
Visual sensitivity	Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to change. Visual sensitivity, defined by the DPHI refers to the quality of the existing view and how sensitive the view is to the proposed change. The visual sensitivity is determined by identifying the sensitivity of each viewpoint and categorising the scenic quality of the area in view. Visual sensitivity ratings are defined as high, moderate or low and very low.
Magnitude of visual change	Visual magnitude refers to the extent of change that will be experienced by receptors. Visual magnitude ratings are defined as high, moderate or low and very low.
Visual impact	Visual impact refers to the change in appearance of the landscape as a result of the Project. Visual impact is the combined effect of visual sensitivity and visual magnitude. Various combinations of visual sensitivity and visual magnitude are shown in Table 6-26.

Table 6-26 Visual impact rating

		Visual magnitude			
		High	Moderate	Low	Very low
Visual sensitivity	High	High	Moderate	Moderate	Low
	Moderate	Moderate	Moderate	Low	Low
	Low	Moderate	Low	Low	Very low
	Very low	Low	Low	Very low	Very low

6.7.2 Existing environment

A summary of the existing landscape environment is provided in Table 6-27.

Table 6-27 Existing landscape character

Aspect	Description
Bioregion context	The Project is located in the Nandewar bioregion and Peel subregion. The region is characterised by hilly landforms with variable topography, bordering the western edge of the New England Tablelands. Formed on Palaeozoic sedimentary rocks, the region contains limestones, basalts, and sandstone. It is predominately characterised by clay or loam soils with stony soils on the ridgelines.
Land zoning	The Project Site is zoned RU4 – Primary Production Small Lots under the Tamworth Regional LEP 2010. Surrounding land zoning within two kilometres of the Project includes R5 Large Lot Residential, R1 General Residences, R2 Low Density Residential, RE1 Public Recreation and RU1 Primary Production. Land zoning is shown on Figure 2-2. Further context regarding land zoning is provided in Section 6.8.

Aspect	Description
Land use	There are two existing land use activities relevant to the Project, including grazing modified pastures and utilities. Other nearby land uses include grazing native vegetation, plantation forests, cropping, irrigated cropping, residential and farm infrastructure, services and electricity substations and transmission. Further context regarding land use is provided in Section 6.8.
Topography	The topographical character of the landscape within two kilometres of the Project typically consists of gentle undulating hills in a north westerly alignment, within the range of around 460 to 393 metres Australian Height Datum (AHD).
Hydrology	Man-made dams are dotted throughout the surrounding farmland to aid in agricultural practices. Small creeks weave through the surrounding hills with scattered vegetation lining their embankments. These include Calala Creek, Goonoo Goonoo Creek and Goonang Creek. Further context regarding hydrology is provided in Section 6.10.
Vegetation	Vegetation within the two kilometres buffer is typical of the Peel subregion with predominantly scattered vegetation within extensive pasture areas. Dominant vegetation communities consist of eucalyptus varieties including White Box, Yellow Box and Blakely's red gum. Within the Project Site, vegetation is limited to a few lone trees dotting the existing site. Further context regarding vegetation is provided in Section 0.
Road corridors	The Project is bounded by Burgmanns Lane to the north and Ascot-Calala Road to the east, both low use, unsealed roads and used by the surrounding residences. The New England Highway is located approximately 3.1 kilometres west of Project Site and is a major inland road that forms part of the route connecting Sydney to Brisbane. The relevant road corridors for the LVIA include Ascot-Calala Road, Calala Lane, Marsden Park Road and Burgess Lane.
Infrastructure	Electrical infrastructure transects and surrounds the Project Site due to the nearby Tamworth Substation. Two overhead 330 kV transmission lines (including towers) transect the Project Site and other 330 kV and 132 kV electrical transmission lines are present within one kilometre of the Project Site.
Rural residential and urban development	The regional centre of Tamworth CBD is located around six kilometres northwest of the Project Site. The suburb of Calala sits between Tamworth and the Project Site and is located around 2.2 kilometres northwest from the Project. With an estimated population of 4,577 (ABS 2021), the suburb of Calala is zoned as R1 General Residential, R2 Low Density Residential and R5 Large Lot Residential.

6.7.2.1 Landscape character zones

Landscape character zones within two kilometres of the Project Site have been identified as per the *Guideline for Landscape Character and Visual Impact Assessment* (TfNSW, 2020). Table 6-28 provides a description of each of these landscape character zones and the corresponding assigned scenic quality rating. The landscape character zones are shown in Figure 6-12.

Table 6-28 Landscape character zones

Landscape character zone (LCZ)	Description	Scenic quality rating
Grazing and cropping pastures	Land within this LCZ is primarily zoned as RU4 Primary Production Small Lots. Land within this zone consists of undulating cleared pastures that have been modified for agricultural use, with low density residential properties scattered throughout. Scattered vegetation is typically in the form of lone trees, windbreaks and residential vegetation, with a few small patches of woodlands near creeks and ridgelines. Water bodies are generally in the form of man-made farm dams or seasonal creeks. Key landscape features include: • Rural properties • Fields for grazing and cropping • Tamworth Substation and associated transmission line infrastructure.	Low
Town	This LCZ is defined by undulating plains and flats, with urban infrastructure located within the suburb of Calala. This includes large and small residential lots, commercial and industrial developments. The landscape within the LCZ is highly modified, with limited vegetation such as windbreaks and residential vegetation. Key landscape features include: • Residential developments • Commercial developments • Urban infrastructure • The Tamworth substation and associated transmission line infrastructure is considered a key landscape feature within the LCZ.	Low
Creek corridors	This LCZ is defined by watercourses including Calala, Goonoo Goonoo and Goonang Creeks. Land around these creeks is typical of the bioregion, comprising of flat valleys cleared for agricultural purposes including grazing and cropping, with some remnants of riparian vegetation visible on creek banks.	Low



Grazing and cropping pastures



Town features



Creek corridor

Figure 6-12 Landscape character zones within two kilometres of the Project

6.7.3 Potential impacts

6.7.3.1 Construction

A description of the construction activities and associated plant and equipment is included in Section 3.3. These activities will be visible from nearby road corridor and residents. However, due to the temporary nature, construction activities are considered unlikely to have significant visual impacts on passing motorists or nearby receptors. Subsequently, landscaping is not proposed to mitigate visual impacts during the construction stage of the Project.

6.7.3.2 Operation

Viewpoint analysis

As described in Section 6.7.1.3, viewpoints were selected to be representative of the worst case scenario. The visual sensitivity and visual magnitude of each viewpoint was assessed which, when combined, results in an overall visual impact for the viewpoint.

Two viewpoints (VP05, VP06) were assessed as having a *low visual impact* rating. PV05 is located on Ascot-Calala Road and VP06 is located on Burgmanns Lane. Based on topography alone, the Project will have a potential visibility of 75-100 percent from these locations. However, the Tamworth substation and its associated infrastructure are an existing visual characteristic of the landscape. Therefore, these views will not significantly alter from the existing character of the landscape.

The remaining fourteen viewpoints were assessed as having a *very low visual impact*.

Visual impacts on public land

The undulating topography, scattered vegetation and built forms associated with the receivers to the northwest of the Project is likely to limit views of the Project beyond a few nearby roads, as detailed in Table 6-29.

Table 6-29 Visual impacts on surrounding roads

Road	Description of Project views
Ascot-Calala Road	Views to the Project would be experienced along a two kilometre stretch of the road. However, the Project would be located next to the existing 330 kV transmission line and would likely be viewed as part of the existing infrastructure. Additionally, the road is a low use road with a low visual sensitivity.
Calala Lane	Views of the Project would likely be partially filtered by the existing vegetation adjacent to the road and as a result would occupy a small portion of the view.
Marsden Park Road	Views of the Project would likely be fragmented, with minimal visual impacts due to the existing vegetation scattered along portions of the road and along the western boundary of the Project.
Burgess Lane	Views of the Project would be fragmented and viewed at speed along small portions of the road due to existing topography, scattered vegetation and intervening built elements.

Due to the distance and scale of the Project, it would not be visible from the regional centre of Tamworth. Furthermore, partial views of the Project would likely be viewed as an extension / a part of the existing electrical infrastructure and would integrate into the existing visual character of the surrounding area.

Visual impacts on non-associated receivers

Non-associated receivers were assessed in clusters. These clusters have been defined by receivers which have similar locations, views and intervening visual elements. A representative receiver has been selected from each cluster and assessed for visual impact. The resulting visual impact rating is considered indicative for all receivers within that group. All receivers not grouped have been assessed individually or removed from assessment as the ZVI calculated that they would have no views of the Project.

Table 6-30 provides a summary of the visual impacts to non-associated receivers without and with mitigation. Energy infrastructure including Tamworth substation and associated transmission lines forms part of the existing surrounding visual catchment and are key elements within the primary views of these receivers. As such, the Project is unlikely to modify the visual catchment and instead be viewed as an extension of existing landscape features. The receiver ID is shown on Figure 6-11.

Table 6-30 Visual impacts on non-associated receivers

Receiver ID (cluster)	Address	Elevation	Distance to Project	Visual impact (without mitigation)	Visual impact (with mitigation)
R16	877 Ascot-Calala Road, Kingswood	441 m	0.72 km	Moderate	Low
R9	910 Ascot-Calala Road, Calala	436 m	0.60 km	Moderate	Low
R2	795 Burgmanns Lane, Calala	427 m	0.05 km	Moderate	Low

Receiver ID (cluster)	Address	Elevation	Distance to Project	Visual impact (without mitigation)	Visual impact (with mitigation)
R3	781 Burgmanns Lane, Calala	427 m	0.15 km	Moderate (in the context of existing infrastructure)	Low
R12	93 Burgess Lane, Calala	425 m	0.67 km	Moderate	Low
R5 (R8, R19, R26, R35) (Cluster 1)	111 Burgess Lane, Calala	430 m	0.49 km	Low	Low
R6 (R7, R10, R11) (Cluster 2)	51 Falcon Drive, Calala	447 m	0.65 km	Moderate	Low
R22 (R28, R31) (Cluster 3)	7 Whipbird Street, Calala	448 m	0.89 km	Low	Very low
R13 (R36, R27, R15, R14, R17, R18, R20, R23, R30, R34) (Cluster 4)	68 Falcon Street, Calala	434 m	0.67 km	Low	Very low
R4 (R25, R21, R29, R24, R33, R32, R37) (Cluster 5)	696 Burgmanns Lane, Kingswood	436 m	0.25 km	Very low	Very low

Landscape character

Table 6-31 provides an overview of the landscape character impacts of the Project on each LCZ, as identified in Table 6-28. The table considers the visual sensitivity and magnitude on each LCZ.

Table 6-31 Landscape character impacts

LCZ	Visual sensitivity	Visual magnitude	Landscape character impact
Grazing and cropping pastures	Moderate	Low	Low
Town	Moderate	Very low	Low
Creek corridors	Moderate	Very low	Low

Night lighting

The requirements for night lighting of ancillary infrastructure for this Project is generally limited to security lighting for the onsite substation, and O&M facilities, internal roads and car park area. The light sources are limited to low level lighting for security, night time maintenance and emergency purposes, designed as per AS4282-1997 (*The Australian Standard for control of the obtrusive effects of outdoor lighting*). It is unlikely the proposed night lighting associated with the ancillary infrastructure would create a noticeable impact on the existing night time landscape.

Design principles, including controlling the level of lighting and lighting design, have taken into consideration the *Dark Sky Planning Guidelines* (DPHI, 2016) and the *National Light Pollution Guidelines for Wildlife* (DEE, 2020).

6.7.4 Mitigation measures

Landscape screening is proposed around along the north, south and east of the BESS facility to mitigate visual impacts during operation.

A conceptual landscaping plan is shown in Appendix J and has been incorporated into the design of the Project (see Figure 3-1). Subject to local conditions (i.e. soil quality and water availability), it is anticipated that within two years, the proposed landscaping will provide sufficient coverage to partially screen Project infrastructure. The final location and extent of landscaping will be determined during detailed design.

Development of the Project design has included and will continue to include general measures to reduce the degree of contrast between Project infrastructure and the surrounding rural landscape, having regard to the form, scale, height, colour and texture of materials incorporated as part of the Project.

Table 6-32 summarises the mitigation measures to reduce potential visual impacts associated with the Project.

Table 6-32 Visual mitigation measures

ID	Mitigation Measures
Design	
V1	The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for project infrastructure to minimise visual impacts (including glare/reflectivity), including the O&M buildings/facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.
V2	Cut off and direct light fittings (or similar technologies) will be used where appropriate to minimise glare and light spill onto private property.
V3	Landscaping will be installed and maintained in accordance with the conceptual landscape plan, including screen planting along the north, east and south of the BESS facility. The final location and extent of landscaping will be determined during detailed design. The key principals will include: - Planting will remain in keeping with existing landscape character - Species selection will be typical of the area - Planting layout will avoid screening views of the broader landscape - The clearing of existing native vegetation will be avoid. Where appropriate any lost vegetation will be reinstated - Native vegetation will be allowed to regrow over any areas of disturbance.

6.8 Land

This section has been prepared to assess the potential impacts on land associated with the Project.

A Preliminary Site Investigation (PSI) has been prepared by Arcadis and is provided in Appendix K. Appendix A provides a summary of the relevant SEARs which relate to land and where these have been addressed in this EIS.

6.8.1 Methodology

6.8.1.1 Government plans, policies and guidelines

The land assessment has been undertaken in accordance with the following guidelines and policies:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended in May 2013 (NEPM), (National Environment Protection Council (NEPC) 2013),
- *Contaminated Land Guidelines: Consultants reporting on contaminated land* (NSW Environmental Protection Authority (EPA) (2020),
- *PFAS National Environmental Management Plan 2.0* (Heads of the EPA (HEPA) 2020)
- *State Environmental Planning Policy (Resilience and Hazards) 2021*
- *Land Use Conflict Risk Assessment Guide* (Department of Primary Industries (DPI), 2011).

6.8.1.2 Approach

A desktop review was undertaken to identify the soils, geological characteristics, and potential for contamination at the Project Site. The desktop assessment included a review of publicly available information including but not limited to LotSearch Enviro Professional, TRC and NSW EPA records as follows:

- LotSearch Enviro Professional [LS045045_E] (LotSearch 2023), which included a search conducted on 20 June 2023 of:
 - Site environmental setting
 - Heritage and cultural sensitivity items, local historical business directories
 - Landfills, gasworks and waste facilities
 - PFAS investigation sites
 - Online searches of relevant NSW EPA and Office of Water databases
- Historical land title ownership records for the Project
- A selection of historical aerial imagery for the Project
- Section 10.7 (2) and (5) council planning certificates for the Project
- A search of the SafeWork NSW Schedule 11 hazardous chemicals database.

In addition to the desktop review, a site walkover was undertaken on 24 October 2023 to document the land use activities being undertaken on the Project Site.

6.8.2 Existing environment

6.8.2.1 Land use

The Project Site is zoned RU4 – Primary Production Small Lots under the Tamworth Regional LEP 2010 and consists of mostly cleared rural land, existing electrical infrastructure and local council roads.

Under the Tamworth Regional LEP 2010 the objectives of the RU4 zone are to:

- Enable sustainable primary industry and other compatible land uses
- Encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature
- Minimise conflict between land uses within this zone and land uses within adjoining zones.

There are two existing land use activities relevant to the Project, including grazing modified pastures and utilities. The land is mostly cleared, with some scattered trees within the Project Site and along the road reserve. Thirty-six

residences are located within one kilometre of the Project Site, including one associated residence located in the southwest corner of the Project Site.

The land surrounding the Project consists of rural residential, grazing land and electrical infrastructure. The Project is in the New England and North West region in which agriculture occupies 7,320,936 hectares, about 74 percent of the region (ABARES 2016). Grazing native vegetation is the most common land use within the region occupying 3,154,113 hectares or 32 percent of the region.

6.8.2.2 Features and constraints

A summary of the natural geological and hydrogeological features of the Project Site and surrounding area is provided in Table 6-33. Further details regarding the surface and groundwater resources at the Project Site and potential impacts are provided in Section 6.10.

Table 6-33 Existing environment

Aspect	Description
Topography and elevation	The Project Site and surrounding area has a surface elevation of approximately 440 metres AHD. The topography includes undulating slopes reaching a maximum height of approximately 460 metres AHD near the southwest corner of the Project Site.
Geology and soils	The Department of Regional NSW (2023) indicates the Project Site and surrounding area is likely to be predominantly underlain by Noumea beds sandstone with interbedded massive- and andesitic-lithic wacke, pebbly wacke, laminated siltstone and mudstone. Boulder to pebble Keepit Conglomerate may also be present in the southwest corner of the Project Site. Nandewar Regional Assessment Area map (2003) indicates a fault line runs north to south through the middle of the site, dividing the lithology of the Project Site and surrounding area. The eastern portion is likely to be underlain by grey, thin-bedded laminated and massive Mandowa mudstone with subordinate, thin siltstone and fine sandstone. The soils landscapes identified for the Project based on the Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Tamworth Sheet include Fullwoods Hill and Duri. Sheet erosion is common to these soil landscape. The erosion hazard is considered low for a grazing land with sheet flow and increases to a high hazard for concentrated flows. Based on the typical slopes for the Project Site the potential erosion hazard was generally found to be low.
Hydrology and hydrogeology	There are 41 groundwater bores located within a one kilometre of the Project Site. These are used predominantly for water supply and irrigation purposes (LotSearch, 2023). Standing water level, provided for five of the groundwater bores, ranged from four metres AHD to 27.6 metres AHD. No details of soil logging data were available for groundwater bores. The aquifer underlying the Project Site is considered to be porous, extensive and of high productivity. Calala Creek is located approximately 800 metres downstream of the Project Site. Based on the location of Calala Creek and the Project Site topography, the inferred direction of groundwater flow at the Project Site is towards the northeast. Based on the topography of the Project Site, surface water flow is inferred to be in a northeasterly direction.
Acid sulfate soils	A review of the CSIRO Atlas of Australian Acid Sulfate Soils Data Source (Fitzpatrick, Powell & Marvanek, 2013) indicated that the Project Site is located in an area of 'low (6-70 percent) probability' of acid sulfate soils occurring.
Crown Land	The Project Site does not contain any Crown Land. The nearest area of Crown Land is located on Lot 1/DP1137483 which relates to the Tamworth Agricultural Institute.
Mining, quarries, mineral or petroleum rights	The Project Site and surrounds are located within a historical petroleum exploration licence (PEL0084, 1955) and was the subject of a preliminary geological report. There is no current mining, quarries, mineral or petroleum rights on the Project Site.

Aspect	Description
Land and soil capability	Land and soil capability (LSC) mapping for NSW (DPIE 2021) classifies the Project Site as being within LSC class 4 – moderate to severe limitations and class 5 – severe limitations, as shown in Figure 6-13. LSC class 4 is defined as land that will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture, whereas LSC class 5 land will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation (NSW Office of Environment and Heritage 2012). The Project Site is not situated on land mapped as Biophysical Strategic Agricultural Land (BSAL) (DPE, 2016). The nearest BSAL is located around 1.5 kilometres west of the Project Site.

6.8.2.3 Contamination

Based on the site history review, regulatory records and site walkover, minor observations of potential land contaminating activities have been identified for the Project, which include:

- General household and electrical good waste stockpile (air conditioners in northwest of the Project Site)
- Small scale above ground fuel storage tank and oil drum
- Pest control management involving use of herbicides
- Operation of the Tamworth substation.

Potential sources of contamination associated potential affected media and contaminants of potential concern (CoPC) are listed in Table 6-34.

