Winterbourne Wind Farm

Amendment Report

PREPARED FOR

WinterbourneWind Pty Ltd

DATE
3 October 2024

REFERENCE
0526676

DOCUMENT DETAILS

DOCUMENT TITLE	Winterbourne Wind Farm
DOCUMENT SUBTITLE	Amendment Report
PROJECT NUMBER	0526676
DATE	3 October 2024
VERSION	05
AUTHOR	Martin Kim, Meg Coles
CLIENT NAME	WinterbourneWind Pty Ltd

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Draft	01	M. Kim,	B. Morgan	M. Davey	31.05.2024	
Draft	02	M. Kim, M. Coles	S. Bennett	M. Davey	11.07.2024	
Draft	03	M. Coles	S. Bennett	M. Davey	28.08.2024	
Final Draft	04	-	S. Bennett	M. Davey	30.08.2024	
Final	05	-	S. Bennett	M. Davey	18.09.2024	

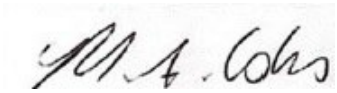
SIGNATURE PAGE

Winterbourne Wind Farm

Amendment Report

0526676

Martin Kim
Senior Environmental Consultant



Meg Coles
Managing Consultant

Simon Bennett
Principal Consultant

Mark Davey
Partner

Environmental Resources Management
Australia Pty Ltd
Level 14, 207 Kent Street
Sydney NSW 2000
T +61 2 8584 8888

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronyms	Description
~	Approximately
<	Less than
>	More than
2D	2-dimensional
ABN	Australian Business Number
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal Cultural Heritage Management Plan
ACMA	Australian Communications and Media Authority
AEMO	Australian Energy Market Operator
AGL	Above Ground Level
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AIA	Aviation Impact Assessment
AIS	Aviation Impact Statement
ALAs	Aircraft landing areas
AMSL	Above Mean Sea Level
ARDG	Australian Resource Development Group
ARTC	Australian Rail Track Corporation
ASIRF	Aboriginal Site Impact Recording Form

Acronyms	Description
BAM	Biodiversity Assessment Method
BBUS	Bird and Bat Utilisation Surveys
BC Act	*Biodiversity Conservation Act 2016*
BC Regulation	Biodiversity Conservation Regulation 2017
BCS	Biodiversity, Conservation and Science, part of the Department of Climate Change, Energy, the Environment and Water, NSW
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BIA	Blasting Impact Assessment
BOP	Balance of Plant
CBF	Community Benefit Fund
CIA Guidelines	Cumulative Impact Assessment Guidelines for State Significant Projects
CIP	Copenhagen Infrastructure Partners
CO_2-e	Carbon dioxide equivalents
COP	Conference of Parties
dB	Decibels
dBL	Linear Decibels
DPE	NSW Department of Planning and Environment (now DPHI)
DPHI	NSW Department of Planning, Housing and Infrastructure
EC	Electrical Conductivity
EDM	Electronically Delivered Mail
EIS	Environmental Impact Statement
EMI	Electromagnetic interference
EMP	Environmental Management Plan
EMS	Environmental Management System
Engagement Guidelines	Undertaking Engagement Guidelines for State Significant Projects
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*
EPL	Environment Protection Licence
ERM	Environmental Resources Management
ESD	Ecologically Sustainable Development
FTE	Full Time Equivalent
GDE	Groundwater Dependent Ecosystem

Acronyms	Description
GHG	Greenhouse Gas
GIA	Groundwater Impact Assessment
GW	Gigawatt
ha	Hectares
HHA	Historic Heritage Assessment
HV	Heavy Vehicle
ICNG	Interim Construction Noise Guideline 2009
IPC	Independent Planning Commission
ISP 2024	Integrated System Plan 2024
kg	Kilograms
km	Kilometres
kV	Kilovolt
$L_{Ceq,\ 10min}$	Highest predicted low-frequency noise level
LEP	Local Environmental Plan
LGA	Local Government Area
LSALT	Lowest Safe Altitude
LVIA	Landscape and Visual Impact Assessment
m	Metres
m/s	Metres per second
m^3	Cubic metres
Met mast	Meteorological Monitoring Masts
mg/L	Milligrams per litre
MIC	Maximum instantaneous charge
ML/yr	Megalitres per year
mm/s	Millimetres per second
MOC	Minimum Obstacle Clearance
MSA	Minimum safe altitude
Mt	Megatonne
MW	Megawatt
MWh	Megawatt hour
NASF	National Airports Safeguarding Framework
NASF	National Airports Safeguarding Framework
NEM	National Electricity Market
NEPC	National Environmental Protection Council of Australia
NEPM	National Environment Protection Measures

Acronyms	Description
NIA	Noise Impact Assessment
NMLs	Noise Management Levels
NMLs	Nautical Miles
NO_2	Nitrogen Dioxide
Noise Bulletin	Wind Energy: Noise Assessment Bulletin for State Significant Wind Energy' Development
NOx	Nitrous oxides
NPI	Noise Policy for Industry 2017
NSW	New South Wales
NVR	Draft Native Vegetation Regulatory Mapping
O&M	Operations and Maintenance
OH&S	Occupational Health and Safety
OLS	Obstacle Limitation Surfaces
OSOM	Over Size Over Mass
PAD	Potential Archaeological Deposit
PCT	Plant Community Type
PHA	Preliminary Hazards Analysis
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
PNTLs	Project Noise Trigger Levels
POEO Act	*Protection of the Environment Operations Act 1997*
PPV	Peak Particle Velocity
RAPs	Registered Aboriginal Parties
RCS	Radar Cross Section
RET	Renewable Energy Target
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
RNP	Road Noise Policy 2011
RRL	Register of Radiocommunication Licences
RSA	Rotor Swept Area
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEP	Stakeholder Engagement Plan
SIA	Social Impact Assessment
SIA Guideline	Social Impact Assessment Guideline for State Significant Projects

Acronyms	Description
SIA Technical Supplement	Technical Supplement: Social Impact Assessment Guideline for State Significant Projects
SISD	Safe Intersection Sight Distance
SSD	State Significant Development
SWIA	Surface Water Impact Assessment
t-CO_2-e pa	Tonnes CO_2 equivalent per annum
TDS	Total Dissolved Solids
TfNSW	Transport for NSW
TIA	Traffic Impact Assessment
TL	Transmission Line
TMP	Traffic Management Plan
TSP	Total suspended particulates
UNFCCC	United Nations Framework Convention on Climate Change
Vestas	Vestas Wind Systems A/S
VPA	Voluntary Planning Agreement
vpd	Vehicles Per Day
vph	Vehicle Movements Per Hour
Walcha LEP	Walcha Local Environmental Plan 2012
Walcha LEP	Water Access Licence
WBM	Water Balance Model
WMP	Waste Management Plan
WMS	Water Management System
WPI	Wind Power Invest
WQO	Water Quality Objective
WTGs	Wind Turbine Generators
YARM	Armidale Airport
YSTW	Tamworth Regional Airport
ZVI	Zone of Visual Influence
µg/m^3	Micrograms per cubic metre

EXECUTIVE SUMMARY

INTRODUCTION

WinterbourneWind Pty Ltd (the Applicant) is seeking approval to construct, operate and decommission the Winterbourne Wind Farm (the Project), located at its closest point about 6.5 kilometres (km) northeast of Walcha in the New England Tablelands region of New South Wales (NSW).

Approval for the Project is sought under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In support of the SSD application (SSD-10471), an Environmental Impact Statement (EIS) was prepared and was publicly exhibited between 18 November 2022 and 23 January 2023 by the (then) NSW Department of Planning and Environment (DPE) (now NSW Department of Planning, Housing and Infrastructure [DPHI]).

During the public exhibition period, 959 submissions were received (excluding duplicates). These submissions are categorised as follows:

- 924 public submissions (excluding duplicates);
- 14 organisation submissions;
- 4 local council submissions; and
- 17 submissions with advice from government agencies.

ACTIONS TAKEN SINCE EXHIBITION

DPE issued a request for the Applicant to prepare a Submissions Report for the Project in January 20243. A separate Submissions Report has been prepared in response to that request and in accordance with clause 59(2) of the *Environmental Planning and Assessment Regulations 2021*, and the State Significant Development Guidelines – Preparing a Submissions Report (Appendix C of the State Significant Development Guidelines). The Submissions Report provides an analysis of the issues raised, explains what actions have been taken by the Applicant since the EIS was exhibited, provides a response to issues raised, and an updated justification and evaluation of the Project.

Since exhibition of the EIS and during preparation of the Submissions Report and this Amendment Report, the Applicant has continued to engage with the community and key stakeholders. Public engagement activities have included a stall at the Walcha Show in March 2023 and 2024, a street stall in Uralla in May 2023, and a Project Office in Walcha open to the public across 8 months in 2023 and since June 2024. Face to face meetings have been held with twelve local businesses. Newsletter updates have issued periodically by mail and email and a Project website is maintained. The Applicant has also continued engagement with relevant NSW and Federal Government agencies, the surrounding community and community groups, Aboriginal groups, proximate landholders and infrastructure owners.

AMENDED PROJECT

In response to issues raised in public submissions and by government agencies, the Project has been amended to reduce its impacts. These amendments are covered in detail in this Amendment Report and should be read in conjunction with the Submissions Report.

The key changes in the Amended Project are:

- Reconfiguration of the Project layout including relocation of 21 WTGs (moved > 100 m), micro-siting of 52 WTGs (moved < 100 m), removal of 2 WTGs and addition of 1 WTG;
- Changes to the Project Area with removal of 13 land parcels and addition of 2 land parcels;
- Realignment of site access locations and internal access tracks, and electrical reticulation;
- Relocation of both substations, the O&M facility, construction compound, BESS and laydown areas;
- Construction of on-site quarry to supply gravel, aggregates and potentially bedding material required for Project construction; and
- Inclusion of a new transport route to avoid Oxley Highway for inbound oversize and overmass (OSOM) vehicles.

The layout of the Amended Project and siting of WTGs and other key infrastructure components has been subject to an ongoing iterative design and siting process, considering environmental, civil engineering and wind generation constraints and opportunities, as well as consideration of issues raised during ongoing community engagement. The Applicant has engaged further with landowners, Project neighbours, the broader community, local government, State and Federal Government agencies, and business and stakeholder groups to inform the Amended Project design. In doing so, the Amended Project has:

- Further avoided and/or minimised adverse environmental impacts;
- Protected sensitive areas and receivers identified through specialist assessments including biodiversity, noise, visual, heritage, hazards and risks, and water;
- Addressed matters raised in submissions of the exhibited Project EIS and outcomes of ongoing engagement with the community, landowners, government agencies, local council and other stakeholders;
- Maximised the yield of wind power generation through suitable positioning of WTGs on-site and in consideration of environmental constraints;
- Maintained minimum Project generation capacity to achieve commercial viability of the Project in the context of the cost required to connect to the existing electrical grid; and
- Optimised accessibility of Project elements through identifying constructability constraints and strategically positioning Project elements to minimise earthworks required during construction and thereby further reduce potential biodiversity impact.

Despite the inclusion of new aspects (i.e., the quarry and modification of OSOM transport route) the Amended Project does not represent a material increase in potential impacts beyond those originally proposed in the EIS. Rather, the Amended Project has significantly reduced impacts related to biodiversity, traffic and transport, visual and telecommunications.

PROJECT JUSTIFICATION

The Project, as amended, is expected to generate around 2,100,000 megawatt hours (MWh) per year of clean, renewable energy — enough to power more than 375,000 NSW homes on average. The Project will deliver renewable, low-cost energy to the national grid and contribute to the NSW Government's net-zero emissions target by 2050. The Project will further provide a significant amount of the new generation capacity required as coal-fired power stations are retired over the next decade, including the 2,880 megawatt (MW) Eraring Power Station (scheduled to close in 2027).

The Project will primarily be developed on agricultural land which has been previously disturbed and/or historically cleared. Wind farms are very much compatible with existing farming operations as the turbines occupy only a small amount of land, and landowners can continue normal grazing or cropping activities.

The Project layout has been designed and revised to maximise the use of existing disturbed areas and to avoid or minimise impacts, including to identified biodiversity and Aboriginal cultural heritage values. Progressive design iterations for the turbines, ancillary infrastructure, and the transmission line corridor have continued with key drivers being measures to minimise and avoid environmental and social impacts in line with the Avoid-Minimise-Mitigate-Offset design hierarchy.

The Project will create a range of social and economic benefits which will create substantial capital investment in Walcha and Uralla and the broader New England region. The Project is anticipated to generate up to 390 FTE construction jobs, in turn creating approximately $150 million in direct wages and profits, and more than $160 million in indirect wages and profits, per year of construction. The construction workforce will generate more economic activity at local restaurants, shops and businesses, and will possibly lead to higher occupancy rates in temporary accommodation.

During operation, the Project will generate up to 16 FTE jobs and $25 million per year in direct and indirect economic benefit for the local region. The Applicant will operate and maintain the WTGs and other infrastructure to ensure safe and efficient facilities that optimise energy generation. The Project service team will include around 16 skilled staff permanently based in Walcha or surrounding towns, who will become part of the local community.

There will be opportunities for local contractors and businesses to supply services during Project construction and operation. The Project will offer training and development to upskill the regional workforce to support the growing renewable energy industry.

The Project will further provide a diversified income stream for host landholders which will help make host farms more resilient to the impacts of droughts, fires and commodity price fluctuations.

A VPA has been entered into between the Applicant, Walcha Council and Uralla Shire Council. Under the VPA, the Applicant is to allocate funds to two Community Benefit Funds for the purpose of providing funding within the Walcha and Uralla Shire Local Government Areas (LGAs).

Through the implementation of best practice management, the potential environmental impacts associated with the Project can be appropriately managed, which will also address the community concerns and associated social impacts identified during the stakeholder engagement process.

1. INTRODUCTION

1.1 BACKGROUND

WinterbourneWind Pty Ltd (the Applicant) is seeking approval to construct, operate and decommission the Winterbourne Wind Farm (the Project), located 6.5 kilometres (km) northeast of Walcha in the New England Tablelands region of New South Wales (NSW). **Figure 1-1** provides the regional context of the Project and **Figure 1-2** shows the Project locality.

Approval for the Project is sought under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as the Project is declared State Significant Development (SSD) under Part 2.2, clause 2.6 and Schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

A referral (EPBC Ref: 2020/8734) was made under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The Project was determined to be a 'controlled action' on 31 August 2020; therefore, approval is also sought under Part 9 of the EPBC Act.

In support of the SSD application (SSD-10471), an Environmental Impact Statement (EIS) was prepared for the Project (ERM, 2022a). The EIS was publicly exhibited between 18 November 2022 and 23 January 2023 by the (then) NSW Department of Planning and Environment (DPE) (now NSW Department of Planning, Housing and Infrastructure (DPHI)). During the public exhibition period, 959 submissions were received (excluding duplicates). These submissions are categorised as follows:

- 924 public submissions (excluding duplicates);
- 14 organisation submissions;
- 4 local council submissions; and
- 17 submissions with advice from government agencies.

On 24 January 2023, the former DPE (now DPHI) requested that the Applicant prepare and submit a Submissions Report which responds to the issues raised in the submissions, as required under section 59(2) of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). A Submissions Report has been prepared (separate to this Report) and provides an analysis of the issues raised in submissions and explains what actions have been taken by the Applicant since the EIS was exhibited.

This Amendment Report should be read in conjunction with the Submissions Report (ERM, 2024). It assesses the potential impacts of the Project's improved design, as well as additional or revised mitigation measures, as required. The Amendment Report has been prepared having regard to the *State Significant Development Guidelines – Preparing an Amendment Report* (Appendix D of the *State Significant Development Guidelines* (DPIE, 2022a)).

1.2 ORIGINAL PROJECT

The Project as originally proposed (i.e., EIS project layout) involved the construction, operation and decommissioning of a wind farm with up to 119 wind turbine generators (WTGs), together with associated and ancillary infrastructure.

The key components of the Project as described in the EIS included:

- Up to 119 WTGs with a 230 m above ground level (AGL) maximum tip height with a combined generating capacity of around 700 MW;
- Two 33/330 kilovolt (kV) electrical substations, including transformers, insulators, switchyard and other ancillary equipment;
- A lithium-ion battery energy storage system (BESS) with a rated capacity of up to 100 MW / 200 MWh;
- Underground and/or overhead 33 kV electrical reticulation and fibre optic cabling connecting the WTGs to the onsite substation (designed to follow site access tracks where practicable);
- A 330 kV single or double circuit, three phase, twin conductor bundle overhead transmission line, connecting the on-site substations to a new switchyard approximately 7 km south of Uralla, approximately 23 km from the wind farm boundary;
- A switchyard to connect the transmission line to the existing 330 kV TransGrid Tamworth to Armidale overhead transmission line network, enabling the Project to connect to the national grid;
- An internal private access road network (combined total length of approximately 113 km);
- An operations and maintenance facility;
- Commissioning and decommissioning of up to four temporary meteorological monitoring masts (met mast) for power testing and installation of up to two permanent met masts; and
- Upgrades of local roads and crossings to facilitate the delivery of wind turbine components and associated infrastructure.

The following temporary elements required during construction of the Project were described in the EIS:

- Temporary site buildings and facilities, including site offices, car parking, and amenities;
- Mobile concrete batching plants to supply concrete for WTG foundations and substation construction works;
- Earthworks to facilitate construction of access roads, WTG foundations;
- Rock crushing facilities for the generation of aggregate suitable for concrete batching, and/or for access roads and hardstand construction;
- Hardstand areas for the storage of construction materials, plant and equipment;
- External water supply for use in concrete batching and construction activities;
- Transport, storage and handling of fuels, oils and other hazardous materials used during construction and operation of the wind farm; and
- Beneficial reuse of materials won from the development footprint during construction.

The Project, as originally proposed, also sought consent for the subdivision of land for the substations and switchyard.

The Project layout as presented in the EIS is provided in **Figure 1-3.**

1.3 AMENDED PROJECT

The Applicant has made amendments to the Project informed by submissions received during EIS public exhibition and constraints identified during the development of the EIS (**Figure 1-4**). The key changes include:

- WTG configuration updates:
  - 21 WTG relocations (moved >100 m);
  - 52 WTG refinements (moved <100 m);One (1) WTG added;
  - Two (2) WTGs removed;
- Project area updates including the addition on two parcels and removal of thirteen parcels of land;
- Realignment of site access locations and internal access tracks, and electrical reticulation;
- Relocation of both substations, Operations and Maintenance (O&M) facility, construction compound, BESS and laydown areas;
- Inclusion of on-site quarry to supply gravel, aggregates and potentially bedding material required for Project construction; and
- New transport route to avoid Oxley Highway for inbound Over Size Over Mass (OSOM) vehicles.

Throughout the planning phase of the Project, a range of alternative Project designs have been considered in the context of technical, environmental, social, and commercial constraints. The Amended Project has:

- Further avoided and/or minimised adverse environmental impacts;
- Protected sensitive areas and receivers identified through specialist assessments including biodiversity, noise, visual, heritage, hazards and risks, and water;
- Addressed matters raised in submissions of the exhibited Project EIS and outcomes of ongoing engagement with the community, landowners, government agencies, local council and other stakeholders;
- Maximised the yield of wind power generation through suitable positioning of WTGs on-site and in consideration of environmental constraints;
- Maintained minimum Project generation capacity to achieve commercial viability of the Project in the context of the cost required to connect to the existing electrical grid; and
- Optimised accessibility of Project elements through identifying constructability constraints and strategically positioning Project elements to minimise earthworks required during construction and thereby further reduce potential biodiversity impact.

The amended Project provides significant environmental and social benefits as summarised in **Table 1-1**.

TABLE 1-1 JUSTIFICATION FOR THE AMENDED PROJECT

Category	Proposed Amendments	Justification
Biodiversity	• Amended project layout - relocation of relevant turbines, internal access tracks, electrical reticulation, ancillary infrastructure.	• The amended Project layout has further avoided woody vegetation, including areas of threatened ecological community and serious and irreversible impact (SAII) entities, leading to approximately: ◦ 88% decrease in potential impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland; ◦ 48% decrease in potential impacts to squirrel glider habitat; ◦ 51% decrease in potential impacts to greater glider habitat; ◦ 77% decrease in potential impacts to glossy black cockatoo habitat; ◦ 70% decrease in potential impacts to potential habitat for the Spotted-tail quoll (*Dasyurus maculatus*); ◦ 40% decrease in potential impacts to potential habitat for the Koala (*Phascolarctos cinereus*); and • Relocation of turbines to provide a minimum 600 m separation to nature reserves.
Aboriginal cultural heritage	• Amended project layout - relocation of relevant turbines, internal access tracks, electrical reticulation, ancillary infrastructure.	• Of the 23 newly recorded sites, 17 will be avoided by the Project
Noise	• Removal of turbine B124	• Reduce noise impacts on associated dwelling SR079
Visual	• Removal of turbine B023 and relocation of turbines B024, B025, B026, B027	• Nine parcels removed from the Project Area
	• Relocation of turbines B032, B033 and B034	• Reduce visual impact on non-associated dwellings SR204, SR034, SR095, SR207 and SR359
	• Removal of turbine B124	• Reduce visual impact on associated dwelling SR079
	• Inclusion of SR087, SR088, SR274 and SR282 as associated dwellings	• Reduce visual impacts by adding associated dwellings in proximity to the project

Category	Proposed Amendments	Justification
Traffic	• Avoid Oxley Highway for inbound OSOM movements • Inclusion of on-site quarry	• Reduce amount of construction traffic using local roads by sourcing raw materials for construction from within the project site
Aviation	• Amended project layout	• No additional impacts on certified airports or existing air routes
Electromagnetic interference	• Relocation of turbines B138, B139, B152, B153 and B154	• Reduce the potential impacts on point-to-point telecommunication links
Social	• Changes to construction timeframe • Change to OSOM vehicle routes • Changes to construction traffic	• Amended Project does not result in any changes to the likelihood, magnitude or pre-mitigation impact significance ratings identified in the EIS and the residual impact ratings remain the same.
Quarry assessments (air quality and greenhouse gas, blasting, noise, groundwater and surface water)	• Inclusion of on-site quarry	• Reduced transport impacts for raw material haulage to the Project site; • Reduced greenhouse gas emissions due to a reduction in construction traffic for raw material haulage; • No additional noise impacts from quarry operation and decommissioning; and • No blast impacts to residences from ground vibration, airblast overpressure nor flyrock are expected.
Cumulative impacts	• Construction expected to commence in Q3 2026	• Potential overlap of construction periods with other projects in the region will remain. The distance between this Project and other projects in the region is not expected to result in significant cumulative impacts.

The proposed amendments to the Project are summarised in **Section 3** and an updated detailed Project description is presented in **Appendix A**. The updated assessment of impacts relevant to the amended Project are described in **Section 6**. These assessments have been prepared by specialists consisting of ERM's in-house technical experts and sub-consultants. Where these assessments are named specifically by the specialists they are referred to as 'Updated' / 'Revised' / 'Addendum'; all other updated assessments use the generic term 'Amended'.

This Amendment Report also updates the mitigation measures proposed for the amended Project to ensure all potential impacts relating to the Project are appropriately managed and mitigated throughout its life. The updated mitigation and management measures are summarised in **Appendix B**.

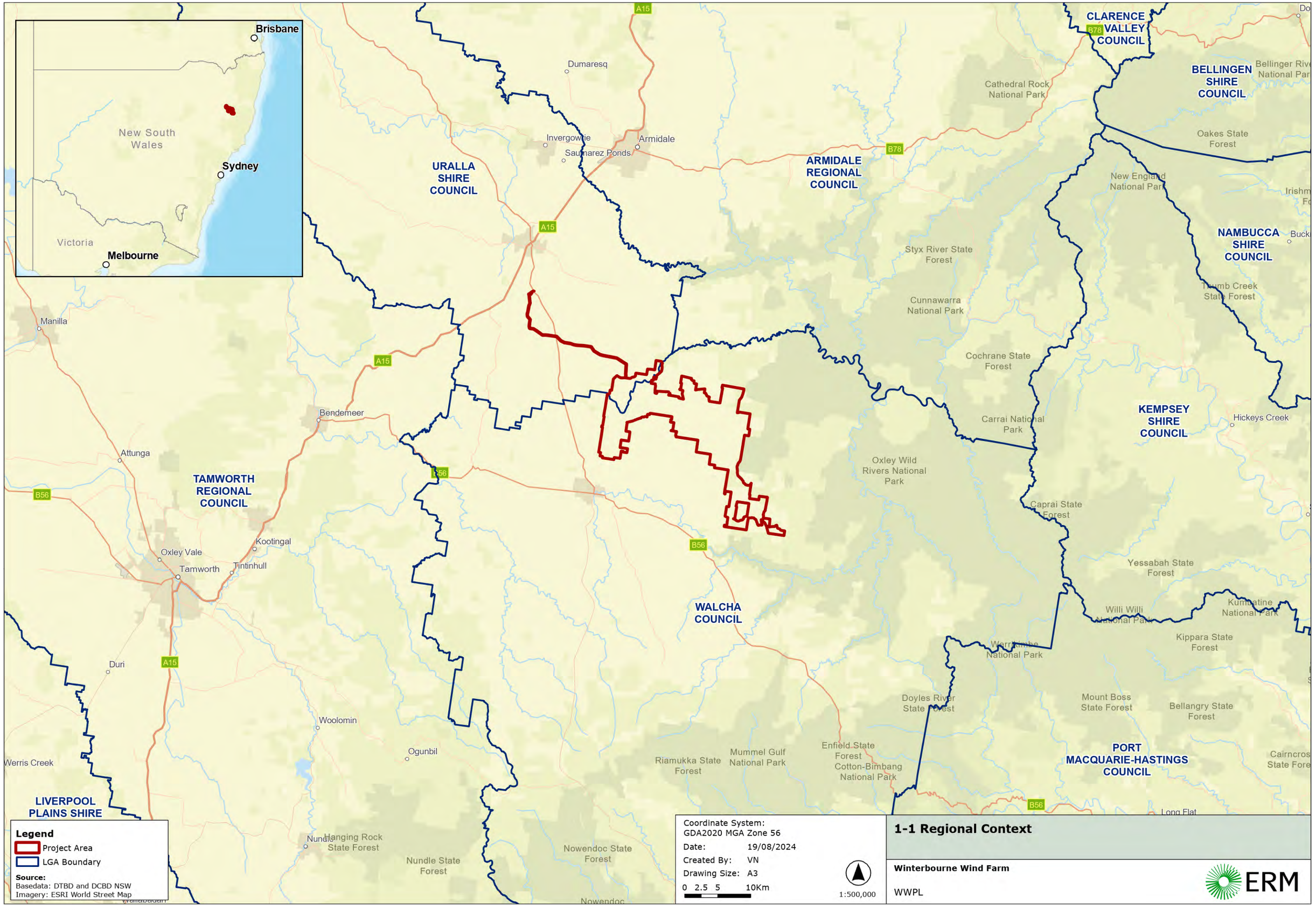
This Amendment Report has been prepared with regard to the *State Significant Development Guidelines – Preparing an Amendment Report* (Appendix D of the *State Significant Development Guidelines* (DPIE, 2022a)). The key objectives of this Amendment Report are to:

- Describe the proposed amendments that have been made to the Project in response to issues raised in public submissions and by government agencies, local councils and other stakeholders during public exhibition of the EIS and to further mitigate the impacts of the Project;
- Assess the environmental, social and economic impacts of the amended Project; and
- Help the community, landowners, government agencies, local councils and the consent authority better understand the Project amendments and their potential impacts.

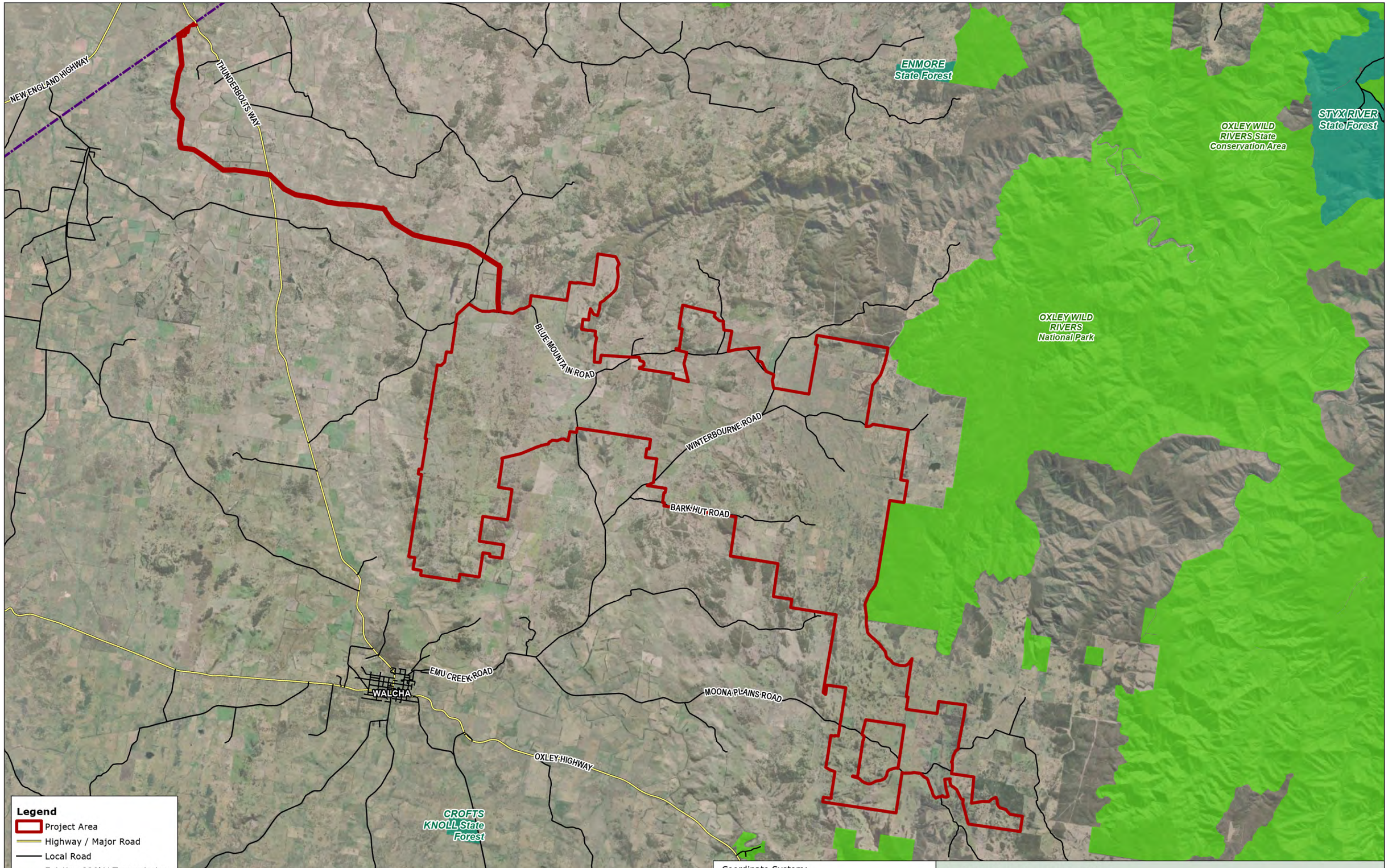
1.4 THE APPLICANT

The Applicant's details are:

- **Applicant:** WinterbourneWind Pty Ltd
- **Address**: Level 4, 477 Collins Street, Melbourne VIC 3000; and
- **ABN**: 59 113 000 150.



0526676_WWF_AGEN_R0.aprx/1-1 Regional Context



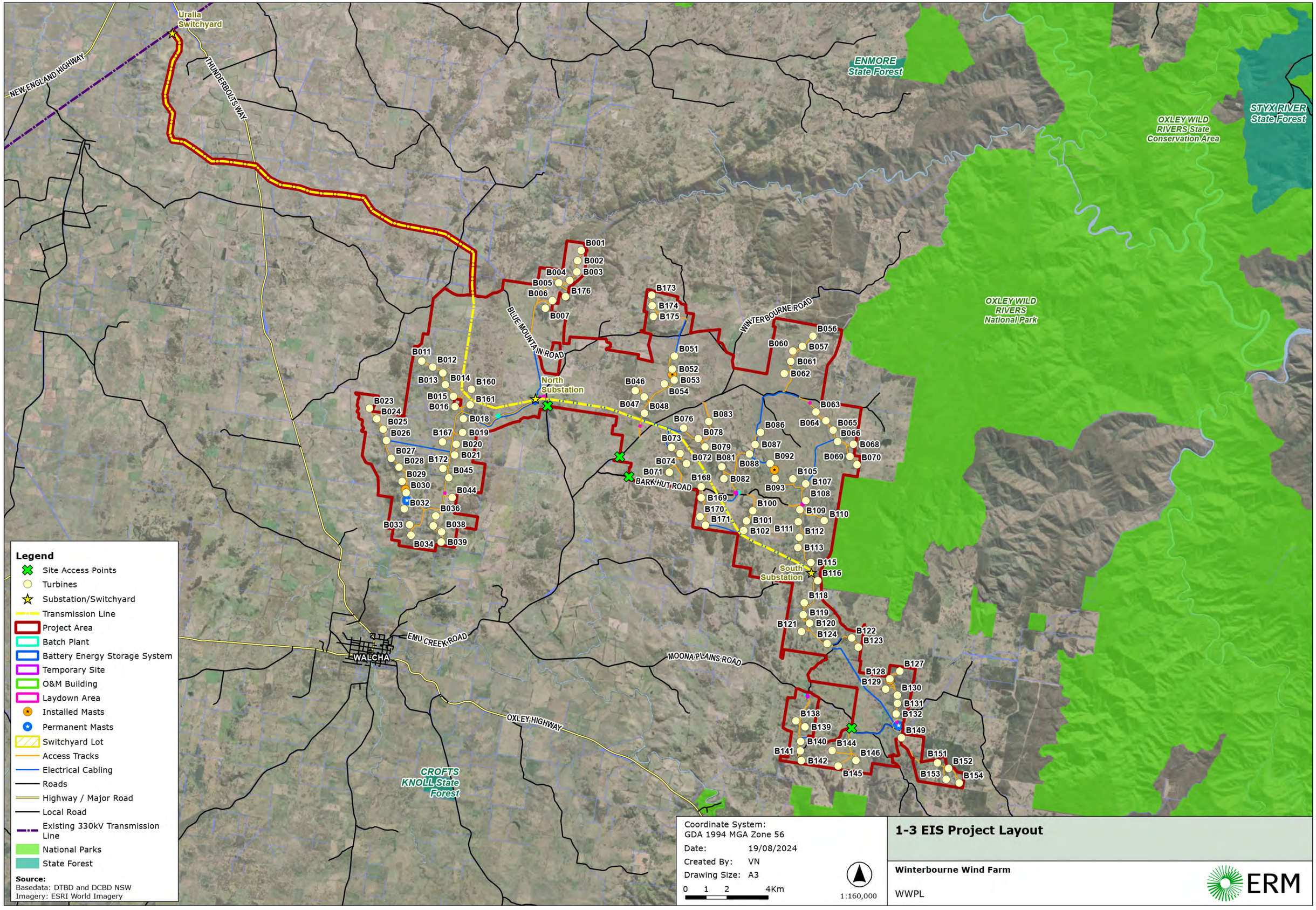
1-2 Project Locality Plan

Winterbourne Wind Farm

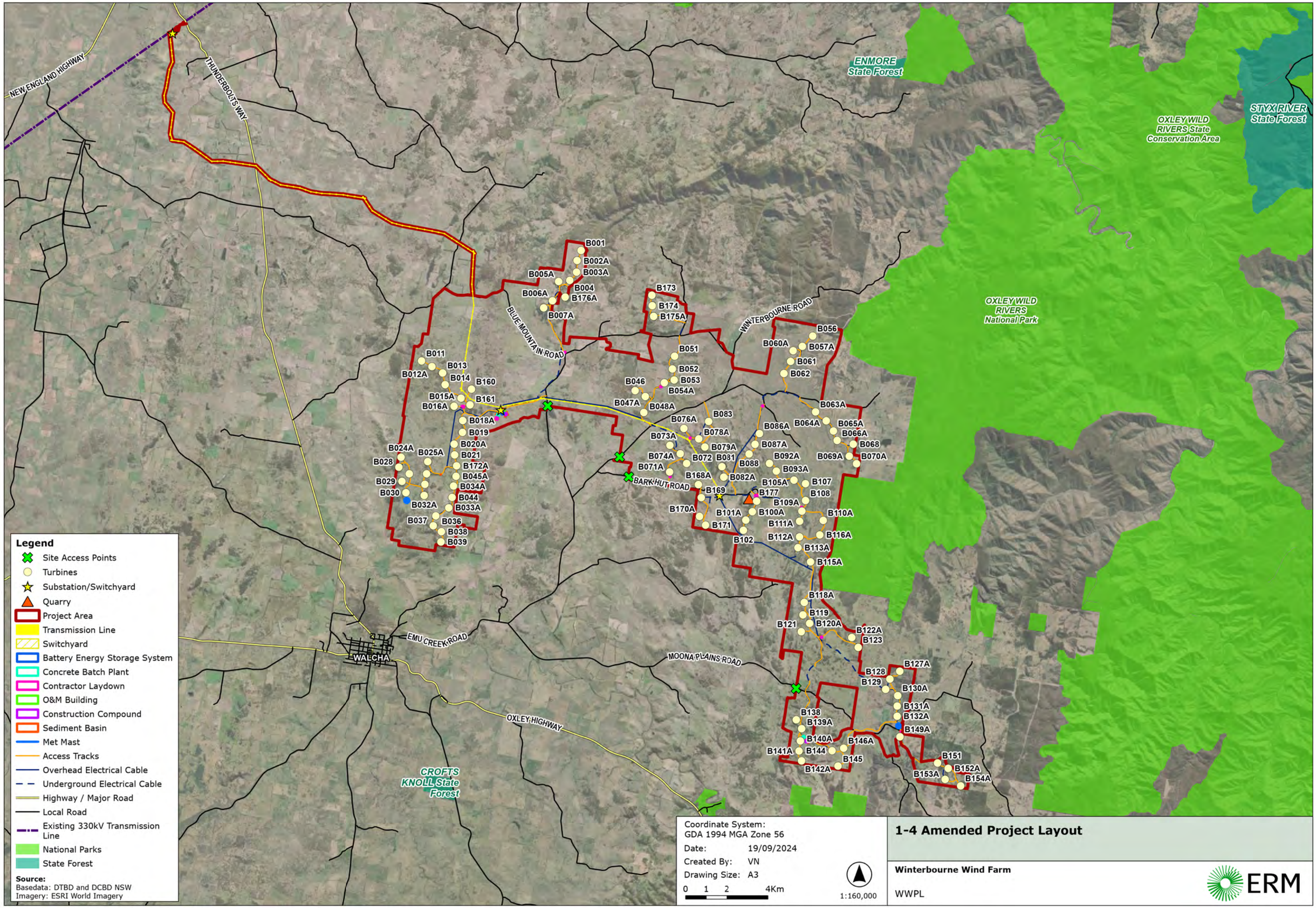
WWPL

ERM

0526676_WWF_AGEN_R0.aprx/1-2 Project Locality Plan



0526676_WWF_AGEN_R0.aprx/1-3 EIS Project Layout



1-4 Amended Project Layout

Winterbourne Wind Farm

WWPL

ERM

0526676_WWF_AGEN_R3.aprx/1-4 Amended Project Layout

2. STRATEGIC CONTEXT

2.1 STRATEGIC FRAMEWORK

The strategic context of the Project remains consistent with that described in Section 2 of the EIS (ERM, 2022). The amended Project remains aligned with current Australian Government and NSW climate change commitments and various strategies, policies, and plans across regional and local contexts, including:

- United Nations 2030 Agenda for Sustainable Development;
- United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties 26 (COP26) and UNFCCC COP21;
- Australian Government Renewable Energy Target (RET);
- Australian Government *Climate Change Act 2022*;
- NSW Government Net Zero Plan Stage 1: 2020–2030;
- NSW Electricity Strategy;
- NSW Transmission Infrastructure Strategy;
- NSW Electricity Infrastructure Roadmap;
- New England North West Regional Plan 2041;
- Walcha Local Strategic Planning Statement 2036;
- Community Strategic Plan Walcha – 2027;
- Uralla Local Strategic Planning Statement 2040; and
- Community Strategic Plan Uralla – 2022 to 2031.

Since preparation of the EIS the Australian Energy Market Operator (AEMO) has released the 2024 Integrated System Plan (ISP 2024) (AEMO, 2024) and the 2023 Electricity Statement of Opportunities (AEMO, 2023).

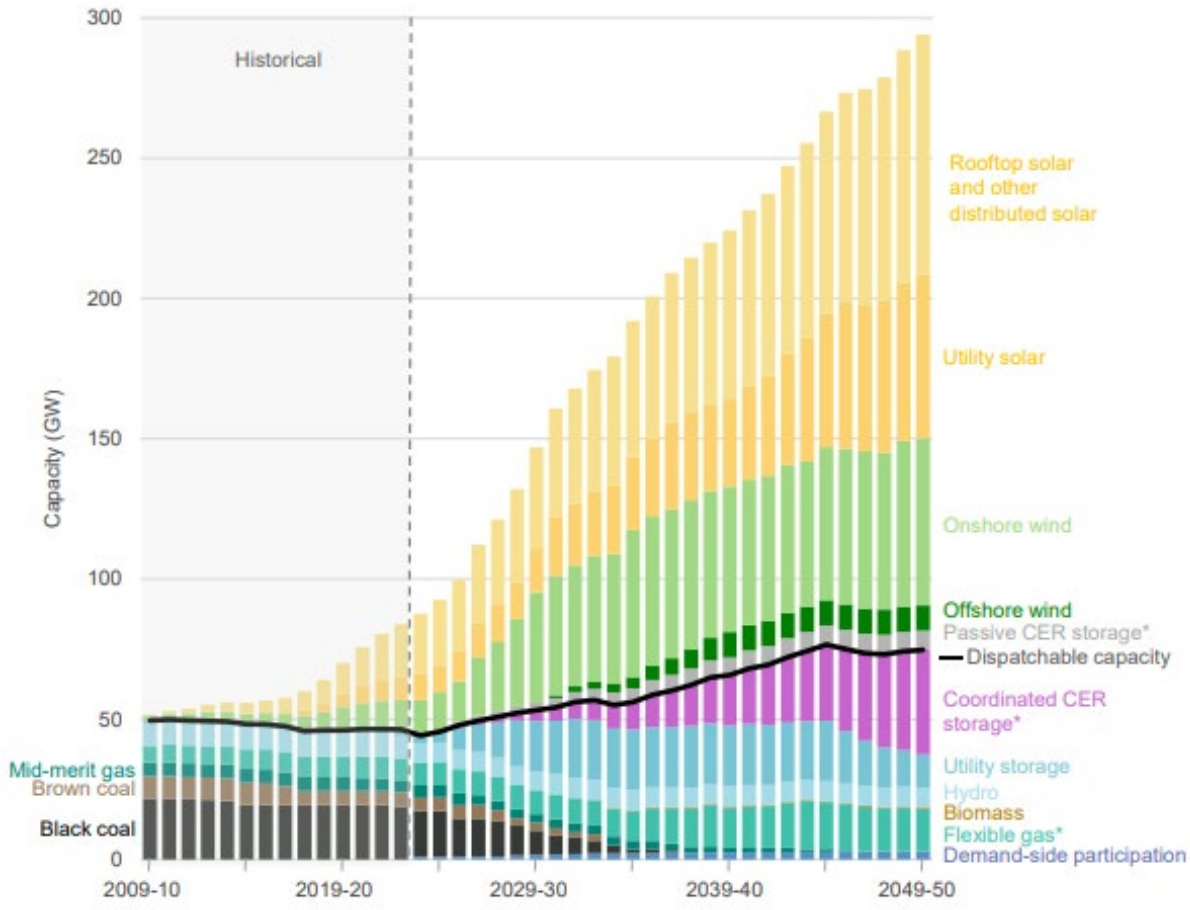
The 2024 ISP highlights the planned retirement by 2040 of all existing coal fired electricity generation in NSW; however, it also forecasts that closure timeframes may be two to three times faster than those announced. At present, three of NSW coal-fired power stations accounting for over 6 GW of generation are planned to retire before 2030, specifically:

- AGL's Liddell power station (1.26 GW) closed in April 2023;
- Origin Energy's Eraring power station (2.92 GW) is scheduled to close in 2027, five years ahead of its previously planned retirement;
- Delta Energy's Vales Point B power station (1.32 GW) is expected to close in 2029;
- AGL's Bayswater power station (2.64 GW) is expected to close between 2030 and 2033, and
- Energy Australia's Mount Piper (1.4 GW), the youngest of NSW's coal-fired power stations, is expected to operate until 2040.

The 2024 ISP (AEMO, 2024) states that the National Electricity Market (NEM) must almost triple grid-scale variable renewable energy by 2030 and increase it six-fold by 2050. Four times the existing firming capacity is also required across the NEM to meet demand. This equates to the installation of approximately 6 GW of new renewable generation capacity every year across the NEM, compared to the current rate of less than 4 GW. Overall, the installed capacity of utility-scale wind and solar must increase from the current 21 GW to 127 GW by 2050.

The NEM forecasted generation mix is presented in **Figure 2-1**.

FIGURE 2-1 NEM GENERATION MIX (2009/10 TO 2049/50) (AEMO, 2024)



Variable forms of storage are required to firm both consumer-owned and utility-scale renewables at different times of the day and year. The NEM is forecast to need 36 GW / 522 GWh of storage capacity by 2034-2035, and 56 GW/66 GWh by 2050.

The AEMO's 2023 Electricity Statement of Opportunities (AEMO, 2023) notes the substantial pipeline of future renewable projects in various stages of development. These projects total 248.4 GW and are spread across all NEM regions, including NSW. **Figure 2-2** illustrates the forecast generation pipeline – existing, committed, anticipated and proposed – of renewable energy projects (AEMO, 2023).

FIGURE 2-2 PROPOSED PROJECTS BEYOND THOSE ALREADY COMMITTED

Source: AEMO's 2023 Electricity Statement of Opportunities (AEMO, 2023)

These forecasts demonstrate that there is an urgent need for additional renewable energy development in NSW over the next seven years to offset the planned retirement of coal fired power and ensure a reliable energy supply.

The Clean Energy Council's Power Playbook (CEC, 2023) states that Australia needs to see a substantial increase in annual financial commitments and construction starts in the order of 5-7 GW of new large-scale wind and solar projects from 2023 to reach the national target of 82% renewables by 2030.

The Project will assist in achieving state and national targets by:

- Supporting the transition in the energy sector away from a centralised system of large fossil fuel generation, towards a decentralised system of widely dispersed, renewable energy generation;
- Providing alternative, renewable energy production to offset the forecast retirement of NSW coal-fired power stations;
- Contributing around 700 MW to meeting increasing energy demand in NSW and throughout the NEM;
- Providing dispatchable energy through the proposed grid-scale BESS with a capacity of up to 100 MW / 200 MWh;
- Contributing to greenhouse gas (GHG) emissions reductions in the order of 1.5 million tonnes CO_2 equivalent per annum (t-CO_2-eq pa), supporting the NSW and Australian Government commitments of net zero by 2050;
- Delivering economic benefits to NSW, regional and local communities, including (approximately):
    - Material employment of up to 390 Full Time Equivalent (FTE) jobs during construction, in turn creating approximately $150 million in direct wages and profits, and more than $160 million in indirect wages and profits, per year of construction;
    - Up to 16 local FTE jobs during operations to provide plant operation and maintenance services and $25 million per year of operation in direct and indirect economic benefit for the local region;
    - Providing a diversified income stream for rural landholders through payments to associated landholders; and

    - Providing benefits to regional infrastructure and services through a 'Community Benefit Fund' (CBF). The Applicant and both Walcha Council and Uralla Shire Council have agreed and signed a Voluntary Planning Agreement for the project CBF;
- Minimising adverse environmental impacts and offset residual impacts;
- Recycling and reuse of materials where practical and economically feasible;
- Ensuring quality, safety and environmental standards are maintained; and
- Liaising and working proactively with the community and all potentially affected stakeholders in the identification, mitigation and/or monitoring of environmental impacts.

2.2 SITE SETTING

A key early consideration in site selection for the Project was the excellent wind resource in the region combined with suitable topography, proximity and access to the existing 330 kV line, site accessibility, land ownership, community and stakeholder acceptance, and minimal environmental and social impacts.

Since submission of the EIS, the Project remains well suited to its regional and local context. The Project area is located on land currently used for grazing. Wind farms and agricultural production, specifically sheep grazing, can co-exist, and it is the intent of the Applicant that most of the Project Area will remain available for agricultural production during operation. Thus, the development of the Project as amended does not present any conflicts with its current or potential future land uses.

3. DESCRIPTION OF THE AMENDMENTS

3.1 OVERVIEW

In response to matters raised in submissions and the outcomes of ongoing engagement with the community, landholders, local councils, government agencies and other stakeholders, the Applicant has made proposed amendments to the Project design and layout. The amendments to the Project aim to further minimise potential impacts on environmental, social and economic aspects of the Project. Specifically, the amendments have been made in consideration of further reducing or avoiding potential impacts to biodiversity, visual amenity, noise, electromagnetic interference, and traffic aspects.

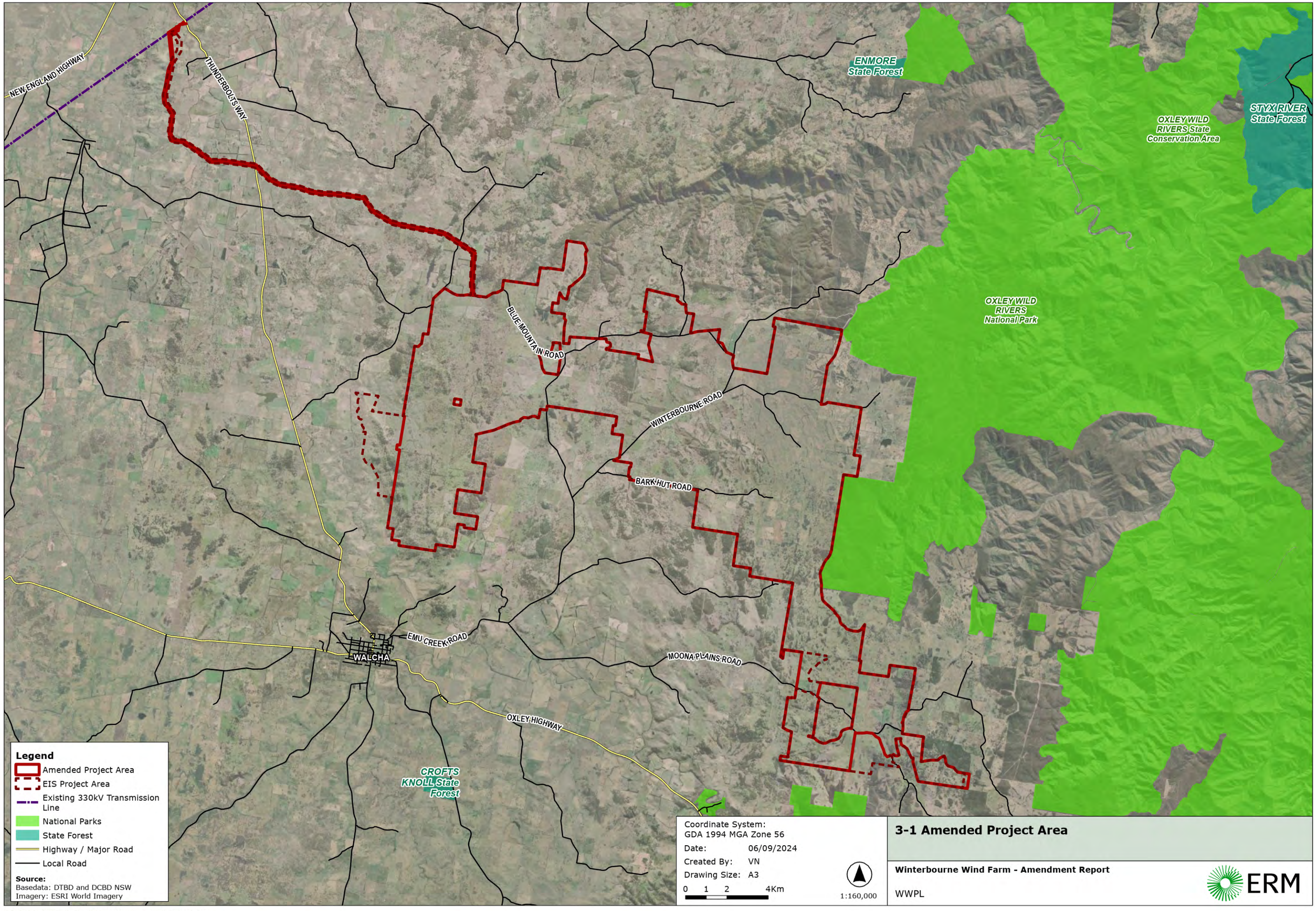
The amendments to the Project were made to:

- Further avoid and/or minimise adverse environmental impacts;
- Protect sensitive areas and receivers identified through specialist assessments as discussed in **Section 6** (including but not limited to biodiversity, noise, visual, heritage, hazards and risks, and water);
- Address matters raised in submissions following the exhibited Project EIS and outcomes of ongoing engagement with the community, landowners, government agencies, local councils and other stakeholders;
- Maximise the yield of wind power generation through suitable positioning of WTGs on-site with regard to environmental constraints;
- Maintain minimum Project generation capacity to achieve commercial viability of the Project in the context of the cost required to connect to the existing electrical grid; and
- Optimise accessibility of Project elements through identifying constructability constraints and strategically positioning Project elements to minimise earthworks required during construction and thereby further reduce potential biodiversity impact.

Amendments include relocation and/or removal of elements of the Project, as well as optimisation of other project infrastructure areas. The amended Project Area is shown in **Figure 3-1**. The amended Project Layout is shown in **Figure 3-2**.

3.2 AMENDED PROJECT SUMMARY

Table 3-1 provides a comparison between the Project as presented in the EIS and the amended Project. An updated Project description of the Amended Project is included in **Appendix A**.



3-1 Amended Project Area

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

0526676_WWF_AGEN_R2.aprx/3-1 Amended Project Area

B113A
B115A
B118A
B119
B120A
B121
B122A
B123
B127A
B128
B129
B130A
B131A
B132A
B138
B139A
B140A
B141A
B142A
B144
B146A
B149A
B151
B152A
B153A
B154A
MOONA PLAINS ROAD
OXLEY HIGHWAY
OXLEY WILD RIVERS National Park
Maxar

Source:
Basedata: LTBD and DCBD NSW
Imagery: ESRI World Imagery

Legend

- Turbines
- Amended Project Area
- 330kV Transmission Line
- Overhead 33kV Line
- Highway / Major Road
- Local Road
- Concrete Batch Plant
- Contractor Laydown
- Construction Compound
- Permanent Met Mast
- Temporary Met Mast
- Underground Electrical Cable
- Access Tracks
- EIS Turbines
- EIS Infrastructure

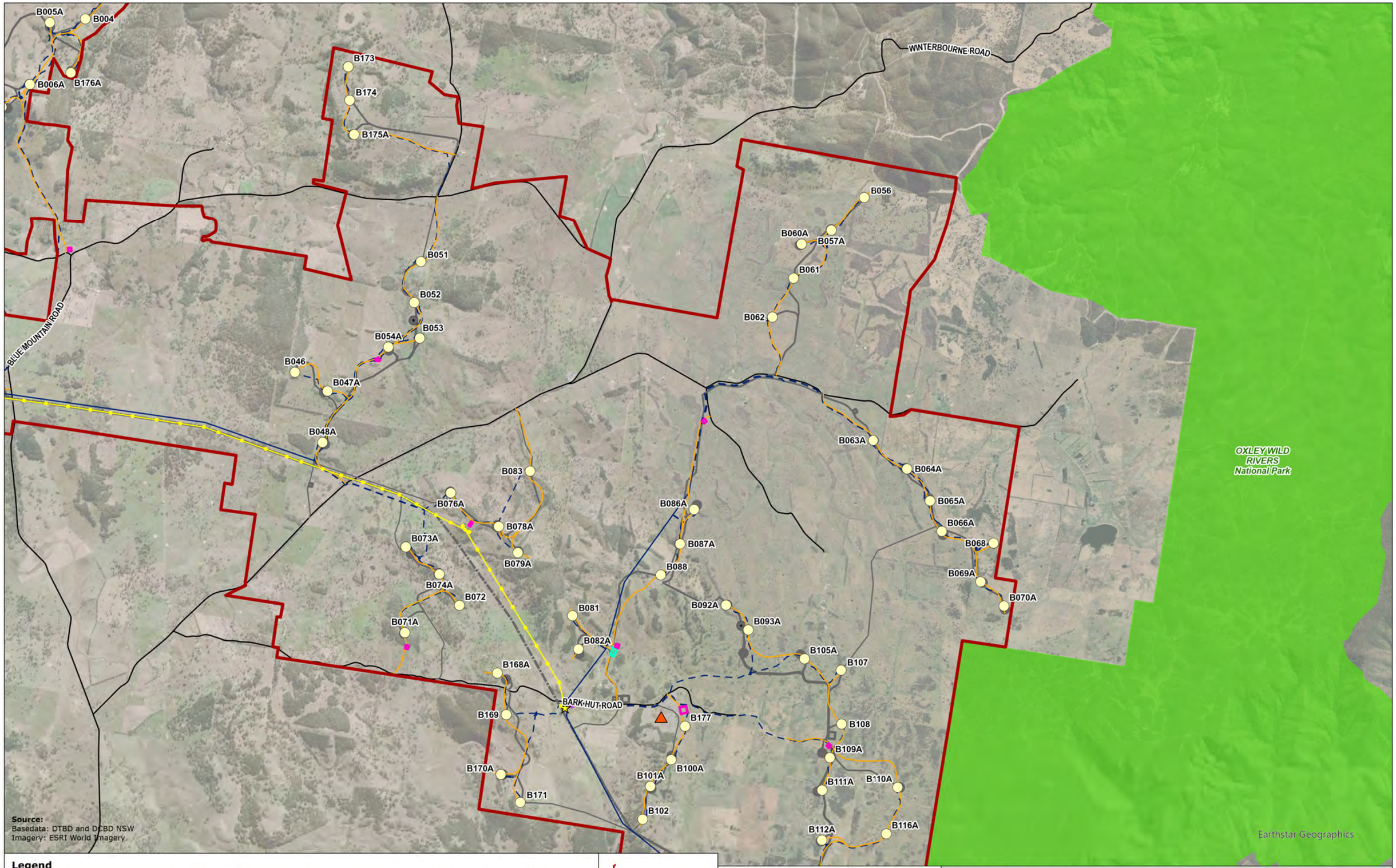
Coordinate System:
GDA 1994 MGA Zone 56
Date: 06/09/2024
Created By: VN
Drawing Size: A3
0 500 1,000 1,500m
1:53,000

3-2 Amended Project Layout

Winterbourne Wind Farm - Amendment Report
WWPL

ERM

0526676_WWF_AGEN_R2.aprx



Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Imagery

Legend

- Turbines
- Amended Project Area
- 330kV Transmission Line
- Quarry
- Overhead 33kV Line
- Local Road
- Concrete Batch Plant
- Contractor Laydown
- Construction Compound
- Underground Electrical Cable
- Access Tracks
- EIS Turbines
- EIS Infrastructure

Coordinate System:
GDA 1994 MGA Zone 56
Date: 06/09/2024
Created By: VN
Drawing Size: A3
0 500 1,000 1,500m
1:53,000

3-2 Amended Project Layout

Winterbourne Wind Farm - Amendment Report
WWPL

ERM

0526676_WWF_AGEN_R2.aprx

B173
B174
B175A
B176A
B006A
B007A
BLUE MOUNTAIN ROAD
B011
B012A
B013
B014
B160
B015A
B161
B016A
B018A
B019
B020A
B021
B024A
B025A
B028
B167A
B026A
B172A
B045A
B027A
B034A
B030
B032A
B044
B033A
B036
B037
B038
B039
B054A
B046
B047A
B048A
WINTERBOURNE ROAD
BARK HUT ROAD
THUNDERBOLTS WAY

Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Imagery

Earthstar Geographics

Legend

- Turbines
- Amended Project Area
- 330kV Transmission Line
- Overhead 33kV Line
- Highway / Major Road
- Local Road
- Concrete Batch Plant
- Contractor Laydown
- O&M Building
- Construction Compound
- Battery Energy Storage System
- Permanent Met Mast
- Temporary Met Mast
- Underground Electrical Cable
- Access Tracks
- EIS Turbines
- EIS Infrastructure

Coordinate System:
GDA 1994 MGA Zone 56
Date: 06/09/2024
Created By: VN
Drawing Size: A3
0 500 1,000 1,500m
1:53,000

3-2 Amended Project Layout

Winterbourne Wind Farm - Amendment Report
WWPL

ERM

0526676_WWF_AGEN_R2.aprx

THUNDERBOLTS WAY

BLUE MOUNTAIN ROAD

B001
B002A
B003A
B004
B005A
B176A
B006A
B007A

Earthstar Geographics

Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Imagery

Legend

- Turbines
- Amended Project Area
- 330kV Transmission Line
- Switchyard
- Highway / Major Road
- Local Road
- Existing 330kV Transmission Line
- Underground Electrical Cable
- Access Tracks
- EIS Turbines
- EIS Infrastructure

Coordinate System:
GDA 1994 MGA Zone 56
Date: 06/09/2024
Created By: VN
Drawing Size: A3
0 500 1,000 1,500m
1:61,000

3-2 Amended Project Layout

Page 4 of 4

Winterbourne Wind Farm - Amendment Report
WWPL

ERM

0526676_WWF_AGEN_R2.aprx

TABLE 3-1 AMENDED PROJECT SUMMARY

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project
Project Area	• 22,285 hectares (ha) (excl. TL)	• 21,603 ha (excl. TL) • 21,844 ha (incl. TL)	• Decrease by 682 ha (3%) (excl. TL)
Permanent disturbance footprint	• 474.2 ha	• 216.6 ha	• Decrease of 257.6 ha (54%)
Temporary disturbance footprint	• 107.2 ha (in addition to permanent disturbance footprint)	• 697.0 ha	• Increase of 589.8 ha (550%)
WTG number / dimensions (maximum)	• Up to 119 • 230 m tip height • 149 m hub height	• Up to 118 • 230 tip height • 149 m hub height	• Reduction of 1 WTG • No change in tip height • No change in hub height
Met mast number	• Up to 4 x temporary • Up to 2 x permanent	• Up to 4 x temporary • Up to 2 x permanent	• No change
Indicative WTG model	• V162-6.2 MW	• V162-6.2 MW	• No change
Indicative capacity	• 737.7 MW	• 731.5 MW	• Decrease by 6.2 MW
Electrical reticulation	• 2 x 33/330 kV substations	• 2 x 33/330 kV substations	• No change
	• 324 km of internal 33 kV electrical reticulation network, underground and overhead	• 210.5 km of internal 33 kV electrical reticulation network, comprising 25.6 km overhead and 184.9 km underground	• Decrease of 113.5 km (35%)
	• 50 km of 330 kV overhead transmission line to connect the project to the existing transmission network	• 44 km of 330 kV overhead transmission line to connect the project to the existing transmission network	• Decrease in overhead 330 kV transmission line length by 6 km
BESS	• 100 MW / 200 MWh lithium-ion battery (indicative)	• 100 MW / 200 MWh lithium-ion battery (indicative)	• No change

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project
New internal access tracks	• Approx. 15 m wide formation including 5.5 m roadway plus shoulders and drainage as required • 113 km total length	• Approx. 15 m wide formation including 5.5 m roadway plus shoulders and drainage as required • 115.3 km total length	• Increase in total length of internal access tracks by 2.3 km
Subdivision	• Subdivision of land for the substations and switchyard	• Subdivision of land for the substations and switchyard	• No change
Construction			
Construction Duration	• Approximately 30 months	• Approximately 52 months	• Expected increase in duration of construction by 22 months
Construction Workforce	• Up to 400 FTE	• Up to 390 FTE	• Reduction of 10 FTE workforce
On-site Temporary Infrastructure	• Concrete batching plants (up to 3), laydown areas (up to 8), site office, including parking etc. (up to 3)	• Concrete batching plants (up to 3), laydown areas (up to 14), site office, including parking etc. (up to 3)	• Increase of 6 potential contractor laydown areas
Ancillary Activities	• Import of external gravel, aggregate and sand to site for on-site construction use • Import water to site for on-site construction use	• On-site quarry for the Project to supply gravel and potentially aggregate and bedding material for construction purposes • On-site water supply from existing/new groundwater bores	• Extraction of up to 500,000 tonnes of material per year • Construction materials including gravel and potentially aggregate and bedding material sourced on-site • Water for construction purposes sourced on-site where possible
Transport Route	• Via Port of Newcastle • OSOM vehicle movements via Oxley Highway • Associated external road upgrades (also used for operational maintenance or decommissioning activities)	• Via Port of Newcastle • Inbound OSOM vehicle movements via new road to be constructed south of Uralla • Associated external road upgrades (also used for operational maintenance or decommissioning activities)	• Avoidance of Oxley Highway for inbound OSOM vehicle movements and instead via the newly constructed road

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project
Heavy vehicle movements	• Up to 278 light vehicles per day • Up to 288 heavy vehicles per day	• Up to 456 light vehicles per day • Up to 116 heavy vehicles per day	• The inclusion of an on-site quarry for the Project reduces the number of heavy vehicles using the local road network by up to 172 vehicles per day.
Operation			
Operational Workforce	• Up to 39 FTE	• Up to 16 FTE	• Reduction of 23 FTE
Operational Duration	• 30 years	• 30 years	• No change
Impacts			
EPBC Act listed entities (SAII entities)	• Clearing of New England Peppermint Grassy Woodlands (SAII entity), comprising: ◦ 11.10 ha of woody vegetation within the Disturbance Footprint ◦ 3.32 ha of non-woody moderate condition grassland within the Disturbance Footprint	• Clearing of New England Peppermint Grassy Woodlands, comprising: ◦ 2.68 ha of woody vegetation within the Disturbance Footprint ◦ 13.70 ha of non-woody moderate condition grassland within the Disturbance Footprint ◦ 3.75 ha of woody vegetation within the local road reserve ◦ No non-woody moderate condition grassland within the local road reserve	• Overall decrease in impacts to New England Peppermint Grassy Woodlands ***woody*** vegetation by 42% • Decrease in impacts to New England Peppermint Grassy Woodlands ***woody*** vegetation within the Disturbance Footprint by 76%

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project

EPBC Act listed entities (SAII entities)	• Clearing of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (SAII entity), comprising:
	  ◦ 42.90 ha of woody vegetation within the Disturbance Footprint
	  ◦ 106 ha of non-woody moderate condition grassland within the Disturbance Footprint
		• Clearing of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland:
		  ◦ 3.26 ha of woody vegetation within the Disturbance Footprint
		  ◦ 13.22 ha of non-woody moderate condition grassland within the Disturbance Footprint
		  ◦ 1.35 ha of woody vegetation within the local road reserve
		  ◦ 5.47 ha of non-woody moderate condition grassland within the local road reserve
			• Overall decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ***woody*** vegetation by 89%
			• Decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ***woody*** vegetation within the Disturbance Footprint by 92%
			• Overall decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland vegetation (both woody and derived native grassland forms) by 84%

BC Act listed entities	• Clearing of 426 ha of potential habitat for the Spotted-tailed Quoll • Clearing of 206.9 ha of potential habitat for the Koala • Clearing of 206.5 ha of potential habitat for the Squirrel Glider • Clearing of 206.5 ha of potential habitat for the Greater Glider • Clearing of 33.8 ha of potential habitat for the Glossy Black-cockatoo.	• Clearing of 128 ha of potential habitat for the Spotted-tailed Quoll • Clearing of 122.9 ha of potential habitat for the Koala • Clearing of 106.5 ha of potential habitat for the Squirrel Glider • Clearing of 101 ha of potential habitat for the Greater Glider • Clearing of 7.8 ha of potential habitat for the Glossy Black-cockatoo.	• Reduction in impacts to potential habitat for the Spotted-tailed Quoll by 70% • Reduction in impacts to potential habitat for the Koala by 41% • Reduction in impacts to potential habitat for the Squirrel Glider by 48% • Reduction in impacts to potential habitat for the Greater Glider by 51% • Reduction in impacts to potential habitat for the Glossy Black-cockatoo by 77%

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project

Visual Impact	• Visual magnitude:
	  ◦ 20 dwellings within the black line (3,100 m);
	  ◦ 23 dwellings within the blue line (4,550 m);
	• Multiple wind turbine tool:
	  ◦ 25 dwellings with potential views in up to 2 60-degree sectors;
	  ◦ 11 dwellings with potential views in up to 3 60-degree sectors;
	  ◦ 1 dwelling with potential views in up to 4 60-degree sectors;
	• Visual impact rating:
	  ◦ 12 non-associated dwellings with potential for moderate visual impacts; and
	  ◦ Five non-associated dwellings with potential for high visual impact.
		• Visual magnitude:
		  ◦ 17 dwellings within the black line (3,100 m);
		  ◦ 21 dwellings within the blue line (4,550 m);
		• Multiple wind turbine tool:
		  ◦ 19 dwellings with potential views in up to 2 60-degree sectors;
		  ◦ 8 dwellings with potential views in up to 3 60-degree sectors;
		  ◦ 1 dwelling with potential views in up to 4 60-degree sectors;
		• Visual impact rating:
		  ◦ 13 non-associated dwellings with potential for moderate visual impacts; and
		  ◦ No non-associated dwellings with potential for high visual impact.
			• Visual magnitude:
			  ◦ Dwellings within black line of visual magnitude reduced by 3;
			  ◦ Dwellings within blue line of visual magnitude reduced by 2;
			• Multiple wind turbine tool:
			  ◦ Dwellings with potential views in up to 2 60-degree sectors reduced by 6;
			  ◦ Dwellings with potential views in up to 3 60-degree sectors reduced by 3;
			• Visual impact rating:
			  ◦ Dwellings with potential moderate visual impact increased by one; and
			  ◦ Dwellings with potential high visual impact decreased by five, such that there are no high visual impact dwellings remaining.