Table 6-34 Sources of contamination

Source	Matrix	Evidence	CoPC
Storage of household waste, scrap metal and air conditioner units	Soils	Walkover of the Area of Study	Metals (e.g. cadmium, lead, and mercury), Polychlorinated biphenyls (PCBs)
Above ground fuel storage	Soil	Presence of tank on-site	Hydrocarbons
Pest control management on-site	Soil	Former licenses on-site involving application of herbicides	Pesticides and herbicides

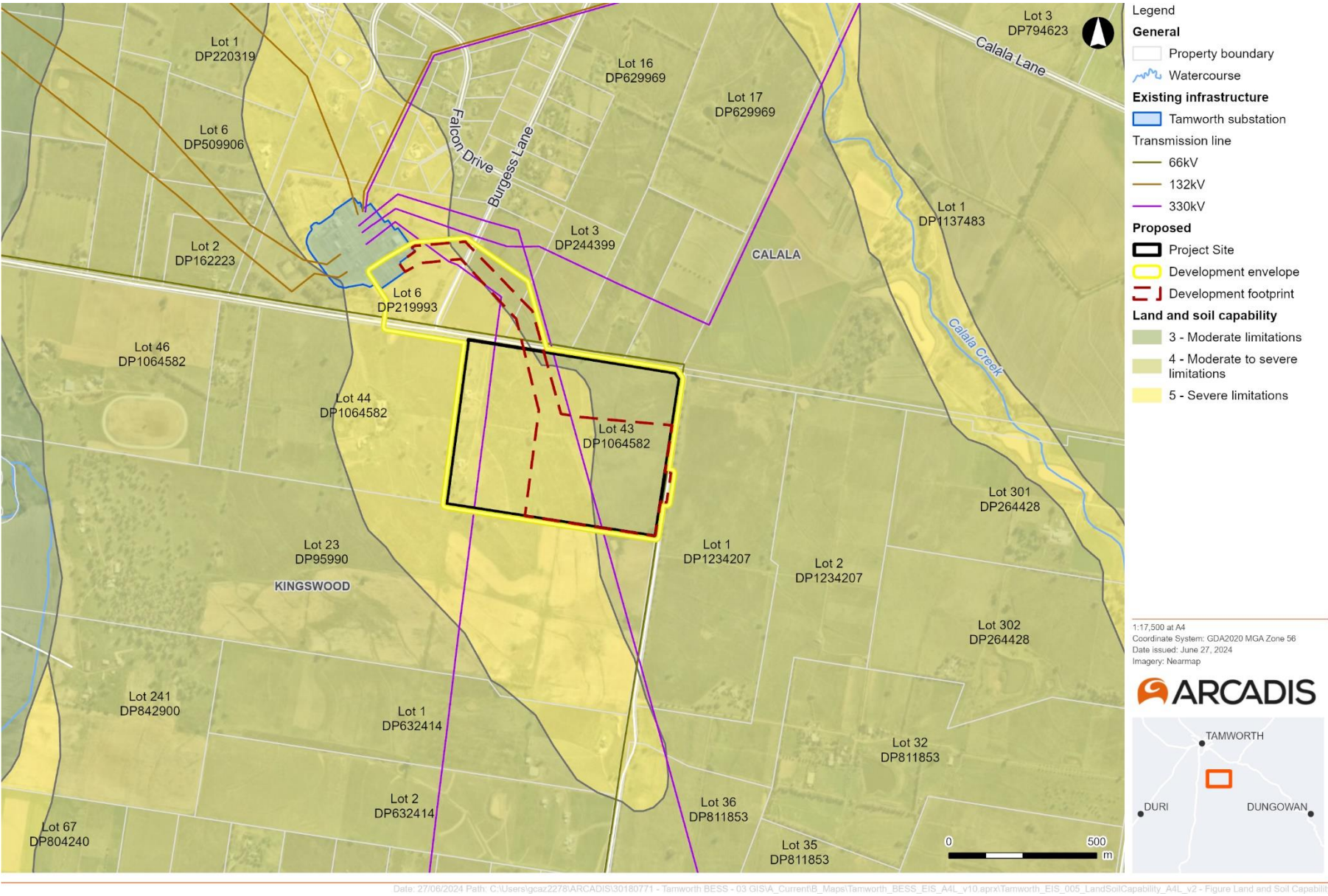


Figure 6-13 Land and soil capability mapping

6.8.3 Potential impacts

6.8.3.1 Construction

Erosion and sedimentation

Construction of the Project would require earthworks and disturbance to the ground surface, which has the potential to result in erosion and sedimentation if not properly managed. The erosion hazard is considered low for a grazing land with sheet flow and increases to a high hazard for concentrated flows. Based on the typical slopes for the Project Site the potential erosion hazard was generally found to be low. Erosion hazards would be further assessed via additional investigations including soil survey.

Sediment and erosion controls would be implemented and managed in accordance with the *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) with site specific recommendations to be included based on future proposed geotechnical investigation and recommendations.

Further details of potential erosion and sedimentation impacts on surface water quality are provided in Section 6.10.

Acid sulfate soils

As defined in the NSW EPA *Waste Classification Guidelines Part 4: Acid Sulfate Soils* (2014), acid sulfate soils are those naturally occurring sediments and soils which contain sulfides, mainly iron sulfide and iron disulfide or their precursors. The risk of exposing potential and/or actual acid sulfate soils may cause major environmental, agricultural and structural impacts in affected areas if not adequately managed. Potential impacts may include:

- Negative impacts to ecosystems
- Impacts on vegetation growth and agricultural productivity
- Structural damage and corrosion of steel and concrete structures.

The risk of exposing potential or actual acid sulfate soils is considered to be low, given the location of the Project and the low potential for acid sulfate soils to be present on the Project Site.

Contamination

As outlined in Section 6.8.2.3 the potential for contamination at the Project Site is considered to be low. Contamination, if present, would be limited to localised soil impacts, and is not considered likely to pose a groundwater risk due to the relatively minor scale of potential contamination on-site and the nature of the sources being non-industrial. As such exposure pathways are expected to be limited to surface and soil related interactions. Potential exposure pathways for contamination may include:

- Incidental ingestion of dust
- Indirect inhalation of dust
- Dermal contact with surface soil and dust particles.

The desktop review and site walkover observations were assessed to develop a preliminary conceptual side model for the Project. The model considers whether there may be risks to the receptor (human health or ecological), either now or in the future. The assessment concluded a low risk for all receptors in the scenarios evaluated due to localised potential for contaminants in soils, the expected exposure conditions, and the future commercial/industrial land use.

Spills or leaks of hydrocarbon fuels and chemicals used in construction have the potential to further contaminate soils and / or water if not managed appropriately.

6.8.3.2 Operation

Erosion and sedimentation

During operation, runoff on the Project Site would be directed toward installed catchment drains and stormwater management infrastructure. Surfaces beneath the battery storage area and switchyard would be gravelled which would stabilise the soil and reduce the movement of sediment.

The risks to water quality during operation including proposed controls is addressed in Section 6.10.

Acid sulfate soils

Presence of acid sulfate soils within the Project Site is considered to be very low, therefore it is unlikely that operation of the Project would further disturb any acid sulfate soils.

Contamination

The Project includes the operation of a BESS and other electrical transmission infrastructure which are considered low risk in terms of the potential for contamination. The operation of the Project is not anticipated to result in contamination impacts.

Chemical hazards arising from acid or corrosive components leaking from would be mitigated by installing containment measures and through the BESS management and monitoring systems. Potential for contamination from spills and leaks from operation and maintenance would be addressed through the mitigation measures presented in the EMS.

Agriculture

The Project Site constraints for agriculture primarily relate to size of the land, the presence of existing electrical infrastructure (overhead 330 kV transmission line) and proximity to the Calala urban area.

The Project Site lot has an area of 40 hectares. The typical farm size for the North West Slopes region (which includes Tamworth, Gunnedah, Moree, Narrabri and Inverell) is 1,140 hectares which suggests that the grazing of cattle on land with an area of 40 hectares would not be sufficient to return enough profit to earn the average wage from the grazing of cattle. This is evidenced as the Project Site is currently incidentally used for cattle grazing but not used for the grazing of livestock for a commercial purpose or for cropping. The property owners do not gain their main source of income from the cattle grazing.

The land is not considered suitable for full time agriculture. Its use for a BESS would not have a detrimental impact on the agricultural capability of the land. Once the Project reaches the end of its investment and operational life, the Project infrastructure would be decommissioned and the Project returned to its pre-existing land use, namely suitable for cattle grazing, or another land use as agreed by the Project owner and the landholder at that time.

Land use

The *Land Use Conflict Risk Assessment Guide* (NSW DPI, 2011) was applied to analyse the compatibility of a change in land use as a result of the Project and potential conflict between neighbouring land uses. Neighbouring land uses are shown on Figure 2-2 and include agriculture land, the Tamworth Agricultural Institute (TAI), electrical infrastructure and rural residential.

Given some of the surrounding land uses are different to the Project, specifically agriculture, this assessment aims to identify and rank potential land use conflicts to ensure they are adequately managed. Where expected conflicts are adequately managed, the rights of the existing and proposed land uses can be protected.

As per the guide there are four key steps to undertaking a Land Use Conflict Risk Assessment (LUCRA):

1. Gather information about the proposed land use change and associated activities
2. Evaluate the risk level of each activity
3. Identify risk reduction management strategies
4. Record results

The land use change that would occur from the development of a BESS at the Project Site is based on the Project as described in Chapter 3.

The risk rankings for construction and operational impacts have been determined using the risk ranking matrix shown in Table 6-35 and in accordance with the probability table and measure consequence table in the LUCRA (NSW DPI, 2011). The matrix ranks the risk of impacts according to the probability of occurrence and the consequence of the impact.

Probability 'A' is described as 'almost certain' to probability 'E', which is described as 'rare'. The level of consequence starts at 1 – Severe to 5 – Negligible. The risk ranking from 1 to 25 is a result of the probability and consequence. For example, a risk ranking of 25 is the highest magnitude of risk.

Table 6-35 LUCRA Risk Ranking Matrix

Likelihood	Consequence				
	A	B	C	D	E
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

Based on the existing characteristics and features of the Project Site and surrounds, detailed in Section 6.8.2, and the risk matrix in Table 6-35, the risk of land use conflicts according to the probability of occurrence and the consequence of the impacts is provided in Table 6-36.

The scores in the mitigated risk rating were acceptable, demonstrating that the proposed construction and operation of the BESS would have minimal impact on the surrounding land uses and is considered manageable with implementation of mitigation measures.

Table 6-36 Hazard identification and risk control sheet

Potential conflict	Hazard	Risk Ranking	Method of Control	Revised Risk Ranking
Agriculture and residents				
Operational noise	Operational noise and associated impacts on residents	B2 = 21 Unacceptable	- Siting of the BESS to maximise distance from non-associated receivers - Noise acoustic barriers, silencers and other design solutions to meet noise criteria. - Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.	C4 = 8 Acceptable
Visual amenity	Visibility of Project infrastructure from residences and the local road network (including lighting and glare)	B3 = 17 Unacceptable	- Noise acoustic barriers and ancillary infrastructure will be coloured to reduce contrast with the surrounding landscape - Planted landscaping around the south and east sides of the BESS area and north of the ancillary infrastructure - External lighting design to be consistent with <i>AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace, Part 5: Outdoor workplace lighting</i> and <i>AS 4282-1997 Control of the obtrusive effects of outdoor lighting</i>.	D4 = 5 Acceptable
Surface water	Change to surface water flows and water quality	C3 = 13 Unacceptable	- The stormwater system will be designed to: - Collect all stormwater runoff from operational areas of the Project Site, including access tracks - Sufficiently detain stormwater runoff to ensure post-developed peak flows do not exceed existing peak flows leaving the Project Site for all design events up to the 1% AEP - Include a dedicated volume for the collection of sediment - Include a dedicated volume for stormwater reuse purposes. - Detailed design would include reviewing hydrology of the Project Site and changes as a result of the development and ensure sufficient drainage capacity, including the stormwater basin are provided to mitigate potential adverse impacts. With the implementation of the recommended mitigation measures, the Project is not anticipated to result in unacceptable impacts to water.	D4 = 5 Acceptable
Livestock	Neighbouring livestock entering premise	D2 = 14 Unacceptable	Security fence and noise wall around Project areas	E3 = 6 Acceptable

Potential conflict	Hazard	Risk Ranking	Method of Control	Revised Risk Ranking
Fire hazards / bushfire	Impacts on land surrounding the Project generated from within the development Impacts on the operation of the Project from external fires (e.g. bushfires)	C3 = 13 Unacceptable	- Controls will be implemented, including protection and suppression systems, and emergency shutdown. The Project will be largely separated from nearby residential dwellings and fire effects are not expected to have an off-site impact. Monitoring equipment will be installed to detect fire risk and initiate an emergency response. An APZ will be established around Project infrastructure in accordance with guideline requirements. - Other measures to minimise fire risks, include: - Complying with guidelines, standards, and conditions to operate in accordance with the applicable legislations as set out by government and regulating bodies - Adopting an Emergency Response Management Plan to outline the protocols and requirements for fires and other risks - Implementing a Fire Safety Study (developed with Fire and Rescue NSW) to identify, assess, and outline controls to manage on-site and off-site risks at a BESS facility	D3 = 9 Acceptable
Agricultural expansion (land opportunities)	The Project would result in the loss of a small proportion of agriculture land	C5 = 4 Acceptable	- The Project will occupy a small portion of land for the purpose of a battery. This is not a significant land requirement, and the remainder of the landholding will be retained for use for rural purposes - The Project is considered to be a temporary and reversible change in land use. Upon decommissioning the Project infrastructure will be decommissioned and the land returned to its pre-existing land use, namely suitable for the grazing of cattle, or another land use as agreed by the project owner and the landholder at that time. - Rehabilitation objectives and strategies (including performance measures) will be established in the arrangements with landowner.	C4 = 8 Acceptable
Property values	Devaluation of neighbouring properties due to proximity to Project infrastructure	D3 = 9 Acceptable	While economic analyses for the industry in relation to valuation and pricing of land is not yet existing, and there are many factors that influence land values, inference can be drawn from one key factor, which is amenity and specifically, the impacts to the amenity of neighbouring properties and the locality. The EIS and supporting technical assessments have considered potential amenity impacts from the Project. Construction impacts will be temporary in nature and are therefore considered unlikely to have a lasting impact on the amenity of the locality. The residual impacts associated with the ongoing operation of the Project (i.e. after the implementation of proposed management and mitigation measures, such as landscaping) are predicted to be minimal.	D3 = 9 Acceptable
Tamworth Agriculture Institute (TAI)				

Potential conflict	Hazard	Risk Ranking	Method of Control	Revised Risk Ranking
Noise	Noise from the BESS on livestock (sheep) grazing in adjacent paddocks and researchers undertaking field work	C2 = 18 Unacceptable	- Siting of the BESS to maximise distance from non-associated receivers - Noise acoustic barriers, silencers and other design solutions to meet noise criteria. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.	C4 = 8 Acceptable
Fire hazards	Hazardous impacts on TAI staff or activities	C3 = 13 Unacceptable	- Controls will be implemented, including protection and suppression systems, and emergency shutdown. The Project will be largely separated from nearby residential dwellings and fire effects are not expected to have an off-site impact. Monitoring equipment will be installed to detect fire risk and initiate an emergency response. An APZ will be established around Project infrastructure in accordance with guideline requirements. - Other measures to minimise fire risks, include: - Complying with guidelines, standards, and conditions to operate in accordance with the applicable legislations as set out by government and regulating bodies - Adopting an Emergency Response Management Plan to outline the protocols and requirements for fires and other risks - Implementing a Fire Safety Study (developed with Fire and Rescue NSW) to identify, assess, and outline controls to manage on-site and off-site risks at a BESS facility	D3 = 9 Acceptable

Potential conflict	Hazard	Risk Ranking	Method of Control	Revised Risk Ranking
Impacts on TAI activities	Potential for future buffer areas or easements around the BESS which may restrict the activities undertaken by NSW DPI at TAI or the establishment of new infrastructure on TAI	E2 = 10 Acceptable	- The TAI land is situated north east of the Project Site. - The site boundary is approximately 400 metres from the BESS and buildings on the Institute land are 1,600 metres from the BESS. - Given this distance no restrictions on the activities undertaken by NSW DPI at TAI or the establishment of new infrastructure on TAI are anticipated	E2 = 10 Acceptable
Impact of TAI activities on the Project	TAI activities potentially impacting the BESS (for example, dust generated from agricultural machinery)	C4 = 8 Acceptable	- Enclosed units, acoustic noise barriers - Routine maintenance and cleaning	E3 = 6 Acceptable

6.8.4 Mitigation measures

Table 6-37 summarises the mitigation measures for managing land impacts during construction and operation of the Project. Land use impacts associated with the Project would be managed through mitigation measures detailed throughout this EIS and summarised in Appendix C.

Table 6-37 Contamination and land use impact mitigation measures

ID	Mitigation Measures
Construction	
L1	A soil survey according to the Australian Soil and Land Survey Field Handbook (CSIRO, 2009) and the Australian Soil Classification (Isbell, 2021) will be undertaken to verify soil characteristics and further inform the potential for salinity, acid sulfate soils and erosion to occur.
L2	An Unexpected Contaminated Land Finds Protocol will be included in the EMS to manage any disturbance of material that is odorous, stained, or containing anthropogenic materials, in the event that these are encountered during construction. Should any unexpected finds or new information become available, reassessment of the identified issues would be undertaken by a contaminated land professional
Operation	
L3	The EMS prepared for the Project will include measures to manage any spills that occur during operation.
L4	A Rehabilitation and Decommissioning Management Plan is to be prepared in consultation with NSW DPI prior to decommissioning. The Rehabilitation and Decommissioning Management Plan will include: • Removal of all above ground infrastructure • Reverse any compaction by mechanical ripping • Verification of a safe, stable and non-polluting site

6.9 Social and economic

This section provides a summary of the potential social and economic impacts associated with the Project.

The Social and Economic Impact Assessment (SEIA) for the Project has been prepared by HillPDA and is provided in Appendix L of this EIS. Appendix A provides a summary of the relevant SEARs which relate to socio-economic impacts and where these have been addressed in this EIS.

6.9.1 Methodology

6.9.1.1 Social

The SEIA was completed in accordance with the requirements of the *Social Impact Assessment Guideline 2023* (DPE, 2023) (SIA Guideline). The assessment used the approach shown in Figure 6-14 to scope, assess, and enhance or mitigate potential positive and negative impacts that may arise from the Project.



Figure 6-14 SEIA methodology

Social impact was defined as the net effect of an activity on a community and the wellbeing of individuals and families. Social impacts may occur across a range of aspects of an individual's and a community's life as shown in Figure 6-15.

<i>way of life</i>	how people live, how they get around, how they work, how they play, and how they interact on a daily basis
<i>community</i>	composition, character, cohesion, function, and sense of place
<i>access</i>	how people access and use infrastructure, services and facilities, whether provided by local, state, or federal governments, or by for-profit or not-for-profit organisations or groups
<i>culture</i>	both Aboriginal and non-Aboriginal culture, including shared beliefs, customs, values, and stories, and connections to country, land, waterways, places, and buildings
<i>health and wellbeing</i>	physical and mental health, especially for those who are highly vulnerable to social exclusion or substantial change, plus wellbeing of individuals and communities
<i>surroundings</i>	access to, and use of, services that ecosystems provide, public safety and security, access to and use of the natural and built environment, and its aesthetic value and amenity
<i>livelihoods</i>	people's capacity to sustain themselves, whether they experience personal breach or disadvantage, and the distributive equity of impacts and benefits
<i>decision-making systems</i>	whether people experience procedural fairness; can make informed decisions; have power to influence decisions; and can access complaint, remedy and grievance mechanisms

Figure 6-15 Types of social impact

To assess the potential impacts, an assessment of the social baseline of the Project surrounds was undertaken. This included a desktop review of available information and data from the Australian Bureau of Statistics (ABS), NSW Bureau of Crime Statistics and Research, DPHI and the specialist reports prepared for the Project.

Potential impacts identified were analysed based on the nature of the impact and its predicted severity. This information was used to determine the level of significance as shown in Table 6-38. Where impacts were identified, mitigation and/or enhancement measures were identified.

Table 6-38 Level of significance adapted from the SIA Guideline

Likelihood	Magnitude				
	Minimal	Minor	Moderate	Major	Transformational
Almost certain	Low	Medium	High	Very High	Very High
Likely	Low	Medium	High	High	Very High
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

6.9.1.2 Economic

Economic activity supported by the Project was assessed through examination of four types of economic impact metrics described in Table 6-39. These metrics were assessed against direct impact and economic multipliers.

Direct impacts refer to the economic activity onsite by the Project during its construction or operational phase. Direct economic activity was based on *IBIS World 2023* world reports and *ABS Input Output tables*. Indirect economic activity was estimated using *Australian National Accounts Input Output tables 2020-21*. Specifically, the multipliers for the *Electricity Transmission in Australia and Electricity Distribution in Australia* have been applied to determine indirect economic activity. It is important to note that these multipliers generally result in an over-estimation of impacts.

Table 6-39 Economic impact metrics assessed

Metric	Description
Output	Output is a gross measure of the total sales generated by the types of land uses present on the site or in the Project
Employment	Employment generated by the types of land uses present on the site or in the Project. Employment is expressed as FTE.
Wages	The wages and salaries paid to employees on the site or in the Project
Gross Value Added	Gross value added (GVA) of an industry refers to the value of outputs less the costs of inputs. It measures the contribution that the industry makes to the country's wealth or gross domestic product (GDP).

The economic impacts were assessed for the following phases:

- **Design and construction phase** is the economic activity generated/supported through the design and construction phase of the Project. These impacts are expected to be short-term, concluding when development activity is completed.
- **Operational phase (post-construction)** is the economic activity generated/supported during and post-construction or operational phase. This phase assumes the development is occupied by the proposed land uses.

The methodology used to estimate the number of jobs was:

- Derived from the estimated development cost for the Project to identify design and construction job years
- Provided by the Proponent for operations based on previous experience in the industry.

6.9.2 Existing environment

6.9.2.1 Social baseline

The study area for the Project was defined by the *Australian Statistical Geography Standard as Tamworth – East Statistical Area Level 2 (SA2)*. Where possible, socio-economic indicators were benchmarked against the Rest of NSW GCCSA (Greater Capital City Statistical Area). The Project is located in a rural area in Kingswood approximately seven kilometres to the south of the Tamworth CBD. The extent of the Tamworth – East Statistical Area Level 2 (SA2) is also shown on Figure 6-16.