The Applicant has refined the Project design in response to agency advice and public submissions received, as well as constructability considerations. These design refinements include:

- Removal of one (1) WTG (B023) and relocation (>100 m movement) of seven (7) to reduce visual impacts to non-associated dwellings to the west of the Project;
- Removal of one (1) WTG to reduce potential visual and noise impacts to associated dwelling SR079;
- Relocation (>100m movement) of 11 WTGs to reduce biodiversity impact and/or improve constructability of hardstands and access tracks;
- Refinements (<100m movement) of 47 WTGs to reduce biodiversity impact and/or improve constructability of hardstands and access tracks;
- Relocation of one (1) WTG to increase the distance between the WTG and the National Park boundary;
- Refinement of two (2) WTGs to provide at least 600 m buffer from the WTG to the National Park boundary;
- Refinement (<100m movement) of three (3) WTGs and relocation (>100m movement) of two (2) WTGs to address concerns raised by NSW Telco Authority relating to potential impacts to point-to-point telecommunication links;
- Addition of one (1) WTG;
- Realignment of access tracks to minimize impacts to biodiversity, optimize transport movements through the project site and reduce traffic impacts on public roads, including removal of OSOM vehicle movements from Moona Plains Road;
- Revised site access along public roads to match revised internal access track layout;
- Realignment of underground electrical reticulation and addition of four sections of overhead 33 kV electrical transmission line to reduce biodiversity impact;
- Relocation of north substation, maintenance building, construction compound, BESS and laydown area approximately 1.8 km west to improve constructability, reduce biodiversity impact and provide a greater buffer between infrastructure and public roads;
- Relocation of south substation approximately 6 km to the northwest to reduce biodiversity impact and consequential reduction in the overhead 330 kV transmission line by ~6 km;
- Inclusion of an on-site quarry for the Project to supply raw construction materials during the construction period. The on-site quarry for the Project will be confined to Lot 95 DP 1128816 and have an annual extraction limit of up to 500,000 tonnes; and
- Inclusion of two additional parcels and removal of thirteen parcels from Project Area.

3.3 COMMUNITY BENEFIT FUNDING

Since exhibition of the EIS in 2022, the Applicant has maintained dialogue with both Walcha Council and Uralla Shire Council regarding the VPA for the Project.

In 2024, the proposed VPA was placed on public exhibition by Walcha Council and Uralla Shire Council. Following the public exhibition of the proposed VPA by each local council, the terms of the VPA were agreed by the Applicant, Walcha Council and Uralla Shire Council.

On 24 August 2024, the Applicant entered into a VPA governed by Subdivision 2 of Division 7.1 of Part 7 of the EP&A Act with Walcha Council and Uralla Shire Council.

The VPA establishes (amongst other things) two CBFs, comprising:

- A CBF for the purpose of providing funding within the Walcha LGA; and
- A CBF for the purpose of providing funding within the Uralla Shire LGA.

The Applicant has committed to making an initial contribution (indexed to CPI) in accordance with the VPA in the amount of $1,000,000 (excluding GST).

Following the initial contribution, the Applicant will also make further contributions (indexed to CPI) in accordance with the VPA in the amount of $750,000 per annum (excluding GST) for the life of the Project and an additional $1,000 per annum (excluding GST) for every installed one (1) megawatt over 600 MW for the Project.

Based on the VPA, the allocation of funds from the Applicant to the two CBFs will be split as follows:

- 90% of funds to the CBF for the Walcha LGA; and
- 10% of funds to the CBF for the Uralla Shire LGA.

This allocation of funds has been informed by the relative geographic and infrastructure split of the Project within each LGA.

Walcha Council and Uralla Shire Council must each establish a community advisory committee. The committee for each council will make recommendations for the expenditure of monetary contributions made in connection with renewable energy developments, including the allocation of funds from the relevant CBF.

4. STATUTORY CONTEXT

The statutory context of the Project remains consistent with that described in Section 4 of the EIS (ERM, 2022a).

As set out in the EIS, the Project is declared SSD and approval is sought under Part 4, Division 4.7 of the EP&A Act. Under section 4.5(a) of the EP&A Act and s 2.7 of the Planning Systems SEPP, the consent authority for SSD is the Minister for Planning and Public Spaces unless any of the following circumstances applies, in which case the consent authority is the Independent Planning Commission:

- Walcha Council or Uralla Shire Council makes a submission by way of objection under the mandatory requirements for community participation;
- at least 50 submissions (other than from a council) are made by way of objection under the mandatory requirements for community participation; or
- the Applicant has disclosed a reportable political donation.

The Independent Planning Commission (IPC) is the consent authority for this Project because at least 50 submissions have been made by way of objection.

An updated statutory compliance table for the amendments to the Project is included in **Appendix C** . This identifies all relevant statutory requirements for the amended Project and indicates where they have been addressed in this Amendment Report or in the EIS.

5. ENGAGEMENT

5.1 ENGAGEMENT CARRIED OUT

The Applicant has continued its community and stakeholder engagement since the exhibition of the EIS. This engagement was implemented in accordance with the Project's 'Stakeholder Engagement Plan' (SEP). The SEP is regularly reviewed and adapted to ensure it remains effective and encourages community participation. The SEP has been developed in a manner consistent with relevant guidelines including the 'Undertaking Engagement Guidelines for State Significant Projects' (Engagement Guidelines), which requires upfront and ongoing engagement for all State Significant Projects (DPHI, 2024). It ensures that stakeholders are afforded multiple opportunities to consult, comment and provide feedback on the Project.

Since exhibition of the EIS in November 2022, the Applicant has developed additional communication materials and continued to implement an extensive engagement program to actively engage with stakeholders to discuss the amendments to the Project and to build an understanding of potential concerns, opportunities and mitigation strategies. These engagement activities also aimed to gather information that could inform the broader communication required to support future stages of the Project including during the delivery stage.

Activities used to engage with the community, local councils and government agencies since EIS exhibition include:

- **Project website:** The dedicated Project website is continually updated as the Project progresses. During the EIS public exhibition period, the website also directed visitors to the DPHI Portal to complete a submission. The Project status will continue to be updated on the website for community members to stay informed about Project development.
- **Advertising:** A dedicated advertising campaign was run across various communication channels in the New England Region with the primary objective to increase Project awareness. This included unaddressed mailouts in Walcha and reach across social media. These advertisements directed the audience to the Project website.
- **EIS summary booklets:** Key technical studies and results from the Project EIS were summarised in non-technical language in a booklet, which also included information about where and how community members could complete a submission for the Project EIS. Booklets are available at the Project website and were distributed in hardcopy at all community sessions and mailed to all addresses in the postcodes of Walcha.
- **Newsletters:** Periodic newsletters have been distributed to approximately 1,925 recipients in the 2354 and 2358 postcodes. The newsletters provide general Project updates, including the amendments to Project. To date, 16 newsletters have been produced and distributed, with the latest updates provided in February 2024, April 2024 and July 2024. The Project updates are distributed via Post and an email subscriber list and are also downloadable from the Project website. Additional electronically delivered mail (EDM's) have also been sent out on an ad-hoc basis to a subscriber list of approximately 250 subscribers (as of 1 July 2024). While the EIS was on public exhibition, social media posts were made on the project Facebook and LinkedIn pages as a reminder of community information sessions and details about how to complete a submission.

- **Community hotline:** The Project team have continued to run a dedicated phone and email address where members of the community can clarify any questions or concerns and provide feedback, creating a channel for two-way communication. Since the EIS was put on public exhibition there have been 54 calls to the 1800 number. Community members can also reach out via a 'Contact Us' form on the Project website. Since the EIS there have been more than 250 engagements with community members via face-to-face meetings, phone, SMS and email.
- **EIS Information Days:** While the EIS was in exhibition, The Applicant hosted a community information event over two days in December 2022 at the Walcha Bowling Club to provide information about the project and key findings of the EIS. The Project Team spoke with community members and provided information on poster boards and handouts to describe the results of key environmental assessments and provide information about the community benefit fund and the types of jobs and skills required for the Project.
- **Community Information Booth**: The Applicant provided a booth over two days at the Walcha Show in both March 2023 and March 2024. The Project Team spoke with many members of the community who stopped by to learn more about the Project and read information presented on poster boards about the Project layout, expected timeline, and the Community Benefit Fund. Questions were answered about wind technology, planning approval processes and construction issues, and ideas were received about how the Community Benefit Fund could be used in the local area.
- **Uralla Street Stall:** The Applicant hosted a street stall in Uralla on 3 May 2024 to share information about the proposed project with the Uralla community. The Project Team spoke with Uralla locals and presented poster boards about the project layout, the development timeline, the transport route and the Community Benefit Fund.
- **FAQs:** An FAQ booklet was prepared to present key information about the Project to help answer common queries and concerns. Hard copies of the FAQ were made available at the EIS Information Days, the Walcha Show 2023, the Walcha Show 2024 and the Uralla Street Stall. The FAQ booklet is available from the Project website: https://www.winterbournewindfarm.com.au/downloads/
- **Community survey:** A survey was distributed between April - May 2023 to ask the Walcha and Uralla community to rank their preferences for use of the Community Benefit Fund across a range of options, and to identify specific community groups or community needs which could be supported through the fund. The survey received 62 responses which indicated a preference for the Community Benefit Fund to be spent on upgrading local parks and sporting facilities, creating new community infrastructure, providing skills training and youth scholarships, and supporting local programs and events.
- **Business engagement:** Twelve local businesses in Walcha were visited on 18 January 2023. Business owners were informed about the exhibition period and the closing date for submissions. A guide to making submissions was distributed. Most of the businesses visited indicated support for the Project. Further engagement with local businesses was conducted in July and August 2024.

- **Project office:** The Project Office in Walcha was open to the public for 60 days across eight months in 2023. This provided opportunities for community members, landholders and potential suppliers to visit the office and discuss the project with a member of the project team. There were 26 visits to the office over the 60 days by people making enquiries about the project. When the office was not attended, a sign was provided on the office door to direct the public to our 1800 number and information-email to ensure there was always an avenue for the public to contact the project team. The office was re-opened in June 2024 and is occupied three days per week.
- **Neighbour engagement:** Attempts were made to contact all project neighbours located within 4.5 km of the project in April 2024. Neighbours were provided with information about the amended Project proposal. Engagement was undertaken via phone and/or email. There were some positive responses to the changes, however some immediate neighbours confirmed they remain opposed to the Project.

Agency engagement undertaken since public exhibition of the EIS is documented within the Submissions Report (ERM, 2024). Specific engagement and issues raised related to the proposed amendments is summarised in **Table 5-1**.

TABLE 5-1 AGENCY ENGAGEMENT SUMMARY SINCE EXHIBITION

Engagement Activity	Description
DPE (now DPHI)	
Meetings, emails and phone conversations held on: • 24, 25 and 31 January 2023; • 2 February 2023; • 7 and 21 March 2023; • 1 and 23 May 2023; • 14 and 21 September 2023; • 17, 27 and 31 October 2023; • 1, 11 and 15 November 2023; • 7 and 12 December 2023; • 18 and 30 January 2024; • 26 February 2024; • 15 August 2024.	• Discussed DPHI requirements and expectations regarding submissions from several agencies (Transport for NSW (TfNSW), NSW Rural Fire Service (RFS), Biodiversity, Conservation and Science (BCS) and Councils) and outlined proposed refinements to the Project in response to submissions received and the need for an Amendment Report and Project submission timeline; • Submissions raised relating to the PHA were addressed in October 2023 via email and included a memo to DPE (at the time) justifying the approach undertaken for the Preliminary Hazards Analysis (PHA) in response to the specific submission raised; • Additional issues raised by DPE (now DPHI) relating to transport and traffic impacts via emails in October and November 2023; • Additional issues raised by DPE (now DPHI) relating to landscape and visual impacts via emails in November and December 2023; • Briefing in respect of proposed onsite quarry in January and February 2024; and • On 15 August 2024, the Applicant discussed outcomes of actions taken during response to submissions phase, finalisation and submissions of Submissions Report, Amendment Report and associated supporting documentation.
BCS	
Meetings, emails and phone conversations held on: • 13, 15 April 2023; • 4, 11, 12 May 2023; • 27 June 2023; • 2, 15, 17 August 2023; and • 16 August 2024.	• The Applicant engaged with BCS in April 2023 to discuss native vegetation regulatory mapping, data licencing and relevant spatial layers for incorporation into the land category assessment and vegetation mapping. These data layers were provided to the Applicant in late April; • The Applicant engaged with BCS in May and August 2023 to discuss survey requirements for bird and bat species; • The Applicant engaged with BCS in June and August 2023 to discuss threatened species survey requirements in generally, and specifically for the Eastern pygmy possum; and • The Applicant engaged with BCS in August 2024 to provide an overview of the survey effort and revisions to the BDAR undertaken since EIS exhibition and in response to agency advice received.
NSW Telco Authority	
• Emails from 8 June 2023 to 26 July 2023; • Phone calls on 14 June 2023 and 28 June 2023; and • Emails from 3 May 2024 to 10 May 2024.	• The Applicant has engaged with NSW Telco Authority on several occasions via phone and email regarding the NSW Telco Authority submission which raised the potential for conflicts between NSW Telco point-to-point links and WTGs B138, B139, B152, B153 and B15; and • The Applicant has worked with NSW Telco Authority to understand the perceived issues and has amended the locations of the disputed turbines to avoid such issues. NSW Telco has advised that they are satisfied with the proposed new locations of the turbines in question.

Engagement Activity	Description
TfNSW	
• Meetings on 18 May 2023 and 31 May 2023; and • Emails between 26 May 2023 and 7 July 2023. • Meetings and emails on 9 and 16 May 2024 and 7 June 2024.	• The Applicant has engaged with TfNSW to discuss the approach to resolving submissions raised relating to the proposed transport route for project component; and • The Applicant has engaged with TfNSW regarding the proposed oversize and overmass transport route through Muswellbrook Local Government Area (LGA) and Tamworth LGA.
Heritage NSW	
• Meeting on 17 April 2023.	• The Applicant has engaged with Heritage NSW to discuss the issues raised in their submission. This included discussion about the consultation process, testing of the predictive model, recording of scarred trees, and need for subsurface testing at Green Range OS-3 with Potential Archaeological Deposit (PAD) and Ranch OS-1 with PAD; • The consultation process with Aboriginal groups was accepted although Heritage NSW would prefer a gap of no more than 6 months in consultation; • Additional records will be included in the Aboriginal Cultural Heritage Assessment Report (ACHAR) including a new AHIMS search, survey coverage mapping, and scarred tree records; and • It was agreed that no subsurface testing was required at Ranch OS-1 with PAD as it is being avoided by the project. The Applicant will consider HNSW's suggestion to monitor sites not being impacted, in particular scarred trees.
EnergyCo	
• Meetings on 17 February and 21 July 2023; • Emails, phone and meetings on 18 August, 27 and 8 November 2023; and • Meetings and emails 7 and 19 February, 20 and 27 March, 11 and 15 April 2024 and throughout June, July and August 2024.	• The Applicant spoke with and held meetings with representatives from EnergyCo in February 2023 to discuss the proposed transport route for OSOM components to the site. The Applicant spoke with a representative of EnergyCo in July 2023 to discuss connection to the electricity network and potential cumulative impacts in the New England region; • The Applicant also exchanged emails, spoke on the phone and met in-person with EnergyCo between August and November 2023 to discuss community benefit funding and wider benefits for the New England region from the Project; and • The Applicant has held meetings and exchanged emails with EnergyCo in relation to the proposed oversize and overmass transport route to the New England region throughout the first half of 2024.

Engagement Activity	Description
Department of Regional NSW	
• Email and in-person meetings on 8 February, 1 March and 22 March 2023.	• The Applicant has engaged with the Department of Regional NSW between February and March 2023 in relation to renewable energy opportunities and benefits for the New England region and for First Nations peoples.
Crown Lands	
• Meeting on 1 September 2023; and • Emails between 1 September 2023, 10 October 2023 and 26 March 2024, and August 2024.	• The Applicant spoke with the Crown Lands section of DPE (at the time) in relation to licencing and easement arrangements for access to Crown Land, specifically Crown Roads. The Applicant also spoke with and exchanged several emails between September 2023 and August 2024 in relation to access to a Traveling Stock Reserve proposed to be used for transport of project components.
Regional Development Australia	
• Meeting on 9 March 2023	• The Applicant met with Regional Development Australia to discuss the regional benefits of jobs and skills development from the proposed Winterbourne Wind Farm Project.
DCCEEW (Cwlth.)	
• 17 April 2023	• The Applicant spoke with DCCEEW on 17 April 2023 in relation to the barriers to increasing renewable energy generation and getting to net zero emissions.
Walcha Council	
• Email, phone and meetings from late 2022; • Emails, phone and meetings throughout 2023 and 2024.	• The Applicant has engaged extensively with Walcha Council members and officers since submission of the EIS in late 2022. Key matters of discussion have included negotiation of a Voluntary Planning Agreement (VPA) for the project and the use and maintenance of local roads during project construction; • The Applicant provided briefings about the revised transport route and proposed onsite quarry to Council officials; and • Additional points of discussion have included waste management, water supply, transport of heavy components, accommodation for workers, and overall community sentiment in the context of the New England Renewable Energy Zone (REZ).

Engagement Activity	Description
Uralla Shire Council	
• Email, phone, meetings in 2023 and 2024.	• The Applicant has engaged with Uralla Shire Council members and the Council General Manager via email, phone, videoconference and in-person meetings throughout 2023 and early 2024. Key matters of discussion have included negotiation of a VPA for the project and the potential for creating and utilising a new proposed OSOM transport to the south of Uralla as an alternative to OSOM transport along the Oxley Highway. • Additional points of discussion have included transport of components, materials and workers along Thunderbolts Way, as well as waste management, water supply, and materials sourcing for the project.
Muswellbrook Shire Council	
• Meeting on 9 March 2023 and 22 August 2024.	• The Applicant met with representatives from Muswellbrook Shire Council in relation to the proposed transport route for OSOM loads through the Muswellbrook LGA.
Armidale Regional Council	
• Email on 27 March 2023.	• The Applicant contacted a representative of Armidale Regional Council to provide information on the proposed Community Benefit Fund and offer a briefing about the project and potential economic benefits and opportunities for the Armidale LGA.

5.2 FUTURE ENGAGEMENT

The Applicant will continue to engage with the community and stakeholders as part of ongoing project development. Such engagement will continue to include face-to-face meetings, stakeholder briefings, project update newsletters and EDMs, maintenance of the Project website, media releases, attendance at community events and sponsorship of local clubs and events. Should the Project receive development consent, the Applicant will continue and expand this engagement during project construction to ensure the community and stakeholders are kept informed about key construction activities.

6. ASSESSMENT OF IMPACTS

6.1 BIODIVERSITY

6.1.1 BACKGROUND

The Biodiversity Development Assessment Report (BDAR) prepared for the EIS (NGH, 2022) has been updated based on the amended Project and in response to relevant matters in submissions received for the EIS. (hereafter referred to as the Amended BDAR; **Appendix D**).

Key Project amendments relevant to the Amended BDAR include:

- Relocation (>100m movement) of 21 turbines (comprising B015, B024-B027, B032-B034, B045, B073, B093, B109, B116, B131, B132, B139, B146, B154, B167, B168, and B172) and associated hardstands and laydown areas to reduce biodiversity impact and/or improve constructability of hardstands and access tracks;
- Refinement (<100m movement) of 52 turbines (comprising B002, B003, B005-B007, B012, B016, B018, B020, B047, B048, B054, B057, B060, B063-B066, B069-B071, B074, B076, B078, B079, B082, B086, B087, B092, B100, B101, B105, B110-B113, B115, B118, B120, B122, B127, B130, B138, B140-B142, B149, B152, B153, B170, B175, and B176) and associated hardstands and laydown areas to reduce biodiversity impact and/or improve constructability of hardstands and access tracks;
- Removal of two turbines (B023 and B124) and addition of one turbine (B177);
- Increase in temporary disturbance footprint from 107.20 ha (EIS) to 697.0 ha (amended Project);
- Decrease in permanent disturbance footprint from 474.21 ha (EIS) to 216.6 ha (amended Project);
- Decrease in the area of native vegetation clearance associated with the Project from 425 ha (205 ha woodland and 220 ha native grassland) in the EIS to 308 ha (124 ha woodland and 184 ha native grassland) for the amended Project; and
- Reduction in area of potential impact to the TEC/SAII White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland by 84%.

The Amended BDAR was prepared in accordance with the following:

- *Biodiversity Conservation Act 2016* (NSW) (BC Act);
- *Biodiversity Conservation Regulation 2017* (NSW) (BC Regulation);
- 'Biodiversity Assessment Method' (BAM) (DPIE, 2020a) applies to the Project under the transitional provisions in section 6.31 of the BC Regulation;
- 'Developments adjacent to National Parks and Wildlife Service Lands' (DPIE, 2020b); and
- EPBC Act.

6.1.2 IMPACT ASSESSMENT

Significant additional survey efforts and assessments have been undertaken since exhibition of the EIS to further avoid and minimise impacts to biodiversity values. This has included:

- Undertaking an ecology due diligence assessment of the haulage route to identify areas outside the Project Area boundary that potentially require clearing of native vegetation and require assessment in the BDAR (**Appendix E**);
- Undertaking 159 additional BAM plots within the disturbance footprint and local road network;
- Updated vegetation mapping across the Subject land and local road network, including consideration of the draft native vegetation regulatory (NVR) mapping for the region, refinement of delineation of plant community types (PCTs) and associated condition states (vegetation integrity);
- Additional targeted threatened species surveys and habitat assessment for:
    - Amphibians – Booroolong Frog (*Litoria booroolongensis*), Yellow-spotted Tree Frog (*Litoria castanea*), Peppered Tree Frog (*Litoria piperata*), Davies Tree Frog (*Litoria daviesia*), Glandular Frog (*Litoria subglandulosa*), Tusked Frog (*Adelotis brevis*) and Sphagnum Frog (*Philoria sphagnicolus*);
    - Raptors – White-bellied Sea Eagle (*Haliaeetus leucogaster*), Little Eagle (*Hieraaetus morphnoides*) and Square-tailed Kite (*Lophoictinia isura*);
    - Diurnal birds - Glossy Black-Cockatoo (*Calyptorhynchus lathami*);
    - Bats – Grey-headed Flying-fox (*Pteropus poliocephalus*), Southern Myotis (*Myotis macropus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Little Bent-winged Bat (*Miniopterus australis*) and Easter Cave Bat (*Vespadelus troughtoni*);
    - Terrestrial Mammals – Parma Wallaby (*Macropus parma*), Brush-tailed Rock-wallaby (*Petrogale penicillata*), Rufous Bettong (*Aepyprymnus rufescens*) and Spotted-tail Quoll (*Dasyurus maculatus*);
    - Arboreal Mammals – Eastern Pygmy-possum (*Cercartetus nanus*), Squirrel Glider (*Petaurus norfolcensis*), Greater Glider (*Petauroides volans*) and Koala (*Phascolarctos cinereus*);
    - Reptiles – Stephens Banded Snake (*Hoplocephalus stephensii*);
- Additional bird and bat utilisation surveys (BBUS), including collection of bat acoustic data from height from the three temporary meteorological masts across the Project Area; and
- Updated turbine strike risk assessment and development of a framework Bird and Bat Adaptive Management Plan.

The above additional survey effort has been used to refine the Project layout, which has resulted in a significant reduction in potential impacts (compared to those stated in the EIS). Much of this effort focussed on reducing impacts to serious and irreversible impact (SAII) entities, habitat for threatened species, and prescribed impacts to bird and bat species. This includes:

- Potential impacts to New England Peppermint Grassy Woodlands TEC:
    - Overall decrease in impacts to New England Peppermint Grassy Woodlands ***woody*** vegetation by 42%;

  - Decrease in impacts to New England Peppermint Grassy Woodlands ***woody*** vegetation within the Disturbance Footprint (i.e., excluding road upgrades) by 76%;
  - Increase to impacts to non-woody moderate condition New England Peppermint Grassy Woodlands; however, the BDAR presented with the EIS did not consider impacts within the local road network, which are included in the amended project;
- Potential impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TREC:
  - Overall decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ***woody*** vegetation by 89%
  - Decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ***woody*** vegetation within the Disturbance Footprint by 92%
  - Overall decrease in impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland vegetation (both woody and derived native grassland forms) by 84%;
- Reduction in impacts to potential habitat for the Spotted-tail Quoll by 70%;
- Reduction in impacts to potential habitat for the Koala by 41%;
- Reduction in impacts to potential habitat for squirrel glider by 48%;
- Reduction in impacts to potential habitat for greater glider by 51%;
- Reduction in impacts to potential habitat for glossy black cockatoo 77%;
- Updates turbine risk assessment and collision risk modelling:
  - The following species were observed within the rotor swept area (RSA):
    - Wedge-tailed Eagle (*Aquila audax*);
    - Australian Raven (*Corvus coronoides*);
    - Nankeen Kestral (*Falco cenchroides*);
    - Brown Falcon (*Falco berigora*);
    - Whistling Kite (*Haliastur sphenurus)*; and
  - Modelled collision risk for these species combined estimated 0.63 collisions per annum based on 99% avoidance scenario, 1.27 collisions per annum based on 98% avoidance scenario, and 3.17 collisions per annum based on 95% avoidance scenario.

6.1.3 UPDATED MITIGATION AND MANAGEMENT

The Amended BDAR recommends the following mitigation and management measures:

Removal of native and threatened species habitat and habitat features

- Residual impacts on habitat will be offset through the Biodiversity Offset Scheme.
- Where vegetation is to be removed it will be undertaken in accordance with specifications provided in a vegetation clearing protocol, detailed within the Biodiversity Management Plan (BMP).
- Plain wire perimeter fencing (not barbed-wire fencing) will be used to avoid potential entrapment of fauna on fences.
- 'Environmental Sensitive No-Go Zones' will be established around areas of retained vegetation, threatened fauna habitat and threatened flora locations outside the Development Footprint.

Impact to native vegetation

- To avoid unnecessary removal or damage to retained vegetation, the limit of clearing will be clearly demarcated and signed as 'Environmental Sensitive No-Go Zones' prior to the commencement of clearing. This will be detailed within the BMP including the following measures:
    - Vehicles or machinery will not be permitted to park within or drive through areas of retained vegetation.
    - Construction materials will not be stockpiled or stored within areas of retained vegetation.
    - Ancillary facilities, such as site compounds and construction zones, will not be located beyond the limits of clearing.
    - Temporary fencing and signage will be maintained throughout construction.
    - Site inductions will be given to all personnel and visitors to ensure all site workers and visitors are aware of any No-Go Zones.
    - Clear boundaries on the eastern side of the Project Area will be established to ensure no impacts to Oxley Wild Rivers National Park.

Light/noise/dust

- The BMP will include measures to avoid light encroachment on adjacent habitats such as the Oxley Wild Rivers National Park by restricting construction works to daylight hours as much as possible and incorporating sensitive lighting arrays that shield the adjoining native vegetation and habitat from stray light, with low-level lighting installed for all required external lighting.
- The Applicant will implement programs to monitor the generation of dust during construction activities. All construction activities will be undertaken with the objective of preventing visible dust emissions from construction activities.

Invasive flora/pathogens

- To minimise the spread of weeds throughout the Project Area and surrounding patches, appropriate weed control activities will be undertaken in accordance with State and regional weed management plans.
- To comply with the objectives of the Northern Tablelands Regional Strategic Weed Management Plan 2017-2022 (LLS, 2017), the following measures will be implemented as part of the Pest Control Management Program:
    - Initial weed treatment - Including eliminating woody species and targeting infestations of exotic herbs. In particular, High Threat Exotic weed species occurring within the subject land will be managed to prevent further spread. Prior to any vegetation clearance, High Threat Exotic weeds should be demarcated for these to be disposed of separately from native material.
    - Containment – Follow-up monitoring and maintenance will be undertaken in areas of the development site that have received past primary weeding treatments to contain re-emergence of weed species.
    - Minimisation – Minimisation of weed species that cannot be effectively controlled on the site, such as exotic grasses, will be prevented from further spread through construction and operational phase site hygiene procedures.

- A pathogen management protocol will be implemented. Infection of native plants by *Phytophthora cinnamomic* is listed as a key threatening process under the BC Act and EPBC Act. The risk of spreading pathogens and the mitigation measures required on site will be regularly communicated to staff and contractors during inductions and toolbox talks.

Increased pest species presence

- Feral pest management programs will be developed and implemented for the Project, with focus on Feral Cats and European Foxes. All control methods will be completed in accordance with relevant legislation / standard operating procedures, including but not limited to the following:
    - Northern Tablelands Regional Strategic Pest Animal Management Plan 2018 - 2023 (LLS, 2018);
    - NSW Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Cats (NSW DPI, 2022); and
    - NSW Threat Abatement Plan: Predation by the Red Fox (Vulpes vulpes) (NSW OEH, 2010).

Erosion and sediment

- A site-specific Erosion and Sediment Control Plan will be developed and implemented to minimise erosion and sediment control risks. The Plan will include arrangements for managing wet weather events, and working with high surface water levels, including monitoring of potential high-risk events and specific controls and follow-up measures to be applied in the event of wet weather to avoid adverse impacts to hydrological processes, wetlands and ephemeral creek lines.

Turbine strike

- The final BBAMP will be prepared in consultation with the BCS, following approval of the Project.

Additional measures (affected SAII entities)

- The Applicant will regenerate up to 15 ha in aggregate of the two affected SAII entities within the local area to an extent that meets or exceeds the woody component lost through clearing for the Project. This additional measure aims to locally compensate for the loss of the woody component of vegetation associated with these PCTs (i.e., higher condition state VZs).

6.2 ABORIGINAL CULTURAL HERITAGE

6.2.1 BACKGROUND

The Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared for the EIS (OzArk Envrionment & Heritage, 2022) has been updated to assess potential impacts to Aboriginal cultural heritage associated with the amended Project (referred to hereafter as the Amended ACHAR; included in **Appendix F**). The Amended ACHAR also includes revisions, as necessary, in response to matters raised in submissions received for the EIS.

Proposed amendments relevant to the Amended ACHAR include:

- Change in temporary disturbance footprint from 107.20 ha to 697.0 ha;

- Change in permanent disturbance footprint from 474.21 ha to 216.6 ha;
- Redesign of the Project area to conserve the most culturally and scientifically important sites recorded during the assessment; and
- Two additional stages in fieldwork undertaken by OzArk and Registered Aboriginal Parties (RAPs) (or their representatives) including:
    - Stage 4 – (test excavation) Tuesday 11 July 2023 to Thursday 13 July 2023; and
    - Stage 5 – Tuesday 9 January 2024 to Saturday 13 January 2024.

The Amended ACHAR was prepared in accordance with the 'Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW' (Office of Environment & Heritage, 2011) and the 'Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW' (DECCW, 2010). Aboriginal community consultation in respect of the Amended Project followed the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2020' (DECCW 2010b).

Additional engagement with RAPs was warranted due to:

- Submissions from Heritage NSW requiring test excavations to be undertaken; therefore, an assessment methodology setting out a test excavation program was sent to all RAPs on 7 June 2023 for a 28-day review period concluding in July 2023; and
- Changes to the location of some project components, which resulted in additional survey effort required; therefore, an assessment methodology for the survey was sent to all RAPs on 24 November 2023 for a 28-day review period concluding on 22 December 2023.

A draft of the revised ACHAR was issued to RAPs on 31 May 2024 for a 28-day review period concluding on 1 July 2024. During this time, no comments were received from the RAPs.

In addition to RAPs, the Applicant has engaged with Heritage NSW, Northern Region Local Aboriginal Land Council and Amaroo Local Aboriginal Land Council. The Applicant will continue to engage with relevant stakeholders relating to Aboriginal cultural heritage, as necessary.

6.2.2 IMPACT ASSESSMENT

The Applicant, through project redesign, has conserved the most culturally and scientifically significant sites recorded within the Project area. The Applicant has also undertaken to fund management of one cultural heritage object within the Project area, but outside of the disturbance footprint, that is at risk of non-project-related impact.

Aboriginal cultural heritage surveys undertaken for the Project (including that undertaken to inform the EIS and Amendment Report, i.e., from July 2022 to January 2024) recorded 23 new Aboriginal sites. One previously recorded site in the Project area was also revisited. The newly recorded sites included artefact scatters, isolated finds, culturally modified trees, a quarry site, and an engraving site.

Project design changes have been made to avoid impact to Aboriginal cultural heritage sites, such that of the 23 newly recorded sites, 17 sites (74%) will be avoided by the Project. These sites are either a sufficient distance to the disturbance footprint or will be protected during construction works. As a result, these sites will remain available to illustrate the deep past of the area and to allow the current Aboriginal community to educate others about their history and culture.

The sites that will not be impacted by the Project include the culturally and scientifically significant sites Queenlee OS-1 with potential archaeological deposit (PAD) and Queenlee E-1, culturally modified trees and a range of artefacts sites. It is recommended that Queenlee OS-1 with PAD and Queenlee E-1 are subject to further research to fully record the sites' features. It is also recommended that several sites are protected with fencing during construction.

The six sites that could be impacted by the Project include Table Top Rd IF-1, Woodburn IF-1, Kambala IF-1, Kambala IF-2, Millbank OS-1, and Green Range OS-3 with PAD [partial]. These comprise four isolated finds and two artefact scatters (one of which will only be partially harmed).

A test excavation program comprising 57 test units was undertaken at Green Range OS-3 with PAD. Disturbance across Green Range OS-3 with PAD from agricultural practices was evident; however, 96 artefacts were recorded across 38 test units, while 19 test units did not contain any artefacts. In general, test units recorded a low-density of subsurface artefacts; however, one test unit recorded 22 artefacts and was interpreted as a knapping event[1]. Across all test units, most artefacts were recorded in the top 10 cm of the soil profile.

The salvage procedures for the six sites that may be harmed will be set out in an Aboriginal Cultural Heritage Management Plan that will be prepared following the project's approval.

The only previously recorded site in the Project area, Aboriginal Heritage Information Management System (AHIMS) site 21-4-0041, is outside of the disturbance footprint and will not be impacted.

The level of assessment achieved during the field survey, and additional consultation with RAPs, is considered adequate for the purposes of determining the cultural and archaeological characteristics of the Project area. Most new Aboriginal sites recorded were recorded outside areas of potential impact. For a project the scale of the Winterbourne Wind Farm, the accumulative harm to Aboriginal objects is low. Only six sites will have recorded artefacts moved to a place of safekeeping in consultation with the RAPs.

There may be places with intangible cultural significance within the Survey Boundary, although no specific locations have been identified by the Aboriginal community. Sites such as Queenlee OS-1 and Queenlee E-1 form important tangible markers of the high regard the Aboriginal community hold for the broader, intangible, cultural landscape.

6.2.3 UPDATED MITIGATION AND MANAGEMENT

The Aboriginal cultural heritage values identified within the Project area can be appropriately managed by implementing the conservation measures set out in the revised ACHAR, as summarised below:

- WinterbourneWind will develop an Aboriginal Cultural Heritage Management Plan (ACHMP), to be approved by the Planning Secretary and which includes consultation with the RAPs and Heritage NSW. The ACHMP will also include an unanticipated finds protocol, unanticipated skeletal remains protocol, and procedures for the long-term management of any artefacts;

[1] Knapping is the manufacture of stone tools by the reductive processes of flaking or chipping from a stone core, using precise strikes with a handheld hammer (also typically stone). A knapping event is where and when this manufacturing activity took place.

- Archaeological management strategies would be implemented to manage and mitigate the impact of the Project;
- If impact to four surface isolated find sites - Table Top Rd IF-1, Woodburn IF-1, Kambala IF-1, and Kambala IF-2 - and two artefact scatters - Green Range OS-3 with PAD [partial] and Millbank OS-1 - is likely during construction of the Project, the sites should be salvaged through the recording and collection of the surface artefacts prior to construction works proceeding, including:
  - Only the portion of Green Range OS-3 with PAD within the Project disturbance footprint will be salvaged. This portion does not include the PAD;
  - The recommended methodology for the salvage will be finalised through engagement with relevant parties and detailed in the ACHMP;
  - The salvage works will include the mapping, analysis, and collection of the surface artefact at the affected site. Results will be included in a brief report to preserve the data in a useable form and an Aboriginal Site Impact Recording Form (ASIRF) will be submitted to the AHIMS.
- Green Range OS-3 with PAD may be partially impacted by the Project. The portion of Green Range OS-3 with PAD that will not be harmed by the project is within a frequently ploughed paddock; therefore, surface artefacts are at risk from continued impacts from ploughing. It is recommended that the site be managed through the collection of surface artefacts (following the methodology set out in the ACHAR). Based on the results of the test excavation at Green Range OS-3 with PAD that demonstrated that the site is mostly a surface manifestation, this action will change the status of the site on the AHIMS register to 'destroyed'.
- The project will consider funding additional research at Queenlee OS-1 with PAD and Queenlee E-1, subject to landowner consent. The research will involve non-invasive recording, mapping, and photography at each site; and
- All land-disturbing activities must be confined to within the Project disturbance footprint. Should the parameters of the proposed work extend beyond this, then further archaeological assessment may be required.

6.3 HISTORIC HERITAGE

6.3.1 BACKGROUND

The Historic Heritage Assessment (HHA) prepared for the EIS (OzArk Envrionment & Heritage, 2022) has been updated to assess potential impacts relating to historic heritage associated with the amended Project (referred to hereafter as the Amended HHA; included in **Appendix F**). The Amended HHA was also revised, as necessary, in response to relevant matters raised in submissions received for the EIS.

The Amended HHA was prepared in accordance with the International Council on Monuments and Sites' 'The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance' (the Burra Charter) (ICOMOS, 2013), Heritage Council of NSW' 'Historical Archaeology Code of Practice' (Heritage Council of NSW, 2006) and 'Assessing Significance for Historical Archaeological Sites and 'Relics'' (Heritage Council of NSW, 2009).

6.3.2 IMPACT ASSESSMENT

The Amended HHA included updated searches of relevant historic heritage databases to determine whether there have been changes in listings of items since exhibition of the EIS. This included National and Commonwealth heritage items, State heritage listings and heritage items identified in Local Environmental Plans (LEPs). Excluding minor changes in the distance from project infrastructure to heritage listed items, no material changes to the impact assessment presented in the EIS were identified. The proposed amendments do not traverse the curtilage of any heritage listings. No impacts to historic heritage items due to the development of the Project are anticipated.

Three historic heritage items (HS01, HS02 and HS03) were recorded during surveys to inform the EIS. Additional surveys to inform the Amended HHA were undertaken in July 2023 and January 2024. One additional historic heritage site (HS04) was identified during these surveys, comprising of a lumber beam bridge across Salisbury Waters. This site is outside the Project area, approximately 3.2 km west of Thunderbolts Way. An assessment of HS04 was undertaken as per the Heritage Council of NSW guidelines and the Burra Charter. This assessment determined HS04 to have no heritage significance.

As per the original EIS, HS01 will be impacted by the Project. It was previously determined to have no heritage significance and as such any impact to this item is considered negligible. HS02, HS03 and HS04 remain outside any proposed project construction areas and do not have heritage significant and are not impacted by the project. Therefore, no mitigation measures are required regarding all four identified historic sites surveyed.

6.3.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended in the Amended HHA. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

6.4 NOISE

6.4.1 BACKGROUND

The Noise Impact Assessment (NIA) prepared for the EIS (Sonus, 2022) has been updated to assess potential impacts relating to noise associated with the amended Project (referred to hereafter as the Amended NIA) (**Appendix G**). The Amended NIA also addresses, as necessary, relevant matters raised in submissions received for the EIS. A separate NIA was prepared for assessment of the on-site quarry in **Section 6.10.3**.

Proposed amendments relevant to the Amended NIA are:

- Deletion of WTG B124 to reduce potential noise impacts to associated dwelling SR079;
- Optimisation of the project layout which resulted in a change in location of 73 WTGs as well as ancillary infrastructure such as the BESS and substations; and
- Reduction in construction traffic volumes on the local road network resulting from development of an on-site quarry and use of existing on-site groundwater bores.

The Amended NIA was prepared in accordance with:

- 'Interim Construction Noise Guideline 2009' (DECC, 2009) (ICNG);
- 'Noise Policy for Industry 2017' (NSW EPA, 2017) (NPI);

- 'Road Noise Policy 2011' (NSW EPA, 2011) (RNP);
- 'Wind Energy: Noise Assessment Bulletin for State Significant Wind Energy' Development (DPE, 2016) (Noise Bulletin); and
- The South Australian 'Wind Farms – environmental noise guidelines' (SA EPA, 2021).

6.4.2 IMPACT ASSESSMENT

6.4.2.1 NOISE CRITERIA

The ICGN sets out project-specific Noise Management Levels (NMLs), for works within the recommended standard hours for construction, for all identified residential dwellings and other sensitive (non-residential) receivers. No changes to the NMLs as presented in Appendix H to the EIS were required.

Assessment of Project-specific noise criterion needs to consider intrusive noise levels, amenity noise levels, and sleep disturbance noise levels. Collectively these set out the Project noise trigger levels (PNTLs). No changes to the maximum PTNLs as presented in Appendix H to the EIS were required.

The primary guidance for assessing the impact of road traffic noise on locations is the RNP. No changes to the road traffic noise assessment criteria for residences near public roads were required (refer Appendix H to the EIS). Note that these criteria apply to permanent situations and are therefore conservative for the temporary nature of construction activities proposed as part of the Project. The RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2 decibels (dB).

6.4.2.2 CONSTRUCTION NOISE IMPACTS

The proposed amendments to the Project did not change the assessment outcomes of ancillary infrastructure noise nor construction noise.

6.4.2.3 CONSTRUCTION TRAFFIC NOISE IMPACTS

The proposed amendments do not change the assessment of construction traffic noise.

6.4.2.4 OPERATIONAL NOISE IMPACTS

Ancillary Infrastructure

The proposed amendments do not change the assessment outcomes for ancillary infrastructure.

WTG Operation

The updated assessment of potential noise propagation from WTG as presented in the Amended NIA used the methodology outlined in Section 4.2 of the NIA that informed the EIS. It is important to note that the NIA that informed the EIS predicted that, without mitigation, noise from all Project WTGs (i.e., 119 WTGs) that were assessed in the EIS achieved the operational noise criteria at all non-associated dwellings.

For the Amended NIA, the noise level from WTG operation was predicted for all integer wind speeds from cut-in to rated power. Based on the prediction noise levels, without any mitigation measures, the noise from the 118 WTGs associated with the amended Project will achieve the operational noise criteria at all dwellings in the vicinity of the Project. The conclusions of the original NIA therefore remain valid.

Low Frequency Noise

The highest predicted low-frequency noise level ($L_{Ceq, 10min}$) at non-associated dwellings is no more than 54 dB(C) (at SR240), which is less than the 60 dB(C) criterion. Table 4 of **Appendix** G shows the $L_{Ceq, 10min}$ low frequency noise levels against the highest $L_{Aeq, 10min}$ noise levels modelled at the closest non-associated dwellings at a hub height wind speed of 11 metres per second (m/s). This demonstrates that the penalty for excessive low frequency noise is not applicable, and no adjustment has been made to the noise impact predictions.

6.4.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended in the Amended NIA. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

6.5 VISUAL

6.5.1 BACKGROUND

The Landscape and Visual Impact Assessment (LVIA) prepared for the EIS (Moir Landscape Architecture, 2022) has been updated to assess potential impacts relating to landscape and viewshed associated with the amended Project (referred to hereafter as the Addendum LVIA; **Appendix H**). The Addendum LVIA has also been revised, as necessary, in response to relevant matters raised in submissions received for the EIS.

Proposed amendments relevant to the Addendum LVIA include:

- Removal of turbine B023 and relocation of seven WTGs (B024, B025, B026, B027, B032, B033 and B034) to reduce visual impacts to non-associated dwellings to the west of the Project;
- Optimisation of the Project layout which resulted in a change in location of 66 WTGs (in addition to the seven WTGs listed above);
- Removal of turbine B124;
- Addition of one WTG (B177);
- Relocation of the north substation, maintenance building, construction compound, BESS and laydown area approximately 1.8 km west and the south substation approximately 5.7 km north west; and
- Inclusion of an on-site quarry.

The Addendum LVIA was prepared in accordance with the 'Wind Energy: Visual Assessment Bulletin' (DPE, 2016).

6.5.2 IMPACT ASSESSMENT

The preliminary assessment tools (visual magnitude, multiple wind turbine tool, zone of visual influence) were revised for the amended Project layout. An overview of the of the visual impact of the amended Project layout is provided in **Table 6-1**, and further discussed in the following sections.

TABLE 6-1 VISUAL IMPACTS TO THE AMENDED PROJECT

Assessment	EIS (original) Project	Amended Project	Variation
Visual Magnitude			
Black Line (3,100 m)	20 dwellings	17 dwellings	Reduced by 3 dwellings
Blue Line (4,500) m	23 dwellings	21 dwellings	Reduced by 2 dwellings
Multiple Wind Turbine Tool			
2 sectors	25 dwellings	19 dwellings	Reduced by 6 dwellings
3 sectors	11 dwellings	8 dwellings	Reduced by 3 dwellings
4 sectors	1 dwelling (SR240)	1 dwelling (SR240)	No variation
Visual Impact Rating			
Moderate	12 dwellings	13 dwellings	Increased by 1 dwelling
High	5 dwellings	No dwellings	Reduced by 5 dwellings

6.5.2.1 VISUAL MAGNITUDE

The EIS identified 43 non-associated dwellings within 4,550 m of a WTG. The Amended Project has 39 non-associated dwellings within 4,550 m of a WTG, four (4) fewer than the EIS Project. The changes are:

- Addition of two (2) non-associated dwellings;
- Removal of four (4) now associated dwellings; and
- Removal of two (2) associated dwellings.

The EIS identified 20 non-associated dwellings within 3,100 m of a proposed WTG location (within the black line). The Amended Project has 18 non-associated dwellings within the black line of visual magnitude (3,100m), effectively a reduction of two dwellings due to:

- One (1) dwelling changing from non-associated to associated (SR274);
- One (1) dwelling changing from associated to non-associated (SR224); and
- Two (2) dwellings now falling outside of the black line (SR141 and SR207) due to relocation of WTG.

As above, relocation of turbines has resulted in the distance between WTGs and 2 non-associated dwellings (SR050 and SR093) increasing such that they are now outside the blue line of visual magnitude. A dwelling that was previously identified as associated is now considered non-associated and is within the visual magnitude of the Project.

6.5.2.2 MULTIPLE WIND TURBINE TOOL

The 2-dimensional (2D) multiples wind turbine tool identified 9 dwellings with the potential for views in more than two, 60-degree sectors. Notably, 5 non-associated dwellings (SR034, SR095, SR204, SR207, SR359) have had potential views reduced from within two, 60-degree sectors to having views in only one, 60-degree sector through design refinements. Additionally, dwelling SR274 was previously identified as non-associated; however, as the Applicant has signed an agreement with this landowner, dwelling SR274 is now considered associated.

Design refinements have resulted in non-associated dwellings with potential views of WTGs in up to three, 60-degree sectors reduced by 2 overall.

6.5.2.3 ZONE OF VISUAL INFLUENCE

The revised zone of visual influence (ZVI) shows a reduction to the number of WTGs visible from land to the west of the Project.

6.5.2.4 DWELLING ASSESSMENTS

Visual impact ratings for several dwellings have been reduced, primarily due to changes made by the Applicant to the Project design. The potential visual impact rating for three non-associated dwellings (SR207, SR262, SR268) has reduced from high to moderate, while the visual impact rating for one dwelling (SR240) has reduced from moderate to low. Potential visual impacts ratings for other non-associated dwellings remain as stated in the LVIA that accompanied the EIS. Comparative dwelling assessments have been undertaken for all non-associated dwellings within the black line of visual magnitude with a moderate or high visual impact rating in the EIS. The Addendum LVIA demonstrates there are no non-associated dwellings with a high visual impact rating within 3,100 m or 4,500 m of a proposed WTG location.

6.5.2.5 PROPOSED QUARRY

A quarry has been proposed along Bark Hut Road, within the Project area. Bark Hut Road is an unsealed minor road which provides access to four homesteads (SR058, SR119, SR259 and SR065). All four (4) dwellings are deemed associated.

The quarry is to the east of a vegetated rise in topography and, as a result, views to the quarry would be difficult to discern when travelling along Bark Hut Road in an easterly direction. The quarry will be noticeable in the landscape to motorists travelling in a west direction along Bark Hut Road. The number of motorists traveling west along Bark Hut Road are low and largely associated with travel to and from associated residences.

Views to the quarry will be unavailable from all other public roads, non-associated dwellings and public viewpoints in the area. Because of the limited visibility, mitigation measures to reduce the visual impacts of the quarry are considered unnecessary.

6.5.3 UPDATED MITIGATION AND MANAGEMENT

The amendments proposed for the Project have reduced visual amenity impacts. As such, no additional mitigation measures were recommended in the Addendum LVIA. Mitigation measures proposed in the EIS are sufficient to address the reduced impacts following the proposed amendments.

6.6 TRAFFIC

6.6.1 BACKGROUND

The Traffic Impact Assessment (TIA) prepared for the EIS (Amber Organisation, 2022) has been updated to assess potential impacts relating to transport and traffic associated with the amended Project (referred to hereafter as the Amended TIA; **Appendix I**). The Amended TIA has also been revised, as necessary, in response to relevant matters raised in submissions received for the EIS.

Proposed amendments relevant to the Amended TIA are:

- Revision of construction commencement from Q2 2024 to Q3 2026;
- Expected increase in construction duration by 22 months (total 52 months);
- Reduction of construction workforce from 400 FTE to 390 FTE;
- Avoidance of Oxley Highway for inbound OSOM vehicle movements;
- Construction and use of new road south of Uralla for inbound OSOM vehicle movements;
- Construction and use of onsite quarry to source materials in place of heavy vehicle movements on the road network; and
- A decrease in daily movement of heavy vehicles from 288 to 116 per day during peak construction.

The Amended TIA was prepared in accordance with:

- 'Guide to Traffic Generating Developments' (RTA, 2002);
- 'Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections' (Austroads, 2021); and
- 'Austroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings' (Austroads, 2019).

The Amended TIA incorporates assessments by Rex J Andrews Pty Ltd (Route Study); Appendix A of **Appendix I**), icubed consulting (Intersection and Site Access; Appendix B of **Appendix I**) and Constructive Solutions (Local Road Network Assessment; Appendix C of **Appendix I**).

6.6.2 IMPACT ASSESSMENT

6.6.2.1 TRAFFIC VOLUMES

Traffic surveys (tube counts) were undertaken in February, June and November of 2023 at five (5) key intersections:

- New England Highway / Oxley Highway, Bendemeer;
- New England Highway (Bridge Street) / Salisbury Street, Uralla;
- Fitzroy Street / Derby Street, Walcha;
- Thunderbolts Way / Darjeeling Road, Walcha; and
- Thunderbolts Way (Uralla Road and Derby Street) / Jamieson Street, Walcha.

The intent of the surveys was to provide baseline measurements to assess the proposed amendments. Survey results were found to carry moderate levels of traffic in the morning and evening peak hours.

Traffic volumes were adjusted to 2024 estimations using 1.5% compounding annual growth rates for New England Highway and 1% for Oxley Highway and Thunderbolts Way. Updated traffic volumes are provided in **Table 6-2**.

TABLE 6-2 STATE AND REGIONAL ROAD TRAFFIC VOLUMES

Road	Survey Location	Growth Factor	Estimated Volume for EIS (vpd)	Estimated Volume for 2024 (vpd)
New England Highway	140 m south of Caroline Street	1.5%	4,365	4,186
	1.66 km west of Glenburnie Road	1.5%	4,331	4,598
	100 m west of Hill Street	1.5%	9,253	9,821
	560 m west of Arding Road	1.5%	7,007	7,437
Oxley Highway	100 m west of Towers Street	1.0%	1,114	1,237
	1.66 km east of Back Woolbrook Road	1.0%	680	755
Thunderbolts Way	2.45 km north of Mirani Road	1.0%	1,226	1,360

Considering the growth factors adjusted for 2024, traffic volume data indicates that the State and regional road network currently carries a modest level of traffic which is well within the existing road capacity.

No changes to the local road traffic volumes were identified between that assessed in the EIS and the Amended TIA. A low level of traffic was determined for the local road network and well within its operating capacity.

Overall, the traffic data indicates the surrounding road network currently accommodates a low to moderate level of traffic for the respective road classifications and can accommodate an increase in vehicle movement.

6.6.2.2 TRAFFIC GENERATION AND DISTRIBUTION

Construction

All vehicles will access the Project area through Walcha and then via Jamieson Street / Ohio Road / Emu Creek Road towards the site access points. Light vehicles will continue along Emu Creek Road and Winterbourne Road to access the northern and western portions of the Project, or via Moona Plains Road to reach the southern and eastern portions. Most heavy vehicles will travel to the north along Winterbourne Road and access the Project via various site access locations from the local road network and internal tracks.

Table 6-3 summarises predicted construction vehicles and their anticipated distribution associated with the amended Project.

TABLE 6-3 VEHICLE TYPE AND DISTRIBUTION

Vehicle type	Description	Traffic Distribution
Light Vehicles	Transport construction workforce to and from the Project area.	• 30% of vehicles coming from Tamworth and 20% from Walcha to comprise site access from the west/south. • 40% of vehicles coming from Armidale and 10% from Uralla to comprise site access from the north.
Heavy Vehicles		
Medium Rigid Trucks (MRV) and Heavy Rigid Trucks (HRV)	Delivery of raw materials and smaller project elements, such as concrete and steel supplies	• 60% of vehicles coming from the west/south (Tamworth and Walcha) and 40% from the north (Armidale and Uralla) throughout construction. Note, heavy vehicle movements associated with water and material sourced from the quarry are completely within the site and are not included in the trip distribution.
Truck and Dog / Semitrailers / B-Doubles	Transport the majority of the large project elements.	• 70% of vehicles coming from the west/south (Tamworth and Walcha) and 30% from the north (Armidale and Uralla) throughout construction. Note, heavy vehicle movements associated with material sourced from the quarry are completely within the site and are not included in the trip distribution.
OSOM Vehicles		
Restricted Access Vehicles/ OSOM vehicles	Transport the largest project elements including blades, substation, transformer and earth moving equipment.	• Up to 50 OSOM deliveries per month over 30 months via Thunderbolts Way.

Table 6-4 provides a summary of the estimated vehicles per day (vpd) and vehicle movements per hour (vph) during the peak of construction. The peak construction traffic movement will occur in the morning when light vehicles transporting the construction workforce arrive onsite (between 6:00 am and 7:00 am) and leaving site (staggered finish times, resulting in peak distributed in the evening). Heavy vehicle movements will be scattered throughout the day, with even inbound and outbound movements.

TABLE 6-4 REVISED PEAK CONSTRUCTION VEHICLE MOVEMENTS

Vehicle Type		EIS Layout		Amended Layout		Variation	
		Daily (vpd)	Peak Hour (vph)	Daily (vpd)	Peak Hour (vph)	Daily (vpd)	Peak Hour (vph)
Light Vehicles		270	105	456	228	186	123
Heavy Vehicles	MRV/HRV	100	12	20	4	-80	-8
	Truck and Dog	142	14	68	14	-74	0
	Semitrailers	34	4	26	5	-8	1

Vehicle Type		EIS Layout		Amended Layout		Variation	
		Daily (vpd)	Peak Hour (vph)	Daily (vpd)	Peak Hour (vph)	Daily (vpd)	Peak Hour (vph)
	B-Doubles	12	2	2	0	-10	-2
	Subtotal	*288*	*32*	*116*	*23*	*-172*	*-9*
Total		**558**	**137**	**572**	**251**	**14**	**114**

Overall, about 251 vph are predicted to be generated by the Project during peak construction during the morning and evening peak hours, with the majority of these being light vehicles. This represents an increase of 114 vph compared to the traffic movements assessed in the EIS; however, virtually all this increase is due to light vehicles and this increase in vehicle movements was assessed to be accommodated by the existing road network and is overall consistent with the EIS assessment.

Operation

The EIS assessed the impact to the existing traffic environment form operational traffic was negligible based on up to 16 vehicle movements per day. Based on revised traffic and transport volumes, the Amended TIA also determined a negligible impact to the existing traffic environment based on up to 32 vehicle movements per day.

6.6.2.3 TRAFFIC ASSESSMENT

The SIDRA analysis undertaken for the EIS was revised to consider the following:

- Adjusted 1.5% compounding annual growth rate applied to existing surveyed traffic volumes over seven years to reflect the end of the construction period in 2030;
- Updated construction traffic volumes during morning and evening peak hours; and
- Cumulative traffic volumes based on current information available from SSDs with a potential to generate additional vehicle movements along New England Highway and Oxley Highway within the vicinity of the Project for overlapping construction periods (refer Section 4.4 of Amended TIA).

The revised SIDRA analysis indicates that intersections are expected to operate consistently with the assessment presented in the EIS, specifically:

- The intersections are expected to operate with minimal queue lengths on all legs;
- The overall average delay at the New England Highway / Oxley Highway intersection is 6.1 seconds in the morning peak hour and 6.2 seconds in the evening peak hour;
- The overall average delay at the New England Highway (Bridge Street) /Salisbury Street intersection is 4.5 seconds in the morning peak hour and 5.1 seconds in the evening peak hour;
- The overall average delay at the Fitzroy Street /Derby Street intersection is 3.7 seconds in the morning peak hour and 4 seconds in the evening peak hour;
- The overall average delay at the Thunderbolts Way / Darjeeling Road intersection is 4.8 seconds in the morning peak hour and 1.7 seconds in the evening peak hour;

- The overall average delay at the Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street intersection is 4.9 seconds in the morning peak hour and 4.7 seconds in the evening peak hour; and
- The intersection is expected to continue to operate in free flow conditions, with good level of service (LoS rating *A*).

The Amended TIA concludes that that the road network can accommodate the Project traffic during the peak construction period. All intersections are expected to operate with minimal queues and delays, and the mid-block sections near the site are expected to continue to operate with a good level of service.

The Amended TIA also considered cumulative traffic and transport impacts associated with relevant past, present and reasonably foreseeable projects. The Amended TIA concluded that cumulative impacts would be readily accommodated by the road network, given existing low traffic volumes and the fact that the road network would operate with less vehicles than during peak hours. Cumulative impact during operation of the Project predicted that the increase in traffic of up to 16 vpd would not result in more than a negligible change to the traffic environment. Therefore, it has been assessed that the road network can accommodate the traffic generated by the Project as well as predicted cumulative traffic volumes associated with relevant past, present and foreseeable future projects.

6.6.2.4 ROUTE ASSESSMENT

Local and Unsealed Road Network

Local Roads

An assessment of the local road network proposed for the transport route was undertaken by Constructive Solutions (refer Appendix C of the Amended TIA). This assessment considered vehicles up to a B-double. The assessment concluded that the following local roads require widening to provide a minimum carriageway width of 6.2 m, minimum shoulder width of 0.5 m and additional shoulder widening as per swept path requirements on any curves:

- Emu Creek Road;
- Winterbourne Road;
- Bark Hut Road;
- Blue Mountain Road between Winterbourne Road and Hazeldean Road;
- Uruga Road (approx. 700m at the southern end of the road);
- Table Top Road between Florida Road and Site Entrance 6 (including bridge bypass);
- Florida Road (approx. 500m at the northern end of the road); and
- Rowleys Creek Road (approx. 1km).

The assessment concluded that Jamieson Street and Ohio Road within Walcha currently have sufficient width at about 13.5 m.

Unsealed Roads

The Project intends to use portions of the following unsealed roads:

- Blue Mountain Road;
- Hazeldean Road;
- Uruga Road;
- Bark Hut Road;
- Table Top Road;
- Florida Road; and
- Rowleys Creek Road.

Unsealed roads would typically be considered for sealing when they accommodate between 200 and 500 vpd. The 'Unsealed Roads Best Practice Guide 2' (Australian Road Research Board, 2020) notes that roads may warrant paving when maintenance costs increase to unacceptable levels, in wet climates, or when economic or social benefits are evident.

Section 5.3 of the Amended TIA demonstrates that the unsealed road network is not anticipated to accommodate more than 200 vehicles per day during peak construction. Given the low expected traffic volume on the unsealed roads and as the increase in traffic is only temporary it is considered acceptable for the roads to remain unsealed. In addition, the Applicant has agreed to seal the first 1.2 km (approximately) of Bark Hut Road to mitigate potential noise and dust impacts at dwelling SR058, subject to agreement and discussion with Walcha Council.

OSOM Route Assessment

The preferred access route from the port to the Project has been identified within a Route Study prepared by Rex J Andrews Pty Ltd, a specialist transport provider (refer Appendix A of the Amended TIA). The proposed transport route identifies several road upgrades which are required to facilitate transport of OSOM vehicles to the Project site. The updated Route Study considers the increased construction period, traversing rail and bridge infrastructure, avoidance of Oxley Highway, and vulnerable road users enroute.

The predicted number of OSOM deliveries has decreased from 1,592 to 1,500 (-92); and these deliveries will occur over a 30-month period (previously assessed 10 months). This equates to up to 50 OSOM deliveries per month. This rate is consistent with the relevant assessment in the original EIS.

Oxley Highway will not be used by inbound OSOM vehicles.

Table 6-5 and **Figure 6-1** provides details of the proposed OSOM access routes.

TABLE 6-5 OSOM ACCESS ROUTES FOR WTG COMPONENTS

Route	Component	Route Overview	
		Roads	**Authority**
Port of Newcastle to Walcha			
1	Blades, towers, nacelles > 5.2 m overall height	1. Selwyn Street	Port Authority
		2. George Street	City of Newcastle
		3. Industrial Drive 4. Maitland Road 5. New England Highway 6. John Renshaw Drive 7. Hunter Expressway 8. New England Highway 9. Golden Highway 10. Denman Road	TfNSW
		11. Bengalla Road 12. Wybong Road 13. Kayuga Road 14. Ivermein Street 15. Stair Street 16. Dartbrook Mine Access Road	Muswellbrook Shire
		17. New England Highway	TfNSW
		18. Staces Road	Uralla Shire
		19. Thunderbolts Way	Uralla Shire / Walcha Council
		20. Jamieson Street	Walcha Council
2	Powertrain, hub, other components < 5.2 m overall height	*Roads 1-8 as per Route 1*	
		9. Bell Street 10. Victoria Street	Muswellbrook Shire
		Route continues onto New England Highway at Roads 17-20 as per Route 1	
Alternative Route via Tamworth			
3	Blades	1. Whitehouse Lane 2. Marsden Park Road 3. O'Briens Lane 4. Nundle Road	Tamworth Regional Council
Walcha to Site Access Locations			
A	Northern site access – all components	1. Jamieson Street 2. Emu Creek Road 3. Winterbourne Road 4. Blue Mountain Road	Walcha Council
B	Eastern site access – all components	*Roads 1-3 as per Route A*	
		4. Bark Hut Road / Table Top Road / Florida Road (various site entrances)	Walcha Council

For the amended Project, OSOM movements will avoid the Oxley Highway and instead travel along New England Highway to Staces Road south of Uralla. OSOM vehicles will then head east along a new road proposed to be constructed between the eastern end of Staces Road and Thunderbolts Way. The new road will be constructed within Lo 7300 DP 1157667 (Crown Reserve R22232). OSOM vehicles will exit onto Thunderbolts Way before continuing south to Walcha. All OSOM vehicles will access the Project area via Jamieson Street, Emu Creek Road and Winterbourne Road, before either heading north on Blue Mountain Road or east along Table Top Road to reach the various site access locations.