The key insights from the social baseline review are summarised below. The study area is notable for:

- A median age of 38 in 2021, which was lower than the median age of 43 for the Rest of NSW GCCSA
- A slightly smaller proportion of people in the study area (6.8 percent) spoke a language other than English at home than in the Rest of NSW GCCSA (8.4 percent)
- A larger proportion of residents born in Australia in the study area (85.2 percent) than in the Rest of NSW GCCSA (81.3 percent)

- A larger proportion of dwellings in the study area are separate houses (85.9 percent) when compared to the Rest of NSW GCCSA (82.3 percent). Meanwhile, the proportion of dwellings that are flats or apartments was significantly lower in the study area (1.6 percent) than in the Rest of NSW GCCSA (6.3 percent)
- The median weekly household income in the study (\$1,383 per week) was slightly lower than that of the Rest of NSW GCCSA (\$1,434 per week) in 2021
- Higher levels of socio-economic disadvantage (such as unemployment, proportion of lower income households, or lower education levels) are present in the study area, with no highly advantaged areas
- Minor crime hotspots were identified beyond an 800 metre radius of the Project Site within the built-up areas of Calala. Further review of crime data revealed that crime rates in Calala (SAL) were generally much lower than the rates for the LGA. It is considered very unlikely that the Project would have an impact on crime rates within the locality
- Due to its location within a rural setting, there is limited social infrastructure in proximity to the Project Site with no social infrastructure facilities being available within an 800 metre radius of the Project Site. The nearest social infrastructure facility is a local park situated approximately 1.5 kilometres to the north of the Project Site in Calala. Due to the sufficient distance provided between the Project Site and the nearest social infrastructure facilities, it is considered unlikely that they would be impacted by the Project
- There is limited public transport access to the Project given its location within a rural area. Given the infrequent nature of the bus services and the approximate 30 minute walk from the bus stops to the Project Site, it is considered unlikely workers or other personnel would travel to the Project Site via public transport
- Data from the *Australian Accommodation Monitor for the 2022-23 Financial Year* indicates that there is availability within local accommodation to meet construction workforce demands, however this availability may not be evenly distributed over the year or spatially within the region. Tamworth has significant demand for tourism accommodation at certain times of year, particularly for annual multi-day events such as the Tamworth Country Music Festival and Taste Tamworth
- Two SSDs for similar BESS projects have been identified in close proximity to the Project Site. This includes the Calala Battery Energy Storage System (SSD-52786213) (in assessment stage) and Tamworth Battery Energy Storage System (SSD-23830229) (currently on exhibition), are located within 800 metres of the Project Site. These proposals could potentially contribute to cumulative social impacts if they are constructed concurrently, such as through impacts to amenity, increased vehicular movements, and an increase in the local worker population.

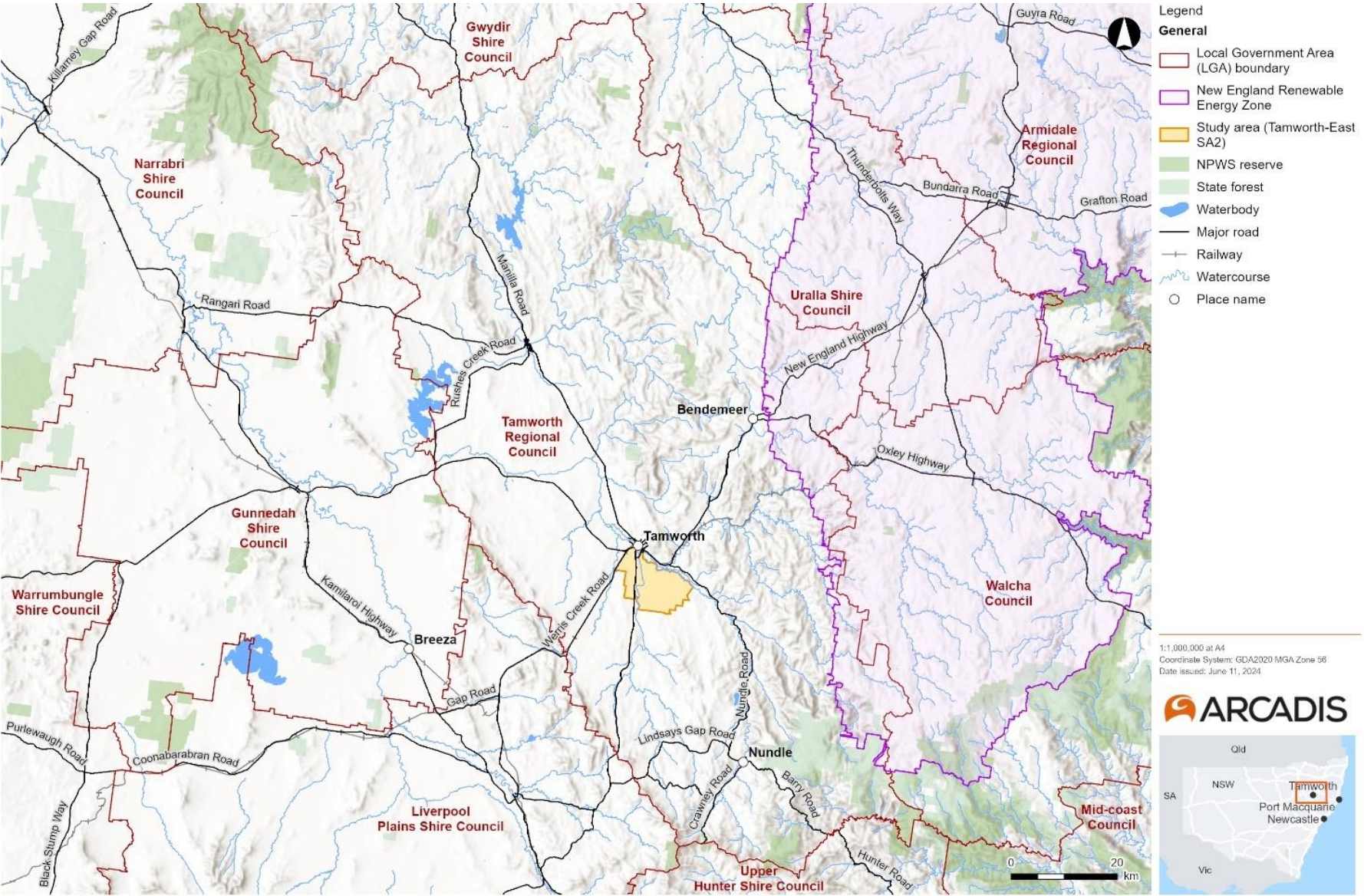


Figure 6-16 Study area

6.9.2.2 Economic base case

Use of the Project Site for agriculture uses is primarily constrained by its size, existing electrical infrastructure (overhead 330 kV transmission line) and proximity to the Calala urban area.

The typical farm size for the North West Slopes region (which includes Tamworth, Gunnedah, Moree, Narrabri and Inverell) is 1,140 hectares. The Project Site's size of 40 hectares suggests use for cattle grazing would not provide a sufficient return to be economically attractive/viable. This is evidenced by the fact that the Project Site is currently incidentally used for cattle grazing but not for livestock grazing for a commercial purpose or for cropping. The property owners do not gain their main source of income from cattle grazing.

As such, the economic activity currently generated onsite is considered negligible, with any economic activity generated by the Project being a net benefit and higher economic outcome for the land.

6.9.3 Potential impacts

6.9.3.1 Social

Activities associated with the construction and operation of the Project have the potential to be disruptive to the day-to-day lives of residents, workers, visitors and businesses in the surrounds. The social impacts from the Project that may arise are influenced by:

- The social and geographic context of the Project Site
- The construction process, final built form, and operations of the Project
- Any measures put in place to mitigate against identified negative impacts and enhance positive impacts.

An evaluation of the potential social impacts and the proposed mitigation response during the construction and operation phase is provided in Table 6-40. The SEIA concluded that the Project can be effectively mitigated through the implementation of a range of measures, as documented throughout this EIS and summarised in Appendix C.

Table 6-40 Social impact evaluation and mitigation

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
Construction				
Way of life	Additional construction vehicle movements may increase congestion on surrounding roads, impacting way of life, access and livelihoods for surrounding residents, workers, and businesses.	Low	Implement CTMP (mitigation measure T1).	Low
	Impacts to surrounding properties from changed access during construction, potentially affecting way of life and access.	Low		Low
Community	Impacts through additional funding for community initiatives	Low	Implement Community Enhancement Fund to support very localised and meaningful community and environmental initiatives that have strong resident and broader community support, throughout the life of the Project would be developed (mitigation measure SE5).	Medium (positive)
Access	Potential changes to access for neighbouring properties during construction, negatively impacting on accessibility.	Low	Implement CTMP (mitigation measure T1).	Low
	Greater demand on local services and infrastructure associated with an increase in population of workers during construction, impacting on access.	Low	Review opportunities for shuttle bus to facilitate construction worker travel (mitigation measure T3).	Low
	Additional demand for accommodation arising from additional short term construction workers potentially reducing short-term access to accommodation	High	Implement a Local Procurement Strategy to prioritise local jobs and businesses and reduce the potential for adverse impacts on local accommodation availability. The Strategy will include an outline of workforce staging and accommodation demands (mitigation measure SE1). Implement a process for monitoring the timing and location of other developments within the vicinity of the Project. Encourage a collaborative effort and take a flexible and iterative approach to ensure the best outcomes (mitigation measure CU1).	Medium
Culture	Potential impact on community and culture through fear of impacts to Aboriginal cultural heritage sites during construction.	Medium	Implement unexpected finds protocols to be implemented in the unlikely event that Aboriginal objects, human remains, or items	Low

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
	Potential impact on local cultural values through fear of impacts to historical cultural heritage sites during construction.	Low	of heritage are discovered during construction or operation (mitigation measure H2).	Low
Health and wellbeing	Noise and vibration from construction activity may negatively affect amenity for residents, workers and businesses surrounding the Project Site, impacting upon quiet enjoyment of surroundings, way of life and health and wellbeing.	Low	Review and update CNVMP prior to commencement of construction. The Plan will identify feasible and reasonable approaches to reduce noise and vibration impacts during construction of the Project (mitigation measure NV3).	Low
	Dust from construction activity could cause a decline in air quality, potentially impacting the amenity of surroundings and health and wellbeing of neighbouring residents and workers.	Medium	Implement EMS which will outline air quality controls to be implemented during construction (mitigation measures AQ1 to AQ8)	Low
Surroundings	Temporary changes to the surroundings during the construction phase.	Medium	Implement EMS (mitigation G1) and Community and Stakeholder Management Plan (mitigation measure SE4)	Medium
Livelihoods	Additional employment opportunities on site arising from construction activity (direct and indirect) positively impacting livelihoods.	High (positive)	Implement Local Procurement Strategy to prioritise local jobs and businesses wherever possible (mitigation measure SE1)	High (positive)
	Expenditure by construction workers while resident in the region.	High (positive)	Engage with local business/tourism to supply information to construction workers with information on local services for shopping and dining options during construction (mitigation measure SE3)	High (positive)
Decision making systems	Potential feeling of powerlessness or lack of means to have input or say on the Project during construction for surrounding properties and the wide community, negatively impacting decision-making systems.	Medium	Implement Community and Stakeholder Management Plan (mitigation measure SE4)	Low
Operation				

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
Way of life	Noise emissions from the operation of the facility could potentially impact residents, workers, and businesses (on site and surrounding) enjoyment of surroundings, way of life and health and wellbeing.	Low	Noise modelling will be undertaken for the preferred supplier to verify compliance with the Project specific noise criteria and design noise mitigation measures to be implemented (mitigation measure NV1) The EMS will include measures and processes for managing noise resulting from the operation of the Project, including a process for managing complaints (mitigation measure NV7)	Low
Community	Potential impacts to local character associated with the construction and operation of the Project in a rural area.	Low	Use of materials that integrate with the surrounding landscape (such as suitable colours and finishes) and cut off and direct light fitting to minimise glare and light spill (mitigation measure V1 and V2) Implement landscape plan (mitigation measure V3)	Low
Health and wellbeing	Potential for fire to start at the Project Site with the potential to spread off-site, increasing risks to the health and wellbeing of surrounding workers and residents.	Medium	Implement Fire Safety Study to identify measures to eliminate the expansion of any fire incident (mitigation measure HR2) Implement bushfire related mitigation measures including APZ, access, water supply and emergency management plan (mitigation measures BR1-BR5).	Low
	Potential for water contamination to start at the Project Site with the potential to spread off-site, increasing risks to the health and wellbeing of surrounding workers and residents.	Medium	Water management infrastructure will be designed in consultation with TRC, with consideration to the TRC DCP 2010, relevant Australian Standards and will include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge (mitigation measure W3). The EMS for the Project will include a management and maintenance schedule to ensure that stormwater management system devices are regularly inspected and maintained (mitigation measure W6).	Low

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
Surroundings	Potential impacts to the surroundings (and community) for local residents through visual impacts and changes to visual amenity associated with the Project.	Low	Use of materials that integrate with the surrounding landscape (such as suitable colours and finishes) and cut off and direct light fitting to minimise glare and light spill (mitigation measure V1 and V2) Implement landscape plan (mitigation measure V3)	Low
	Broader benefits to the surrounding environment from reduced emissions.	Low (positive)	N/A	Low (positive)
Livelihoods	Potential fears and anxieties surrounding the perceived impacts of the Project on property values, impacting on livelihoods.	Medium	Implement mitigation measures outlined in Appendix C (particularly in relation to noise, visual and hazard) Implement Community and Stakeholder Management Plan (mitigation measure SE4)	Low
Decision making systems	Potential feeling of powerlessness or lack of means to have input or say during operations, negatively impacting decision-making systems.	Low	Implement Community and Stakeholder Management Plan (mitigation measure SE4)	Low

6.9.3.2 Economic

Construction

During its construction, the Project would generate and support economic activity at the regional (Tamworth LGA) and State level. The Project is estimated to directly increase Tamworth LGA's economic output by around \$124.9 million. This new economic output would support an additional \$234.7 million in economic output across NSW. In total, the forecast increase in output generated supported across NSW as a whole is estimated at approximately \$360 million (directly and indirectly).

The construction phase of the Project is expected to require up to 100 construction personnel. Based on the economic multiplier methodology, job years have been calculated based on the estimated development cost and equal one full-time job over one year.

The economic outputs during the construction phase are summarised in Table 6-41

Table 6-41 Construction phase economic impact summary

Performance indicator	Regional direct (new) impact	Impact supported across NSW	NSW whole impacts
Output (\$m)	\$123,900,000	\$235,000,000	\$360,000,000
Employment (job years)	271	730	1,001
Remuneration (\$m)	\$22,000,000	\$57,000,000	\$79,000,000
Gross value added (\$m)	\$39,000,000	\$110,000,000	\$149,000,000

Operation

It is estimated that upon operation of Project, the Project would directly generate two new FTE jobs. The net increase in economic activity supported on the Project Site during the operation phase is summarised in Table 6-42

Table 6-42 Operation phase net economic impact summary

Impact metric	Direct	Indirect	Total
Employment (FTE)	2	11	13
Gross output (\$/annum)	\$1,000,000	\$1,600,000	\$2,600,000
Remuneration (\$/annum)	\$200,000	\$600,000	\$800,000
Gross value added (\$/annum)	\$800,000	\$1,800,000	\$2,600,000

The Project will provide a range of long-term economic benefits contributing to a more resilient, efficient, and sustainable energy system, including:

- Grid stability and reliability
 - The Project will help balance supply and demand by storing excess energy during periods of low demand and releasing it during peak demand, enhancing grid stability
 - The Project will provide rapid response services to maintain grid frequency, reducing the need for expensive and less efficient conventional energy sources to operate for frequency regulation.
- Grid deferral and infrastructure savings
 - The Project will help defer the need for grid infrastructure upgrades by providing localised energy storage solutions, reducing the strain on the grid during periods of high demand.
- Backup power and resilience.
 - The Project will provide backup power during grid outages minimising economic losses due to downtime.
- Job creation and economic growth

- The Project will contribute to the regional economy in the form of annual direct and indirect purchases. The construction phase of the Project is expected to require up to 100 construction personnel (and associated job years), the majority of which are expected to be generated in Tamworth and surrounding regions.

6.9.4 Mitigation measures

Table 6-43 summaries the mitigation measures for managing social and economic impacts during construction and operation of the Project.

Table 6-43 Social and economic mitigation measures

ID	Mitigation Measures
Construction	
SE1	A Local Procurement Strategy will be implemented to prioritise local jobs and businesses wherever possible. The Local Procurement Strategy will: • Encompass considerations regarding local employment and procurement (with a specific focus on First Nations participation) and the associated accommodation of the construction workforce • Target people and businesses within Tamworth LGA and regional surrounds • Continue to consult with stakeholders such as the TRC, Department of Regional NSW, Tamworth Business Chamber and other economic development or local social service agencies.
SE2	An outline of the planned workforce staging, and likely material requirements will be communicated to the broader local business community to allow local supply chains to plan for potential surges in need for goods and services as part of broader engagement with local business (Local Procurement).
SE3	Engagement will be undertaken with local business/tourism bodies to obtain information on local tourism, dining and service offering to supply construction workers with information on local services for shopping and dining options during construction.
SE4	A Community and Stakeholder Management Plan will be prepared and implemented in line with <i>Undertaking Engagement Guidelines for State Significant Projects</i> (DPE, 2022). The plan will provide procedures for: • Informing stakeholders of potential impacts • Providing project-related updates • Registering and responding to complaints and feedback.
Operation	
SE5	A Community Enhancement Fund to support very localised and meaningful community and environmental initiatives that have strong resident and broader community support, throughout the life of the Project will be developed. Iberdrola is committed to establishing a benefit sharing scheme such as a fund for community-based projects. The details of the benefit sharing scheme are yet to be determined but will likely be managed through a committee comprising representatives from Iberdrola, TRC and the local community. This has been discussed with TRC but requires further development in partnership with the community and key stakeholders.

6.10 Water

This section provides a summary of the potential water quality, flooding, groundwater and water use impacts.

The Water Impact Assessment (WIA) for the Project has been prepared by Arcadis is provided in Appendix M of this EIS. Appendix A provides a summary of the relevant SEARs which relate to water and where these have been addressed in this EIS.

6.10.1 Methodology

6.10.1.1 Government plans, policies and guidelines

The Water Assessment was prepared with reference to the following legislation, policies and guidelines:

- *Water Management Act 2000*
- *Protection of the Environment Operations Act 1997*
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021*
- *Australian Rainfall and Runoff* (Commonwealth of Australia, 2019)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000)
- *Flood Risk Management Manual* (State of NSW and DPE, 2023)
- *Managing Urban Stormwater: Soils and Construction – Volume 1*, commonly known as the ‘Blue Book’ (Landcom, 2004)
- *Storing and Handling liquids: Environmental Protection: Participant’s Manual* (DEC, 2007)
- *Tamworth Regional Development Control Plan (DCP) 2010*
- *Liquid Chemical Storage, Handling and Spill Management: Review of Best Practice Regulation* (DEC, 2005)
- *Tamworth City Wide Floodplain Risk Management Study* (HydroSpatial, 2023)
- *Tamworth City Wide Flood Investigation* (Lyll & Associated, 2019)

6.10.1.2 Approach

A desktop review and site inspection on Tuesday 23 January 2024 was undertaken to review potential water quality, flooding and water use impacts. The assessment included:

- Review of legislation, policies and guidelines
- Review of topography, climate, hydrology, hydrogeology and existing water quality
- Identification of potential risks in relation to flooding, water sourcing and security, surface water quality and groundwater.

6.10.2 Existing environment

6.10.2.1 Climate

Climate data was sourced from the BoM website for the Tamworth Airport automatic weather station (AWS number 055325). The weather station is located 14 kilometres northwest of the Project Site and is currently operational. Data has been collected since 1992 (a 32 year period).

The average total annual rainfall over this 32 year period was 649 mm. The monthly variation in average rainfall and temperature is shown below in Figure 6-17. Rainfall occurred on an average of 61 days of the year with April and May being the driest months.

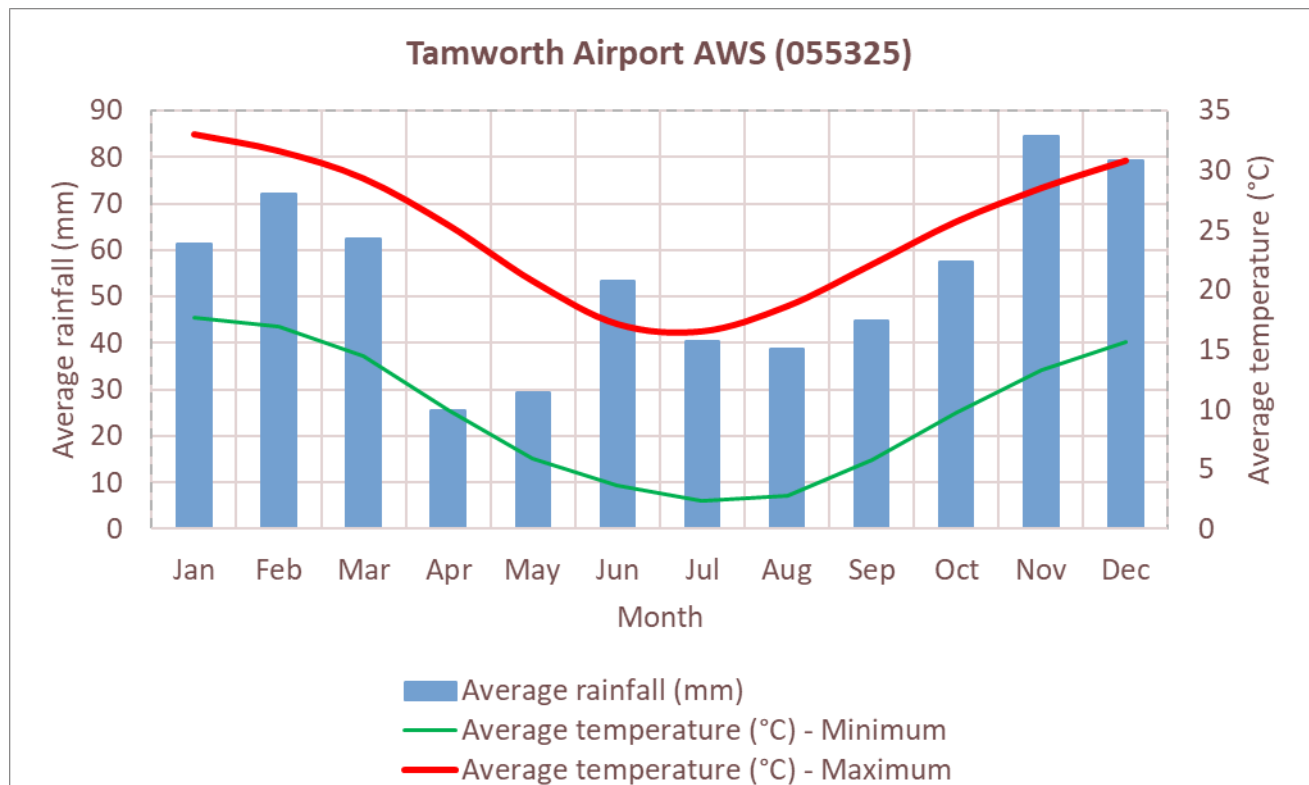


Figure 6-17 Tamworth climate statistics

6.10.2.2 Land use

The existing Project Site and immediately surrounding properties are large rural blocks of cleared grazing land bounded by wire fencing. The ground cover is long grasses with unsealed gravel roadways bordering the Project Site. A few isolated patches of vegetation and trees are present within the Project Site. A residential house and several sheds are located along the western edge of the Project Site and are accessed via a dirt driveway. Livestock graze within the Project Site. Two overhead transmission lines cut through the Project Site as shown in Figure 2-2.

6.10.2.3 Water and sewer supply

The Project Site is not serviced by any mains water or sewer connection. No new connections are proposed as part of the Project.

6.10.2.4 Soils

The soil runoff potential and erosion hazard has been reviewed based on the Blue Book (Landcom 2004). The following soils landscapes were identified for the Project Site based on the Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Tamworth Sheet:

- Fullwoods Hill (fh) – erosional: located in the higher elevations of the Project Site
 - complex soils; localised engineering hazard; inherent erosion risk; localised poor moisture availability; localised known recharge area; localised rock outcrop; shallow soils; sheet erosion risk. Soil materials have localised low wet strength; organic topsoils; high erodibility; hardsetting topsoils; and low permeability.
- Duri (du) – residual: located in the lower elevations of the Project Site
 - Complex soils; localised dieback; localised poor drainage; localised engineering hazard; gully erosion risk; inherent erosion risk; localised permanently high watertables; localised known discharge and recharge area; localised high run-on; localised dryland salinity; localised seasonal waterlogging; localised shallow soils; sheet erosion risk; localised wind erosion risk (under traditional cultivation). Soil materials have localised low

wet strength; organic topsoils; stoniness; localised sodicity; localised high structural decline hazard; erodibility; localised hardsetting surfaces; and low permeability.

Sheet erosion is common to these soil landscape. The erosion hazard is considered low for a grazing land with sheet flow and increases to a high hazard for concentrated flows. Based on the typical slopes for the Project Site the potential erosion hazard was generally found to be low.

6.10.2.5 Topography and hydrology

A review of the Project Site topography has been undertaken based on the one metre 2022 digital elevation model data covering the Project Site, 10 metre contour data for the region and hydroline spatial data sourced from the NSW Government Spatial Services.

The Project Site is located along a ridgeline running north to south near the western lot boundary. The majority of the Project Site falls towards the east with elevations ranging from 460 metres AHD at the ridge in the southwest to 420 metres AHD in the northeast. A small area of the Project Site along the western boundary falls from the ridgeline to the north-west. The Project Site is steepest near the ridgeline with grades around 1:7 flattening out to less than 1:25 for the majority of the Project Site.

The majority of stormwater runoff from the Project Site area would drain east across similar rural properties to Calala Creek approximately 800 metres downstream of the Project Site. Stormwater runoff from a small portion of the Project Site would drain northwest to Goonoo Goonoo Creek approximately 1.3 kilometres downstream. No ephemeral watercourses are noted within or immediately downstream of the Project Site. Both Calala Creek and Goonoo Goonoo Creek drain north approximately six to seven kilometres to the Peel River at Tamworth which ultimately drains to the Namoi River located within the northern basin area of the Murray-Darling Basin.

Similar to other grazing land in the area, small surface channels with parallel downstream bunds have been cut along the contours of the Project Site to manage stormwater runoff. No other formal drainage infrastructure, including farm dams, are present within the Project Site. Downstream of the Project Site stormwater is expected to collect and be conveyed alongside overgrown roadside swales. Several minor cross drainage structures (circular culverts) are located beneath the roadways bordering the Project Site to convey flows to the downstream.

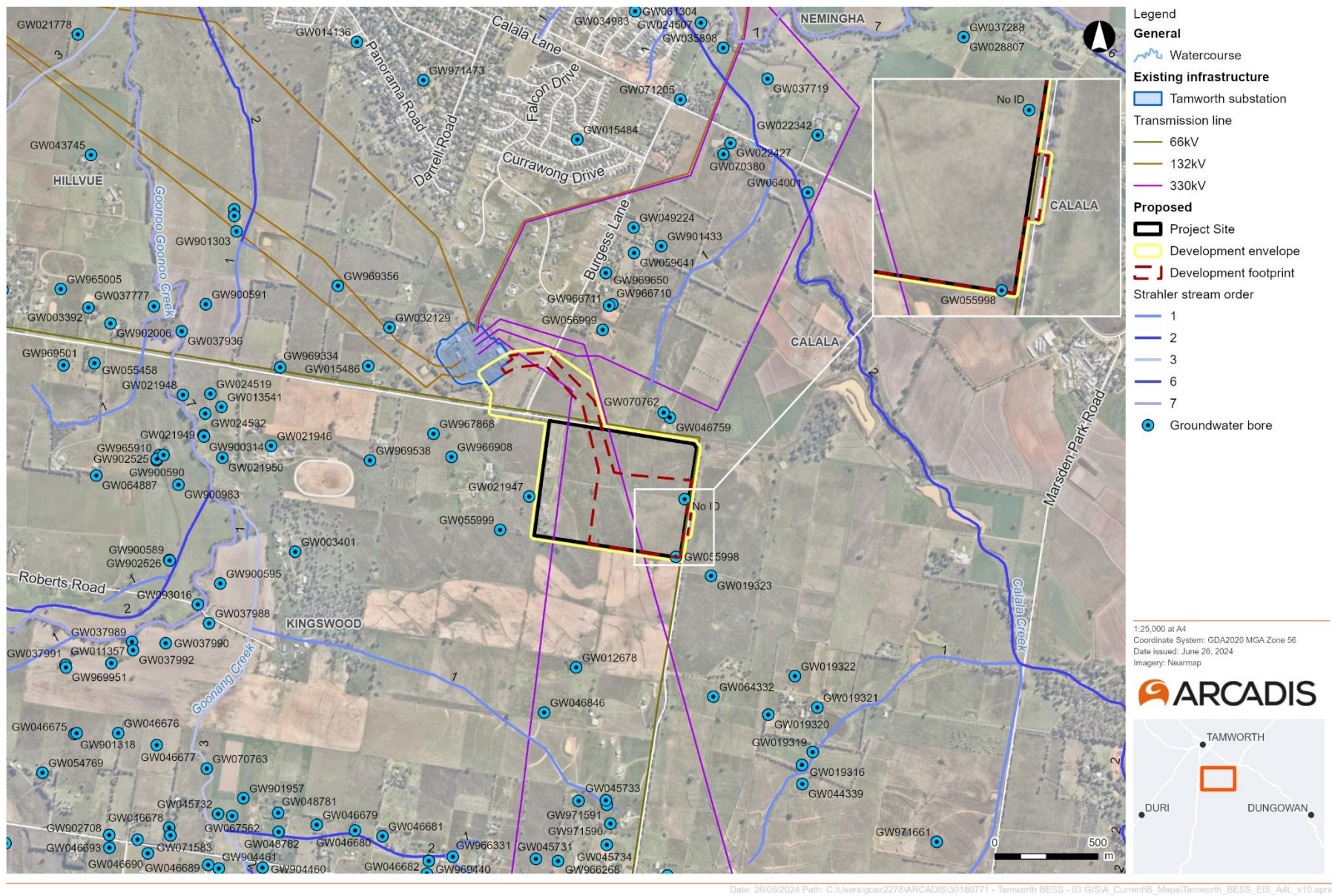


Figure 6-18 Watercourses and groundwater bores

6.10.2.6 Flooding

The Project Site was not identified as being subject to flood-related development controls or within the flood planning area in the *Floodplain Risk Management Study* (HydroSpatial, 2023) or *Tamworth City Wide Flooding Investigation* (Lyll & Associated, 2019). The Project Site is beyond the mapped extent for flood affected land as outlined in the TRC DCP 2010.

6.10.2.7 Water quality

The Project Site is located downstream of the Chaffey Dam along the Peel River which supplies water to the city of Tamworth. As such, flows and water quality along the Peel River are impacted by dam operations.

No known water quality monitoring data is available for the Project Site or immediate downstream areas. Water quality monitoring results for stations along the Peel River were included in the *Namoi Valley Annual Surface Water Quality Report 2021-2022*. For this period, flooding was the main driver for water quality across the Namoi Valley given the heavy rainfall experienced from December 2021 through to March 2022. The water quality scores for the Peel River stations are provided in Table 6-44. The Peel River downstream of Chaffey Dam also had a red alert warning for blue-green algae during the January to February 2022 period.

Table 6-44 Peel River water quality scores

Water Quality Monitoring Station	Station Number	Latitude/ Longitude	Location	Water Quality Score (2021-2022)
Peel River upstream of Paradise Weir	419024	-31.100560 150.938627	Upstream of Goonoo Goonoo Creek and Calala Creek confluences	73 Moderate
Peel River at Carrol Gap	419006	-30.938601 150.529189	Approx 55 kilometres downstream of Tamworth	49 Poor

6.10.2.8 Groundwater

There are 41 groundwater bores located within a one kilometre radius of the Project Site. These are used predominantly for water supply and irrigation purposes. Standing water level data was available for five of the groundwater bores. The reported water level ranged from four metres AHD to 27.6 metres AHD.

Based on the location of the surface watercourses and Project Site topography, the inferred groundwater flow direction at the Project Site is considered likely to be towards the northeast. The aquifer is considered to be porous, extensive and of high productivity. There are two existing bores located within the Project Site along the eastern property boundary (Figure 6-19).



Figure 6-19 Existing groundwater bores within the Project Site (left - GW055998, right - no known ID)

6.10.3 Potential impacts

6.10.3.1 Construction

Water sources and demand

A potable water source would be required for workforce consumption (drinking water), fire suppression and for making concrete. Water consumption demand is estimated to be up to one kilolitre per day (based on 10 litres/person/day). A fire suppression water tank of 20 kilolitres, would be required. Potable water supply would be required to initially fill the tank, but also in the unlikely event of an emergency a top-up.

Dust suppression of active disturbed areas would be required throughout construction and would primarily occur on days with no rain (304 days/year on average). Active disturbed areas would be minimised through construction staging and erosion and sediment control planning, including consideration of chemical suppressants to reduce dust generation and associated water demands.

Water sources appropriate for the specific water usage and demand volumes would be employed. The likely water sources that would be confirmed by the contractor include:

- Reuse of captured rainwater and stormwater runoff within rainwater tanks and temporary / permanent stormwater infrastructure
- Arrangement with the local utility (TRC) to utilise the Tamworth town water supply network
- Use of the existing groundwater bore (GW055998) or construction of a new water supply bore within the Project Site.

Details of the construction staging would be finalised during detailed design and appointment of the contractor, however, are anticipated to be typical for civil projects of this nature and size.

During detailed design and construction staging, a detailed construction water balance would be developed to ensure the works are phasing appropriately such that water can be sourced in the required quantities. Where a shortfall is identified, the phasing would be adjusted. Following implementation of these proposed mitigation measures no residual impact to water sourcing is anticipated for the Project.

Surface water quality and quantity

Construction activities with the potential to impact the surface water quality and quantity of the downstream environment associated with the Project construction include:

- Alteration of the topography of the Project Site
- Vegetation clearing
- Concentration of surface water flows
- Use of water for construction activities such as dust suppression
- Stockpiling of materials
- Spills or leaks of substances such as oil, hydraulic fluids and fuels
- Waste materials from construction activities
- Movement of vehicles and equipment.

The risk of construction activities impacting water quality, flood risk or water quantity is increased when in proximity to areas such as concentrated overland flow paths and construction compound areas where stockpiling of materials and equipment occurs. Off-site changes to flooding, overland flow, water quality (including spills of stored materials and fuels), erosion and sedimentation could occur downstream during construction.

Prior to construction, a Soil and Water Management Plan (SWMP) and Erosion and Sediment Control Plan (ESCP), or equivalent, would be incorporated into the EMS for the construction of the Project. The SWMP and ESCP would be developed in accordance with the principles and requirements of the Blue Book (Landcom 2004). The ESCP would be progressively updated to reflect the changing nature of the Project Site as construction activities progress.

Potential residual risks and impacts are considered minor and manageable for a Project of this scale with implementation of the EM the SWMP and ESCP and the short term and temporary nature of construction works.

Flooding

Access to the Project Site may be impacted should flooding occur along Goonoo Goonoo Creek at Whitehouse Lane or Burgmanns Lane. The CTMP and Emergency Management Plan for the Project would detail the alternative route to be used in consultation with stakeholders during the detailed design of the Project.

Groundwater

As identified in Section 6.10.2, 41 groundwater bores are located within a one kilometre radius of the Project Site. While exact details of the final design layout and foundation requirements are to be developed during detailed design, it is likely that works would include some surface excavation to permit slab installation and foundations as well as trenching to install services (such as the transmission connection). It is unlikely that depths of any earthworks would exceed four metres of depth below the ground level and, accordingly, interaction with the local aquifer is not anticipated.

6.10.3.2 Operation

Water sources and demand

During operation, minor water requirements are anticipated for on-site facilities, maintenance, or to maintain volumes for fire-water management. Water would be trucked in as required. No impacts to water sources during operation are predicted on this basis.

Surface water quality and quantity

Without mitigation measures, changes to the topography, ground cover and overland flow paths of the Project Site may increase stormwater runoff volumes and peak flows leaving the Project Site. This may lead to erosion and sedimentation and reduced flood immunity/worsening flood conditions downstream.

Pollutants of concern would include typical stormwater pollutants such as gross pollutants (litter and small vegetation/debris), sediment (in the form of increased total suspended solids (TSS) loads / concentrations) and nutrients (in the form of increased total nitrogen (TN) and total phosphorous (TP) loads/concentrations).

The battery and transformer units would be fully enclosed without the generation of leachate or other process wastewaters. Notwithstanding this, handling of materials that pose enhanced water quality risks would occur, although infrequently, during the Project's operation. Other Project specific pollutants and contaminants of concern would include:

- Hydrocarbons and oil/grease associated with the handling of fuels and hydrocarbons
- Chemical hazards and oil leakage from Project infrastructure
- Exposure of materials during catastrophic conditions (e.g., battery fires).

Detailed design water quality control infrastructure would be developed following final product specification based on the selected Project supplier. The overarching design and development of infrastructure and engineered control during detailed design would include:

- Ongoing consultation with TRC on required water control controls to manage general risks associated with increases in impervious areas. Infrastructure would be developed with consideration to Appendix A of the TRC DCP 2010.
- Design of oil-water management controls within the on-site BESS substation to consider relevant Australian Standards, as well as any requirements of electricity distributors
- Design of stormwater infrastructure would include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge.

The existing stormwater management infrastructure within and immediately downstream of the Project Site would be maintained where feasible. This includes the small surface channels/bunds, roadside swales and minor cross drainage culverts. Additional channels/bunding would be used to divert stormwater runoff around the operational areas to the downstream as needed. Level spreaders and/or scour protection measures would be employed where required to manage impacts of concentrated flows.

Within the Project Site, stormwater runoff would be collected in surface drains and conveyed to a surface stormwater basin/s for retention, detention and water quality treatment. Where appropriate, the stormwater basin/s may function as temporary sediment basins during the construction period.

The basin/s would be designed as a wet basin to retain stormwater for on-site reuse (e.g. dust suppression), with a dedicated volume for collected sediment. The basin/s would have a sufficient volume to mitigate peak stormwater flows leaving the Project Site to existing conditions up to the 1% AEP design event.

The detailed design would meet applicable Australian standards and guidelines and align with the TRC DCP 2010 where appropriate. Project infrastructure would be elevated above flood levels in accordance with applicable industry standards and guidelines. For the batteries and electrical equipment these would be elevated above the 1% AEP flood level as a minimum

With implementation of the above, the Project is not anticipated to result in unacceptable risks with relation to surface water quality, flood risk and quantity. Appropriate management plans, such as an Operational Water Management Plan and Emergency Management Plan would be embedded in the EMS to monitor and manage operational water during routine and emergency scenarios.

Groundwater

Once operational, no ongoing interaction with groundwater is anticipated. Installation of the battery pad, BESS substation and associated infrastructure is anticipated to reduce the quantity of infiltrating water which may have otherwise interacted with the ground surface. No ongoing monitoring of groundwater for operation of this project is proposed on this basis.

6.10.4 Mitigation Measures

Mitigation measures can be implemented during the design and construction phases of the Project to avoid, minimise, mitigate and/or manage the potential impacts. These include adequate consideration of the stormwater management strategy in the design, the staging and timing of construction work to limit the disturbance of areas and avoid wet weather periods, best practice erosion and sediment control procedures and undertaking ongoing inspection and monitoring of activities to identify and rectify issues.

Table 6-45 summarises the mitigation measures for managing waters impacts during construction and operation of the Project.

Table 6-45 Water mitigation measures

ID	Mitigation
Detailed Design	
W1	A construction water balance will be undertaken to confirm the water requirements and ensure sustainable access to water sources.
W2	Excavations will be limited to depths above the observed groundwater levels. Where deeper excavation is required, the groundwater assessment will be reviewed.
W3	The overarching design and development of infrastructure and engineered control during detailed design will include: • Ongoing consultation with TRC on required water quality targets and water controls to manage general risks associated with increases in impervious areas. Infrastructure will be developed with consideration to Appendix A of the TRC DCP 2010. • Oil-water management controls within the BESS substation will be designed to consider relevant Australian Standards, as well as any requirements of electricity distributors • Stormwater infrastructure will be designed to include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge.
Construction	
W4	A Soil and Water Management Plan (SWMP) and Erosion and Sediment Control Plan (ESCP) will be developed to manage potential water impacts during construction. The ESCP will be developed in accordance with the principles and requirements of the Blue Book (Landcom 2004).
W5	Flood emergency response protocols will be prepared and implemented to address the potential for access routes to be affected by road closures during flood events.
Operations	
W6	The EMS for the Project will include a management and maintenance schedule to ensure that stormwater management system devices are regularly inspected and maintained.

6.11 Waste

This section includes a preliminary waste management plan to identify, quantify and classify the likely waste streams to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Appendix A provides a summary of the relevant SEARs which relate to waste and where these have been addressed in this EIS.

6.11.1 Purpose

This preliminary waste management plan (WMP) has been developed to mitigate and manage potential waste impacts as from the Project. The WMP would form part of the EMS for the Project and would be reviewed and updated prior to the commencement of construction.

6.11.2 Legislation and guidelines

The WMP has been prepared with reference to the following legislation, standards and guidelines:

- POEO Act (NSW)
- POEO (Waste) Regulation 2014 (NSW)
- *Dangerous Goods (Roads and Transport) Act 2008*
- Dangerous Goods (Road and Transport) Regulation 2014
- *Waste Avoidance and Resource Recovery (WARR) Act 2001 (NSW)*
- *Hazardous Waste (Regulation of Exports and Imports) Act 1989*
- National Environment Protection Measure (NEPM) (Movement of Controlled Waste between States and Territories) 1998
- *NSW Waste Classification Guidelines* (EPA 2014)
- *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021* (EPA 2014)
- *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)
- Australian Code for the Transport of Dangerous Goods by Road or Rail (ADG).

6.11.3 Roles and responsibilities

The proposed EMS for the Project would outline key roles and responsibilities for both the Proponent and the Project Contractor working on the Project. Typical roles include:

- Project Contractor roles such as Environmental Advisor, Site Superintendent and Contractor Staff
- Proponent roles such as Project Manager, Environmental Managers and Supervisors.