The Applicant has engaged with Uralla Shire Council and NSW Crown Lands throughout 2023 and early 2024 and discussed the new proposed OSOM transport route along Thunderbolts Way to the south of Uralla as an alternative to the OSOM routes along Oxley Highway that was proposed in the EIS. Uralla Shire Council and NSW Crown Lands have not raised any concerns or objections to the new proposed OSOM routes.

The full schedule of road upgrades required to facilitate the OSOM routes are described in Section 11 and Appendix A of the Amended TIA. It is understood that some of the works identified may be undertaken prior to Project construction due to other approved wind energy projects and/or commitments made by EnergyCo and Transport for NSW to upgrade the transport network to facilitate renewable energy projects in the Central-West Orana REZ and the New England REZ. It is therefore recommended that an updated assessment is conducted prior to construction in consultation with Transport for NSW (TfNSW) and the relevant councils to identify the actual required road infrastructure upgrades.

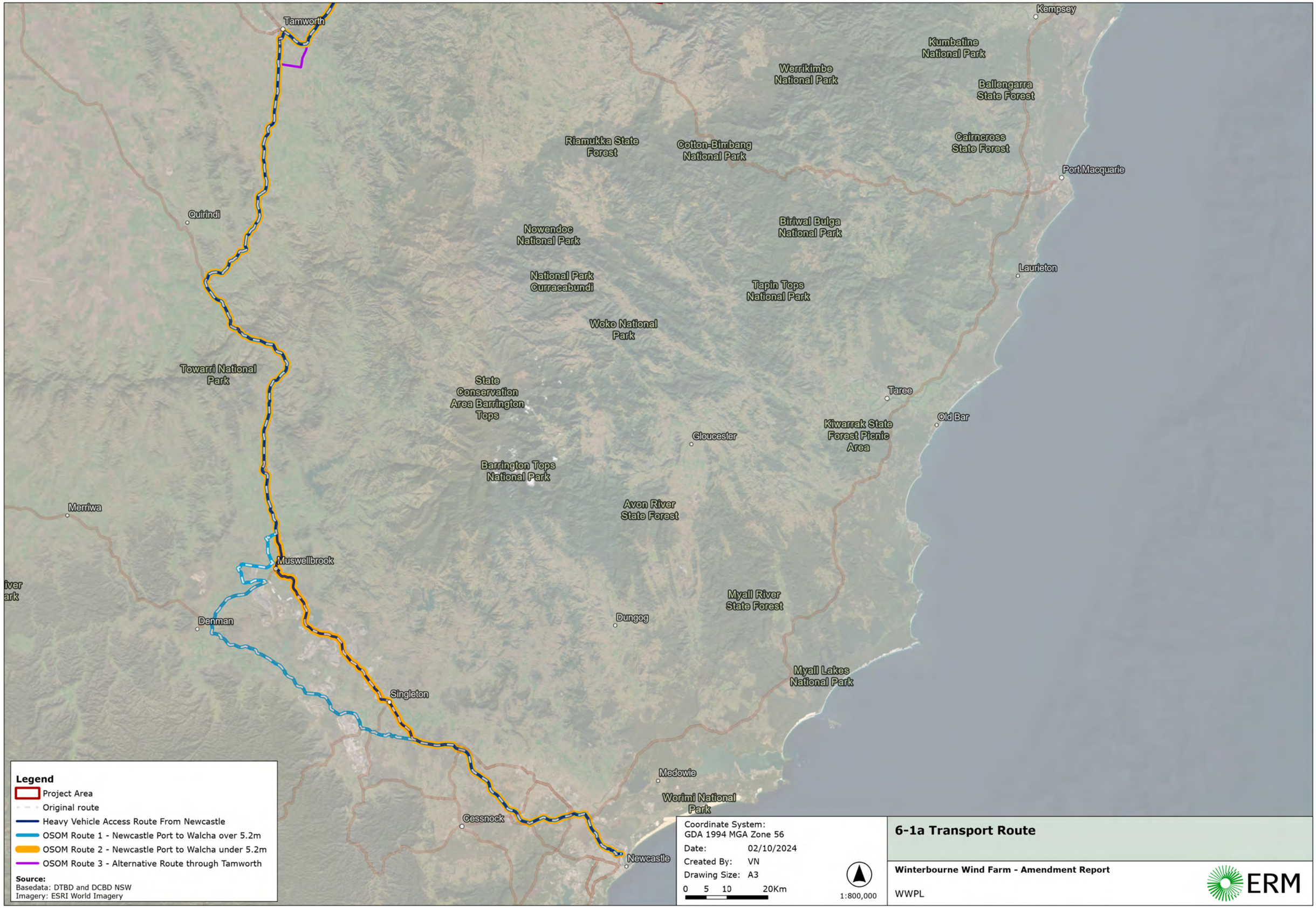
A review of the rail and bridge infrastructure along the proposed OSOM routes identified 133 such assets including overpasses, underpasses and level crossings. Limiting factors will require further investigation, utility adjustment works and Australian Rail Track Corporation (ARTC) supervision at select locations; however, it is concluded that the OSOM traffic will have no major impact on the operation or safety of the identified assets. Permits and requirements for OSOM vehicles will be detailed in the Traffic Management Plan (TMP).

The amended TIA identified the following vulnerable road user along the OSOM routes:

- Muswellbrook High School;
- Murrurundi Kindergarten and Pre-school, and Murrurundi Public School; and
- Moonbi Public School.

The peak operating times at these locations should be identified and, where possible, OSOM transport avoided near these facilities during these peak times which would be included as part of the TMP.

- The updated Route Study concluded that Routes 1 and 2 provide the most appropriate transport options for the Project. The alternative Tamworth bypass route (Route 3) may also be considered.



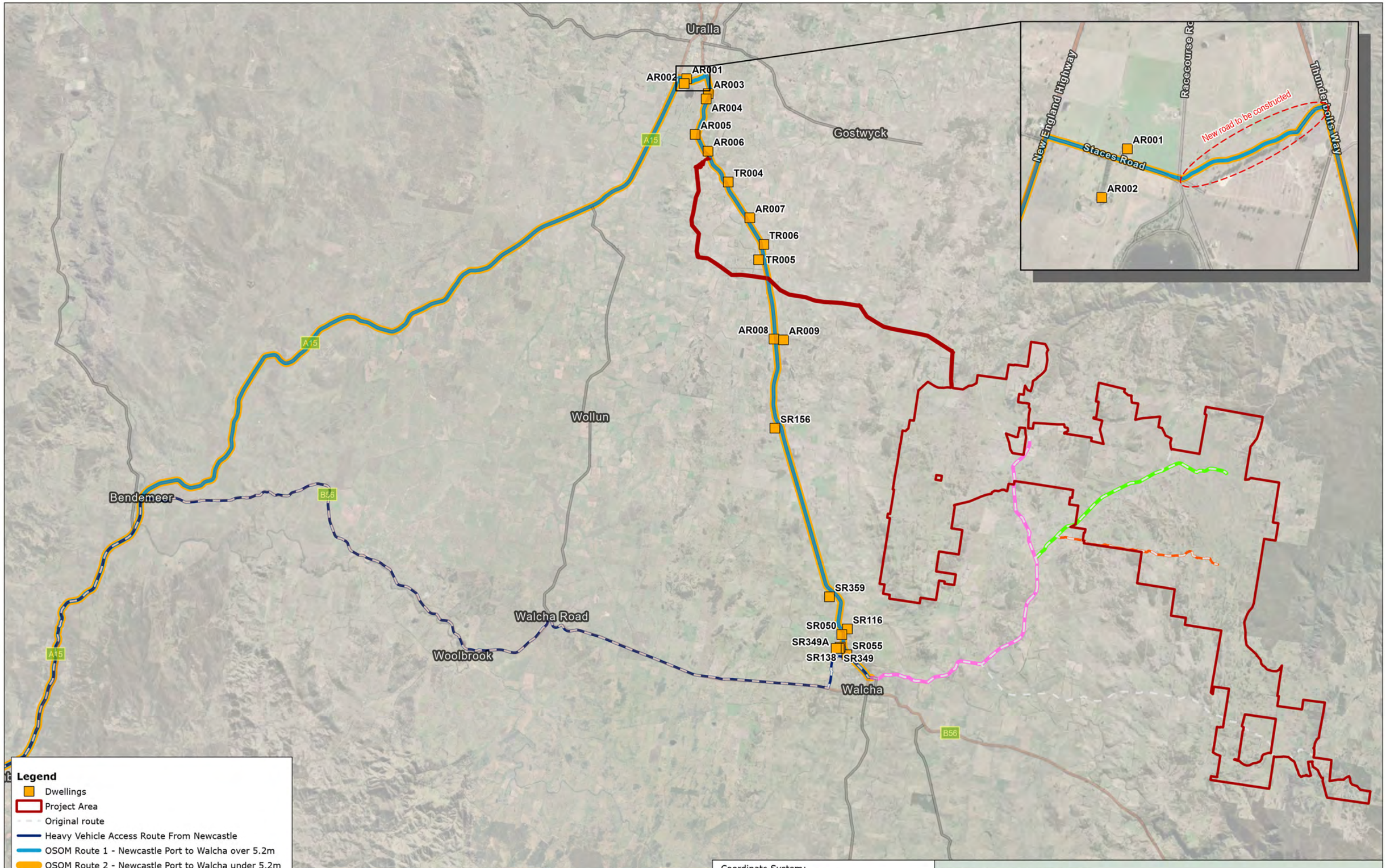
6-1a Transport Route

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

0526676_WWF_AGEN_R4.aprx/6-1a Transport Route



6-1b Transport Route

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

6.6.2.5 SITE ACCESS

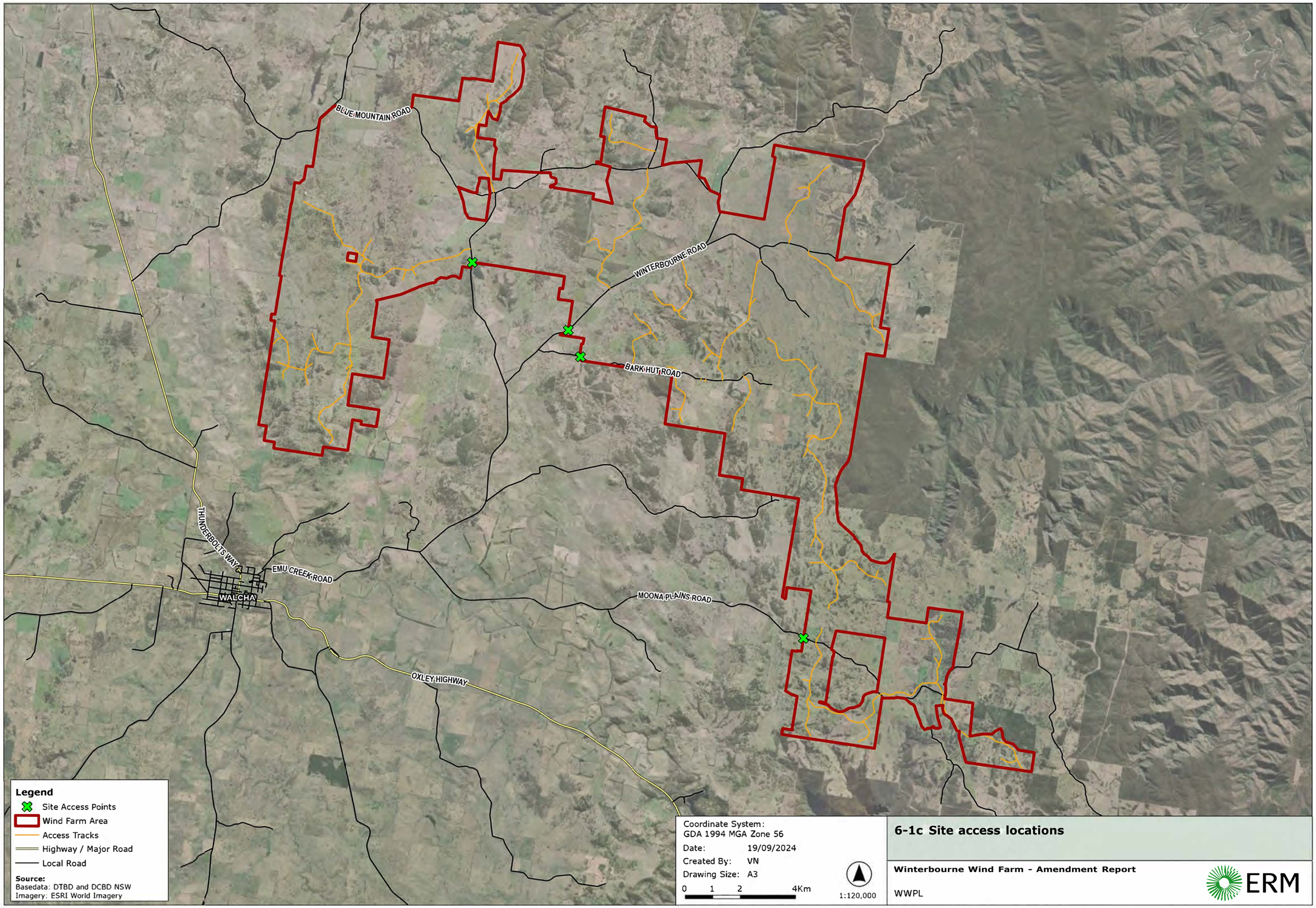
The Amended Project has 31 site access locations where the Project area connects with the local road network (**Figure 6-3**). This is an increase of ten locations compared to those identified in the EIS.

An assessment of the Safe Intersection Sight Distance (SISD) as specified within the 'Austroads Guide to Road Design – Part 4A: Unsignalised Intersections' (Austroads, 2021) has been carried out by icubed consulting at the proposed access locations. Several access locations do not currently provide sufficient sight distances to meet the recommended provisions outlined within the guide.

Site access locations that do not comply with the SISD include:

- North-eastern approach on Winterbourne Road (sealed) at location #4;
- Western approach on Bark Hut Road (unsealed) at locations #8, #10, and #11;
- North-eastern approach on Rowleys Creek Road (unsealed) at location #16;
- South-eastern approach on Moona Plains Road (sealed) at locations #19 and #20; and
- Eastern approach on Bark Hut Road (unsealed) at location #27.

The approach to site access locations that do not comply with the SISD would require either physical works such as benching or regrading of the road, or adoption of traffic mitigation measures to reduce operating speeds along the road. Appropriate solutions will be developed in consultation with Walcha Council to ensure vehicles are able to enter the road network safely.



6-1c Site access locations

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

0526676_WWF_AGEN_R3.aprx/6-1 Site access locations

6.6.3 UPDATED MITIGATION AND MANAGEMENT

In addition to the mitigation measures including in the EIS, the following updated mitigation and management measures are recommended:

- Expand the Traffic Management Plan to include maps of primary haulage routes highlighting critical locations, induction processes for drivers, and a complaints resolution process;
- Implement a carpooling program to support sharing of vehicle trips for the workforce travelling to and from the site; and
- Implement a driver code of conduct to manage vehicle access to and from the site, ensure only designated routes are used and vehicles abide by delivery schedules, and avoid heavy vehicle movements during peak school bus times.

6.7 AVIATION

6.7.1 BACKGROUND

The Aviation Impact Assessment (AIA) prepared for the EIS (Aviation Projects, 2022) has been updated to assess potential impacts relating to aviation associated with the amended Project (referred to hereafter as the Amended AIA; **Appendix J**). The Amended AIA has also been revised, as necessary, in response to relevant matters raised in submissions received for the EIS.

The Amended AIA was prepared in accordance with:

- *Civil Aviation Safety Regulations 1998*;
- National Airports Safeguarding Framework (NASF) Guideline D "Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation"; and
- ISO 31000:2018 Risk Management –Guidelines.

The Amended AIA includes an Aviation Impact Statement (AIS). Refer **Appendix J** for the complete methodology.

6.7.2 IMPACT ASSESSMENT

The proposed amendments will not impact the nearest certified airports - Tamworth Regional Airport (YSTW) and Armidale Airport (YARM) - the latter of which is within 30 nautical miles (nm) of the Project. WTG B007A is the highest WTG located within the horizontal extent of the minimum safe altitude (MSA) of 25 nm of Armidale Airport but is outside the 10 nm MSA and its circling areas. WTG B007A is also below the minimum obstacle clearance (MOC) of Armidale Airport. The Project is outside the horizontal extent of obstacle limitation surfaces (OLS) of Armidale Airport and will not impact instrument procedures.

In summary, the Project will not impact any certified airports.

No additional aircraft landing areas (ALAs) were identified relevant to the proposed amendments. As per the original AIA, Argyll ALA which is owned by a non-associated landowner, may be subject to condition-dependent wake turbulence. The nearest WTG to this ALAs (B127A) will not impact its circuit area.

As per the original AIA, the highest WTG AMSL (WTG B007A) is below the obstacle height limit of the applicable grid lowest safe altitude (LSALT). However, WTG B007A may impact air route W128 as it is within its MOC by 32.9 m (108 feet). This was an 11.6 m (38 feet) decrease from that assessed in the original AIA for which Airservices Australia assessed as having no impacts to existing air routes (refer Section 5, Appendix K of the EIS). Similarly, Airservices Australia assessed the amended Project as having no impacts.

The proposed amendments will not result in any impacts to aviation facilities including route surveillance radar and Doppler radar as per the original AIA.

The conclusions of the AIS for the Amended AIA (Section 6 of **Appendix J**) were the same as those for the original AIA. There were no material changes to the risk assessment within the Amended AIA (Section 9 of **Appendix J**) because of the proposed amendments. Aviation lighting was assessed to not be required for WTGs and met masts, and the same mitigation measures will apply.

6.7.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended in the Amended AIA. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

6.8 TELECOMMUNICATIONS AND EMI

6.8.1 BACKGROUND

The electromagnetic interference (EMI) assessment (DNV, 2022) prepared for the EIS has been updated to assess impacts to telecommunications links associated with the Amended Project (**Appendix K**).

Amendments relevant to the EMI are:

- Relocation of WTGs B138, B139, B152, B153, B154; and
- Updated radiocommunications environment.

The EMI has been updated based on a copy of the Australian Communications and Media Authority (ACMA) Register of Radiocommunication Licences (RRL) database dated 22 January 2024 and a copy of the ACMA Broadcast Transmitter Database dated 11 July 2023. The updated EMI considers any changes in nearby radiocommunication licences or services (such as the existence or discovery of new services).

6.8.2 IMPACT ASSESSMENT

The Amended Project presents some instances where the aggregated radar cross section (RCS) of the WTGs has increased compared to the EIS layout, and other instances where the aggregated WTG RCS has decreased. However, no change is expected to digital radio signals impacting mobile phones and mobile broadband services for wireless internet, AM and FM signals for radio broadcasting, and television broadcasting.

For point-to-point links operated by the NSW Telco Authority and associated radiocommunication towers within 2 km of proposed WTG locations, potential impact has been reduced. The WTGs (B138, B139, B152, B153, B154) in proximity to point-to-point links and associated radiocommunication towers have been relocated, in consultation with NSW Telco Authority, to avoid impacts. NSW Telco Authority have confirmed that the revised location of turbines B138, B139, B152, B153 and B154 are acceptable.

The amended Project represents no change in impact for other point-to-point links and radiocommunication towers within 2 km of proposed WTG locations – e.g., emergency services, meteorological radar, trigonometrical stations, citizens band radio services, NBN fixed wireless internet services and satellite television and internet services.

Impacts to mobile phone services, wireless internet provided by mobile phone networks, and radio and television broadcasting services were, overall, assessed to be reduced due to the amended Project layout.

6.8.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

6.9 SOCIAL

6.9.1 BACKGROUND

The Social Impact Assessment (SIA) prepared for the EIS (ERM, 2022b) has been updated to assess potential impacts relating to social and community impacts associated with the amended Project (referred to hereafter as the Addendum SIA; **Appendix L**). The Addendum SIA has also been revised, as necessary, in response to relevant matters raised in submissions received for the EIS.

Amendments relevant to the Addendum SIA include:

- Revision of construction commencement from Q2 2024 to Q3 2026 (+24 months);
- Expected increase in construction duration by 22 months (total 52 months);
- Avoidance of Oxley Highway for inbound OSOM vehicle movements;
- Construction and use of new road south of Uralla for inbound OSOM vehicle movements;
- Construction and use of an onsite quarry to source materials and use of existing onsite groundwater bores to source water, thereby significantly reducing heavy vehicle movements on the local road network;
- Decrease in expected daily movement of heavy vehicles from 288 to 116 per day, and
- Increase in expected light vehicles from 270 to 456 per day.

The Addendum SIA was prepared in accordance with:

- 'Social Impact Assessment Guideline for State Significant Projects' (SIA Guideline) (DPIE, 2023a); and
- 'Technical Supplement: Social Impact Assessment Guideline for State Significant Projects' (SIA Technical Supplement) (DPIE, 2023b).

In accordance with the methodology outlined in the EIS SIA, potential social impacts were initially considered using the primary and secondary data collected and compiled for the social baseline, including community voices, and then assessed with the rigorous impact significance methodology as outlined in the Technical Supplement (DPE, 2023).

6.9.2 IMPACT ASSESSMENT

The Project's Social Locality remains consistent with that identified in Section 6.12.4 of the EIS, being the Project area, the area surrounding the Project area wherein noise, visual and other amenity impacts may occur, the transport routes where similar amenity impacts may be experienced, and the communities in larger population centres that may provide workers or goods and services to the Project.

No changes to the likelihood, magnitude or pre-mitigation impact significance ratings identified in Table 6.2 of the SIA have been identified based on the amended Project, and the residual impact ratings specified in Table 7.1 of the SIA remain.

6.9.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended in the Addendum SIA. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

6.10 ON-SITE QUARRY

The Amended Project includes a temporary, on-site quarry as development that is ancillary to the Project. The estimated demand of quarry materials (e.g., road base/capping; concrete aggregates; gabion/drainage rock/ TR sand) for the Project is 1 Mt for the construction period and most of this material could be supplied from the on-site quarry.

Approval for the extraction of up to 500,000 tonnes per annum of material from the quarry for the Project is being sought as development that is 'ancillary development' to Electricity Generation Works as part of an amendment to the Project subject to development application number SSD-10471. An Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act) would also be sought for the quarry's operation.

The quarry would be located within the Project area on Lot 95 DP1128816, which is immediately adjacent to the access track for turbines B177, B100A, B101A and B102. The quarry site has direct access to Bark Hut Road (**Figure 6-4**).

Justification for the on-site quarry to be considered as development that is ancillary to the Project includes that the proposed quarry:

- Is temporary in nature;
- Would occupy a very small portion of the Project area; and
- Will only be operated for the sole purpose of facilitating the construction of the Project.

Detailed site geological and geotechnical investigations indicate that the quarry resource is suitable to produce a range of products, including road-base, concrete aggregates, and drainage rock. These materials are required for construction of the local public road upgrades, internal access tracks, turbines foundations and hardstand areas and other civil works associated with the Project.

As material to be sourced from the quarry will be used for local public road upgrades, the construction of the quarry would need to be delivered prior to the commencement of construction of the other Project infrastructure.

There are five commercial quarries at distances between 250 – 395 km in return haul distance from the Project. These quarries would have the potential to supply all quarry materials required by the Project. There is one quarry to the west of Walcha (return haul distance of 76 km) that is capacity constrained and as such could only supply a small proportion of the Project's materials demand.

However, supply of materials to the Project from these quarries would require haulage through the regional locality, as well as Walcha township. Based on the estimated 1 Mt Project demand, this equates to about 62,500 truck movements through Walcha (assuming haulage by 32 t truck and dog combos). The supply of quarry materials from the on-site quarry provides substantial benefits to the local Walcha community, and the region, by containing the movement of quarry haul trucks within the road network local to the Project area.

The benefits of the on-site quarry include:

- Removal of trucks hauling quarry material from the regional road network, including Oxley Highway and Thunderbolts Way, and through the township of Walcha;
- Reduced construction traffic noise impacts for residents and road users, particularly residents along the regional public road network;
- Improved road safety by reducing heavy/light vehicle interactions along the regional public road network;
- Reduced damage to the road pavement of the regional public road network; and
- Response to community submissions - community concerns were raised regarding the movement of heavy vehicles (HV) along the road network and through Walcha; therefore, the on-site quarry minimises such HV movements.

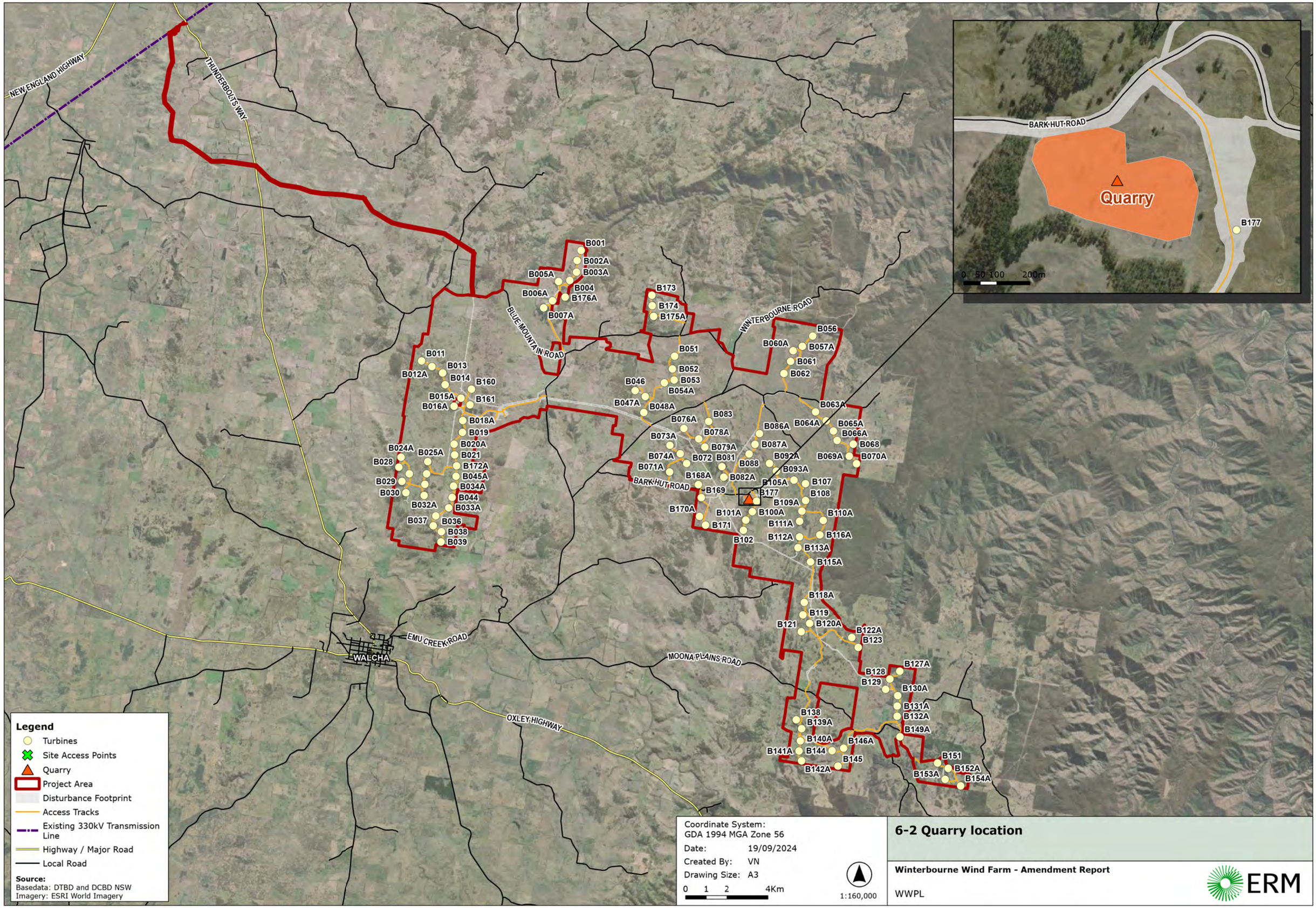
The proposed quarry includes areas for processing, stockpiling, and overburden /topsoil storage areas. Mobile equipment will be used to crush, and process extracted rock. Temporary administration and facilities (mobile self-contained units), and surface water management infrastructure will be located within the Project area.

Construction and operation would be undertaken during daytime hours, being Monday to Friday 7 am to 6 pm and Saturday 8 am to 6 pm, with minor non-audible works to be undertaken outside of these hours (e.g., maintenance activities).

Blasting will be required periodically to enable access to blasted rock in approximately 75,000 – 85,000 tonne quantities. Assuming a total materials demand of up to 500,000 tonnes per annum, this would equate to a blast frequency of approximately one every 6 – 8 weeks.

Upon completion of wind farm construction and public road rectification works, the temporary quarry will be decommissioned, and the land will be rehabilitated in consultation with the landowner to determine an appropriate, safe and stable landform(s) that can facilitate ongoing rural activities.

An environmental impact assessment was prepared by ARDG (hereafter referred to as Quarry Impact Assessment; **Appendix M**) and assessed the potential impacts associated with the construction and operation of an on-site quarry for the Project. A summary of these impacts is provided in the subsequent sections. The detailed technical assessments specific to the quarry development are provided in **Appendix M**.



6-2 Quarry location

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

0526676_WWF_AGEN_R3.aprx/6-2 Quarry location

6.10.1 AIR QUALITY AND GREENHOUSE GAS

6.10.1.1 BACKGROUND

An Air Quality and Greenhouse Gas Impact Assessment (**Appendix M**) was prepared to assess impacts to the atmospheric environment associated with an on-site quarry for the Project. The quarry was not included in the EIS Project design and therefore forms part of the Amended Project.

The assessment was prepared in accordance with the:

- 'Approved Methods for Modelling and Assessment of Air Pollutants in NSW' (NSW EPA, 2022); and
- 'National standards for air quality as per the National Environmental Protection Council of Australia' (NEPC) as part of the National Environment Protection Measures (NEPMs) (NEPC, 1998 and updates).

The greenhouse gas impact assessment was prepared in accordance with emission categories as per the 'Greenhouse Gas Protocol' (WRI, 2004) to aggregate emissions that contribute to global warming expressed as carbon dioxide equivalents (CO_2^{-e}). These categories are summarised as follows:

- Scope 1 – Direct emissions from sources that are owned or operated by the organisation (e.g., combustion of diesel in company owned vehicles or used in on-site generators);
- Scope 2 – Indirect emissions associated with the import of energy from another source (e.g., importation of electricity or heat); and
- Scope 3 – Other indirect emissions (other than Scope 2 energy imports) which are a direct result of the operations of the organisation but from sources not owned or operated by them (e.g., business travel, by air or rail, and product usage).

In May 2024, NSW Environment Protection Authority (EPA) issued the draft 'Climate Change Assessment Requirements' (NSW EPA, 2024a) and draft 'Guide for Large Emitters' (NSW EPA, 2024b) set out benchmarks for SSD projects to apply these EPA requirements for those likely to exceed 25,000 t CO_2^{-e} for Scope 1 and 2 emission categories.

6.10.1.2 EXISTING ATMOSPHERIC ENVIRONMENT

The atmospheric environment of the Project area is consistent with that identified in Section 6.10.2 of the EIS. The assessment undertaken to assess the construction and operation of the Quarry included additional data from 2023. The 2023 data was more reliable for air quality modelling as the bushfire event of 2019/20 influenced the previous data set. The Armidale weather station has complete data suitable for modelling. Particulate matter (PM_{10}, $PM_{2.5}$ and total suspended particulates (TSP)), deposited dust and nitrogen dioxide (NO_2) were compared against EPA criteria as summarised in **Table 6-6**. Estimates of background air quality levels were calculated using reasonable percentiles/statistics as described in Section 4.4 of **Appendix M**.

TABLE 6-6 AIR QUALITY STATISTICS FOR ARMIDALE

Statistic			2019	2020	2021	2022	2023	Assumed Background Level	EPA Criterion
Particulate matter	PM_{10}	Maximum 24-hour average (µg/m^3)	310	113	41	51	36	15	50
		Number of days above 50 µg/m^3 (days)	41	4	0	1	0	-	-
		Annual average (µg/m^3)	28	14	10	10	12	10	25
	$PM_{2.5}$	Maximum 24-hour average (µg/m^3)	267	54	35	45	32	10	25
		Number of days above 50 µg/m^3 (days)	60	27	3	11	7	-	-
		Annual average (µg/m^3)	17.2	9.2	7.2	7.1	8.6	5.9	8
	TSP[2]	Annual average (µg/m^3)	70	34	25	24	30	24	62.5
Deposited dust		Annual average (g/m^2/month)	3.1	1.5	1.2	1.1	1.3	1.1	4[3]
NO_2		Maximum 1-hour average (µg/m^3)	74	57	105	53	53	53	164
		Annual average (µg/m^3)	9.6	7.1	6.0	4.5	5.4	5.4	31

[2] Not monitored in the vicinity of the Project and therefore calculated to be the result of dividing 40% from annual average PM_{10} values as recommended by the NSW Minerals Council (2000).
[3] Estimated EPA criterion of 90 µg/m^3 equivalent to 4 g/m^2/month for the purposes of modelling.