6.11.4 Waste classification

The Waste Classification Guidelines provide a framework for the classification of waste streams that pose similar risks to the environment or human health. The classes of waste are defined in Schedule 1 of the POEO Act and inform the classification process within the Waste Classification Guidelines. The waste classifications are summarised in Table 6-46.

Table 6-46 Waste classification descriptions

Waste classification	Definition
Special waste	Waste that has unique regulatory requirements, for example, asbestos waste, waste tyres, anything classified as special waste under an EPA gazettal notice.
Liquid waste	Waste (other than special waste) that 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, or is classified as being a liquid under an EPA gazettal notice.
Hazardous waste	Waste (other than special or liquid waste) that has been pre-classified by the EPA as 'hazardous waste', including dangerous goods classed under the Transport of Dangerous Goods Code (Class 1 to Class 8). For example, coal tar, lead-acid or nickel-cadmium batteries and lead paint waste.

Waste classification	Definition
General solid waste (putrescible)	Waste (other than special, liquid or hazardous waste) that has been pre-classified by the EPA as 'general solid waste (putrescible)'. This waste includes household waste, waste from litter bins collected by council, manure, animal waste, grit or screenings from sewerage treatment systems that have been dewatered, or a mixture of these.
General solid waste (non-putrescible)	Waste (other than special, liquid, hazardous or general solid waste (putrescible) waste) that has been pre-classified by the EPA as 'general solid waste (non-putrescible)'. This includes, for example, glass, plastic, rubber, plasterboard, ceramics, bricks, concrete, metal, paper, cardboard, household recyclable waste that does not include food waste, garden waste, wood waste, virgin excavated material, building or demolition waste, asphalt waste, cured concrete.

6.11.5 Waste hierarchy

The construction and operation of the BESS would generate waste from a variety of sources and activities. Waste would be managed where feasible, in accordance with the hierarchy of priorities for the efficient use of resources, which is consistent with the objectives of the WARR Act.

The waste hierarchy is displayed in Figure 6-20 and is as follows (EPA, 2022):

- **Avoidance:** Including action to reduce the amount of waste generated by households, industry, and all levels of government
- **Resource recovery:** Including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
- **Disposal:** Including management of all disposal options in the most environmentally responsible manner.

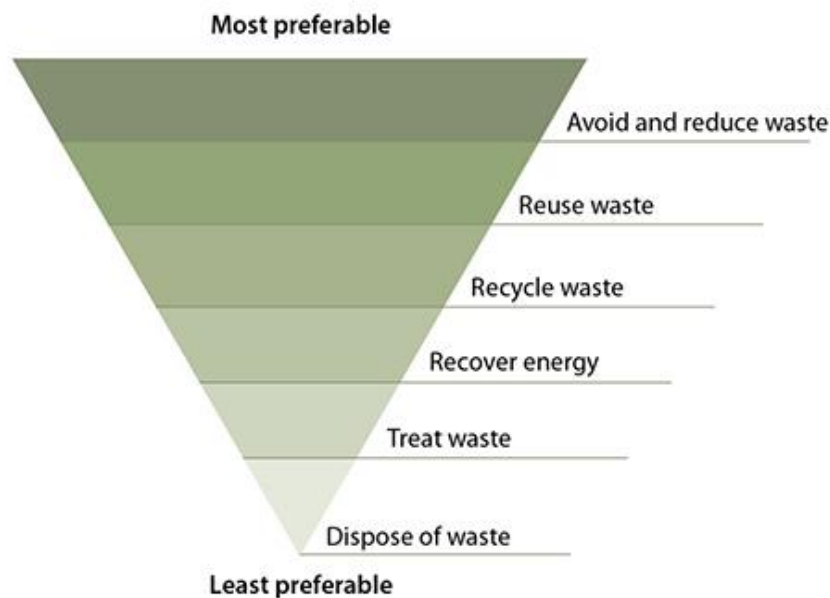


Figure 6-20 Waste hierarchy

6.11.6 Likely waste streams and proposed management

Types of waste generated for construction and operation of the Project is presented in Table 6-47.

Table 6-47 Estimates of waste streams generated during construction and operation

Waste Type	Description	Likely classification	Estimated quantity	Proposed management
Construction				
Construction waste	Packaging, timber, drums, waste concrete, scrap metal, plastic wrapping, plasterboard, and cables	General	Limited packaging waste is required as BESS components would be delivered pre-assembled. Concrete may be generated from project foundations, and metals from BESS enclosures/electrical components and ancillary infrastructure.	Removed off-site to return to suppliers or recycling contractors where feasible
Hazardous and chemical materials	Adhesives, lubricants, waste fuel and oil, engine coolant, batteries, hoses and tyres from the maintenance of construction plant, vehicles and equipment, spill from construction vehicles and equipment	Hazardous	Minimal.	Off-site disposal at an appropriately licenced facility
Excavated material	Natural rock, soils and clay excavated during earthworks	General	Subject to detailed design. Generated through excavation for new structures, footings and cabling. Soil would also be generated through vegetation clearing, site levelling and other construction activities.	Excavated material will be reused on-site for construction fill where possible (i.e. aggregate, sub-base, etc)
Green waste	Clearing of vegetation	General	The development footprint is 21.68 ha. Green waste would be generated from clearing of up to 0.16 ha of native vegetation and 21.36 ha of Category 1 land (mixed native/exotic pasture).	Off-site disposal at an appropriately licenced facility Recycle or disposal
Recyclables from activities at construction compounds and site office(s)	Paper, cardboard, plastics, glass, printer cartridges	General	As generated from worker activity.	Recycling contractors

Waste Type	Description	Likely classification	Estimated quantity	Proposed management
General waste	Foods scraps and other putrescibles which are not recyclable	Putrescible	Approximately 100 kg per day. Generated from worker activity.	Off-site disposal at an appropriately licenced facility
Sewage and greywater from washdown activities and staff amenities	Sewage and greywater from staff amenities and washdown activities.	Liquid	Up to 18,000 litres per week at peak construction (based on 100 people with an amenities water use of 25 litres per person per day).	Off-site disposal at an appropriately licenced facility
Operation				
Battery modules	Li-ion batteries and battery components, inverters and transformer replacement / maintenance	Hazardous/general	184 battery modules. This would be subject to procurement of the selected battery supplier and detailed design.	End-of-life or defective Li-ion batteries are expected to be returned to the supplier for repurposing or appropriate disposal. Steel components will be recycled.
Recyclables from activities at site office	Paper, cardboard, plastics, glass, printer cartridges	General	As generated during maintenance periods. This is expected to be minimal as the BESS would be monitored remotely.	Council provided bins or recycling contractors.
Hazardous and chemical material	Used spill kit consumables	Hazardous	Minimal and would only occur in the event of a spill event.	Off-site disposal at an appropriately licenced facility.
Sewage and greywater from washdown activities and staff amenities	Sewage and greywater from staff amenities and washdown activities.	Liquid	As generated during maintenance periods. This is expected to be minimal as the BESS would be monitored remotely.	Off-site disposal at an appropriately licenced facility.
Stormwater systems	Sediment removed from stormwater treatment devices and stormwater management systems.	General	As generated. Expected to be representative of typical stormwater maintenance regime. Sediment which accumulates in the operational basin would be monitored and removed (anticipated to be 5 yearly).	Off-site disposal at an appropriately licenced facility if required or reused on-site where feasible.

6.11.7 Compliance and reporting

Recommended monitoring and inspection for construction and decommissioning of the Project is provided in Table 6-48. Key findings and results of all monitoring and inspections will be communicated to the site teams during pre-start meetings. There would be no operational monitoring associated with the BESS Project. Incident management, complaints and enquiries would be managed in accordance with the EMS.

Table 6-48 Waste monitoring

Type of monitoring	Monitoring overview	Frequency	Responsibility	Records
Environmental inspection	- Implementation of waste management activities - Site is neat, tidy and free of litter - Stockpiled and segregated waste collection points are clearly signposted - Quantities of stored materials are appropriate based on construction scheduling/procurement constraints	Weekly	Project Contract	Inspection checklist

6.11.8 Mitigation Measures

The management measures provided in Table 6-49 would be implemented to minimise potential waste impacts from the Project.

Table 6-49 Waste mitigation measures.

ID	Mitigation Measures
Construction	
WM1	The preliminary Waste Management Plan prepared as part of the EIS will be reviewed and updated prior to the commencement of construction.
WM2	All materials requiring removal from the Project will be classified in accordance with the NSW EPA <i>Waste Classification Guidelines</i> (2014). This material will only be transported from the Project to an appropriately licensed landfill for disposal, or to an appropriately licenced recycling facility.
WM3	The resource management hierarchy principles established under the WARR Act of avoid / reduce / reuse / recycle / dispose will be applied where feasible.
WM4	Wastes will be appropriately quantified, transported, stored and handled in accordance with NSW EPA waste classification and in a manner that prevents pollution of the surrounding environment
WM5	The handling and management of special wastes will be carried out in accordance with relevant legislation, codes of practice and Australian standards
WM6	A Waste Register will be maintained for the duration of construction. The register will detail the type of waste, volume/quantity of waste and recycle/disposal options.
WM7	Working areas will be maintained, kept free of rubbish, and cleaned up at the end of each working shift.
Operation	
WM8	Waste will be managed and disposed of in accordance with the relevant applicable legislation, policies and guidelines, including the WARR Act and the <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-21</i> (EPA 2014).

6.12 Air quality

This section provides an assessment of air quality impacts associated with the Project.

6.12.1 Methodology

A qualitative air quality impact assessment was undertaken to determine the potential air quality impacts associated with the construction and operation of the Project. This assessment included:

- Review of the existing environment
- Identification of construction activities which may lead to emissions
- Identification of nearby sensitive receivers
- Identification of mitigation measures to manage air quality impacts.

6.12.2 Applicable guidelines and legislation

The air quality assessment was prepared with reference to the following plans, policies and guidelines:

- The POEO Act sets the statutory framework for managing air quality in NSW, including establishing the licensing scheme for major industrial premises, and offences and penalties for a range of air pollution issues. The Act is supported by the Protection of the Environment Operations (General) Regulation 2022 (POEO Regulation).
- The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) lists the statutory methods to be used for modelling and assessing emissions of air pollutants in NSW. This instrument supersedes the 2016 version and took effect on 9 September 2022.
- The NSW Government is also a signatory to the National Environment Protection (Ambient Air Quality) Measure (NEPC, 2021) (AAQ NEPM) which sets out the standards for six key air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), ozone (O₃) and particulates of aerodynamic diameter <10 µm and <2.5 µm (PM₁₀ and PM_{2.5}). The AAQ NEPM was established by the National Environment Protection Council and has been varied several times since its inception in 1998, with the most current variation taking effect in May 2021.

6.12.3 Ambient air quality criteria

The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) prescribes the impact assessment criteria for NSW. These are replicated in Table 6-50.

Table 6-50 Impact assessment criteria for pollutants (EPA, 2022)

Pollutant	Averaging Period	Concentration		Source
Sulfur dioxide (SO ₂)	1 hour	10 pphm ^a	286 µg/m ³	NEPC (2021)
	1 hour	7.5 pphm ^b	215 µg/m ³	NEPC (2021)
	24 hours	2 pphm	57 µg/m ³	NEPC (2021)
Nitrogen dioxide (NO ₂)	1 hour	8 pphm	164 µg/m ³	NEPC (2021)
	Annual	1.5 pphm	31 µg/m ³	NEPC (2021)
Photochemical oxidants (as ozone)	8 hours	6.5 pphm	139 µg/m ³	NEPC (2021)
Lead	Annual	-	0.5 µg/m ³	NEPC (1998)
PM _{2.5}	24 hours	-	25 µg/m ³	NEPC (2021)

Pollutant	Averaging Period	Concentration		Source
	Annual	-	8 µg/m ³	NEPC (2021)
PM ₁₀	24 hours	-	50 µg/m ³	NEPC (2021)
	Annual	-	25 µg/m ³	NEPC (2021)
Total suspended particulates	Annual	-	90 µg/m ³	NHMRC (1996)
Deposited dust	Annual	2 g/m ² /month ^c	4 g/m ² /month ^d	NERDDC (1988)
Carbon monoxide (CO)	15 minutes	87 ppm	100 mg/m ³	WHO (2000)
	1 hour	25 ppm	30 mg/m ³	WHO (2000)
	8 hours	9 ppm	10 mg/m ³	NEPC (2021)
Hydrogen fluoride	90 days	0.5 µg/m ³ ^f	0.25 µg/m ³ ^g	ANZECC (1990)
	30 days	0.84 µg/m ³ ^f	0.4 µg/m ³ ^g	ANZECC (1990)
	7 days	1.7 µg/m ³ ^f	0.8 µg/m ³ ^g	ANZECC (1990)
	24 hours	2.9 µg/m ³ ^f	1.5 µg/m ³ ^g	ANZECC (1990)

Notes

- a. This impact assessment criterion applies to assessments prepared before 1 January 2025
- b. This impact assessment criterion applies to assessments prepared after 1 January 2025
- c. Maximum increase in deposited dust level
- d. Maximum total deposited dust level
- e. Dust is assessed as insoluble solids as defined by AS 3580.10.1–1991 (AM-19)
- f. General land use, which includes all areas other than specialised land use
- g. Specialised land use, which includes all areas with vegetation sensitive to fluoride, such as grapevines and stone fruits.

6.12.4 Existing environment

6.12.4.1 Sensitive receivers

The Project is located in a predominantly rural setting. The nearest residential zoned land is located in Calala around 470 metres north and isolated receptors are present in adjacent properties on Burgmanns Lane and Ascot-Calala Road.

6.12.4.2 Emissions sources

The Kingswood area and surrounding suburbs are characterised by general agricultural land uses which have a considerable influence on the local and regional air quality. Sources of emissions close to the Project include:

- Ampol Tamworth Depot, located approximately 3.3 kilometres north of the Project
- Calala Water Treatment Plant Tamworth, located approximately 3.6 kilometres northwest of the Project
- Baiada Lynwood Poultry Facilities, located approximately 6.5 kilometres east of the Project.

The National Pollutant Inventory (NPI) is maintained by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) and contains emission estimates for 93 toxic substances which can affect human health and the environment. The inventory includes the source and location of these emissions. A review of the NPI was undertaken to identify the types and sources of emissions within the Kingswood area for the 2021-2022 reporting year.

The search indicated that the existing air quality in Kingswood is primarily influenced by emissions from poultry farming and petroleum depots. Twelve substances were identified as being emitted by local industry.

The most common substances include:

- Ammonia
- Total volatile organic compounds
- Benzene.

Other emission sources in the locality include service stations, motor vehicles, domestic wood fires, railways, lawn mowing, domestic/commercial solvents and aerosols, windblown dust and bushfires.

6.12.4.3 Ambient air quality

A review of Air Quality Data Services (DPE, 2023) was undertaken to identify average particulates ($PM_{2.5}$ and PM_{10}) concentrations within the area. The Tamworth monitoring station, located approximately six kilometres northwest of the Project Site, was considered representative of the area in which the Project is located. Data for the period between October 2019 and October 2023 was reviewed.

As shown in Figure 6-21, the PM_{10} and $PM_{2.5}$ concentrations for the period between October 2019 and March 2020 were considerably higher than the remaining recorded data, and correlate with the Black Summer bushfires which occurred between late 2019 and early 2020.

For the period 2019-2023, the monthly PM_{10} concentrations average was $16.9 \mu\text{g}/\text{m}^3$ (below the annual criterion of $25 \mu\text{g}/\text{m}^3$), while the monthly $PM_{2.5}$ concentrations average was $7.3 \mu\text{g}/\text{m}^3$ (below the annual criterion of $8 \mu\text{g}/\text{m}^3$).

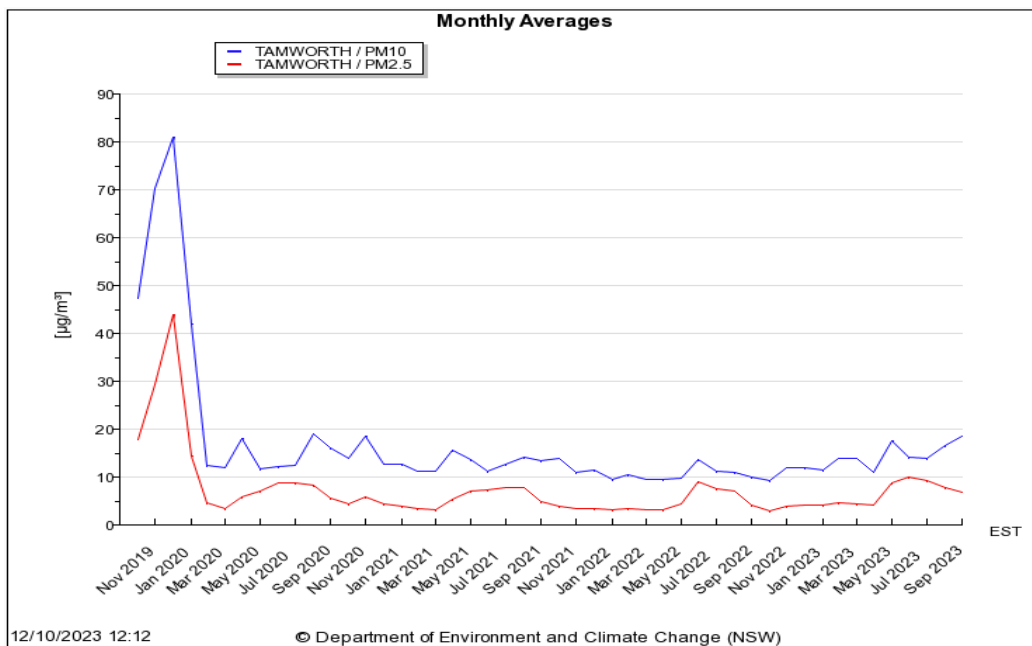


Figure 6-21 Measured PM_{10} and $PM_{2.5}$ concentrations – Tamworth (DPE, 2023)

6.12.5 Potential impacts

6.12.5.1 Construction

The most likely impacts to air quality during construction of the Project relate to potential fugitive dust and emissions from construction vehicles, plant and equipment. The construction period would be up to 15 months.

Construction activities that may result in the generation of dust and emissions include:

- Vehicle movements on surrounding unsealed roads
- Earthworks and levelling
- Stockpiling of excavated material
- Stockpiling and placement of material for preparation activities
- Construction of fencing and site access (including internal roads)
- Excavations for footings, potential underground cabling and transmission infrastructure
- Construction of ancillary infrastructure.

Given the short term and temporary nature of construction works, the Project is unlikely to have a significant impact on the local air quality during construction. Potential impacts during construction would be managed with the implementation of the proposed mitigation measures listed in Section 6.12.6.

6.12.5.2 Operation

Operation of the BESS would not result in any emission of particulates or other pollutants.

Movement of staff vehicles on the access road to and through the Project Site during maintenance activities may result in minor particulate and dust emissions. However, during operation, staff movements are estimated to be minimal due to the Project being operated remotely and would have a negligible impact on local air quality.

Decommissioning and rehabilitation of the Project is expected to produce similar or less emissions and impact than construction. Therefore, these emissions and impacts have not been further assessed.

6.12.6 Mitigation measures

Table 6-51 summarises the mitigation measures for managing air quality issues during construction and operation of the Project.

Table 6-51 Air quality mitigation measures

ID	Mitigation Measures
Construction	
AQ1	Reasonable and feasible dust suppression will be implemented during construction activities to minimise fugitive dust emissions
AQ2	All vehicles transporting materials to and from the Project will be covered and secured
AQ3	Speed limits on the Project Site will be established and enforced during construction
AQ4	All plant and equipment will be inspected before it is used on-site and maintained in accordance with manufacturers specifications and will comply with relevant vehicle emission standards, where applicable.
AQ5	All plant and equipment will be switched off when not in use for extended periods
AQ6	Air quality measures will be included in the EMS

ID	Mitigation Measures
AQ7	Dust and air quality complaints will be managed in accordance with the overarching complaints handling process for the Project. Appropriate corrective actions, if required, will be taken to reduce emissions in a timely manner.
Operation	
AQ8	Plant and equipment will be maintained in good condition to minimise ignition risk of fuel or chemicals, spills and air emissions that may cause nuisance.

6.13 Cumulative impacts

A cumulative impact assessment for the Project has been undertaken in accordance with the CIA Guideline (DPE, 2022c). Cumulative impacts are a result of incremental, sustained, and combined effects of human action and natural variations over time and can be both positive and negative. They can be caused by the compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise. The assessment of cumulative impacts at the strategic level and Project-level is termed cumulative impact assessment (CIA).

6.13.1 Strategic level

The Project will contribute and align with Federal, State and Local Governments plans, strategies, and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. This is detailed in Chapter 2.

6.13.2 Project level

6.13.2.1 Methodology

A search of the DPE Major Projects database was undertaken to identify other State Significant Development (SSD) and State Significant Infrastructure (SSI) projects within the vicinity of the Project that may be relevant to the cumulative impact assessment. Stakeholder engagement (Chapter 5) for the Project also identified potential projects for consideration.

Screening criteria was developed, as shown in Table 6-52. The criteria were applied to determine whether each development that may have the potential to result in a cumulative impact with the Project should be included in the cumulative impact assessment. Projects that satisfied at least one of the triggers in each of the screening criteria in Table 6-52 were included in the CIA.

Table 6-52 Screening criteria for cumulative impact assessment

Criteria	Triggers
Location A development was considered relevant for consideration where it met one of the triggers	Direct overlap: construction footprint of the proposed development intersects with the Project In the vicinity: within ten kilometres of the construction footprint of the Project

Criteria	Triggers
Timeframe A development was considered relevant where it met one of the triggers	Concurrent construction programs
	Consecutive construction programs (less than 18 months between the Project and the development's construction program(s))
	Concurrent operational programs
Status A development was considered relevant where it was at one of the following stages of the statutory assessment and approval process	Approved projects (statutory approvals received), including approved projects that have not started construction, projects currently under construction, and recently completed projects
	Proposed projects (currently under statutory environmental impact assessment which includes where an application has been lodged, publicly announced or related development)
Scale of potential impact A development was considered relevant where the project involved substantial impacts to one or more of the following	• Traffic and transport • Noise and vibration • Hazard and risk • Visual amenity • Social and economic

Relevant developments that were identified to meet the screening criteria included:

- Calala Battery Energy Storage System (SSD-52786213)
- Tamworth Battery Energy Storage System (SSD-23830229)
- Lambruk Solar Farm
- Goonoo Goonoo Road duplication
- Burgmanns Lane causeway replacement.

6.13.2.2 Calala Battery Energy Storage System (SSD-52786213)

Equis Energy is proposing to develop a stand-alone BESS (300 MW / 1200 MWh) at 57 Burgess Lane, Calala NSW, approximately 530 metres north of the Project. The proposal also includes the installation of underground transmission lines connecting to Tamworth substation and ancillary works. Approval for this proposal is being sought as SSD under Part 4 of the EP&A Act. The EIS for the proposal was lodged in October 2023 and is currently being assessed by the DPHI.

The Calala BESS EIS indicates that the construction of the BESS will take around 18 months and commence in the second half of 2024. The BESS is expected to operate for approximately 25 years.

Considering the proximity of this development to the Project, in conjunction with its scale and expected timeframes for construction and operation, it has been considered in this cumulative impact assessment.

The following assumptions have been made and incorporated into the technical assessments:

Table 6-53 Calala BESS overview

Aspect	Calala BESS EIS (Meccone, 2023)	Cumulative scenario
Traffic and transport	The Calala BESS EIS is expected to generate around 67 vehicles (one-way) per day, comprising around 60 light vehicles and seven trucks, during the peak construction period. OSOM vehicle movements are expected which will occur across the project programme. The preferred routed is from the Port of Newcastle. During operations, only a small number of workers are expected to travel to and from the site via private vehicle.	The TIA has incorporated the Calala BESS traffic assumptions (quantitative assessment).
Noise and vibration	The Calala BESS EIS concluded that noise during the construction phase would occur mostly from construction vehicles and equipment and aligns with similar medium-sized infrastructure projects in a semi-rural setting. Operational noise sources associated with the BESS would include the battery unity, transformers and inverters. With suitable noise controls, including noise attenuation walls and nearfield HV transformer barriers, the acoustic impact of the BESS does not exceed the noise threshold for all receivers	The NVIA has incorporated the Calala BESS noise assumptions for construction and operation (qualitative assessment).
Hazard and risk	The Calala BESS EIS concluded that “for all identified events the resulting consequences are not expected to have significant off-site impacts (serious injury and/or fatality to the public or off-site population)”. The separation of the BESS from surrounding development mitigates the likelihood of off-site impacts	The PHA included review of the potential for cumulative impacts with the Calala BESS based on site separate distances (quantitative assessment).
Visual amenity	The Calala BESS EIS assessment of view impact to surrounding residences finds that the highest visual impact is ‘moderate’ at one residence and ‘moderate-low’ at three residences. The remaining viewpoints experience an impact assessed as ‘low’. The BESS will minimally impact on the existing night-time appearance of the area as the operation of the BESS does not necessitate major light-emitting activities. To reduce impact on visibility, a range of measures are proposed.	The LVIA included review of the potential for cumulative impacts with the Calala BESS based on a conceptual cumulative zone of visual influence.
Social and economic	The Calala BESS will create up to 170 jobs through construction and seven jobs during the operation. A number of social impacts and benefits were identified as being mitigation and enhanced.	The SEIA included review of the potential for cumulative impacts with the Calala BESS.

6.13.2.3 Tamworth Battery Energy Storage System (SSD-23830229)

Valent Energy is seeking to develop a BESS (200 MW / 400 MWh) at 696 Burgmanns Lane, Tamworth NSW, located directly west and adjacent to the Project Site. Installation of a new underground or overhead transmission line connecting the proposed substation to the existing Tamworth substation is included in the proposal. Approval for this proposal is being sought as SSD under Part 4 of the EP&A Act. A scoping report for the proposal was lodged in July 2021 and the SEARs were issued on 1 September 2021 and was used to inform the potential for cumulative impacts. The Tamworth BESS recently submitted the EIS for exhibition in May 2024.

The Tamworth BESS scoping report indicates that construction of the BESS will take 12 months. The BESS is expected to be operational for 20 years.

Considering the proximity of this development to the Project, in conjunction with its scale and expected timeframes for construction and operation, it has been considered in this cumulative impact assessment.

The following assumptions have been made and incorporated into the technical assessments:

Table 6-54 Tamworth BESS overview

Aspect	Tamworth BESS Scoping Report (Accent Environmental, 2021)	Cumulative scenario
Traffic and transport	During construction, Tamworth BESS is estimated to generate 40 light vehicle, five heavy vehicle per day. An estimated eight OSOM vehicle return trips are anticipated. During operation, vehicle movements into and out of the Tamworth BESS will be minimal, with an average of one to two return vehicle trips per week.	The TIA has incorporated the Tamworth BESS traffic assumptions (quantitative assessment).
Noise and vibration	Construction of the would generate noise and vibration impacts. Construction hours would be between 7 am – 6 pm on Monday to Friday and 8 am – 1 pm on Saturday. During the operation of the BESS, noise will be emitted from various equipment at the facility, including inverters, transformers and battery enclosures.	In the absence of detailed information in the Scoping Report, the NVIA has incorporated estimated Tamworth BESS noise assumptions for construction and operation (qualitative assessment).
Hazard and risk	Hazards associated with the BESS include the presence of potentially flammable lithium-ion batteries.	The PHA included review of the potential for cumulative impacts with the Tamworth BESS based on site separate distances (quantitative assessment).
Visual amenity	The proposal would be visible for several residential properties located nearby, as well as local road users. During operation, the proposal would be consistent with the location's current visual character, considering the existing Tamworth substation and associated electrical transmission infrastructure. The preliminary review identifies that the Tamworth substation and associated electrical transmission infrastructure are already part of the viewshed of the area. Therefore, the proposal would be consistent with these elements of the location's visual character.	The LVIA included review of the potential for cumulative impacts with the Tamworth BESS based on a conceptual cumulative zone of visual influence.
Social and economic	The construction phase of the proposal would result in increased local employment. However, pressure on local services such as accommodation and health services may also result due to relocation of construction workers into the area.	The SEIA included review of the potential for cumulative impacts with the Tamworth BESS.

6.13.2.4 Lambruk Solar Farm (SSD-67436209)

Venn Energy Pty Ltd is proposing to develop the Lambruk Solar Project, approximately 15 kilometres south of Tamworth, NSW. The Project would include photovoltaic (PV) solar arrays, a substation, a switchyard, a BESS, internal access tracks, an office and amenities building(s) and onsite transmission lines. Approval for this proposal is being sought as SSD under Part 4 of the EP&A Act. A scoping report for the proposal was lodged in February 2024 and the SEARs were issued on 29 February 2024.

Considering the proximity of this development to the Project, in conjunction with its scale and expected timeframes for construction and operation, it has been considered qualitatively in this cumulative impact assessment.

6.13.2.5 Goonoo Goonoo Road duplication

The Australian and NSW Governments are investing \$40 million for the duplication of Goonoo Goonoo Road (New England Highway) between Jack Smyth Drive and Calala Lane which is the last length of single lane carriageway on

Goonoo Goonoo Road in Tamworth. As part of the duplication works, road widening, pavement reconstruction, installation of a central median between two lanes each way and improvement of pedestrian and cycling facilities will be included, as well as upgrades to four intersections along Goonoo Goonoo Road.

TfNSW has started early preparation work including building approximately 48 metres shared paths on the western side of Goonoo Goonoo Road, installing new line marking for the shared paths, relocating services and minor vegetation clearing. The major work upgrades are expected to start in December 2024.

The upgrade is around 3.8 kilometres northwest of the Project. Given this distance cumulative impacts are largely not anticipated with the exception of traffic. It is expected that the heavy vehicle route to the Project Site will not use the proposed upgrade intersections and will not be impacted by the above road upgrades. However, traffic management coordination and implementation will be considered as the upgrades may overlap with construction of the proposed BESS.

6.13.2.6 Burgmanns Lane causeway replacement

TRC has advised that Burgmanns Lane is one of TRC's current major road repairs projects to improve road safety and mitigate against future floods. The two existing concrete causeways, one with a large multi-cell box culvert structure (western causeway) and the other with a concrete bridge (central causeway) with a higher flood immunity are planned to replace on Burgmanns Lane crossing over Goonoo Goonoo Creek. This project has been funded through the Australian Government's Bridges Renewal Program and will make the area safer during potential floods. TRC's *Draft Blueprint 100 Our Delivery Plan 2023-2025 and Our Annual Plan and Budget 2023/24* stated that the central causeway replacement with low level two-lane bridge is schedule for planning, design and investigations in 2023/2024, and expected to be constructed in 2024/2025.

Given this distance and scale of the replacement, cumulative impacts are largely not anticipated with the exception of traffic. It is expected that the heavy vehicle route to the Project Site will not use the proposed upgrade intersections and will not be impacted by the above road upgrades. However, traffic management coordination and implementation will be considered as the upgrades may overlap with construction of the proposed BESS.

6.13.3 Assessment

Uncertainties exist in relation to the timing of the Projects listed above. The greatest potential for cumulative impacts is in relation to the Calala BESS and Tamworth BESS. However, given the uncertainties of project approval, financing, grid connection agreements and market conditions, the timing associated with energy-related SSDs is particularly uncertain.

6.13.3.1 Traffic and transport

The greatest potential for cumulative impacts of future projects and the project in relation to traffic are associated with the Tamworth BESS, Calala BESS and Goonoo Goonoo Road upgrade. These projects are expected to require increased heavy vehicle movements during construction. In particular it is expected that heavy and light vehicle movements would utilise New England Highway / Goonoo Goonoo Road.

The TIA (Appendix L) considered a worst-case scenario whereby peak construction traffic associated with each of these nearby developments were to occur simultaneously with that of the Project. The impact of the accumulative traffic demand generated by the Project and the surrounding development on the road network is summarised in Section 6.1. The assessment demonstrated that under this scenario, the capacity of the existing road network would remain within an acceptable level of service (LOS D) and would only be experienced for the period during which these peak construction periods for each project overlapped.

Given that the heavy vehicle route to the Project Site (i.e. Whitehouse Lane and Ascot-Calala Road) will not use the proposed Goonoo Goonoo Road intersection upgrade intersections or Burgmanns Lane, potential cumulative traffic impacts with these developments can be mitigated and managed.

Potential cumulative impacts are likely if the peak construction periods of these projects overlap, and it is proposed that this be further considered in subsequent phases of the Project as the construction timeframes for each of the projects becomes more certain. A range of mitigation measures are proposed as part of the Project, including the implementation of a construction traffic management plan, which will incorporate adaptive management measures to ensure that potential cumulative impacts can be effectively managed and minimised as far as practical.

6.13.3.2 Noise and vibration

The greatest potential for cumulative impacts of future projects and the Project in relation to noise are associated with the Tamworth BESS and Calala BESS. Given the distance to the Goonoo Goonoo Road duplication and scale of the Burgmanns Lane causeway replacement, cumulative noise impacts with these Projects have not been considered further.

The receivers most likely to cumulatively impacted by noise include receivers R2, R3, R4 and R5. Whilst other receivers may receive cumulative impacts as well, it is predicted that the above mentioned receivers would likely be the most affected by cumulative impacts due to their proximity between the Calala BESS, Tamworth BESS and the Project. Should construction periods overlap, the predicted cumulative construction noise levels would be in the range of 3 – 5 dB(A) higher than those presented in Section 6.2.3.1. This would result in a potential worst case cumulative noise levels of between 51 dB(A) and 68 dB(A). No receivers are predicted to be highly noise-affected due to cumulative noise impacts.

Should operations of the Calala BESS, Tamworth BESS and the Project overlap, under noise enhancing meteorological conditions it is possible that noise levels could exceed up to approximately 2 dB(A) during evening and night-time periods.

However, the following should be considered:

- The above qualitative assessment assumes the worst-case downwind direction meaning that the wind direction would be from the noise source to receiver for all developments. In reality, receivers would not receive worst case downwind direction for all developments at the same time. Wind analysis over the period of one year revealed that the most occurring wind directions are SSE and SE.
- Predictions are based on noise enhancing meteorological conditions which occur during limited days of the year.
- Marginal exceedances of 1 to 2 dB(A) are deemed to have negligible impact as ≤ 2 dB(A) exceedance is typically not discernible by the average human ear. Therefore, predicted levels that exceed the noise criteria by 2 dB(A) or less are considered to achieve compliance with the criteria.
- All BESS projects in the area are at the planning stage and the equipment selection and layouts are not finalised. Therefore, it is currently not feasible to offer comprehensive predictions on the cumulative impact.

Potential cumulative impacts are considered manageable in subsequent phases of the Project. A draft CNVMP is presented in Appendix E which will incorporate adaptive management measures to ensure that potential cumulative impacts can be effectively managed and minimised as far as practical.

6.13.3.3 Hazard and risk

To assess any off-site impact and interaction with other BESS sites in the vicinity, the PHA considered the cumulative risk of the Project, Calala BESS and Tamworth BESS.

As no significant off-site impact from the Project is expected, no interaction from the Project to the other BESS developments would occur. A PHA has also been undertaken for these other developments, and off-site risk has been identified as acceptable. The injury impact distance resulting from Project is well below the distances from the BESS

compound to the other BESS developments. As such, the interaction between Kingswood and other BESS developments and cumulative risk impacts are expected to be minimal.

The identified contributors to cumulative EMF in the vicinity of the project include the Project, Calala BESS, Tamworth BESS, Tamworth substation and new/existing proposed transmission lines. The cumulative exposure to EMF from these developments is considered unlikely as the strength of EMF attenuates rapidly with distance. Thus, no off-site impact is expected from EMF, and it is not carried forward for risk assessment or further assessment.

6.13.3.4 Visual amenity

The greatest potential for cumulative impacts of future projects and the Project in relation to visual amenity are associated with the Tamworth BESS and Calala BESS. A ZVI has been prepared to illustrate areas from which there is the potential to view the Project, Tamworth BESS and Calala BESS simultaneously (based on topography alone). Existing screening, including structures or vegetation were not considered during preparation of the ZVI and as such provides a worst case scenario.

The cumulative ZVI identified:

- Receiver R22 will have the potential to view the Project, Calala BESS and Tamworth BESS. However, analysis of aerial imagery identified that all projects will likely be screened by existing built elements and vegetation. No other receivers have the potential to view the projects together.
- Twenty five receivers have the potential to view both the Project and Calala BESS. However, analysis of the aerial imagery identified that:
 - Both projects will likely be screened from most receivers due to intervening vegetation and built elements
 - Receivers R2, R3 and R9 appear to have limited existing screening elements and therefore will likely have potential views of multiple projects.

Potential cumulative visual amenity impacts have been minimised. As outlined in LVIA (Appendix J) vegetation buffers comprised of native plants are proposed to mitigate or reduce visual impacts. The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for Project infrastructure to minimise visual impacts (including glare/reflectivity), including ancillary infrastructure such as the O&M buildings / facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, to better blend in with the local rural landscape.

6.13.3.5 Social and economic

Potential cumulative social and economic impacts (both positive and negative) during overlapping construction periods include:

- Employment demands may cause potential impacts on the availability of skilled workforce in the local area which may require additional workers to be sourced from outside the local and regional areas.
- Diversion of a section of the local workforce to the construction of major projects in the region could result in labour shortages within local towns, however, would have the positive effect of reducing local unemployment rates.
- Short term pressures on accommodation and housing, however there is potential for an increase in local job availability supported by a number of SSDs to drive industry growth in the local area and the region.
- Increases in local commercial activities and retail sales along with money generated within the local economy due to the employment of locals. Projects under construction will also provide opportunities for local businesses and tradespeople to provide services.

Once construction has been completed, new developments will result in less pronounced but positive cumulative socio-economic impacts. The benefits of renewable energy generation and storage in the region (and State level) will be further enhanced by having a number of renewable energy developments co-located within the region. Once installed, solar farms, wind farms and BESSs require a small workforce for their ongoing operation. Therefore, any cumulative operational impacts resulting from the Kingswood BESS and nearby renewable energy-related SSDs will be minimal and no greater than the currently operating Tamworth substation.

6.13.4 Mitigation measures

Projects are required to mitigate their own impacts to acceptable levels, which will minimise cumulative impacts overall. Mitigation measures for this Project can be found throughout Chapter 6 and in Appendix C.

Iberdrola has taken a collaborative approach to cumulative impacts through ongoing consultation with key stakeholders. The timing and location of other developments will continue to be monitored in conjunction with Project timelines. Where potential adverse cumulative impacts are identified, consultation will be undertaken encourage a collaborative effort as these projects progress and will take a flexible and iterative approach to ensure the best outcomes.

Table 6-55 Cumulative impact mitigation measures

ID	Mitigation Measures
Construction	
CU1	A process for monitoring the timing and location of other developments within the vicinity of the Project will be outlined in the EMS. Where potential adverse cumulative impacts are identified, consultation will be undertaken to encourage a collaborative effort as these projects progress, and take a flexible and iterative approach to ensure the best outcomes.

7 Justification of the Project

7.1 Justification

Over the last 10-15 years, there has been a steady increase in the uptake and implementation of renewable projects generating electricity for use in the NEM, while more of the older, traditional coal-fired power stations have been retired and decommissioned. This transition from thermal generation to renewable generation is expected to continue into the future. To support this transition, energy storage will be required to support the intermittent nature of generating electricity from renewable energy sources and to provide a reliable and secure source of electricity to consumers and the local population.

The Federal, State and Local Governments have put in place a number of plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market.

Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, dispatchable firm generation (i.e. gas and battery storage) is able to meet electricity demand, provided there is sufficient firm generation capacity.

Without the development and operation of short and long-term dispatch infrastructure to support increasing investment in renewable energy, there is the potential for a future deficit in capacity and consequently the reliability of the NSW power supply system is exposed. In a worst-case scenario, this can lead to load shedding or blackout events.

The Project involves the development of a large-scale BESS. BESS facilities, such as that proposed by the Project, would provide enabling infrastructure to protect the ongoing reliability of electricity supply during the expansion of the renewable energy industry in NSW.

7.2 Strategic context

The Project is supported by Commonwealth, State, regional and local plans and policies (as described in Chapter 2) and will support the Commonwealth and State governments to achieve their respective renewable energy and GHG emission reduction targets.

7.3 Design development

The Project has been designed to avoid and minimise impacts where reasonable and feasible. The Project has been sited to avoid and / or minimise environmental impacts whilst minimising distances to the Tamworth substation. The key strategies adopted include:

- Siting of the BESS to maximise distance from non-associated receivers
- Suitable asset protection zones and separation distances
- Planted landscaping around Project infrastructure
- Noise acoustic barriers and silencers
- Siting of BESS outside of existing easements.

7.4 Statutory compliance

The objects of the EP&A Act are set out in Section 1.3 of the Act. An assessment of the consistency of the Project with the objects of the EP&A Act is provided in Table 7-1.

Table 7-1 Objects of the EP&A Act

Objective	Consistency
To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources	The Project provides for grid firming and would otherwise support the penetration of renewable energy sources in the NEM.
To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The Project is consistent with the principles of ESD, as outlined in Section 7.5.
To promote the orderly and economic use and development of land.	The Project comprises a permissible development, which is consistent with the statutory and strategic planning controls and is in close proximity to similar land uses including the Tamworth substation. The Project would result in positive economic impacts, with appropriate mitigation measures being proposed to reduce any adverse environmental and social impacts.
To promote delivery and maintenance of affordable housing	This objective is not relevant to the Project.
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	A comprehensive Biodiversity assessment (Appendix F) has been undertaken to identify potential adverse impacts on biodiversity. The assessment demonstrates that the Project would not have a significant impact on any local populations of native biota, including threatened and endangered species, populations, or ecological communities listed under the BC Act or the EPBC Act.
To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The Project would not impact upon cultural or built heritage values.
To promote good design and amenity of the built environment	Good design and amenity of the built environment has, and would continue to be, considered during ongoing project development. Early consideration was given to the configuration of the Project and placement of the main project components with a view to optimising the Project layout in conjunction with minimising the potential for social and environmental impact.
To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	A PHA (Appendix G) has been completed for the Project that has identified initial risks and recommended further studies and mitigation measures to be implemented based on ongoing design and procurement of infrastructure components. Importantly, a lithium-iron-phosphate battery chemistry has been adopted which is determined to have a lower fire risk than other battery systems currently in operation around Australia.
To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State	The Project is subject to the provisions of Part 4 of the EP&A Act, and the Minister for Planning and Public Spaces or Independent Planning Commission (IPC) will be the consent authority.