The existing atmospheric environment was shown to be largely compliant with EPA criteria when the 2019/20 data that coincided with bushfires is excluded. Maximum 24-hour averages and annual averages of particulate matter showed some exceedances of EPA criteria; however, is noted that Armidale weather station is approximately 50 km from the Project area and anthropogenic sources of particulate matter in the Armidale region would not accurately represent the existing atmospheric environment surrounding the quarry.

Wind roses representing conditions from Armidale weather station between 2019 and 2023 were assessed and are shown in **Table 6-7**. **Appendix M** provides the detailed modelling results.

TABLE 6-7 WIND SPEED STATISTICS FOR ARMIDALE

Statistic	2019	2020	2021	2022	2023
Percentage complete (%)	100	100	100	100	99
Mean wind speed (m/s)	2.2	2.0	2.0	2.2	1.9
99th percentile wind speed (m/s)	7.5	6.4	6.5	6.8	6.0
Percentage of calms (≤0.5 m/s) (%)	12	13	13	10	12

Prevailing winds at the quarry site were modelled to be stronger than those at Armidale and from the east and west, with a relatively low proportion of calm conditions. This can be attributed to the higher elevation and more undulating terrain at the quarry site compared to Armidale. This model was used to inform the particle dispersion modelling for the quarry site and forms the basis of the predicted impacts of the quarry operation and decommissioning.

6.10.1.3 IMPACT ASSESSMENT

Operational dust, post-blast fume and diesel exhaust were modelled using industry-standard equipment inventory appropriated to the expected plant and vehicle fleet proposed to operate the quarry. Section 5 of **Appendix M** details these benchmarks and assumptions.

Operational Dust

Concentrations of PM_{10}, $PM_{2.5}$ and TSP were modelled to predict dust emissions from the quarry operation at nearby sensitive receptors.

For PM_{10}, the quarry would not cause exceedances of the EPA assessment criterion for 24-hour average of 50 µg/m^3 at any nearby receptor. Modelling assessing compliance with the EPA's assessment criterion for annual average PM_{10} (25 µg/m^3) also demonstrated compliance at all nearby receptors. This included accounting for the estimated background level of 10 µg/m^3. This demonstrates that the quarry would not cause adverse impacts with respect to PM_{10}.

For $PM_{2.5}$, the quarry would not cause exceedances of the EPA assessment criterion for 24-hour average of 25 µg/m^3 at any nearby receptor. Modelling included consideration of the estimated background level of 10 µg/m^3. Modelling predicted that the EPA's assessment criterion for annual average $PM_{2.5}$ (8 µg/m^3) was not exceeded at any nearby receptors. This demonstrates that the quarry would not cause adverse impacts with respect to $PM_{2.5}$.

For TSP, the quarry would not cause exceedances of the EPA assessment criteria of 24-hour average TSP criteria at any nearby receptor. Average TSP was compliant with relevant EPA criteria at all nearby receptors. This demonstrates that the quarry would not cause adverse impacts with respect to TSP.

Post-blast Fume

Modelling for emissions from blasting activities assumed a single source from the quarry's centre to occur every hour between 9 am and 5 pm every day as a worst-scenario. However, the Project will carry out 6 to 12 blasts per year, mostly likely timed between 12 pm and 3 pm.

Nitrous oxides (NO_x) monitoring data was supplemented by data collected from Gunnedah weather station to compare the percentage of NO_2 in NO_x against the total NO_x concentration for the purpose of calculating worst-case NO_2/NO_x conditions. The percentage of NO_2 in NO_x was generally shown to decrease to 20% or less as the total NO_x concentration increases; therefore, the modelling assumed a conservative 20% NO_2 to NO_x relationship.

Modelling showed that the quarry would not cause exceedances of the EPA assessment criterion of the maximum 1-hour average NO_2 of 164 $\mu g/m^3$ at any sensitive receptor, including consideration to the estimated background level of 53 $\mu g/m^3$ (refer **Table 6-6**).

Diesel Exhaust

The emissions from diesel exhaust specifically modelled NO_x (specifically NO_2) from standard diesel engine exhaust values as per Section 5.3 of **Appendix M**. Modelling demonstrated that the quarry would not cause exceedances of the EPA assessment criterion of the maximum 1-hour average NO_2 of 164 $\mu g/m^3$ at any nearby receptor, including consideration of the estimated background level of 53 $\mu g/m^3$ (refer **Table 6-6**). This assumed 20% of the NO_x is NO_2 at the locations of maximum ground-level concentrations.

For average annual NO_2 concentrations, modelling showed that the quarry would not exceed the EPA assessment criterion of 31 $\mu g/m^3$, including consideration to the estimated background level of 5.4 $\mu g/m^3$ (refer **Table 6-6**). This assumed that 100% of the NO_x is NO_2 at the locations of maximum ground-level concentrations.

Greenhouse Gas

It should be noted that there are no specific criteria for which to assess the significance of projected greenhouse gas emissions from individual projects. The convention is to compare estimated emissions with state and national figures for consideration in achieving their respective emissions targets. **Table 6-8** shows the estimated GHG emissions identified in association with the Project as per the scopes in the 'Greenhouse Gas Protocol' (WRI, 2004). **Table 6-9** compares the Scope 1 emissions with state and national targets.

TABLE 6-8 ESTIMATED GHG EMISSIONS

Activity	Usage (kL/y)	Emission factor (kg CO_2-e/kL)			Emission (t CO_2-e/y)			
		Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	Total
Fuel (diesel) usage (on-site)	765	2,709.72	0	667.78	2,073	0	511	2,584
Fuel (diesel) usage (transporting product)[4]	42	2,717.40	0	667.78	113	0	28	141
Total	809	-	-		2,186	0	539	2,725

TABLE 6-9 PROJECT GHG EMISSION COMPARISON WITH STATE AND FEDERAL

Project emissions (Scope 1) (Mt CO_2-e)	Emissions (Mt CO_2-e) (with Project proportion as a percentage)	
	NSW	Australia
0.0022	111.00 (0.0020%)	432.62 (0.0005%)

The predicted Scope 1 and 2 emissions are well below the 25,000 t CO_2-e threshold for a large emitter under the draft 'Guide for Large Emitters' (NSW EPA, 2024b); therefore, the requirement under this guide for a 'GHG Mitigation Plan' and 'Climate Change Mitigation and Adaptation Plan' do not apply to the Project.

Operation of the quarry will provide a more efficient option for supplying materials to the Project, compared to sourcing materials from more distant, existing quarries as assessed in the EIS. Prior to the proposed quarry, materials from existing quarries would need to be transported 150 km or more. From these distances, the transport of a notional 1 megatonne (Mt) of construction materials from the Project is estimated to avoid GHG emissions in the order of 10,747 t CO_2-e.

6.10.1.4 UPDATED MITIGATION AND MANAGEMENT

Due to the low predicted levels of all assessed emissions at the nearest sensitive receptors, particulate and depositional dust monitoring is not considered to be warranted. The implementation of reactive controls such as additional watering or sprays in the event of visible dust emissions from activities which can be controlled (e.g., haulage emissions and crushing / processing operations) is considered sufficient to manage potential impacts.

Therefore, mitigation measures proposed in the EIS to address impacts to air quality can be similarly applied to those recommended in **Appendix M**.

[4] Estimated based on 10 km return distance to the Project, fuel consumption of 40 L/100 km, and average of 29 return trips per day (every day of the year).

6.10.2 BLASTING

6.10.2.1 BACKGROUND

A Blasting Impact Assessment (BIA) has been prepared by Enviro Strata Consulting to assess impacts from blasting and drilling activities from an on-site quarry for the Project. Refer to **Appendix M** for the complete assessment.

The BIA was prepared in accordance with the following:

- 'Technical Basis For Guidelines To Minimise Annoyance Due To Blasting Overpressure And Ground Vibration' (ANZECC, 1990) for blast emission criteria; and
- 'Australian Standard (AS) 2187.2-2006 – Explosives – Storage and Use – Part 2: Use of Explosives' for vibration criteria for infrastructure, supplemented by the 'Effect of Blasting on Infrastructure' (Richards & Moore, 2008).

The BIA considered an area encompassed by a 4 km buffer of the quarry to include all sensitive receptors and existing infrastructure that have the potential to be impacted by ground vibrations, airblast overpressure and flyrock because of blasting and drilling activities.

6.10.2.2 IMPACT ASSESSMENT

Assumptions applied to the modelling included that blasting would be undertaken Monday to Friday, between 9 am and 5 pm, and drilling would be undertaken Monday to Saturday, between 7 am and 6 pm. This represents the worst-case scenario. Notably, the Project will carry out between 6 to 12 blasts per year, mostly likely timed between 12 pm and 3 pm.

Six (6) nearby receptors were identified to be within 4 km of the on-site quarry. The nearest receptor is SR119 at approximately 900 m. It is understood that this receptor is an unoccupied residence of an associated landowner. Bark Hut Road is the nearest public infrastructure item to the quarry and is approximately 180 m away. The nearest Project infrastructure consists of WTGs, laydown area, underground cabling that range between 100 to 185 m from the quarry.

Table 6-10 details the criteria for sensitive receptors and infrastructure set by ANZECC (1990) and AS 2187.2-2006 supplemented by Richards & Moore (2008), with ground vibration quantified by millimetres per second (mm/s) and airblast overpressure quantified by linear decibels (dBL). It is understood that unoccupied infrastructure facilities are not assessed in terms of airblast overpressure exposure as the levels required to inflict damage are not applicable and/or not reached; therefore, this was not applied in the assessment.

TABLE 6-10 SUMMARY OF BLAST EMISSION CRITERIA

Item	Vibration Criteria (mm/s)	Airblast Criteria (dBL)
Private residences [1]		
Limit applicable to 95% of blasts over a 12-month period	5	115
Limit not to be exceeded	10	120
Unoccupied infrastructure		
Public roads [2] and bridges Buried electrical cables WTGs [3] Groundwater bore / pipelines	100	N/A

Item	Vibration Criteria (mm/s)	Airblast Criteria (dBL)
Low voltage timber power poles		
High voltage transmission towers (330 kV)	100 / 50 (4)	N/A

1. applies to buildings and sheds only (after ANZECC (1990))
2. applies to sealed roads
3. to be verified against WTG manufacturer's guidelines for specific vibration tolerance limits
4. 100 mm/s applies to suspension towers, 50 mm/s applies to tension towers.

Based on the on-site quarry design, up to 15 m benches will be targeted which corresponds to a maximum instantaneous charge (MIC) mass for blasting approximately 100 kilograms (kg) per hole (3 total holes proposed i.e. 300 kg simultaneously). These comprised the two modelled blasting scenarios at MIC 100 kg and MIC 300 kg.

Predictive models for ground vibration and airblast overpressure were developed from a comparable open-cut mining operation that used similar blasting parameters to those of the on-site quarry. The below impact assessment is therefore based on this best-fit assumption. A blast monitoring program will be implemented by measuring PPV and airblast overpressure to develop site-specific protocols upon quarry operation.

Ground Vibration and Airblast Overpressure

For nearby receptors, the maximum ground vibration exposure, as estimated using two modelled scenarios, was found to be in the range of 0.1 to 2.6 mm/s for sensitive receptors. These estimates are below the applicable limits specified as 5 mm/s (for 95% of blasts) and 10 mm/s (not to be exceeded). The maximum airblast overpressure exposure, as estimated using two modelled scenarios, was found to be in the range of 95 to 115 dBL for occupied sensitive receptors and 117 dBL for the unoccupied associated residence (SR119). These estimates are within the applicable limits specified as 115 dBL (for 95% of blasts) and 120 dBL (not to be exceeded).

For infrastructure (public and Project), maximum ground vibration exposures for the two modelled scenarios are summarised in **Table 6-11** below.

TABLE 6-11 GROUND VIBRATION MODELLING RESULTS FOR INFRASTRUCTURE

Item	Vibration Criteria (mm/s)	Maximum Ground Vibration Scenario (mm/s) at MIC 100 kg	Maximum Ground Vibration Scenario (mm/s) at MIC 300 kg
Public infrastructure			
Bark Hut Road (unsealed) (1)	100	14	34
Timber power poles	100	3	7
Proposed 330 kV transmission line / tension towers	100 / 50	<1	1
Project infrastructure			
WTGs	100	13	32
Underground cabling	100	19	45

Item	Vibration Criteria (mm/s)	Maximum Ground Vibration Scenario (mm/s) at MIC 100 kg	Maximum Ground Vibration Scenario (mm/s) at MIC 300 kg
Laydown area	100	31	74
Groundwater bore	100	36	87

1. Vibration criteria does not apply to unsealed roads but is included for information only.

Flyrock

The nearest sensitive receptor (SR119) is approximately 900 m from the quarry and is understood to be an unoccupied residence of an associated landowner. Due to this distance, the risk of flyrock impacts is negligible to low.

The nearest public infrastructure item is Bark Hut Road approximately 180 m from the quarry and will require implementation of a Road Closure Management Procedure to manage flyrock risks and ensure public safety.

The nearest Project infrastructure ranges between 100 to 185 m from the quarry and will require implementation of procedures to be outlined in a Blast Management Plan to coordinate activities with the appointed balance of plant (BOP) contractor to manage flyrock risks and ensure safety.

It is expected that flyrock risk will decrease as quarry benching and pit depths are updated to be deeper and away from the outermost quarry boundary. Blast methodology will be updated as quarry operation progresses; examples include recommendation to heave material in a westerly direction to be away from Project infrastructure east of the quarry.

Based on the on-site quarry location and implementation of mitigation measures, impacts from flyrock are considered to be negligible.

6.10.2.3 UPDATED MITIGATION AND MANAGEMENT

The proposed blast management measures recommended for the on-site quarry are as follows:

- A site-specific Blast Management Plan will be prepared by the Proponent and drill and blast contractor that will address all occupational health and safety (OH&S) requirements, including procedures for neighbour notification of blasting;
- Utilising an appropriate charge mass design to avoid overcharging holes;
- Employing a suitable initiation sequence to minimise the risk of blast-hole interactions, aiming for single-hole initiation;
- Maintaining the use of quality stemming material and controlling stemming height to ensure proper confinement of explosive charges, thereby minimising high airblast overpressure emissions;
- Ensuring the appropriate quality of stemming material and stemming height to facilitate the confinement of explosives, thereby minimising the risk of stemming ejection and/or flyrock incidents;

- The proposed monitoring system for private residences should consist of two (2) monitoring stations to capture ground vibration and airblast overpressure impacts from blasting at the quarry site. The stations should be positioned near residences SR199 and SR259 to provide coverage for the north and east areas respectively;
- Due to the proximity to a public road (Bark Hut Road), a Road Closure Management Procedure for the duration of the blast will be required. To ensure the safety of the public, the quarry will develop and implement this procedure as part of the Blast Management Plan and seek approval from Walcha Council as required;
- The quarry will implement and maintain a suitable protocol, considering weather impacts and including the positioning of blasting sentries, to manage blasting operations and to minimise the impacts on the surrounding area; and
- Establish a landowner notification system for each blast, for adjoining landowners. Determine notification preferences (e.g., phone/text/email) with each landowner. This should encompass scheduled blast dates and times, along with any updates or changes.

6.10.3 NOISE

6.10.3.1 BACKGROUND

A NIA (Sonus, 2024) has been prepared to assess noise impacts from operations associated with an on-site quarry for the Project, including its decommissioning (the Quarry NIA; **Appendix M**). The quarry was not previously assessed in the EIS and forms part of the Amended Project.

The Quarry NIA was prepared in accordance with the ICNG, NPI and RNP as introduced in **Section 6.4.1**. The same NMLs set out by the ICNG and the previous NIA for the EIS applied to this Quarry NIA.

6.10.3.2 IMPACT ASSESSMENT

Quarry Operation

The NIA considered the concept layout of the quarry (**Figure 6-4**) and the location and noise generation from plant/equipment in concurrent operation as detailed in **Appendix M**.

Utilisation percentages and assumed sound power levels (SWLs) for each plant/equipment were considered when modelling for 'worst-case' and 'typical' usage cases within a 15-minute assessment period ($L_{Aeq\ (15min)}$). As per the ICNG, a noise penalty of 5 dB was added to account for activities considered to be "particularly annoying" to non-associated sensitive receptors.

Noise modelling showed that the highest noise level at the non-associated receptor (SR240) is predicted to be less than 20 dB(A) during both the worst-case and typical operation scenarios, including the application of a 5 dB penalty. The predicted noise levels easily achieve the (most onerous) Saturday 1pm – 6pm NML of 40 dB(A).

The highest predicted noise level at the nearest associated residences (SR119) was 44 dB(A) under typical operation and 46 dB(A) under worst-case operation. However, the predicted noise levels for associated receivers are provided for information only. As SR119 is an associated receiver and unoccupied residence, it is assumed that a higher noise level would be agreeable during the quarry operations.

Traffic Noise

There are two (2) associated receptors located along Bark Hut Road (SR058 and SR119) that may be adversely impacted by traffic noise associated with the on-site quarry. There are no non-associated receptors in the vicinity of Bark Hut Road (over 4.5 km to nearest non-associated receptor SR240). Nevertheless, the noise impact due to traffic noise on the associated receivers has been assessed at the residence closest to Bark Hut Road (SR058), for information only.

Traffic volumes along Bark Hut Road between Winterbourne Road and the quarry applied quantities from the Amended TIA (**Appendix I**). Based on the maximum expected road traffic volumes during construction, the predicted road traffic noise levels at sensitive receptor SR058 are shown in **Table 6-12**. The predictions show that the applicable road traffic noise criteria can be met at the nearest sensitive receptor on Bark Hut Road, with or without the quarry.

TABLE 6-12 ROAD TRAFFIC NOISE PREDICTIONS AT SR058

Time	Criteria	Scenario Predictions	
		With Quarry	Without Quarry
Day (peak hour)	$L_{Aeq\ (1\ hr)}$ ≤55 dB(A) externally	47 dB(A)	32 dB(A)

Decommissioning

At the completion of Project construction, quarry operations will cease, and the site will be rehabilitated in consultation with the landowner to determine an appropriate, safe and stable landform(s) that can facilitate ongoing rural activities. The quarry will be stabilised and returned to pre-disturbance existing condition in consultation with the landowner (e.g., re-seeded with appropriate pasture grass).

Decommissioning noise is not considered to be louder than the noise associated with operation and will therefore achieve the NMLs.

Maintenance Activities

It is noted that minor works (e.g., maintenance activities) may be undertaken outside of standard operating hours. These types of operations would typically include only light vehicles, hand tools and a portable generator. The noise levels from such activities would be significantly lower than the predicted noise levels for the worst-case and typical scenarios, which already achieve the NML of 35 dB(A) at SR240.

6.10.3.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures were recommended in the Quarry NIA (**Appendix M**). Mitigation measures proposed in the EIS are sufficient to address noise impacts related to the quarry.

6.10.4 SURFACE WATER

A detailed Surface Water Impact Assessment (SWIA) for an on-site quarry for the Project was prepared (Engeny 2024) (**Appendix M**). The SWIA was prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the Project and included the preparation of a site water balance and consideration of potential licensing and Water Sharing Plan requirements, flooding impacts, water quality and quantity impacts, and impacts on water-related infrastructure. The SWIA also included a detailed description of the proposed water management system, water monitoring program and other measures to mitigate surface water impacts. This section of the report provides a summary of the main findings of the SWIA.

6.10.4.1 EXISTING ENVIRONMENT

The Project area does not intersect any ephemeral or perennial watercourses. The site drains via overland/sheet flow when soils are saturated to an ephemeral channel located on the northern side of Bark Hut Road. This channel drains via a series of farms dams to Dog Trap Creek, approximately three km to the west of the quarry site. In turn Dog Trap Creek drains to Emu Creek, a tributary of the Apsley River.

An existing culvert is located immediately downstream of the proposed sediment basin that directs flows under Bark Hut Road towards the unnamed ephemeral creek to the north of the site. Net flow through the culvert is expected to reduce as a result of the runoff being contained by the Quarry WMS catchment. There are several farm dams within the vicinity of the Project Area. There is only one farm dam located downstream of the Quarry catchment, approximately 1.3 km west of the Project area. Any spills from this farm dam drain via a narrow incised ephemeral channel to Dog Trap Creek.

6.10.4.2 WATER QUALITY

Water quality monitoring was undertaken at one surface water (SW01) and two groundwater monitoring locations (GW01 and GW02) in the vicinity of the Project on 26 June 2024 (refer Figure 11 of **Appendix M**). Water quality monitoring results are summarised as follows:

- At SW01, values for pH, electrical conductivity (EC) and total dissolved solids (TDS) were within the (Water Quality Objective) WQO range. The NOx (and Nitrate) result at SW01 (0.99 mg/L) exceeded WQO of 0.25 mg/L for aquatic ecosystems but was less than the Nitrate WQO of 400 mg/L for livestock drinking water. Results for nitrite and total oil and grease were below the limit of detection; and
- Groundwater quality at GW01 and GW02 indicates close to neutral pH groundwater with low electrical conductivity and TDS concentrations. All results for nitrate, nitrate, NOx and total oil and grease were below the limit of detection at GW01 and GW02.

6.10.4.3 PROPOSED WATER MANAGEMENT SYSTEM

Detailed description of the Project water management system (WMS) is provided in the SWIA. In summary, the WMS will be comprised of one sediment dam and a series of drains and bunds to contain sediment water on the site and divert runoff from upstream clean water catchment areas, and a groundwater bore. Erosion and sediment controls will be designed and implemented generally in accordance with requirements outlined in 'Managing Urban Stormwater: Soils and Construction Volume 1' (Landcom, 2004) and 'Volume 2E – Mines and quarries' (DECC, 2008) (the 'Blue Book'). An assessment undertaken in accordance with the 'Blue Book' determined that based on the soil types on site a type-D sediment basin would be required. Based on these calculations the required design Sediment Basin volume is 4.6 ML. This volume is inclusive of the calculated settling zone of operational volume (2,936 m^3) and the sediment storage capacity (1,622 m^3).

Pumps will be used to dewater the Pit via a pipeline to the Sediment Basin when the basin has available storage capacity above the required settling zone capacity. The Sediment Basin will dewater to the Pit sump as required to ensure that the required settling zone capacity is available to contain runoff from the design storm event. Controlled releases are not expected to be required. Water captured on site will be used to meet operational demands and will be stored in Pit as needed to maintain Sediment Basin freeboard requirements. Should controlled releases be required due to excessive accumulation of the sediment water impeding operations, ARDG will apply for a licensed discharge point to be added to the site EPL with appropriate discharge criteria.

6.10.4.4 WATER BALANCE

A water balance model (WBM) representative of the proposed WMS was developed using the GoldSim software platform. The model simulates inflows from rainfall and runoff (including direct rainfall on water surfaces), outflows for dust suppression and process demands, and evaporative losses to assess future inventories and the frequency and volume of uncontrolled releases from the site.

Water sources included in the model were WMS catchment runoff and direct rainfall on water storages, groundwater inflows to the pits and a groundwater bore as a supplementary supply.

Modelled quarry water demands and losses include dust suppression on exposed areas and stockpiles, material processing, evaporation from water storage surfaces and evaporation of groundwater inflow seepage.

Water balance modelling results indicate that the quarry is likely to have:

- A water deficit (average 2.4 ML/yr; maximum 11.6 ML during dry years) and a requirement for imports to meet operational demands; and
- Limited requirements for discharge. Model results indicate that there is an approximately 85% chance that an overflow from the Sediment Basin will occur during the modelled life of quarry (four years). The average number of modelled overflow events per year is 1.4. This is consistent with the target of 1 – 2 overflow events per year indicated in Volume 2E of the 'Blue Book' as being typical of sediment basins sized to contain runoff from a 5 day 95th percentile rainfall event.

6.10.4.5 IMPACT ASSESSMENT

Water Quality

Given all surface water runoff will be captured by the WMS which will prevent the potential for contamination of a water source, impacts to downstream water quality will be negligible.

Flow Regimes and Stream Stability

The total catchment area for the Project is approximately 10.7 ha equating to a small portion (<0.001%) of the Macleay River Catchment. Reductions in downstream flow as a result of the diversion of the Project catchment are therefore considered to be negligible.

The expected reduction in catchment reporting to the downstream farm dam is 6.8% which would result in a slight reduction in flow reporting to the dam.

Given the net catchment reporting to the downstream environment will be reduced as a result of the Project and there are no proposed controlled discharges, impacts to stream stability are considered unlikely.

6.10.4.6 LICENCING, MONITORING AND REPORTING

Licensing

The quarry will be required to hold an EPL as it will be carrying out a premises-based activity listed in Schedule 1 of the POEO Act, (i.e., Activity 19 Extractive activities, >30,000 tonnes/year). At this stage, the inclusion of a licensed discharge point on the EPL to permit controlled discharges from the WMS is not considered to be required.

All surface water runoff captured by the WMS will be to prevent the contamination of a water source. As such, all Project water storages are considered as excluded works under Schedule 1 of the *Water Management (General) Regulation 2018* and therefore, exempt from requiring a Water Access Licence (WAL) under Schedule 4 Clause 12 of the *Water Management (General) Regulation 2018*.

The applicant will obtain a WAL and sufficient entitlement to cover the maximum groundwater take associated with groundwater bores constructed to supply operational demands. Recent trades (between 2021 and 2024), water made available and water usage statistics for recent water years (2023/2024, 2022/2023) indicate there is sufficient market depth for sufficient WAL entitlements to be obtained. Groundwater inflows are expected to continue for a period post closure until water levels within the Pit have recovered above the pre-quarry groundwater levels. A WAL will therefore still be required in the post closure phase of the quarry project.

Monitoring

- A surface water quality and quantity monitoring program for the quarry is proposed, with monitoring to be undertaken as detailed in the SWIA. Water quality monitoring will assess a range of parameters with impact assessment criteria for receiving water quality downstream of the quarry will be developed in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).

Reporting

Subject to conditions of the EPL for the Project, the EPL holder (i.e., the Applicant) may be required to complete and submit an Annual Return to the NSW EPA that it is anticipated to include a summary of an uncontrolled water discharges, monitoring, any complaints and a statement of compliance with EPL conditions. If an incident occurs that threatens or causes environmental harm such as the contamination of water that does not meet EPL criteria, the proponent will notify the EPA immediately after becoming aware of the incident. The proponent will also provide a written report to the EPA within seven days of the date of becoming aware of the incident.

Subject to conditions of the development consent for the Project, the proponent will submit an Annual Review to DPHI that will include a summary of the quarry WMS performance. It is anticipated that the Annual Review will include the annual site water balance results, water quality monitoring results and details of any incidents or complaints. If an environmental incident involving surface water occurs the relevant authorities will be notified in accordance with licensing and statutory requirements, and reports provided as required.

6.10.4.7 MITIGATION MEASURES

Management measures outlined below would be documented in the Environmental Management Plan (EMP) and implemented to minimise the potential impacts to the surrounding environment:

- Erosion and sediment controls designed in accordance with the 'Blue Book';
- Erosion and sedimentation controls checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request; and
- Erosion and sediment control measures remaining in place until the works are completed, and areas are stabilised as part of rehabilitation activities.

General Soil and Water Mitigation Measures

The WMS for the site aims to protect the environmental values of receiving waterways by combining on-site retention of surface water runoff with regular monitoring and inspection of mitigation measures. Dirty water captured in the WMS will be reused for operational demands including dust suppression. No off-site discharge of 'dirty water' is proposed from the WMS. This will ensure that the risk of suspended solids and turbid waters entering these waterways from the quarry site is minimised, and that the natural sediment load is not increased above and beyond that which currently occurs during design rainfall events.

The WMS design and management measures would be documented in the EMP for the site and implemented to minimise the potential impacts to the surrounding environment. The primary objective of the WMS design is to ensure that suspended solids and turbid water are not discharged from the quarry site. This would be achieved by the following design elements and mitigation measures to be implemented including the following:

- Regular, scheduled inspection and pump out of the sediment basin will be undertaken to ensure that its design capacity is maintained to ensure maximum efficacy in the event of an exceedance of a design storm event. Water pumped out of the basin will be either re-used onsite for dust suppression or transferred to the extraction pit. No off-site discharge of surface water is proposed from the WMS. Any sediment removed from the settling zone of the basin will be incorporated back into the quarry product mix;
- To mitigate potential impacts in the unlikely event of exceedance of the design storm event that results in the basin capacity being exceeded, the basin will include a constructed, rubble lined spillway that will act to control the velocity of any spill and direct the flow through a sediment trap comprising geofabric / silt stop fencing;
- Installation of all erosion and sediment control measures as the first step in the process for site establishment and land disturbance;
- Clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas;
- Minimising all disturbed areas and stabilisation of disturbed areas as soon as practicable;
- Construction of clean water diversion mounds to direct clean water runoff from any undisturbed upslope area away from disturbed areas, where practical. The diversion structures will be designed to ensure effective segregation of runoff within the site and surface water flow from undisturbed areas outside the site;
- Dirty water diversion to direct runoff from disturbed areas into the sediment basin;
- Construction of catch drains and diversion drains/mounds to capture runoff from disturbed areas and direct runoff into the extraction area following completion of extraction operations. Any excess drainage will be directed to the sediment basin, which will be retained after completion of operations on the site;
- Construction of other temporary erosion and sediment control measures, where required, such as sediment fences within the catchment area while permanent soil and water management structures are being established;
- Construction of drainage controls such as table drains on hardstand areas and toe drains on stockpiles if required;
- An in-pit sump and/or sediment basin may be excavated to manage surface runoff from within the extraction area(s) if required;
- Regular maintenance of all controls and inspection of all works and after storm events to ensure erosion and sediment controls are performing adequately; and
- Immediate repair or redesign of erosion and sediment controls that are not performing adequately, as identified by field inspections.

All the mitigation structures described above will be subject to regular, scheduled inspection, detailed in the operational EMP for the site, to ensure they are maintained and working effectively. This would include inspection during and after rainfall events.

The following measures will be implemented in relation to quarry haul trucks leaving the site:

- All heavy vehicle loads will be covered prior to leaving the site (in accordance with TfNSW requirements);

- Draw bars and tail gates will be inspected for all heavy vehicles prior to leaving the site to ensure that any loose material is removed; and
- The measures described above will significantly reduce the risk of any loose material (if present) being trafficked onto Bark Hut Road and the local road network.

6.10.5 GROUNDWATER

A detailed Groundwater Impact Assessment (GIA) for an on-site quarry for the Project was prepared by GHD in accordance with the SEARs for the Project and with reference to the Groundwater Assessment Toolbox for Major Projects in NSW – Overview Document (DPE, 2022) and is provided in **Appendix M**. This section of the report provides a summary of the main findings of the GIA.

6.10.5.1 EXISTING ENVIRONMENT

The Project area is located within the New England Fold Belt Coast Groundwater Source which is managed by the Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources. The New England Fold Belt Coast Groundwater Source is a fractured aquifer system with groundwater contained within and moving through fractures in the rock that have occurred due to folding and faulting of the rock formations (DPI, 2016a). Yields within the groundwater source are generally low, around 1 L/s; however, yields up to 10 L/s may be obtained from highly fractured fault systems (DPI, 2016a). Groundwater is typically recharged by direct rainfall infiltration which, combined with mineral leaching, has resulted in good quality water over time (DPI, 2016a).

At the Project, groundwater observations during drilling, monitoring and pump testing indicate a confined fractured rock aquifer which is overlain by a clay/saprolite aquitard which allows for some vertical leakage. Groundwater monitoring, pump testing, and groundwater observations during drilling are further discussed in **Appendix M**.

The hydro-stratigraphy of the project area consists of:

- Clay/saprolite aquitard (and weathered profile), average thickness 16 m, overlying; and
- Confined fractured rock aquifer, up to 50 m thick, from 13 m to 17 m below ground level.

Groundwater levels at the project have been monitored since 23 January 2024 via a series of nine (9) monitoring bores (refer Figure 12 of **Appendix M**). Groundwater levels are monitored by dataloggers at one-hour intervals. Since monitoring began, groundwater levels have remained relatively stable. Diurnal fluctuations (up to 0.06 m) are observed in all monitoring bores, which are consistent with phases of the moon. Average groundwater levels in the fractured rock aquifer range from 1,186.3 m AHD at ARDG-BHPZ02 to 1,189.5 m AHD at ARDG-PGW02. The standing water level within the aquitard reflects soil saturation and infiltrating rainfall recharge. The water level within the aquitard does not represent a shallow groundwater system.

Groundwater Quality

Groundwater was sampled by ARDG at bores ARDG-PGW01 and ARDG-PGW02 on 26 June 2024 and analysed for major ions, nutrients, total metals, pH, EC and oil and grease. The groundwater in both bores is similar and of good quality. pH is circumneutral and ranges from 6.5 to 6.84. pH is within the guideline range for all WQOs. EC is relatively fresh at 523 – 566 µS/cm; however, it exceeds the guideline value of 350 µS/cm for aquatic ecosystem health. In summary, total concentrations of metals, cyanide, nitrate/nitrite and oil and grease were all below detection limits.

Groundwater Dependent Ecosystems

The background document for the WSP for the North Coast Fractured and Porous Rock Groundwater Sources 2016 (DPI, 2016a) refers to the High Priority Groundwater Dependent Ecosystem Map (DPI, 2016b) which was reviewed to identify any high priority Groundwater Dependence Ecosystems (GDEs) within the New England Fold Belt Coast Groundwater Source. The nearest high priority GDEs are located near the Macleay River to the east, approximately 70 km from the project site. The GDEs are classified as karst springs.

The Probable Vegetation Groundwater Dependent Ecosystems – Northern Rivers and Namoi datasets (DPE Water, 2022) was reviewed to identify highly probable GDEs in the vicinity of the project site. The dataset indicates there are areas of low to high probability GDEs within 10 km of the project. Only low probability GDEs were identified with the project disturbance boundary.