Objective	Consistency
	Despite this, Council, as the local government authority, has been regularly consulted throughout the planning phases of the Project and preparation of this EIS. As such, it is deemed that both local and State levels of government have been provided with sufficient opportunities to share in responsible environmental planning of the Project.
To provide increased opportunity for community participation in environmental planning and assessment.	Consultation with the community was undertaken by means of a project website, community newsletters, community town hall sessions, face to face door knocks, one on one meetings and provision of enquiry lines (for phone and email). Exhibition of the EIS would provide additional opportunities for community participation in the environmental planning and assessment process.

7.5 Ecologically sustainable development

As required under the SEARs and the EP&A Regulation (reg 192), Table 7-2 outlines how the Project is consistent with the principles of ecologically sustainable development.

Table 7-2 Principles of ecologically sustainable development

Principal	Definition	Consistency
Precautionary principle	If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In applying the precautionary principle, public and private decisions should be guided by: - careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment - an assessment of the risk-weighted consequences of various options.	The precautionary principle approach has been applied throughout the development of the Project and in the preparation of all technical studies associated with the Project. The main intent is to minimise any potential environmental impacts. This included identifying opportunities to avoid and minimise potential impacts to the surrounding environment and sensitive residential receivers. The findings of the technical assessments are summarised in Chapter 6. This EIS details the evaluation of environmental impacts associated with the Project and was prepared by adopting a conservative approach which included assessing worst-case impacts and scenarios. It has been undertaken using the best available technical information and has adopted best practice environmental standards, goals and measures to minimise environmental risks. The environmental assessment has been undertaken in collaboration with key stakeholders and relevant statutory and agency requirements. Mitigation measures (Appendix C) have been identified to minimise environmental impacts during design, construction, and operation of the Project. With these measures, it is considered there would be no threat of serious or irreversible damage to the environment.

Principal	Definition	Consistency
Inter-generational equality	The present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	NSW is undergoing an energy sector transformation which will change how energy is generated and used throughout the state. The need to increase the generation of renewable energy as some of the state's largest coal-fired power stations begin to close has been identified. The Project provides benefits to both existing and future generations through the provision of large-scale battery storage which is expected to contribute to the ability of the electricity grid to accommodate renewable energy sources (particularly wind and solar). The mitigation measures provided in Appendix C of this EIS, in particular those relating to traffic and transport, biodiversity, noise and vibration, hazard and risk, visual amenity and social and economic impact are reflective of the commitment of Iberdrola (as the Proponent) to ensuring that the Project does not adversely affect quality of the environment for future generations.
Conservation of biological and ecological integrity	The conservation of biological diversity and ecological integrity should be a fundamental consideration	A comprehensive biodiversity assessment has been undertaken to identify potential adverse impacts on biodiversity. The assessment demonstrates that the Project would not have a significant impact on any local populations of native biota, including threatened and endangered species, populations, or ecological communities listed under the BC Act or the EPBC Act.
Improved valuation, pricing and incentive mechanisms	Environmental factors should be included in the valuation of assets and services, such as: • Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement • The users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste • Established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems	This EIS has, where possible, avoided or minimised environmental impacts and identified mitigation measures for areas where adverse environmental impacts may occur as part of this Project. Burning of fossil fuels like coal and oil has increased the concentration of atmospheric carbon dioxide which is known to contribute to climate change. Climate change impacts could potentially impose a significant financial burden on governments and taxpayers through rising health care costs, destruction of property, increased food prices, and more. The social cost of carbon is a measure of the economic harm from those impacts, expressed as the dollar value of the total damages from emitting one tonne of carbon dioxide into the atmosphere. The construction of the Project would facilitate the increased uptake of renewable energy projects, which is expected to ultimately replace fossil fuels in energy generation. Economic benefits would be achieved through minimising emissions of carbon dioxide into the atmosphere. The Project would generate around 100 jobs during construction and around 2 FTE throughout operations.

7.6 Ethics and equality

Iberdrola Group's *Policy on Respect for Human Rights* (2023) commits to the rejection of child labour, forced compulsory labour, and any form of modern slavery, endeavouring to ensure and encourage the elimination of such situations with regard to their suppliers and their supply chain. Suppliers and their professionals must adopt such measures as may be needed to eliminate all forms or types of forced or compulsory labour and any form of modern slavery within their organisation, as well as promote the adoption of this within their supply chain. Iberdrola would apply the highest levels of transparency in line with its Governance and Sustainability System (2023).

The Iberdrola *Modern Slavery Statement* (2023), details completed and future actions to be undertaken during the reporting period of 1 January 2022 to 31 December 2022. Completed actions include:

- The continued inclusion of modern slavery clauses in relevant supplier and service provider contracts that require the counterpart to comply with modern slavery laws
- Implement and maintain appropriate measures to assess and address modern slavery risks and to cooperate with Iberdrola to reduce and mitigate modern slavery risks in its activities related to the contract
- Development of a Remediation Action Plan for when modern slavery risks are raised and identified.

Iberdrola intends to implement the following initiatives in the next reporting period:

- Continue to be a member of the Risks of Modern Slavery Working Group within the Clean Energy Council
- Commitment to hire additional local procurement resources to coordinate the prequalification due diligence process of new and existing suppliers
- Establish an Anti-Modern Slavery Working Group within Iberdrola to continue to raise the visibility, awareness, training and collaboration in relation to modern slavery issues
- Refresh employee training and awareness on modern slavery and what it means for Iberdrola, particularly considering ongoing employee growth
- Continue to liaise with our counterparts across the Iberdrola Group to:
 - (a) foster collaboration
 - (b) learn from their experiences; and
 - (c) leverage procedures and processes that we may be able to use in Australia
- Implement applicable recommendations from the Pinsent Mason External Review.

7.7 Community views

Consultation conducted for the Project is described in Chapter 5. Local issues were raised by various stakeholder groups during the preparation of this EIS. Interest in the Project primarily came from neighbouring landowners within the locality. These issues generally focused on the risk of fire, traffic, noise, visual and water related impacts to neighbouring receptors.

Stakeholders will continue to be identified and consulted during the approvals and response to submission phase, and if approved, during the construction, operation, and decommissioning and rehabilitation phases of the Project.

7.8 Project impacts

This EIS has considered the potential impacts associated with the Project, as well as the need for the Project and alternative development options. Table 7-3 provides a summary of the potential impacts below.

Table 7-3 Project impacts

Environmental issue	Summary of potential impacts
Social	The Project will provide direct benefits to NSW overall, through providing firming capacity to the NEM. The Project will also directly benefit the local area and regional area of Tamworth, as outlined in the SIA, as summarised in Section 6.9 of this EIS. While the project has potential negative impacts, it is considered that these can be managed to acceptably low levels. Iberdrola is committed to establishing a community benefit fund which would allocate funds for community-based projects. The details of the fund are yet to be determined but would likely be managed through a committee comprising representatives from Iberdrola, TRC and the local community.
Economic	The Project will provide a range of long-term economic benefits contributing to a more resilient, efficient, and sustainable energy system, including: • Grid stability and reliability – The Project will help balance supply and demand by storing excess energy during periods of low demand and releasing it during peak demand, enhancing grid stability – The Project will provide rapid response services to maintain grid frequency, reducing the need for expensive and less efficient conventional energy sources to operate for frequency regulation. • Grid deferral and infrastructure savings – The Project will help defer the need for grid infrastructure upgrades by providing localised energy storage solutions, reducing the strain on the grid during periods of high demand • Backup power and resilience. – The Project will provide backup power during grid outages minimising economic losses due to downtime. • Job creation and economic growth – The Project will contribute to the regional economy in the form of annual direct and indirect purchases. The construction phase of the project is expected to require up to 100 construction personnel, the majority of which are expected to be generated in Tamworth and surrounding regions.
Environmental – biodiversity, heritage, land and water	Physical impacts to biodiversity, heritage, land and water include: • The Project would result in the removal of 0.16 hectares of native vegetation (PCT 3396 - Northwest Slopes Box-Blakely's Red Gum Forest). However, as the development envelope is made up primarily of Category 1 land (vegetation not conforming to any plant community type and containing less than five percent native understory composition) no impacts to threatened native flora or fauna are expected to occur. Under the BAM, the Project requires 2 ecosystem credits to offset impacts on PCT 3396. A referral under the EPBC Act is not required, as the Project is not considered to be a controlled action • No impacts to Aboriginal cultural heritage or historic heritage are predicted • The potential to encounter acid sulfate soils or contamination during construction is considered low. Contamination, if present, would be limited to localised soil impacts, and is not considered likely to pose a groundwater risk

Environmental issue	Summary of potential impacts
	• The potential erosion hazard would be further assessed via investigations during detailed design, however based on the size and scale of the development, potential erosion and subsequent sedimentation risks are expected to be manageable with standard construction techniques. • Impacts to the surrounding land uses was assessed using the LUCRA Guide (NSW Department of Primary Industries, 2011). All aspects following revision of the risk ratings, through controls outlined in Appendix C, were considered able to meet an acceptable risk ranking • Groundwater and surface water impacts are not predicted to be significant. The Project is not expected to have any requirements for surface water licensing and a variety of options are being explored with water sourcing, with stormwater reuse likely to be undertaken during construction and an agreement with TRC for potable water. Providing the existing landholder's bore is sufficient to supply water potentially required to supplement construction and operation, a water supply work approval (WA) will be required to change the approved usage of the bore from stock and domestic use to water supply use. • The design and development of infrastructure during detailed design will include ongoing consultation with TRC on required water control controls to manage general risks associated with increases in impervious areas. Oil-water management controls within the BESS substation will be designed to consider relevant Australian Standards, as well as any requirements of electricity distributors and the stormwater infrastructure will be designed to include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge.
Amenity – noise and vibration, traffic and transport and visual	Potential amenity impacts include: • Construction noise levels from the Project are predicted to exceed noise management levels (NMLs) at a number of assessment locations. The largest exceedance is predicted at receiver R2 during the clearing and earthworks phase of construction. No receivers are predicted to be highly noise-affected. A draft CNVMP is presented in Appendix E and includes a range of noise mitigation measures • Operational noise has been assessed under adverse weather conditions and considering the actual 100% utilisation of the BESS. Noise mitigation measures have been included in the modelling following the outcome of preliminary noise modelling indicating noise exceedances. Following the implementation of all feasible and reasonable mitigation options, the modelling has demonstrated noise compliance can be achieved for all assessment locations during day and night NPfI assessment periods • No impacts from construction vibration on nearby residents is predicted • Peak construction traffic movements are anticipated to comprise up to 80 light vehicles per day (80 in and 80 out) and up to 60 heavy vehicles per day (60 in and 60 out, including OSOM vehicles). Consultation identified a primary heavy vehicle access route to and from the Project via Whitehouse Lane and Ascot-Calala Road. Traffic generated during construction of the Project is not expected to compromise safety or function of the surrounding road network and impacts during morning and evening peak periods are expected to be minimal • The largest anticipated OSOM vehicle is anticipated to be 35 metres with 14 axles. A review of the potential OSOM route from the Port of Newcastle identifies locations where minor traffic management and / or modification of existing traffic furniture would be required to accommodate vehicle manoeuvres. This would be confirmed during detailed design upon confirmation of the required OSOM vehicle • The Project has been designed to integrate with the surrounding environment to minimise visual impacts. Visual impacts arising from the Project are not anticipated to be significant and screening vegetation will be implemented. The existing landscape include the Tamworth substation and overhead electrical infrastructure. With the implementation of mitigation measures, visual impacts

Environmental issue	Summary of potential impacts
	have been assessed as low to very low. Glint and glare impacts and light spill impacts are not anticipated.
Hazards and risk	Hazards and risks associated with the project are not predicted to be significant. Risks have been assessed through a PHA and bushfire assessment. The PHA and bushfire assessment included an assessment of all potential hazards and risks including but not limited to bushfires, spontaneous ignition, and electromagnetic fields. The PHA and bushfire assessment concluded there no significant off-site impacts predicted from the operation of the project.

7.9 Compliance

An EMS would be developed to provide the overall strategic framework for environmental management and compliance. The EMS would be prepared in accordance with the mitigation measures detailed in this EIS (Appendix C) and the Conditions of Consent, if the Project is approved. It would also be prepared in accordance with any other statutory or licensing requirements that apply to the Project at the time.

The purpose of the EMS would be to ensure that environmental mitigation measures outlined in the issue-specific environmental management plans are incorporated into a comprehensive framework to facilitate appropriate management throughout the life of the Project.

The EMS would detail how compliance with the Project would be monitored and communicated and would include requirements to:

- Ensure that controls are properly implemented, regularly monitored, and audited to assess their effectiveness
- Ensure processes for resourcing and implementing the environmental management strategy are developed to provide certainty of delivery
- Demonstrate compliance with statutory, legislative and consent conditions
- Minimise impacts on the community and the environment
- Ensure timely and efficient response to environmental incidents and complaints
- Monitor, review, and report on environmental impacts of construction, operation, and decommissioning.

7.10 Key uncertainties

The number and location of the Project components are subject to refinement through detailed design. It would be subject to commercial tendering and procurement processes to ensure the Project is optimised in terms of yield and efficiency, within the parameters of the approval.

As the final specifications and location of infrastructure are subject to change during detailed design, where required in this section, upper limit quantities and power level estimates are provided to ensure the assessment and any subsequent approval maintains the flexibility required in the detailed design stage, following Project approval. Similarly, while an indicative design is provided to provide a clearer understanding of what would be constructed, the delineation of the development envelope provides the assessment and flexibility to minor layout changes in the final design.

The connection of the BESS to the Tamworth substation will be confirmed through the connection application process with Transgrid, potentially resulting in a change to Project configuration. To minimise this potential, a development envelope has been identified. This uncertainty will be resolved during discussion of the connection processes agreement and any implications for Project consent will be discussed with DPHI.

Together this 'upper limit' or 'worst case' approach ensures that all impacts of the Project are captured in Section 6 of this EIS and that any recommendations and mitigation strategies would be appropriate to the final detailed design.

This approach allows the Project to maximise potential benefits from the rapid technology advancements currently underway in the BESS industry. Iberdrola operates energy storage systems internationally and has experience in operating their facilities to meet relevant standards and best available technologies.

A competitive bid process will select an engineering, procurement and construction contractor with a demonstrated ability to build the Project in a manner that is consistent with the concept design and proposed mitigation and management strategies (refer to Appendix C).

7.11 Conclusion

Iberdrola Australia Development Pty Ltd is seeking development consent for the construction, operation and maintenance of a large-scale BESS at 744 Burgmanns Lane, Kingswood NSW 2340 (Lot 43 DP1064582). The BESS would have a capacity of up to 270 MW and provide up to 1,080 MWh of battery storage capacity.

The Project would involve construction and operation of the following:

- BESS including battery enclosures, inverters, transformers, switch gear and control building
- Onsite 33/330 kV substation to convert electricity between the high voltage transmission network and medium voltage BESS
- High voltage transmission connection (above ground and/or below ground) between the BESS and the Tamworth substation
- Ancillary infrastructure and mitigative features including:
 - Site access to the BESS from Ascot-Calala Road
 - Internal site access road and parking
 - Permanent office and staff amenities
 - Operations and maintenance building
 - Stormwater management infrastructure
 - Services and utilities
 - Lighting, fencing and security devices
 - Noise acoustic barriers
 - Asset protection zone
 - Landscaping and screening vegetation.

The BESS would operate 24 hours a day, seven days a week and be monitored remotely, with infrastructure maintenance undertaken on-site. Environmental investigations were undertaken during the preparation of the EIS to assess the potential environmental impacts of the Project.

The EIS concludes that many of the potential impacts identified would be effectively managed through Project design. To manage other impacts, and in some cases eliminate them completely, a number of mitigation measures would be implemented as outlined in Appendix C. The EIS includes an assessment of the permissibility of the Proposal under relevant Environmental Planning Instruments and legislation (Chapter 4). The Project is permissible with consent and is SSD under Part 4, Division 4.7 of the EP&A Act.

The Project has been assessed in accordance with the EP&A Act and the SEARs. The Project satisfies the requirements of the SEARs (Appendix A) and is consistent with the principles of ecologically sustainable development. The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. The assessment concluded that no significant environmental impacts have been identified as a result of the Project. It is considered that any potential impacts can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Project has been assessed against, and has been found to be consistent with, the priorities and targets adopted in relevant published and draft State plans, as well as Government policies and strategies. Overall, the Project is considered critical in supporting the NSW Government's electricity strategy for a reliable, affordable and sustainable electricity future that supports a growing economy.

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Appendix A SEARs

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
General	
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the <i>Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)</i> and must have regard to the <i>State Significant Development Guidelines</i> .	Throughout the EIS Declaration Appendix B
In particular, the EIS must include:	See below
A stand-alone executive summary	Executive Summary
- A full description of the development, including: - Details of construction, operation and decommissioning, including any staging of the development	See below
- A high quality site plan at an adequate scale showing all infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process)	Figure 3-1
- A high quality detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development	Figure 2-2 Figures throughout Chapter 6
A strategic justification of the development focusing on site selection and the suitability of the proposed site with respect to potential land use conflicts with existing and future surrounding land uses (including other proposed or approved energy facilities, Crown lands within and adjacent to the project site, rural residential development and subdivision potential)	Chapter 2 Chapter 7
a risk assessment of the potential impacts of the development, identifying the key issues for further assessment	Kingswood BESS Scoping Report
- An assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including: - A description of the existing environment likely to be affected by the development using sufficient baseline data	See below
- An assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing or proposed developments in the region, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice including <i>the Cumulative Impact Assessment Guideline (DPIE, 2021)</i>	Sections 6.1 to 6.13 Appendix D to Appendix N
- A description of the measures that would be implemented to avoid, mitigate and/or offset the impacts of the development (including draft management plans for specific issues as identified below)	Sections 6.1 to 6.13 Appendix C
- A description of the measures that would be implemented to monitor and report on the environmental performance of the development	Sections 6.1 to 6.13 Appendix C
A consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS	Appendix C
A detailed evaluation of the merits of the project as a whole having regard to:	See below

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
— The requirements in Section 4.15 of the <i>Environmental Planning and Assessment Act 1979</i>, including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development	Section 7.5 Appendix B
— The suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses	Section 2.6
— Feasible alternatives to the development and its key components, including siting and project design alternatives to avoid areas of biodiversity value and the consequences of not carrying out the development	Section 2.5
• A detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter	Section 2.1
Capital Investment Value and Employment • Provide a detailed calculation of the capital investment value (CIV) of the development, prepared by an AIQS Certified Quantity Surveyor or RICS Chartered Quantity Surveyor in accordance with Planning Circular PS 21-020: Calculation of Capital Investment Value. The calculation of the estimated CIV is to be accurate at the date of application and include details of all components and assumptions from which it is derived	Provided to DPHI as part of the EIS Lodgement
• Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the development, including details of the methodology to determine the figures provided	Section 6.9.1 Section 6.9.3.2
The development application must be accompanied by:	See below
• The consent of the owner/s of the land (as required in Section 23(1) of the Regulation)	Section 2.3 Provided to DPHI as part of the EIS Lodgement
• A declaration from a Registered Environmental Assessment Practitioner that the EIS includes the information specified in the <i>Department's Registered Environmental Assessment Practitioner Guidelines</i>.	Declaration
Biodiversity	
• An assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW) (BC Act), the <i>Biodiversity Assessment Method (BAM) 2020</i> and documented in a Biodiversity Development Assessment Report (BDAR), including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act, unless BCD and DPE determine the proposed development is not likely to have any significant impacts on biodiversity values	Section 0 Appendix F
• An assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the <i>Fisheries Management Act 1994</i>, and a description of the measures to minimise and rehabilitate impacts	Section 0 Appendix F
• The BDAR must document the application of the avoid, minimise and offset framework in accordance with the BAM	Appendix F

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
If an offset is required, details of the measures proposed to address the offset obligations.	Section 0 Appendix F
Heritage	
an assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological test excavations (if required);	Section 6.5 Appendix H
evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	Chapter 5 Section 6.5 Appendix H
assess the impact to historic heritage having regard to the NSW Heritage Manual	Section 6.6 Appendix I
Land	
a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, land contamination, permissibility, strategic context and existing site constraints	Chapter 2 Chapter 6
an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including	See below
– agricultural land, flood prone land, Crown lands, mining, quarries, mineral or petroleum rights	Section 6.8
– a soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils and erosion to occur	Given that the Project Site is not BSAL. Soil surveys are a commitment of the Project to ensure construction risks are mitigated. They are not considered required to inform compatibility.
– a cumulative impact assessment of nearby developments	Section 6.13
an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including	See below
– consideration of the zoning provisions applying to the land, including subdivision (if required)	Section 6.8
– completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide	Section 6.8
– assessment of impact on agricultural resources and agricultural production on the site and region	Section 6.8
Visual	
A detailed assessment of the likely visual impacts of all components of the project (including transmission lines, substations and any other ancillary infrastructure) on surrounding residences	Section 6.7 Appendix J