High probability GDEs are associated with:

- Dog Trap Creek (approximately 7 km to the south west);
- Snake Creek (approximately 4.5 km to the south west); and
- Oxley Wild Rivers Nature Reserve (approximately 6 km to the east).

Based on the groundwater bores which target the fractured rock aquifer, groundwater flow is controlled by topography.

Snake Creek and its tributaries to the east of the project have an elevation of approximately 1,240 m AHD to 1,260 m AHD and are therefore too high in elevation to be points of discharge for groundwater at the project. Dog Trap Creek and its tributaries to the west of the project have an elevation of approximately 1,160 m AHD to 1,180 m AHD and could potentially to be a point of discharge for the groundwater at the project. Dog Trap Creek and its tributaries however are dry for much of the year, with flow depending on rainfall. It is therefore unlikely that these water courses are reliant on groundwater baseflow. The project is therefore unlikely to have an impact on aquatic GDEs or baseflow.

Landholder Bores

A search of the Australian Groundwater Explorer (BOM, 2024) and Water NSW (2024) was undertaken to identify registered bores in the vicinity of the project. The search identified 11 bores within an approximate eight-kilometre radius. Nine bores were reported to be water supply bores (stock and domestic) and are likely to be basic landholder rights bores. The purpose of two bores was unknown.

The nearest basic landholder rights bore (GW307759) is located approximately 2.7 km from ARDG-PGW02. The most conservative predicted radius of drawdown of the development is 378 m. GW307759 is well outside the influence of the quarry pit's radius of drawdown and therefore no drawdown is expected to occur at any of the registered bores because of dewatering the quarry pit. The impact of the quarry pit therefore meets the NSW AIP Level 1 Minimal Impact Considerations for Landholder Bores.

6.10.5.2 CONCEPTUAL HYDROGEOLOGICAL MODEL

A conceptual hydrogeological was developed based on drilling and groundwater monitoring data, downhole logs and core photographs provided by Australian Resource Development Group (ARDG) and interpreted geology. In summary, the following model parameters were applied to the assessment of potential impacts of the proposed quarry on groundwater:

- The groundwater flow system occurs in a confined fractured rock aquifer within the Lochaber Greywacke;
- The hydrostratigraphy of the Project area consists of two hydrostratigraphic layers:
  - Clay/saprolite aquitard; and
  - Confined fractured rock aquifer;
- Groundwater levels only have a minor response to rainfall recharge;
- Groundwater is recharged by rainfall infiltration and subsequent leakage through the clay aquitard, and by direct rainfall recharge outside of the project area where the fractured rock outcrops;
- Based on the groundwater bores which target the fractured rock aquifer, groundwater flow is controlled by topography; and
- Groundwater within the fractured rock aquifer is unlikely to contribute to baseflow to the nearby ephemeral creeks.

The conceptual hydrogeological model is shown in Figure 13 of **Appendix M** as one cross section (A-A') through the Project area. Cross section A-A trends northwest to southeast through the centre of the proposed pit. All monitoring and production bores have been offset onto the cross section.

The final quarry pit design is shown in Figure 14 of **Appendix M**. The groundwater level shown as a light-blue-dashed line in Figure 14. represents pre-quarrying and pre-pumping conditions and is based on average groundwater levels. The soil saturation/infiltrating rainfall level is shown as a dark-blue-dashed line in the figure. The top of the confined fractured rock aquifer is shown as a yellow-dashed line.

Pumping from the potential production bore (based on conversion of ARDG-GW02) will lower the groundwater level in the vicinity of the project (purple-dashed line, based on a pumping rate of 0.5 L/s, after three years continuous pumping). During development, groundwater inflow into the pit will cause additional groundwater drawdown in the vicinity of the project. The predicted drawdown impact from pit inflows is shown as a red-dashed line (based on a radius of influence of 378 m).

6.10.5.3 IMPACT ASSESSMENT

A summary of the potential impacts of the quarry on groundwater are provided below.

Pit Inflow

Impacts are not predicted until the pit depth reaches below the water table, however the magnitude of any inflows to the pit are dependent on the rate of pumping from a production bore located close to the pit. For a continuous pump rate of 0.3 – 0.5 l/s at a potential production bore located close to the pit, annual inflows are modelled as 10.6 – 4.8 ML/year respectively.

Groundwater Dependent Ecosystems

The nearest high priority GDEs are located near the approximately 70 km from the project site. These GDEs are well outside the predicted radius of drawdown of the quarry pit and production bore and therefore will not be impacted by drawdown associated with the project.

No areas of probable vegetation GDEs within the most conservative predicted radius of drawdown (378 m) have been mapped as part of the Probable Vegetation Groundwater Dependent Ecosystems –– Northern Rivers and Namoi datasets (DCCEEW, 2022) The impact of the quarry pit therefore meets the NSW AIP Level 1 Minimal Impact Considerations for GDEs.

Highly probable vegetation GDEs associated with Snake Creek have been mapped as part of the Probable Vegetation Groundwater Dependent Ecosystems –– Northern Rivers and Namoi datasets (DCCEEW, 2022) within the predicted radius of drawdown (5 km) of a production bore. The highly probable vegetation GDEs associated with Snake Creek are located approximately 4.5 km to the southwest of a potential production bore. Based on a continuous pumping rate of 0.5 L/s for three years, no drawdown is predicted to occur at the highly probable GDEs. The impact of the quarry pit therefore meets the NSW AIP Level 1 Minimal Impact Considerations for GDEs.

Groundwater Quality

The project and associated production bore are not expected to cause any significant change in groundwater quality or in the beneficial use of the groundwater. Major ion analysis of groundwater does not indicate any previous or potential oxidation of sulfide minerals. The project is not expected to result in the generation of acid groundwater. Additionally, no processing waste or tailings are to be produced or emplaced at the project site.

Quarrying activities may increase groundwater recharge in the post closure phase which may result in a localised improvement in groundwater quality.

Cumulative Impacts

Cumulative impacts have been assessed for the project. The total drawdown will be the drawdown impact from both pit inflows and pumping from the potential production bore. Drawdowns greater than 0.46 m are not expected to occur at any of the registered bores; therefore, the cumulative impact of the project meets the NSW AIP Level 1 Minimal Impact Considerations for Landholder Bores.

No drawdown is expected to occur at any of the highly probably GDEs and therefore there is unlikely to be an impact any potential GDEs. The cumulative impact of the project therefore meets the NSW AIP Level 1 Minimal Impact Considerations for GDEs.

Post Closure

At the end of development, the groundwater table will be locally depressed to 1,175 m Australian Height Datum (AHD). With time, groundwater levels in the aquifer surrounding the quarry pit will recover until equilibrium within the system occurs, and a pit lake forms within the final void. The pit lake is likely to be an area of enhanced recharge for the confined aquifer. Once the system is in equilibrium, the flux of water within the pit lake will only be from rainfall and evaporation. During the recovery stage however, groundwater inflows will occur, and a WAL will still be required in the initial post closure phase of the project.

Recovery of groundwater levels post closure has not been modelled in this assessment. Water level recovery in the final void however has been modelled in the Surface Water Impact Assessment for the project.

Any enhanced recharge that occurs as a result of the quarry in the post closure phase would reduce the time required for groundwater levels to recover. The increased groundwater recharge in the post closure phase may also result in a localised improvement in groundwater quality.

It is recommended that groundwater monitoring continues in the post closure period however, so that groundwater level recovery can be monitored, and predictions made regarding how long a WAL may be required after the project is completed.

WAL Requirements

The Project is located within the New England Fold Belt Coast Groundwater Source which is managed by the WSP for the North Coast Fractured and Porous Rock Groundwater Sources. Any interference or extraction of groundwater at the project requires a WAL under the WM Act.

Modelling indicates that a WAL would be required to obtain approximately 9.5 ML/year to 15.8 ML/year for direct take (production bore). A WAL would also be required to obtain for approximately 4.8 ML/year to 10.6 ML/year for passive take (groundwater inflows).

Based on recent trades (between 2021 and 2024), water made available and water usage statistics for recent water years (2023/2024, 2022/2023) there is sufficient market depth for a licence of this magnitude.

6.10.5.4 MITIGATION AND MANAGEMENT MEASURES

A groundwater monitoring program will be detailed in the EMP prepared for the quarry operations. The purpose of the groundwater monitoring program is to:

- Measure dewatering performance;
- Assess potential impacts to groundwater levels and quality on other groundwater users in the vicinity;
- Identify groundwater issues such as potential large drawdowns at receptors as early as possible;

- Provide data which can be used to calibrate the analytical model and update the groundwater inflow predictions; and
- Measure groundwater level recovery post closure and provide data which can be used to predict how long a WAL may be required after the project is completed.

Mitigation and management measures include:

- The monitoring program should be established prior to the commencement of the project.
- Bores should continue to be monitored whilst they are not affected by the quarry operations. It is recommended that groundwater levels initially be monitored quarterly. Once groundwater inflows occur, it is recommended that the monitoring frequency increase to monthly.
- It is recommended that water quality be monitored quarterly in all monitoring bores for the first two years after the project commences (or until they are affected by quarry operations). The monitoring program should be reviewed every two years to determine if monitoring results indicate that less frequent monitoring would still provide a reasonable level of data to enable the impacts to be reliably detected.
- Once the quarry pit extends below the top of the confined aquifer, the monitoring program should also include monitoring of groundwater inflow into the quarry. Measuring groundwater take is a requirement from a licensing perspective and the measured inflows can also be used to calibrate the analytical model and provide updated predictions. Groundwater inflow rates should therefore be accurately recorded.
- Groundwater quality monitoring requirements post closure should be reviewed as part of closure planning with a focus on understanding the impacts of groundwater recharge from a recovering pit lake on the local groundwater system. Groundwater levels should continue to be monitored in the post closure phase until groundwater levels stabilise and/or regulation requirements are met. Monitoring locations and frequency in the post closure period should be identified as part of the quarry closure planning process and be informed by monitoring undertaken during the life of project, updated predictions of pit lake recovery and likely water quality and risks presented from pit lake recovery.

The groundwater monitoring program will provide a safeguard against any impacts that have not been identified in this assessment. If unforeseen impacts are identified during monitoring, the dewatering operation and/or the monitoring program will be amended to prevent further reductions in groundwater levels and/or quality.

6.11 CUMULATIVE IMPACTS

6.11.1 BACKGROUND

Cumulative impacts for the Project were assessed within the EIS in accordance with the 'Cumulative Impact Assessment Guidelines for State Significant Projects' (CIA Guidelines) (DPIE, 2022b).

This Amendment Report provides an updated cumulative impact assessment that considers, as necessary, the amended Project and changes to impacts associated with environmental and social aspects (**Section 6**). The 'planning status' of projects considered in the cumulative impact assessment in the EIS has also been updated where necessary. Similarly, relevant future projects that have been added to, or withdrawn from the planning system have been considered.

6.11.2 IMPACT ASSESSMENT

The commencement of construction of the amended Project is now anticipated to commence in Q3 2026, if approved. Potential overlap of construction periods with other projects in the region will remain; however, the distance between these sites is not expected to warrant significant cumulative impacts. Any cumulative impacts would be minor. Refer to **Table 6-13** for the updated list and status of other projects declared to be SSD within 92 km of the Project area, and **Figure 6-5** for additional context.

A total of nine (9) projects are anticipated to have cumulative impacts on traffic and transport, and 10 are expected to have broader cumulative socio-economic impacts, particularly relating to accommodation and worker influx, and local employment and procurement.

Since the exhibition of the EIS, three (3) additional relevant future projects have been made public - Kingswood BESS, Nottingham Park Solar Farm and Armidale East BESS. The Salisbury Solar Farm was included in the cumulative impact assessment in the EIS; however, this Project has been withdrawn. There is no publicly available information relevant to cumulative impacts for Salisbury Wind Farm, Ruby Hills Wind Farm, Yarrowyck Wind Farm, Boorolong Wind Farm or the New England REZ Transmission Project. These projects have therefore been excluded from this cumulative impact assessment.

6.11.3 UPDATED MITIGATION AND MANAGEMENT

No additional mitigation measures are recommended. Mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments.

TABLE 6-13 CUMULATIVE IMPACT ASSESSMENT

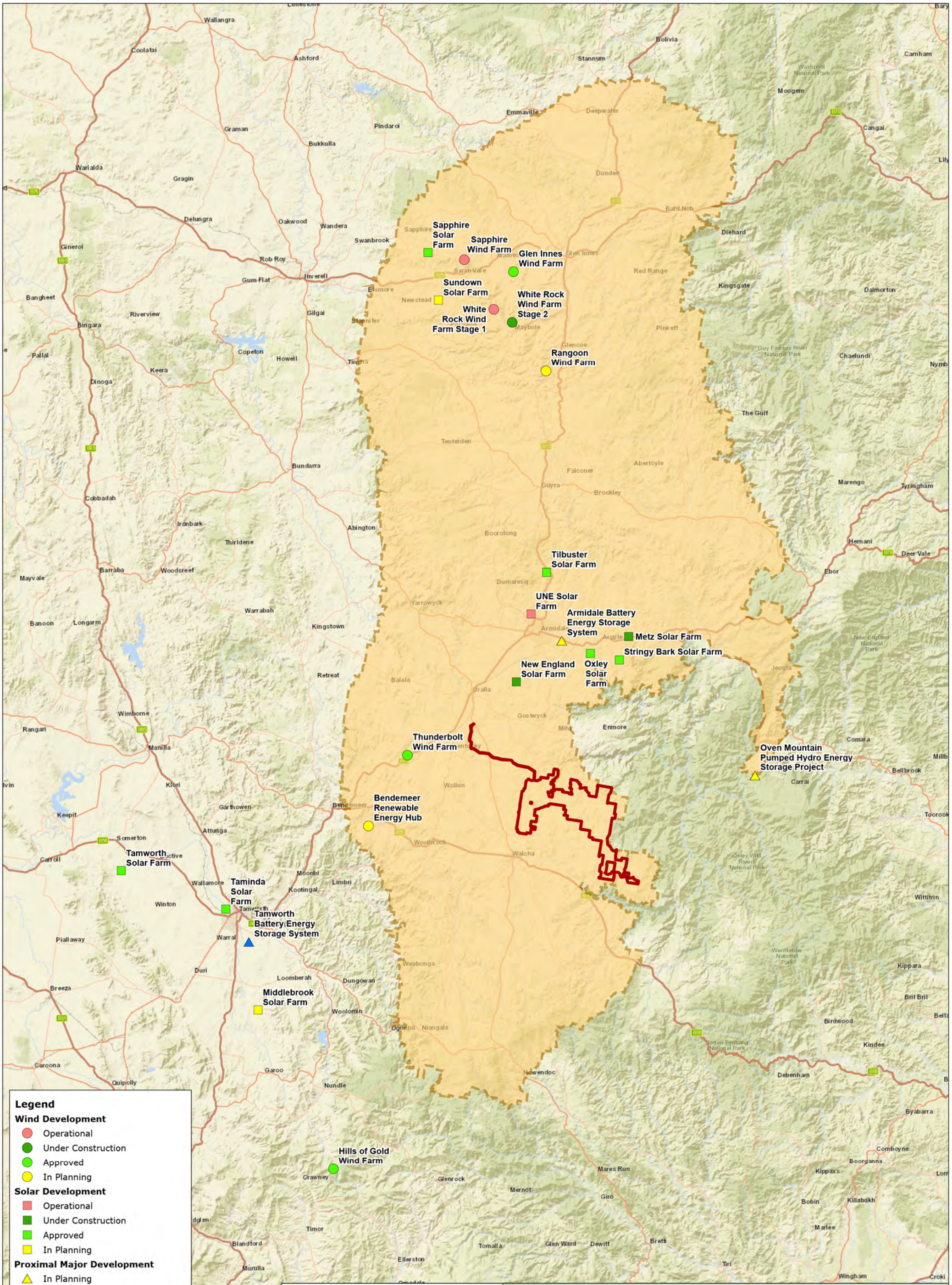
Project / LGA(s)	Description / Status*	Approx. distance (km) from the Project	Potential Cumulative Impacts	Relevant Future Development
Thunderbolt Wind Farm Tamworth Regional & Uralla Shire LGAs	• Approved May 2024 • Nominal generating capacity 192 MW • Up to 32 WTGs • Battery energy storage and ancillary infrastructure • Peak construction workforce up to 190 FTE • Operational workforce of up to 9 FTE • Construction expected to commence early 2025 for 18-24 months	26	Traffic & Transport Social & Economic	Likely relevant – The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale, Uralla, and Tamworth and will use part of the same transport route to deliver plant from the Port of Newcastle.
Hills of Gold Wind Farm Tamworth Regional, Liverpool Plains Shire, Upper Hunter Shire LGAs	• Approved September 2024 • Nominal generating capacity 384 MW • 62 WTGs • Battery energy storage and ancillary infrastructure • Peak construction workforce up to 211 FTE • Operational workforce of up to 28 FTE • Construction expected to commence early 2025 for 18-24 months (subject to project approval)	88	Traffic & Transport Social & Economic	Likely relevant – The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Tamworth and will utilise part of the same transport route to deliver plant from the Port of Newcastle.

Project / LGA(s)	Description / Status*	Approx. distance (km) from the Project	Potential Cumulative Impacts	Relevant Future Development
Rangoon Wind Farm Glen Innes Severn Shire & Armidale Regional LGAs	• In Planning (Prepare EIS) • Nominal generating capacity 130 MW • Up to 25 WTGs • Battery energy storage and ancillary infrastructure • Construction and operational workforce not reported in Scoping Report • Construction commencement not reported. • 18-24 months construction duration	92	Traffic & Transport	Unlikely relevant, noting that this project is still in the "Prepare EIS" phase. It is expected that the construction phase of the project would commence after the completion of the Winterbourne project and there would be no overlap.
Oxley Solar Farm Armidale Regional LGA	• Approved December 2023 • Approx. 215 MW solar farm • Battery energy storage and ancillary infrastructure • Peak construction workforce up to 300 FTE • Operational workforce of up to 5 FTE. • Approx 12-18 months construction duration. Estimated to commence Q1 2024.	28	Traffic & Transport Social & Economic	Unlikely relevant – It is expected that the construction phase of the project would be completed before the start of construction of the Winterbourne project. Should there be an overlap there may be traffic impact, this should be minimal as their peak periods will not be occurring at the same time. During operation the projects are both expected to generate a minimal level of traffic.
Bendemeer Solar Farm Tamworth Regional LGA	• In Planning (Response to Submissions) • Approx. 210 MW solar farm • Battery energy storage and ancillary infrastructure • Peak construction workforce up to 250 FTE • Operational workforce of up to 10 FTE • Approx 12-18 months estimated to commence Q2 2025.	33	Traffic & Transport Social & Economic	Likely relevant – There is potential for construction of both projects to overlap. Construction traffic generated by the projects may interact within the township of Armidale and Tamworth where staff for both projects are proposed to be located.

Project / LGA(s)	Description / Status*	Approx. distance (km) from the Project	Potential Cumulative Impacts	Relevant Future Development
Nottingham Park Solar Farm Tamworth Regional LGA	• In Planning (Prepare EIS) • Development of a 250 MW solar farm - associated infrastructure and battery storage • Potential to generate 500 jobs during construction, and approximately 10 jobs during operations.	82	Traffic & Transport Social & Economic	Unlikely relevant - The timing for the construction of this project is not reliably known and therefore we have assumed there is no overlap in construction phase and thus no cumulative impact.
Tilbuster Solar Farm Armidale Regional LGA	• Approved March 2022 (stage 2 Prepare EIS) • Approx. 150 MW solar farm • Battery energy storage and ancillary infrastructure	45	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Middlebrook Solar Farm Tamworth Regional LGA	• In Planning (Recommendation) • Development of a 320 MW solar farm with battery storage of up to 300 MW/600 MWh (DC coupled) and associated infrastructure. • Construction estimated to commence Q2 2024 (subject to project approval) for a 21-to-30-month period • Operational workforce up to 15 FTE	73	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both projects are proposed to be located. Upgrades are proposed to the intersection of Middlebrook Road / New England Highway to allow vehicle to turn safely from the state road.

Project / LGA(s)	Description / Status*	Approx. distance (km) from the Project	Potential Cumulative Impacts	Relevant Future Development
Eathorpe BESS Armidale Regional LGA	• In Planning (Prepare EIS) • 150 MW BESS and ancillary infrastructure • Peak construction workforce up to 150 FTE • Operational workforce up to 1 FTE employees (BESS will be operated remotely) • Approx 12 months construction estimated to be completed in 2026	30	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Armidale East BESS Armidale Regional LGA	• In Planning (Prepare EIS) • 500MW BESS and ancillary infrastructure • Approx 18 months construction estimated to be completed in 2027 • Peak construction workforce not reported in Scoping Report.	35	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Oven Mountain Pumped Hydro Energy Storage Project Armidale Regional LGA	• In Planning (Assessment) • 600 MW pumped hydro energy storage and generation • Ancillary infrastructure • Peak construction workforce up to 600 FTE • Operational workforce up to 30 FTE • Construction estimated to be 36 to 48 months in duration.	33	Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. Temporary accommodation will be required for the construction workforce which will be identified during detailed design and EIS preparation and may be outside the project area. Broader transport logistics options are still under consideration and may include the use of local ports, including the Port of Newcastle.

Project / LGA(s)	Description / Status*	Approx. distance (km) from the Project	Potential Cumulative Impacts	Relevant Future Development
Tamworth BESS Tamworth Regional LGA	• In Planning (Response to Submissions) • 200 MW BESS and ancillary infrastructure • Peak construction workforce up to 150 FTE	67	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both Projects are proposed to be located.
Kingswood BESS Tamworth Regional LGA	• In Planning (Response to Submissions) • 500 MW BESS and ancillary infrastructure • Peak construction workforce up to 100 FTE • Minimal operational workforce (BESS will be operated remotely) • Construction estimated to be up to 18 months. • Construction planned to commence in Q4 of 2024 • Operational workforce up to 1 FTE. • 12 months construction period. Scheduling not reported in Scoping Report.	72	Traffic & Transport Social & Economic	Potentially relevant – There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both Projects are proposed to be located.



0526676_WWF_AGEN_R3.aprx/6-3 Nearby projects

7. JUSTIFICATION OF THE AMENDED PROJECT

7.1 AMENDED PROJECT DESIGN EVOLUTION

During the preparation of the EIS, Submissions Report (ERM, 2024) and this Amendment Report, an ongoing, iterative design and siting process has been adopted by the Applicant. This approach has been adopted with the objective of developing an efficient Project that avoids and minimises environmental and social impacts to the greatest extent practicable.

The Amended Project for which approval is sought has been informed by:

- Environmental, social and economic impacts;
- Government agency advice and submissions made by the public, local councils and other stakeholders during (and after) the EIS exhibition; and
- Other comments received during the comprehensive community and stakeholder engagement that has been conducted since EIS exhibition.

Throughout the Project amendment process the Applicant has undertaken additional surveys and design work to avoid and minimise potential environmental and social impacts and optimise the Project layout and constructability.

Where the potential for environmental impacts could not be avoided, design principles were sought to minimise environmental impacts, and mitigation measures have been proposed to manage the extent and severity of any residual impacts. The mitigation and management measures have been updated based on the amended Project layout and are summarised in **Appendix B**.

The amended Disturbance Footprint reflects the most appropriate area for the Project infrastructure. This was determined based on inputs provided during engagement with regulatory and community stakeholders, environmental assessments undertaken and the functional requirements of project infrastructure.

Key amendments to the Project since EIS exhibition include:

- Removal of two (2) WTGs (B023 and B124) and addition of one (1) WTG (B177) reducing the overall number of WTGs by one (1) to 118;
- Relocation of 21 WTGs (over 100m movement) and refinement of 52 WTGs (less than 100m movement);
- Increase in temporary disturbance footprint from 107.20 ha (EIS) to 697.0 ha (amended Project);
- Decrease in permanent disturbance footprint from 474.21 ha (EIS) to 216.6 ha (amended Project);
- Decrease in native vegetation clearance associated with the Project from 425 ha (205 ha woodland and 220 ha native grassland) in the EIS to 308 ha (124 ha woodland and 184 ha native grassland) for the amended Project;
- Reduction in area of potential impact to the TECC/SAII White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland by 120.92 ha (81%);
- One (1) additional associated dwelling (SR274) and one (1) additional non-associated dwelling (SR224) are within the 'black line' of visual magnitude (3,100 m to nearest wind turbine);

- Two (2) dwellings (SR141 and SR207) now fall outside of the black line of visual magnitude due to relocation of WTGs;
- Removal of 13 properties from the Project area and the inclusion of one additional land parcel within the Project area and one additional land parcel transport route;
- Realignment of site access locations and internal access tracks, and electrical reticulation;
- Relocation of substations, O&M facility, construction compound, BESS and laydown areas;
- Change to the proposed OSOM transport route to avoid Oxley Highway and instead travel to Walcha via Thunderbolts Way; and
- Inclusion of an onsite quarry to extract raw materials required for Project construction.

During detailed design and prior to construction, it is expected that the placement of infrastructure and extent of construction activities will be further refined (within approved limits) to further avoid and minimise environmental impacts.

7.2 CONSISTENCY WITH STRATEGIC CONTEXT

The strategic context of the amended Project remains consistent with and as described in Section 2 of the EIS and in **Section 2** of this report. The Project will support Australian Government and NSW climate change commitments to achieve their respective renewable energy and greenhouse gas emission reduction targets.

Additionally, the Project will contribute to the continued growth of renewable energy generation and storage capacity in the New England REZ and contribute to the target of 82% renewables by 2030.

7.3 COMPLIANCE WITH RELEVANT STATUTORY REQUIREMENTS

The permissibility of the Project, compliance of the Project with other approvals, as well as mandatory matters for consideration are summarised in **Appendix C** . The consistency of the Project with the objects of the EP&A Act pursuant to Section 1.3 remains unchanged to that assessed and described in Appendix C of the EIS.

Through the adoption of the updated management and mitigation measures for the amended Project, as described throughout **Section 6** and compiled in **Appendix B**, and appropriate design and site selection, the Project complies with statutory requirements.

7.4 CONSISTENCY WITH COMMUNITY VIEWS

During public exhibition of the EIS, 959 submissions were received (excluding duplicates). These submissions are categorised as follows:

- 924 public submissions (excluding duplicates);
- 14 organisation submissions;
- 4 local council submissions; and
- 17 submissions with advice from government agencies.

Fifty-three percent (53%) of submissions were in support of the Project. Responses to these submissions are addressed in the Submissions Report (ERM, 2024).

Submissions in support of the Project recognised the need to transition our energy sector to renewable energy generation. Other key benefits raised in submissions of support included:

- The Project would assist NSW and Australia transition to an alternative, low-carbon energy supply using renewable resources, and in turn minimise the impacts of climate change;
- The location of the Project was well selected in proximity to existing transmission infrastructure and in an area that has excellent wind resource;
- The Project stakeholder consultation process was inclusive and informative, with ample information made available for individuals interested in learning more about the Project;
- The developer is a responsible company that has generated trust within the community through the development and implementation of a Community Consultation Plan; and
- Feedback from the consultation sessions was incorporated into the Project design.

Submissions in objection to the Project raised concerns regarding the location of the New England REZ, arguing that renewable energy should be developed closer to the State's large populations centres where there is higher demand for electricity. Many also suggested alternate energy generation technologies, such as nuclear, should be considered rather than developing wind farms.

Throughout the development of the EIS, the Applicant has conducted engagement activities with a range of stakeholders including NSW and Federal Government agencies, the nearby community and community groups, Aboriginal representatives, proximate landholders and infrastructure owners (refer **Section 5** and Appendix E of the EIS). These engagement activities have continued since EIS exhibition to discuss the amendments to the Project layout and to address potential concerns, opportunities and mitigation strategies, as described in **Section 5** of this report and Section 3 of the Submissions Report (ERM, 2024). The Applicant will continue to work with the community and stakeholders to address any concerns (refer **Section 5.2**).

7.5 ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

The Project will primarily be developed on land which has been previously disturbed and historically cleared for agricultural purposes. The Project layout has been refined and amended to maximise the use of existing disturbed areas and to avoid and/or minimise impacts to identified biodiversity and Aboriginal cultural heritage values and surrounding receivers.

Progressive design iterations for the WTGs, BESS, and associated infrastructure have continued throughout the development of the EIS and since its exhibition with key drivers being measures to avoid and minimise environmental and social impacts in line with the Avoid-Minimise-Mitigate-Offset design hierarchy.

Table 7-1 provides a summary of the updated potential impacts of the amended Project to various environmental, economic and social aspects and cumulatively with other past, present and reasonably foreseeable future SSDs.

TABLE 7-1 AMENDED PROJECT IMPACTS SUMMARY

Categories	Updated Environmental, Economic and Social Impacts
Environmental	
Biodiversity	The impacts to biodiversity as a result of the Project have been avoided and minimised as much as practicable through design phase refinements. Further mitigation measures are outlined and proposed to be adopted to minimise biodiversity impacts during the construction and operational phases and include provisions for biodiversity offsets, management measures and monitoring and adaptive management measures. The Amended BDAR confirms that there are no serious and irreversible impacts to CEECs resulting from the Project.
Aboriginal Cultural Heritage	An Amended ACHAR has been prepared to assess potential impacts to Aboriginal cultural heritage associated with the amended Project in consultation with the RAPs. The Aboriginal cultural heritage surveys undertaken for the Project recorded 23 new Aboriginal sites. The newly recorded sites include artefact scatters, isolated finds, culturally modified trees, a quarry site, and an engraving site. Project design changes have been made to avoid impact to Aboriginal cultural heritage sites, such that of the 23 newly recorded sites, 17 sites (74 per cent) will be avoided by the Project. Salvage procedures for the six sites that could be impacted will be set out in an ACHMP that will be prepared following the project's approval.
Historic Heritage	The Amended HHA included updated searches of relevant historic heritage databases to determine whether there have been changes in listings of items since exhibition of the EIS. Aside from minor changes in the distance from project infrastructure to heritage listed items, no material changes to the impact assessment presented in the EIS were identified. The proposed amendments do not traverse the curtilage of any heritage listings. No impacts to historic heritage items are anticipated. Following development consent of the Project, a HHMP will be developed and used during the construction and operation of the Project. If items of historic heritage significance are uncovered during the Project, then the unanticipated finds protocols in the HHMP will be enacted.
Noise	The Amended NIA has been updated to assess potential impacts relating to noise associated with the Amended Project. Based on the prediction noise levels, without any mitigation measures, noise from the WTGs will achieve the operational noise criteria at all dwellings in the vicinity of the Project. The mitigation measures proposed in the EIS are sufficient to address impacts related to the proposed amendments. With regards to construction noise impacts, no changes were required to the NMLs and maximum PTNLs presented in the EIS.
Visual	The LVIA has been updated to assess potential impacts relating to landscape and viewshed associated with the Amended Project. As a result of design refinements and new neighbour agreements, the number of non-associated dwellings within 4,550 m of a WTG has reduced by 4 dwellings. The number of non-associated dwellings with potential views of WTGs in up to three, 60-degree sectors has reduced by 2 dwellings. The Amended Project achieves a slight reduction to the number of WTGs visible from land to the west of the Project and visual impact ratings for several dwellings have been reduced. No dwellings within 4,500 m of a WTG location were assessed as having a high visual impact. The Amended Project includes the introduction of an onsite quarry. The location of the quarry is such that views will not be available from public roads, non-associated dwellings and public viewpoints and mitigation measures are not required.

Categories	Updated Environmental, Economic and Social Impacts
Soils and Agriculture	The Amended Project infrastructure will overlap about 44 ha of BSAL during construction and 10 ha of BSAL during operation. The agricultural potential of the remainder of this land will remain the same. The Amended Project does not result in any additional impacts to soils and agriculture and the mitigation measures included in the EIS remain adequate.
Water Resources, Hydrology and Flooding	Most of the Project will be situated away from watercourses and high flood risk areas. The WTGs are generally located on catchment ridge lines or high ground some distance away from the major watercourses. There may be local overland flow paths at some sites which should be suitably managed or avoided. There is no apparent flood risk from the closest watercourses. Water required for construction of the project will be sourced from existing onsite groundwater bores within the Project area.
Traffic	The TIA has been updated to assess potential impacts relating to transport and traffic associated with the Amended Project. The Amended Project avoids using the Oxley Highway for OSOM vehicles and instead these vehicles travel along New England Highway to Staces Road south of Uralla. OSOM vehicles will then head east to Thunderbolts Way before continuing south to Walcha. The inclusion of an onsite quarry has significantly reduced the number of heavy vehicles travelling on local roads as raw materials for construction can be sourced within the Project area. Similarly, the use of existing onsite groundwater bores will further reduce the number of heavy vehicles travelling on local roads. Traffic generation analysis shows that there would be adequate capacity in the road network to accommodate the Amended Project. A detailed Traffic Management Plan will be prepared prior to project construction, and individual transport permits will be required for all OSOM loads.
Hazards and Risks	The AIA has been updated to assess the potential impacts of the Amended Project on aviation. The Amended Project will not impact any certified airports or existing air routes and the mitigation measures presented in the EIS remain adequate. Five WTGs have been relocated in the Amended Project to avoid potential impacts on point-to-point communication links and radiocommunication towers operated by NSW Telco Authority.
Air Quality	Air quality impacts associated with the Amended Project will be temporary and low during the construction phase. It is anticipated that the Amended Project will not generate significant air quality impacts and appropriate measures will be implemented to minimise the potential for offsite dust impacts resulting from construction. During the operation phase, the Amended Project will generate electricity without directly emitting air pollutants that are known to affect the climate and human health. The Project will contribute to the improvement of air quality through the displacement of emissions that would otherwise be generated through the burning of fossil fuels used to generate electricity from traditional coal fired power stations. The Project would thus abate the production of up to 1.5 Mt CO_2-e per annum which is a substantial contribution.
Waste	The Amended Project will produce various waste streams during the construction, operations, and decommissioning stages. The mitigation measures as presented in the EIS remain adequate including the preparation of a Waste Management Plan (WMP) prior to construction.
Cumulative Impacts	The commencement of construction of the amended Project is now anticipated to commence in Q3 2026. Potential overlap of construction periods with other SSDs in the region will remain; however, the distance between these sites is not expected to warrant more than minor cumulative impacts.