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
and key locations, scenic or significant vistas and road corridors in the public domain and provide details of measures to mitigate and/or manage potential impacts	
Noise	
An assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area), and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria	Section 6.2 Appendix E
Transport	
An assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation	Section 6.1 Appendix D
An assessment of the likely transport impacts to the site access route and site access point(s) particularly in relation to the capacity and condition of the roads, road safety and intersection performance	Section 6.1 Appendix D
A cumulative impact assessment of traffic from nearby developments	Section 6.1 Section 6.13
Details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority.	Section 6.1 Appendix D
Water	
A detailed and consolidated site water balance and an assessment of the likely impacts of the development (including flooding) on surrounding watercourses (including their Strahler Stream Order) and groundwater resources and measures proposed to monitor, reduce and mitigate these impacts including water management issues	Section 6.10 Appendix M
Details of water requirements and supply arrangements for construction and operation	Section 6.10 Appendix M
A description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with <i>Managing Urban Stormwater: Soils & Construction</i> (Landcom 2004)	Section 6.10 Appendix M
assessing the impacts of the development, including any changes to flood risk and overland flows on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required	Section 6.10 Appendix M
where the project involves works within 40 metres of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the <i>DPI Guidelines for Controlled Activities on Waterfront Land</i> (2018) and (if necessary) <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings</i> (DPI 2003), and <i>Policy & Guidelines for Fish Habitat Conservation & Management</i> (DPE, 2013)	N/A
Hazards	
A preliminary risk screening completed in accordance with <i>State Environmental Planning Policy (Resilience and Hazards)</i> and <i>Applying SEPP 33</i> (DoP, 2011)	Section 6.4 Appendix G

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
A Preliminary Hazard Analysis (PHA) must be prepared in accordance with the <i>Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment</i> (DoP, 2011). The PHA must consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with <i>Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning</i> (DoP, 2011);	Section 6.4 Appendix G
An assessment of potential hazards and risks including but not limited to bushfire risk against the <i>RFS Planning for Bushfire Protection 2019</i>, electromagnetic fields or the proposed grid connection infrastructure against the <i>International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields</i>.	Section 6.4 Section 6.5 Appendix G Appendix N
Social and Economic	
An assessment of the social and economic impacts in accordance with the <i>Social Impact Assessment Guideline</i> (DPE, Feb 2023), any benefits of the project for the region and the State as a whole, including consideration of any increase in demand for community infrastructure services, consideration of construction workforce accommodation, assessment of impact on agricultural resources and agricultural production on the site and region	Section 6.9 Appendix L
Waste	
A waste management plan to identify, quantify and classify the likely waste stream to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste	Section 6.11
Plans and documents	
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Part 3 of the Regulation. Provide these as part of the EIS rather than as separate documents.	Various Figures throughout the EIS
In addition, the EIS must include high quality files of maps and figures of the subject site and proposal	Various Figures throughout the EIS
Legislation, Policies & Guidelines	
The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified.	Chapter 4
- A list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at: https://www.planning.nsw.gov.au/Policy-and-Legislation/Planning-reform s/Rapid-Assessment-Framework/Improving-assessment-guidance https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines; and http://www.environment.gov.au/epbc/publications#assessments	Chapter 4
Consultation	
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups, affected landowners and any exploration licence and/or mineral title holders. In particular you must undertake detailed consultation with affected landowners surrounding the development, Cumberland City Council and relevant government agencies.	Chapter 5
The EIS must:	Chapter 5

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
Detail how engagement undertaken was consistent with the Undertaking <i>Engagement Guide: Guidance for State Significant Projects</i> (DPIE, 2021); and	
Describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, an explanation should be provided.	Chapter 5

Appendix B EP&A Regulation checklist

Requirement	Where addressed in EIS
Part 8 Division 5 cl 190. Form of the environmental impact statement	
(1) An environmental impact statement must contain the following information:	Declaration
(a) the name, address and professional qualifications of the person who prepared the statement	
(b) the name and address of the responsible person	Declaration
(c) the address of the land:	Declaration
(i) to which the development application relates, or	
(ii) on which the activity or infrastructure to which the statement relates will be carried out,	
(d) a description of the development, activity or infrastructure	Chapter 3
(e) an assessment by the person who prepared the statement of the environmental impact of the development, activity or infrastructure, dealing with the matters referred to in this Division	Declaration
(2) The person preparing the statement must have regard to:	Section 1.6
(a) for State significant development – the <i>State Significant Development Guidelines</i> , or	
(b) for State significant infrastructure – the <i>State Significant Infrastructure Guidelines</i> .	
(3) An environmental impact statement must also contain a declaration by a relevant person that:	Declaration
(a) the statement has been prepared in accordance with this Regulation, and	
(b) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure, and	
(c) the information contained in the statement is not false or misleading, and	
(d) for State significant development or State significant infrastructure—the statement contains the information required under the <i>Registered Environmental Assessment Practitioner Guidelines</i> .	
Part 8 Division 5 cl 191 Compliance with environmental assessment requirements	
The environmental impact statement must comply with the environmental assessment requirements notified under section 176 or the Act, section 5.16(4).	Appendix A
Part 8 Division 5 cl 192 Content of the environmental impact statement	
(1) An environmental impact statement must contain the following:	
(a) a summary of the environmental impact statement,	Executive Summary
(b) a statement of the objectives of the development, activity or infrastructure,	Section 1.2
(c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives, including the consequences of not carrying out the development, activity or infrastructure,	Section 2.5
(d) an analysis of the development, activity or infrastructure, including	
(i) a full description of the development, activity or infrastructure, and	Chapter 3

Requirement	Where addressed in EIS
(ii) a general description of the environment likely to be affected by the development, activity or infrastructure and a detailed description of the aspects of the environment that are likely to be significantly affected, and	Chapter 6
(iii) the likely impact on the environment of the development, activity or infrastructure, and	Chapter 6
(iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and	Chapter 6 Appendix C
(v) a list of the approvals that must be obtained under another Act or law before the development, activity or infrastructure may lawfully be carried out,	Chapter 4
(e) a compilation, in a single section of the environmental impact statement, of the measures referred to in paragraph (d)(iv),	Appendix C
(f) the reasons justifying the carrying out of the development, activity or infrastructure, considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in section 193.	Chapter 7

Appendix C Mitigation measures

The EIS for the Project has identified a range of environmental impacts and recommended mitigation measures to avoid, mitigate or remedy these impacts (refer to Chapters 6 of this EIS). The table below presents a summary of the mitigation measures (excluding mitigation measures that are built into the physical layout and design of the Project and captured in the project description) which Iberdrola is committed to implementing either prior to construction, during construction or during operation for the Project.

These mitigation measures may be revised in response to public submissions to the EIS or design changes following public exhibition of this EIS. It is envisaged that these mitigation measures will form the basis for the Conditions of Approval which would be provided for the Project, subject to successful approval.

Compilation of mitigation measures

ID	Mitigation Measures
General	
G1	Prior to construction, an Environmental Management Strategy for the development will be prepared and implemented. This strategy will: • Provide the strategic framework for environmental management • Identify the statutory approvals that apply • Describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management • Set out the procedures that would be implemented The Environmental Management Strategy will be reviewed and updated prior to the subsequent key stages of the development including operations and decommissioning.
Traffic and transport	
T1	A CTMP will be prepared to mitigate potential construction traffic impacts. The CTMP will include the following: • Consultation outcomes with the relevant road authorities and adjacent landowners during preparation of the CTMP • A process for ongoing consultation with relevant road authorities, stakeholders and nearby developments to understand any overlap in construction programs and ensure appropriate coordination of construction activities • Measures to minimise potential traffic movement during key events in Tamworth (such as the Tamworth Country Music Festival) • Primary and secondary routes to be used by heavy construction-related vehicles • Traffic dust management measures • Notification requirements prior to the movement of hazardous / dangerous or oversize construction material and equipment • Measures to manage and facilitate the ingress/egress of the vehicles to ensure safety for all users along Ascot-Calala Road, including, as required regulatory and direction signposting, variable message signs, traffic management personnel and all other traffic control devices necessary for the implementation of the CTMP • Monitoring objectives to review the performance of traffic management
T2	A dilapidation survey of Ascot-Calala Road will be undertaken prior to the commencement of construction.
T3	Opportunities for the use of a shuttle buses during construction will be explored in consultation with TRC to reduce the need for private vehicle use. The outcomes of this review will be documented in the CTMP.
T4	A detailed route assessment will be completed for all OSOM vehicles used during construction.

ID	Mitigation Measures
T5	A process for managing OSOM vehicle deliveries will be developed and implemented (obtain either a Ministerial Orders, Class 1 National Notices or permits with the National Heavy Vehicle Regulator depending on the size and loads of the vehicles).
T6	A Driver Code of Conduct will be implemented to maintain safety within and around the Project and will be included in the CTMP. The Code of Conduct will be communicated to all site workers during site induction and will be reminded of the requirements of the code regularly in toolbox meetings. The Code of Conduct will be revised prior to commencement of on-site works and when required during construction works. The Code of Conduct will include but not be limited to: • All vehicles associated with the Project are required to travel within the posted speed limits on public roads • All large vehicles associated with the Project are required to follow the designated heavy and OSOM vehicle routes and minimise impact on school bus routes • All operators of the vehicles associated with the Project should maintain a high level of awareness and respect for all other road users • Safe driving practice training will be provided prior to start-up of any traffic and access related management tasks, and provide updates if the tasks, equipment or procedures are expected to, or have changed.
T7	Fatigue management measures will be introduced and enforced for all workers including the standard hours of operation.
T8	All vehicles associated with the Project will be compliant with relevant State legislation in relation to roadworthiness and modifications, and maintained regularly by way of vehicle checks and maintenance.
T9	Site access management will be implemented to maintain the safety of the general public and the employees. This will include measures such as advisory truck turning signage and mandating heavy vehicles come from south via Whitehouse Lane.
Noise and vibration	
NV1	Noise modelling will be undertaken for the preferred supplier to verify: • Compliance with the Project specific noise criteria in accordance with the <i>Noise Policy for Industry</i> (EPA, 2017) • Design noise mitigation measures to be implemented such as silencers, layout refinements and noise path controls. Other approaches to reduce noise levels that would be considered include selecting suppliers with fewer sound sources (quantity) and lower noise emissions and / or adjusting fan speeds to account for reduced cooling capacity overnight.
NV2	All nearby receivers (including those along the primary heavy traffic route on Whitehouse Lane and Ascot-Calala Road) will be notified about works and expected duration in accordance with the community consultation developed and implemented for the Project.
NV3	The draft CNVMP will be reviewed and updated prior to the commencement of construction. The Plan will identify feasible and reasonable approaches to reduce noise and vibration impacts during construction of the Project.
NV4	Works will occur during standard working hours only. These hours are: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturday • No work on Sundays or public holidays. If works must occur out of hours for justified reasons (e.g. worker safety or reduction of impact on traffic), preference will be given to day and/or evening time works (i.e. between 7 am and 10 pm). Out of Hours works will be separately assessed with appropriate noise mitigation and community consultation implemented as necessary based on the level of predicted impact.
NV5	Worksite induction training and 'toolbox talks' will include education for workers on noise issues related to the site (e.g. workers will be advised to avoid shouting or whistling on-site near sensitive receivers).

ID	Mitigation Measures
NV6	The EMS will include measures and processes for managing noise resulting from the operation of the Project, including a process for managing complaints.
Biodiversity	
FF1	Clearing of native vegetation will not occur until the EMS is approved. The EMS will include flora and fauna management measures to be implemented.
FF2	If native clearing occurs during spring nesting season, pre-clearing surveys will be undertaken. No breeding sites or active nests will be disrupted, as far as practical.
FF3	Native vegetation clearing will be minimised as far as is practicable.
FF4	The limits of native vegetation clearing will be marked on plans and on site with signed fencing so that clearing activities are constrained to approved areas only.
FF5	Where fauna species are identified in native vegetation to be cleared, animals will be removed and relocated to adjacent bushland prior to clearing. If this is not possible, the tree will be sectionally dismantled or soft felled under the supervision of a suitably qualified ecologist or wildlife carer, before relocating the animal.
FF6	Pits/trenches adjacent to native vegetation that will remain open overnight, will be securely covered, where possible. Alternatively, fauna ramps (logs or wooden planks) will be installed to provide an escape for trapped fauna.
FF7	Appropriate sediment and erosion controls around the impact area will be installed prior to the commencement of earthworks.
FF8	Where possible, earthworks will be undertaken during dry weather conditions. No clearing of vegetation will occur during overland flow events.
Hazards and risk	
HR1	The investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) will be review and relevant findings will be implemented for the Project when finalising design and preparing for operations. The publicly available investigation reports include: • Energy Safe Victoria: <i>Statement of Technical Findings on fire at the Victorian Big Battery</i> • Fisher Engineering and Energy Safety Response Group: <i>Report of Technical Findings on Victorian Big Battery Fire</i>.
HR2	A Fire Safety Study will be prepared in accordance with the development conditions to identify measures to eliminate the expansion of any fire incident. These may include: • Type of firefighting or control medium; and • Demand, storage and containment measures for the medium.

ID	Mitigation Measures
Bushfire	
BR1	An asset protection zone (APZ) will be implemented for a distance of 12 metres in all directions (unless a performance based solution adequately demonstrates that a smaller APZ would meet the aims and objectives of the PBP guidelines).
BR2	A vehicular access track around the BESS, consistent with access standards in PBP (NSW RFS 2019) will be provided
BR3	Provide a minimum 20,000 litre static water supply for fire fighting purposes and suitable fittings sufficient to enable firefighting. The tank is to be concrete or metal and all exposed water pipes external to the building are metal, including any fittings. A static water supply marker should be obtained from the Rural Fire Service and displayed in a prominent position at the front gate. This supply may form part of larger water holding structure.
BR4	Where practicable, electrical transmission lines will be located underground.
BR5	Prepare a Bushfire Emergency Management and Evacuation Plan in accordance with the RFS document <i>A Guide to Developing a Bushfire Emergency Management and Evacuation Plan</i> to be implemented for construction and operation of the Project.
BR6	Establish a 'hot works management system' for both construction and operation phases to prevent accidental bushfire ignition from hot works on site
Heritage	
H1	Construction teams and operations staff will receive cultural training to ensure they understand the cultural values of these sites and their connection to the surrounding landscape and the Local Gamilaroi / Kamilaroi Aboriginal community that continue to care for country.
H2	The EMS will include unexpected finds protocols to be implemented in the unlikely event that Aboriginal objects, human remains, or items of heritage are discovered during construction or operation.
Visual amenity	
V1	The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for project infrastructure to minimise visual impacts (including glare/reflectivity), including the O&M buildings/facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.
V2	Cut off and direct light fittings (or similar technologies) would be used where appropriate to minimise glare and light spill onto private property.
V3	Landscaping will be installed and maintained in accordance with the conceptual landscape plan, including screen planting along the north, east and south of the BESS facility. The final location and extent of landscaping will be determined during detailed design. The key principals include: - Planting should remain in keeping with existing landscape character - Species selection is to be typical of the area - Planting layout should avoid screening views of the broader landscape - Avoid the clearing of existing native vegetation. Where appropriate reinstate any lost vegetation - Allow native vegetation to regrow over any areas of disturbance.
Land	
L1	A soil survey according to the Australian Soil and Land Survey Field Handbook (CSIRO, 2009) and the Australian Soil Classification (Isbell, 2021) will be undertaken to verify soil characteristics and further inform the potential for salinity, acid sulfate soils and erosion to occur.

ID	Mitigation Measures
L2	An Unexpected Contaminated Land Finds Protocol will be included in the EMS to manage any disturbance of material that is odorous, stained, or containing anthropogenic materials, in the event that these are encountered during construction.
L3	The EMS prepared for the Project will include measures to manage any spills that occur during operation.
L4	A Rehabilitation and Decommissioning Management Plan is to be prepared in consultation with NSW DPI prior to decommissioning. The Rehabilitation and Decommissioning Management Plan will include: • Removal of all above ground infrastructure • Reverse any compaction by mechanical ripping • Verification of a safe, stable and non-polluting site
Social and economic	
SE1	A Local Procurement Strategy will be implemented to prioritise local jobs and businesses wherever possible. The Local Procurement Strategy will: • Encompass considerations regarding local employment and procurement (with a specific focus on First Nations participation) and the associated accommodation of the construction workforce • Target people and businesses within Tamworth LGA and regional surrounds • Continue to consult with stakeholders such as the TRC, Department of Regional NSW, Tamworth Business Chamber and other economic development or local social service agencies.
SE2	An outline of the planned workforce staging, and likely material requirements will be communicated to the broader local business community to allow local supply chains to plan for potential surges in need for goods and services as part of broader engagement with local business (Local Procurement).
SE3	Engagement will be undertaken with local business/tourism bodies to obtain information on local tourism, dining and service offering to supply construction workers with information on local services for shopping and dining options during construction.
SE4	A Community and Stakeholder Management Plan will be prepared and implemented in line with <i>Undertaking Engagement Guidelines for State Significant Projects</i> (DPE, 2022). The plan will provide procedures for: • Informing stakeholders of potential impacts • Providing project-related updates • Registering and responding to complaints and feedback.
SE5	A Community Enhancement Fund to support very localised and meaningful community and environmental initiatives that have strong resident and broader community support, throughout the life of the Project would be developed. Iberdrola is committed to establishing a benefit sharing scheme such as a fund for community-based projects. The details of the benefit sharing scheme are yet to be determined but would likely be managed through a committee comprising representatives from Iberdrola, TRC and the local community. This has discussed with TRC but requires further development in partnership with the community and key stakeholders.
Water	
W1	A construction water balance will be undertaken to confirm the water requirements and ensure sustainable access to water sources.
W2	Excavations will be limited to depths above the observed groundwater levels. Where deeper excavation is required, the groundwater assessment will be reviewed.

ID	Mitigation Measures
W3	The overarching design and development of infrastructure and engineered control during detailed design will include: • Ongoing consultation with TRC on required water quality targets and water controls to manage general risks associated with increases in impervious areas. Infrastructure will be developed with consideration to Appendix A of the TRC DCP 2010. • Oil-water management controls within the BESS substation will be designed to consider relevant Australian Standards, as well as any requirements of electricity distributors • Stormwater infrastructure will be designed to include a closure mechanism (e.g. penstock gate) or alternative arrangement to detain flows from leaving in the event of a spill/firewater discharge.
W4	A Soil and Water Management Plan (SWMP) and Erosion and Sediment Control Plan (ESCP) will be developed to management potential water impacts during construction. The ESCP will be developed in accordance with the principles and requirements of the Blue Book (Landcom 2004).
W5	Flood emergency response protocols will be prepared and implemented to address the potential for access routes to be affected by road closures during flood events.
W6	The EMS for the Project will include a management and maintenance schedule to ensure that stormwater management system devices are regularly inspected and maintained.
Waste	
WM1	The preliminary Waste Management Plan prepared as part of the EIS will be reviewed and updated prior to the commencement of construction.
WM2	All materials requiring removal from the Project will be classified in accordance with the NSW EPA <i>Waste Classification Guidelines</i> (2014). This material will only be transported from the Project to an appropriately licensed landfill for disposal, or to an appropriately licenced recycling facility.
WM3	The resource management hierarchy principles established under the WARR Act of avoid / reduce / reuse / recycle / dispose will be applied where feasible.
WM4	Wastes will be appropriately quantified, transported, stored and handled in accordance with NSW EPA waste classification and in a manner that prevents pollution of the surrounding environment
WM5	The handling and management of special wastes will be carried out in accordance with relevant legislation, codes of practice and Australian standards
WM6	A Waste Register will be maintained for the duration of construction. The register will detail the type of waste, volume/quantity of waste and recycle/disposal options.
WM7	Working areas will be maintained, kept free of rubbish, and cleaned up at the end of each working shift.
WM8	Waste will be managed and disposed of in accordance with the relevant applicable legislation, policies and guidelines, including the WARR Act and the <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-21</i> (EPA 2014).
Air quality	
AQ1	Reasonable and feasible dust suppression will be implemented during construction activities to minimise fugitive dust emissions
AQ2	All vehicles transporting materials to and from the Project will be covered and secured
AQ3	Speed limits on the Project Site will be established and enforced during construction
AQ4	All plant and equipment will be inspected before it is used on-site and maintained in accordance with manufacturers specifications and will comply with relevant vehicle emission standards, where applicable.
AQ5	All plant and equipment will be switched off when not in use for extended periods

ID	Mitigation Measures
AQ6	Air quality measures will be included in the EMS
AQ7	Dust and air quality complaints will be managed in accordance with the overarching complaints handling process for the Project. Appropriate corrective actions, if required, will be taken to reduce emissions in a timely manner.
AQ8	Plant and equipment will be maintained in good condition to minimise ignition risk of fuel or chemicals, spills and air emissions that may cause nuisance.
Cumulative impacts	
CU1	A process for monitoring the timing and location of other developments within the vicinity of the Project will be outlined in the EMS. Where potential adverse cumulative impacts are identified, consultation will be undertaken to encourage a collaborative effort as these projects progress and take a flexible and iterative approach to ensure the best outcomes.