Categories	Updated Environmental, Economic and Social Impacts
Social	
Social Impact	A wide variety of consultation activities have been utilised to inform the social and economic impacts of the Project. Regular and ongoing stakeholder engagement activities, including targeted stakeholder interviews, provided feedback. The Project's Social Locality remains consistent with that identified in the EIS. The Amended Project does not result in any changes to the likelihood, magnitude or pre-mitigation impact significance ratings identified in the EIS and the residual impact ratings remain.
Economic	
Economic Impact	The Amended Project will create a range of social and economic benefits which will create substantial capital investment in Walcha and the broader New England region. The Project is anticipated to generate up to 390 FTE construction jobs, in turn creating approximately $150 million in direct wages and profits, and more than $160 million in indirect wages and profits, per year of construction. During operations, the Amended Project will generate up to 16 FTE jobs and $25 million per year in direct and indirect economic benefit for the local region. The Proponent will operate and maintain the WTGs and other infrastructure to ensure safe and efficient facilities that optimise energy generation.

The amendments to the Project provide the following benefits:

- Retention of existing native vegetation which avoided areas of high biodiversity value containing EPBC Act and BC Act listed Box Gum Woodland TEC and potential habitat for the threatened Squirrel Glider;
- Avoidance of impacts to Tusked Frog and Eastern Pygmy-possum;
- Reduction of visual impact on nearby sensitive receivers;
- Reduction of noise impact on nearby sensitive receivers;
- Reduction of heavy vehicle movements on the local and regional road network, with the flow-on benefits of improved public safety, reduced traffic impacts, and reduced wear on public roads;
- Mitigation of community concerns in respect of OSOM transport along Oxley Highway;
- Onsite sourcing of quarry materials to reduce demand for these products from regional quarries; and
- Avoidance of areas with higher potential for erosion such as gullies.

7.6 COMPLIANCE AND MONITORING

An Environmental Management System (EMS) will be developed to provide the overall framework for environmental management during the construction, operation, decommissioning and rehabilitation of the amended Project. The EMS will be designed to ensure that appropriate measures and processes are in place to manage identified environmental risks and provide for ongoing continual improvement. The EMS will incorporate mitigation measures that have been identified throughout this report, EIS and associated technical assessments and will include relevant management plans.

Appendix B provides a summary of the updated environmental management commitments of the Project which will be implemented to avoid, minimise and where necessary, offset the potential environmental impacts associated with the Project.

Prior to the commencement of construction, detailed design and layout plans will be finalised and submitted for approval. Environmental mitigation and management measures outlined in the EMS and the associated environmental management plans will be prepared and submitted as required by the conditions of development consent.

7.7 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecologically sustainable development (ESD) is an object of the EP&A Act. In the context of an EIS, the applicable principles of ESD are set out in section 193 of the EP&A Regulation. **Table 7-2** provides a summary of the evaluation of the amended Project against the principles of ESD.

TABLE 7-2 UPDATED ESD PRINCIPLES CONSIDERATIONS

ESD Principal	Evaluation of the amended Project
The Precautionary Principle	The environmental impacts of the amendments to the Project have been carefully evaluated in this report and where reasonable and practicable have been avoided, mitigated, managed or offset. Various options have been considered for the WTGs, BESS and associated infrastructure having regard to environmental risks. Ultimately, options with lower environmental impacts and risks have been selected to avoid and minimise potential biodiversity, heritage and amenity impacts. Management measures have been proposed for all significant environmental impacts, and where uncertainty exists, measures have been suggested to address the uncertainty. As a result, there is no threat of serious or irreversible damage to the environment.
Inter-generational Equity	The amended Project involves a new renewable energy resource which will result in abatement of about 1.5 million t-CO_2-^{e} of greenhouse gas per annum. This is an action against climate change that will benefit future generations. The Project will also reduce emissions that negatively affect air quality and minimise pollutants that negatively affect surface or groundwater resources compared to Projects mining needed for coal-fired power generation. Following decommissioning, the Project area will be rehabilitated and existing agricultural activities can continue. Alternatively, Project infrastructure may be updated for continued renewable energy generation. Both options provide benefits for future generations.
Conservation of Biological Diversity and Ecological Integrity	Conservation of biodiversity has been a fundamental consideration throughout development of the Project. Extensive desktop, field assessment and additional design work have been undertaken to understand the anticipated biodiversity impacts. The findings of the biodiversity assessment have informed an ongoing iterative design for the layout of the amended Project and siting of WTGs and other key infrastructure. Impacts to biodiversity will be avoided, mitigated and offset where necessary to ensure that there is no net loss in biological diversity and that ecological integrity is maintained (refer **Section 6.1**).

ESD Principal	Evaluation of the amended Project
Improved Valuation, Pricing and Incentive Mechanisms	The Project enables the utilisation of a valuable resource, wind energy and large-volume energy storage, which is otherwise lost if the Project does not proceed. The Project further contributes to the transition from fossil fuel generation sources, reducing air, water and land pollution from coal-fired power stations, which currently bear none of the external costs of such pollution. The environmental consequences of the amended Project with potential for adverse impacts have been considered and identified in this report (refer **Section 6**). Implementing the updated mitigation measures will impose an economic cost on the Applicant, which increases the costs of the Project. Project benefits are considered to outweigh the costs. Additionally, the Project will generate up to 390 FTE jobs during construction and 16 FTE jobs during operations and will provide economic benefits to the local community. It will also provide tangible and durable financial benefits to the community through the Community Benefit Fund.

7.8 CONCLUSION

The amended Project involves the construction, operation and decommissioning of a wind farm with up to 118 WTGs, BESS with a capacity of approximately 100 MW / 200 MWh and associated infrastructure (including an on-site quarry for the Project).

The amended Project has been carefully designed and sited to further minimise environmental and social impacts in consultation with the community and other relevant stakeholders. The residual environmental and social impacts identified throughout this report, EIS and technical assessments will be managed through the updated mitigation and management measures summarised in **Appendix B**.

The Project is located within the New England REZ and will help achieve the objectives of the REZ. Further, the amended Project will contribute significantly to reducing carbon emissions and human induced climate change as part of the necessary and ongoing clean energy transition from fossil fuels.

The amended Project will not result in significant impacts to the environment, or the local community and these impacts will be significantly outweighed by the strong strategic, environmental, economic and social benefits of the Project.

The Project will:

- Assist the Federal and NSW Governments to fulfil targets and policies to reduce GHG emissions by approximately 1.5 million t-CO_2-^{e} p.a., and increase renewable energy supply, including achieving the objectives of the New England REZ;
- Assist in meeting energy demand as part of the market transition from traditional energy sources; and
- Deliver economic benefits to regional and local communities.

The amended Project represents a positive addition to the local and wider NSW economy and the NEM. Through the implementation of proposed mitigation and management measures, it is considered that the Project, as amended, is consistent with the objects of the EP&A Act and is in the public interest.

8. REFERENCES

AEMO. (2023). *2023 Electricity Statement of Opportunities: A report for the National Electricity Market.* Retrieved from https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2023/2023-electricity-statement-of-opportunities.pdf

AEMO. (2024). *2024 Integrated System Plan: A roadmap for the energy transition.* Retrieved from https://aemo.com.au/consultations/current-and-closed-consultations/draft-2024-isp-consultation

Amber Organisation. (2022). *Winterbourne Wind Farm Traffic Impact Assessment.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093258.378%20GMT

ANZECC. (1990). *Technical basis for guildeines to minimise annoyance due to blasting overpressue and ground vibration.* Retrieved from https://www.environment.nsw.gov.au/resources/noise/anzecblasting.pdf

Austroads. (2019). *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings.*

Austroads. (2021). *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections .*

Aviation Projects. (2022). *Winterbourne Wind Farm Aviation Impact Assessment.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093300.408%20GMT

BOM. (2024). *Bureau of Meteorology*. Retrieved from Australian Groundwater Explorer: http://www.bom.gov.au/water/groundwater/explorer/

CEC. (2023). *Power Playbook: Accelerating Australia's Clean Energy Transformation.* Retrieved from https://assets.cleanenergycouncil.org.au/documents/Clean-Energy-Council-Power-Playbook.pdf

DCCEEW. (2022). *State Government of NSW and NSW Department of Climate Change, Energy, the Environment and Water*. Retrieved from , Probable Vegetation Groundwater Dependent Ecosystems - Northern Rivers, accessed from The Sharing and Enabling Environmental Data Portal: [https://datasets.seed.nsw.gov.au/dataset/2e7692cf-6446-44da-a827-fac64ca3da17]

DECC. (2008). *Managing Urban Stormwater: Soils and Construction Volume 2E - Mines and quarries.* Retrieved from https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Water/Water-quality/managing-urban-stormwater-soils-construction-volume-2e-mines-quarries-08208.pdf

DECC. (2009). *Interim Construction Noise Guideline.* Retrieved from https://www.environment.nsw.gov.au/resources/noise/09265cng.pdf

DECCW. (2010). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.* Retrieved from https://www.environment.nsw.gov.au/-

/media/OEH/Corporate-Site/Documents/Aboriginal-cultural-heritage/code-of-practice-for-archaeological-investigation-of-aboriginal-objects-100783.pdf

DNV. (2022). *Winterbourne Wind Farm EMI Assessment.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093301.691%20GMT

DPE. (2016). *Wind Energy: Noise Assessment Bulletin for State significant wind energy development.* Retrieved from https://www.planning.nsw.gov.au/sites/default/files/2023-03/wind-energy-noise-assessment-bulletin.pdf

DPE. (2022). *Groundwater assessment toolbox for major projects in NSW - Overview document.* Retrieved from https://nla.gov.au/nla.obj-3090344989/view

DPE. (2023). *Technical Supplement: Technical Supplement to Support the Social Impact Assessment Guideline for State-significant Projects.* Sydney: Department of Planning and Environment. Retrieved from DPE. (2023). Technical Supplement: Technical Supplement to Support the Social Impact Assessment Guideline for State-significant Projects. Sydney: Department of Planning, Industry and Environment.

DPE Water. (2022). *Probable Vegetation Grounwater Dependent Ecosystems - Northn Rivers.* Retrieved from https://datasets.seed.nsw.gov.au/dataset/probable-vegetation-gde-northern-rivers

DPHI. (2024). *Undertaking Engagement Guidelines for State Significant Projects.* Retrieved from https://www.planning.nsw.gov.au/sites/default/files/2023-03/undertaking-engagement-guidelines-for-ssp.pdf

DPI. (2016a). *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources.* Retrieved from https://water.dpie.nsw.gov.au/__data/assets/pdf_file/0004/166873/nth-coast-fractured-porous-rock-gw-background.pdf

DPI. (2016b). *High Priority Groundwater Ecosystem Map.* Retrieved from https://legislation.nsw.gov.au/view/pdf/map/88d95c45-2569-4b54-a1a2-f21605050437

DPIE. (2020a). *Biodiversity Assessment Method.* NSW Department of Planning, Industry and Environment.

DPIE. (2020b). *Developments adjacent to National Parks and Wildlife Service Lands - Guidelines for consent and planning authorities.* NSW Department of Planning, Industry and Environment.

DPIE. (2022a). *State significant development guidelines – preparing an amendment report (Appendix D to the state significant development guidelines).* Retrieved from https://www.planning.nsw.gov.au/sites/default/files/2023-03/ssd-guidelines-preparing-an-amendment-report.pdf

DPIE. (2022b). *Cumulative Impact Assessment Guidelines for State Significant Projects.* Retrieved from https://www.planning.nsw.gov.au/sites/default/files/2023-03/cumulative-impact-assessment-guidelines-for-ssp.pdf

DPIE. (2023a). *Social Impact Assessment Guideline.* Retrieved from https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIA%20Guideline_NEW%20VI_14_02_23.pdf

DPIE. (2023b). *Technical Supplement: Social Impact Assessment Guideline for State Significant Projects.* Retrieved from https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIAG%20-%20Technical%20Supplement_NEW%20VI_14_02_23.pdf

ERM. (2022a). *Winterbourne Wind Farm Environmental Impact Statement.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221212T225834.796%20GMT

ERM. (2022b). *Winterbourne Wind Farm Social Impact Assessment.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221110T214815.260%20GMT

ERM. (2024). *Winterbourne WInd Farm Response to Submissions Report.* Environmental Resources Australia Pty Ltd.

Heritage Council of NSW. (2006). *Historical Archaeology Code of Practice.*

Heritage Council of NSW. (2009). *Assessing Significance for Historical Archaeological Sites and 'Relics'.*

ICOMOS. (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance.*

Landcom. (2004). *Managing Urban Stormwater: Soils and construction - Volume 1.* Retrieved from https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Water/Water-quality/managing-urban-stormwater-soils-construction-volume-1-fourth-edition.pdf

Moir Landscape Architecture. (2022). *Landscape and Visual Impact Assessment Winterbourne Wind Farm.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093220.865%20GMT

NGH. (2022). *Biodiversity Development Assessment Report Winterbourne Wind Farm.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221212T225919.214%20GMT

NSW EPA. (2011). *NSW Road Noise Policy.* Retrieved from https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/2011236nswroadnoisepolicy.pdf

NSW EPA. (2017). *Noise Policy for Industry.* Retrieved from https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf

NSW EPA. (2022). *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.* Retrieved from https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/22p3963-approved-methods-for-modelling-and-assessment-of-air-pollutants.pdf

NSW EPA. (2024a). *EPA climate change assessment requirements for larger emitters.* Retrieved from https://hdp-au-prod-app-nswepa-yoursay-files.s3.ap-southeast-2.amazonaws.com/3317/1590/9116/24p4514-epa-climate-change-assessment-requirements-consultation-draft.pdf

NSW EPA. (2024b). *NSW EPA Guide for Large Emitters.* Retrieved from https://hdp-au-prod-app-nswepa-yoursay-files.s3.ap-southeast-2.amazonaws.com/1017/1626/5068/24pp4492-nsw-epa-guide-for-large-emitters-consultation-draft.pdf

Office of Environment & Heritage. (2011). *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.* Retrieved from https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Aboriginal-cultural-heritage/guide-to-investigating-assessing-reporting-aboriginal-cultural-heritage-nsw-110263.pdf

OzArk Envrionment & Heritage. (2022). *Aboriginal Cultural Heritage & Historic Heritage Assessment Report.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093302.288%20GMT

Richards, A., & Moore, A. (2008). *Effect of Blasting on Infrastructure.* Brisbane: ACARP.

RTA. (2002). *Guide to Traffic Generating Development.* Roads and Traffic Authority.

SA EPA. (2021). *Wind farms enviromental noise guidelines.* Retrieved from https://www.epa.sa.gov.au/files/47788_windfarms.pdf

Sonus. (2022). *Winterbourne Wind Farm Noise and Vibration Assessment.* Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10471%2120221102T093220.189%20GMT

WaterNSW. (2024). *Continuous water monotoring network*. Retrieved from WaterNSW: https://realtimedata.waternsw.com.au/water.stm

WRI. (2004). *The Greenhouse Gas Protocol.* Retrieved from http://pdf.wri.org/ghg_protocol_2004.pdf

APPENDIX A AMENDED PROJECT DESCRIPTION

AMENDED PROJECT DESCRIPTION

This section presents a detailed description of the proposed works associated with the construction, operation, maintenance and decommissioning phases of the Amended Project and provides a detailed overview of the proposed wind farm layout and infrastructure components.

OVERVIEW

The regional context of the Project is shown in **Figure 1**. The Amended Project layout is show in **Figure 2**.

The Amended Project involves the construction, operation, maintenance and decommissioning of a wind farm with up to 118 WTGs, together with associated and ancillary infrastructure.

The Amended Project design has been revised and refined in response to submissions and the further identification and assessment of environmental constraints, constructability requirements, and consideration of the outcomes of agency, landowner, and community consultations.

The Amended Project consists of the following key components:

- Up to 118 WTGs, each with:
  - Three blades mounted to a rotor hub (hub height of 149 m) on a nacelle above a tubular steel tower, with a blade tip height (blade length plus hub height) of up to 230 m AGL;
  - A gearbox and generator assembly housed in the nacelle;
  - Adjacent hardstands for use as crane pads, assembly and laydown areas;
- Two 33/330 kV electrical substations, including control room, transformers, circuit breakers, switches and other ancillary equipment;
- An operations and maintenance facility;
- A BESS of up to 100 MW/200 MWh capacity (two hours of storage);
- Aboveground and underground 33 kV electrical reticulation and fibre optic cabling connecting the WTGs to the onsite substations (generally following site access tracks);
- 330 kV single or double circuit twin conductor overhead transmission line (transmission line) route of approximately 44 km connecting the two substations to a new electrical switchyard (including circuit breakers, switches and other ancillary equipment), located approximately 7 km south of Uralla and adjacent to TransGrid's 330 kV Tamworth to Armidale transmission line (Line 85);
- Internal access tracks (combined total length of approximately 115.3 km) connecting the WTGs and associated Project infrastructure with the public road network;
- Upgrades to roads and intersections required for the delivery of OSOM WTG components, transformers and associated construction-phase materials and vehicular movements; and

- Decommissioning of four existing meteorological monitoring masts and installation of up to two permanent meteorological monitoring masts. The permanent monitoring masts will be located close to a WTG location with a maximum height of 149 m AGL, equivalent to the hub height of the installed WTGs.

The following temporary elements will be required during the construction phase of the Project:

- Site buildings and facilities for construction contractors / equipment, including site offices, car parking and amenities for the construction workforce;
- On-site quarry for the Project to supply gravel and potentially aggregate and bedding material for construction purposes;
- On-site water supply and storage from existing groundwater bores;
- Mobile concrete batching plant/s to supply concrete for WTG footings and substation construction works;
- Earthworks for access tracks, WTG platforms and foundations, potentially including controlled blasting in certain areas;
- Rock crushing facilities for the generation of suitable aggregates for concrete batching and/or for access track and hardstand construction;
- Hardstand laydown areas for the storage of construction materials, plant, and equipment;
- Up to four temporary meteorological monitoring masts. The temporary monitoring masts will be installed for 3-6 months on the foundations of WTG locations with a maximum height of 149 m AGL;
- External water supply and storage for concrete batching (if required) and domestic consumption;
- The transport, storage and handling of fuels, oils and other hazardous materials for construction and operation of wind farm infrastructure; and
- Beneficial reuse of materials won from within the development footprint during cut and fill and WTG foundation excavation works for use in access track, hardstands and foundation material.

The Applicant is seeking consent for the subdivision of land for the substations and switchyard as an ancillary aspect of the Project.

Table 1 provides an overview of the approximate dimensions of the Project components.

TABLE 1 PROJECT COMPONENTS AND APPROXIMATE DIMENSIONS

Project Components and Infrastructure	Approximate Dimensions	Quantity
WTGs		
Rotor diameter	162 m	118 WTGs
Blade length	• Blade length of 79.3 m. • Distance from the centre-point of the hub to the tip of the blade equals 81 m	
Uppermost blade tip	230 m	
Tower (hub) height	149 m	
WTG hardstand	0.8 ha per WTG (permanent footprint)	
Ancillary Infrastructure		
100 MW/200 MWh BESS	100 m x 100 m	1

Project Components and Infrastructure	Approximate Dimensions	Quantity
33/330 kV Substation	100 m x 100 m	2
O&M Facility including carpark	50 m x 40 m	1
New 330 kV transmission line	Steel lattice towers approximately 40 m high, spaced about 300 to 400 m (subject to terrain) or steel monopoles approximately 50 m high, spaced approximately 250 m (subject to terrain), within 60 m easement.	44 km
Underground and/or overhead 33 kV cables	Trenching for underground electrical cabling will be approximately 0.6 m wide per circuit by 1.0 m deep. Overhead 33 kV lines will be installed using steel monopoles spaced about 200 to 250 m (subject to terrain).	210.5 km (25.6 km overhead; 184.9 km underground)
Switchyard	250 m x 200 m	1
New internal access tracks and drainage	Approximately 15 m wide formation including 5.5 m roadway plus shoulders and drainage as required.	115.3 km
New meteorological masts (with concrete footings for mast and guy wires)	Sensor height at 149 m on approximately 3 m x 3 m concrete foundation.	Up to 2
Temporary Facilities		
Concrete batching plants	100 m x 100 m	Up to 3
Laydown Areas	6 laydown areas at 50 m x 50 m 8 laydown area at 100 m x 100 m	Up to 14
Site office, car parking and storage areas	180 m x 90 m 120 m x 60 m 100 m x 60 m	Up to 3
Temporary meteorological masts (with concrete footings for mast and guy wires)	Sensor height at 149 m, installed on WTG foundations.	Up to 4
Other Project elements		
Duration of construction phase	About 52 months	
Construction workforce	Up to 390 FTE	
Duration of operation phase	30 Years	
Operational workforce	Up to 16 FTE	
Construction hours	• Monday to Friday: 7.00 am to 6.00 pm; • Saturday: 8.00 am to 6.00 pm; and • No works on Sunday or public holidays.	

Dumaresq
Invergowrie
Saumarez Ponds
Armidale
URALLA SHIRE COUNCIL
ARMIDALE REGIONAL COUNCIL
CLARENCE VALLEY COUNCIL
BELLINGEN SHIRE COUNCIL
Cathedral Rock National Park
Oakes State Forest
New England National Park
NAMBUCCA SHIRE COUNCIL
Styx River State Forest
Cunnawarra National Park
Cochrane State Forest
KEMPSEY SHIRE COUNCIL
Hickeys Creek
Carrai National Park
Oxley Wild Rivers National Park
Caprai State Forest
Yessabah State Forest
Willi Willi National Park
Kumbatine National Park
Kippara State Forest
Werrikimbe National Park
Mount Boss State Forest
Bellangry State Forest
Doyles River State Forest
PORT MACQUARIE-HASTINGS COUNCIL
Long Flat
Manilla
Bendemeer
Attunga
TAMWORTH REGIONAL COUNCIL
Kootingal
Oxley Vale
Tamworth
Tintinhull
Duri
WALCHA COUNCIL
Woolomin
Ogunbil
Werris Creek
LIVERPOOL PLAINS SHIRE
Nundle
Hanging Rock State Forest
Nundle State Forest
Nowendoc State Forest
Nowendoc
Riamukka State Forest
Mummel Gulf National Park
Enfield State Forest
Cotton-Bimbang National Park
A15
B56
B78

Legend
- Project Area
- LGA Boundary

Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Street Map

Coordinate System: GDA2020 MGA Zone 56
Date: 20/09/2024
Created By: VN
Drawing Size: A3
0 2.5 5 10Km
1:500,000

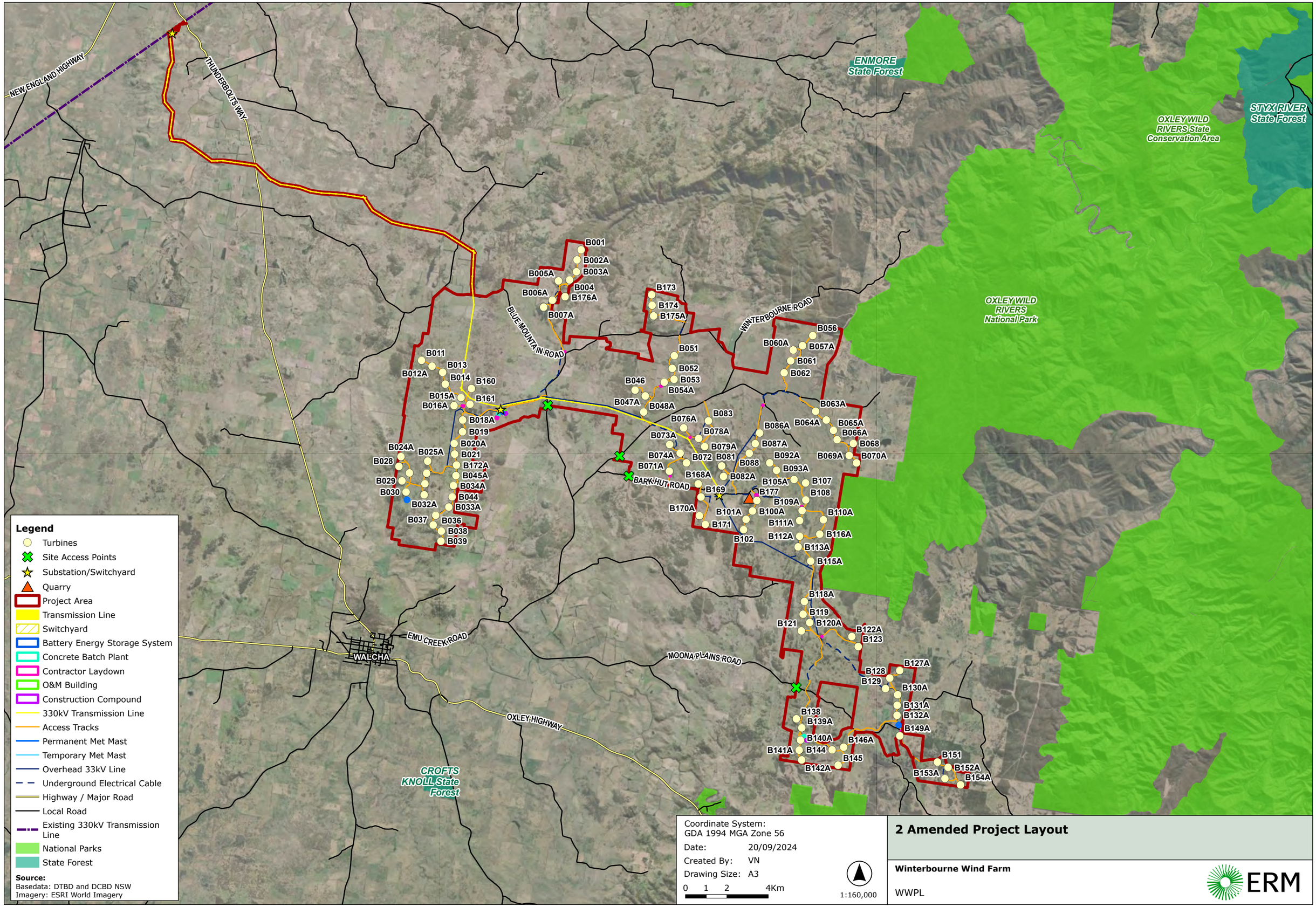
1 Regional Context

Winterbourne Wind Farm

WWPL

ERM

0526676_WWF_PDC_R0.aprx/1 Regional Context



2 Amended Project Layout

Winterbourne Wind Farm

WWPL

ERM

0526676_WWF_PDC_R0.aprx/2 Amended Project Layout

SITE SETTING AND SURROUNDING LAND USE

The Project Area is entirely located on land zoned RU1 – Primary Production.

The area surrounding the Project Area is generally also zoned RU1 – Primary Production, except for the Oxley Wild Rivers National Park to the east and south of the Project Area, which is zoned C1 – National Parks and Nature Reserves.

Walcha town centre is located approximately 6.5 km from the nearest proposed turbine (B034), where there is also a mixture of various land uses, including residential, commercial, industrial, and public recreation.

Table 2 provides a summary of surrounding land use. **Figure 3** shows the land zoning of the Project area. **Figure 4** shows the site setting and surrounding land use.

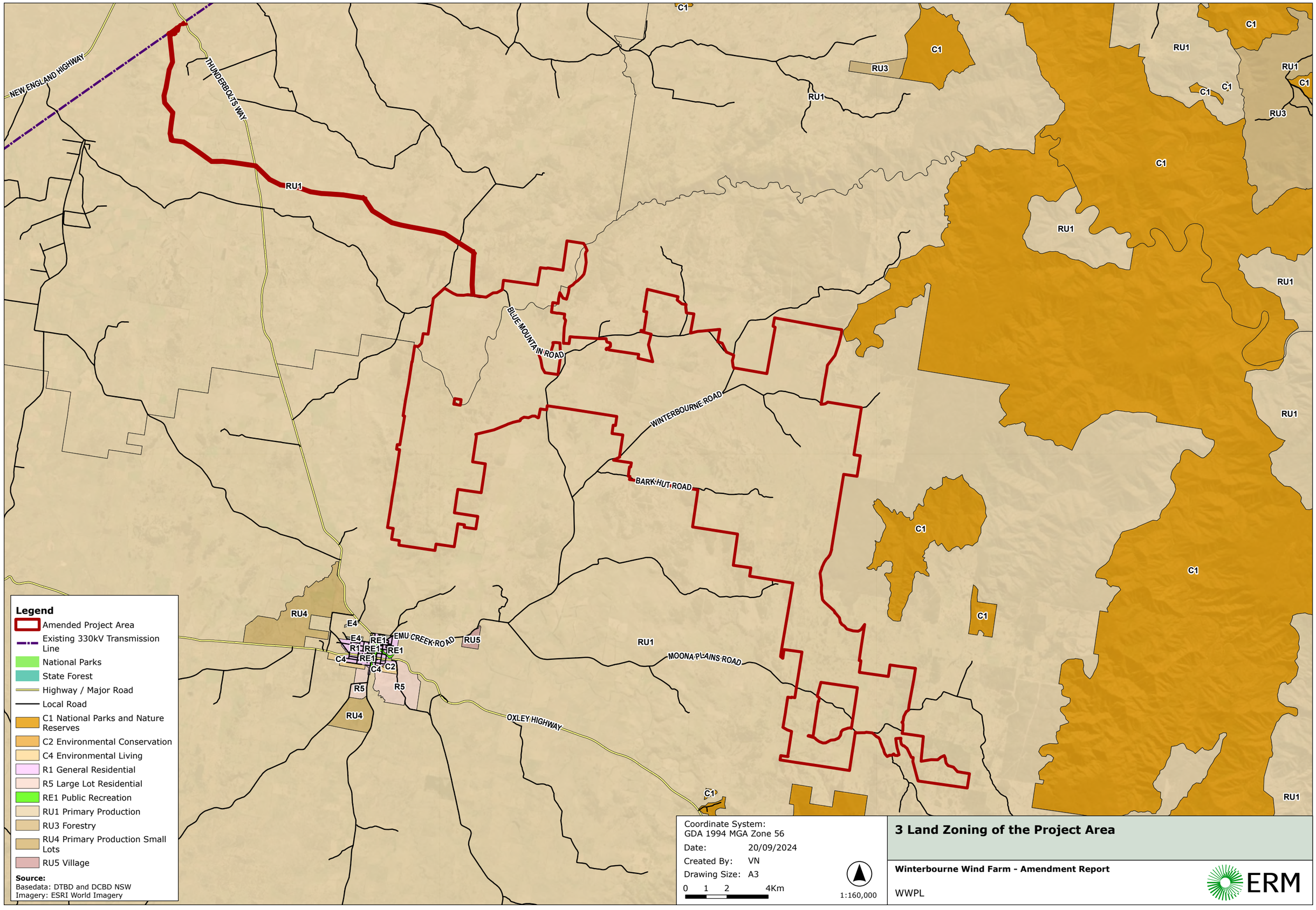
TABLE 2 SURROUNDING LAND USE

Land use	Summary
Conservation areas	Oxley Wild Rivers National Park is situated to the east and south of the Project Area and has a total area of 165,000 ha. It lies within the Macleay River catchment and mostly comprises gorges and deep river valleys on the upper reaches of the river and its tributaries, with relatively small areas of peripheral and residual tableland. The National Park was established in 1986 though the amalgamation of several smaller reserves. The park now comprises 12 separate blocks of land and includes a Crown lease in the Styx River area / region, which was declared as part of the national park in 1988. Oxley Wild Rivers National Park was inscribed on the World Heritage List in 1994 as one of six National Parks that make up the Gondwana Rainforests of Australia World Heritage Area. The Gondwana Rainforests of Australia contains the most extensive areas of subtropical rainforest in the world, large areas of warm temperate rainforests, and most of the world's Artic beech cool temperate rainforests. Two portions of the National Park, covering a total area of over 81,000 ha, are also declared as wilderness areas under the *Wilderness Act 1987* (NSW). These are: • Macleay Gorges Wilderness, which covers most of the central area of the national park and includes a large area of the upper Macleay River catchment. It was declared in 1996 with a total area of 59,338 ha; and • Kunderang Wilderness, located to the east of the Macleay Gorges Wilderness, and covering much of the eastern and south-eastern section of the Kunderang Brook catchment. It was declared in 1998 with a total area of 21,937 ha.
Mineral resources	A search of the NSW DPE MinView mapping tool was undertaken in September 2024. The search indicated that there are no current Exploration Licences (ELs) or Applications within the Project Area. EL8479 is about 1.5 km northeast of the Project Area. EL8479 was granted to Providence Gold and Minerals Pty Ltd on 21 October 2016.
Tourism and viewpoints	The township of Walcha offers a range of accommodation options, including hotels, motels, bed and breakfasts, and a caravan park. Within the wider locality there are a number of farm stay options, including Cheyenne Wilderness Retreat Farmstay, located 6.5 km north of the nearest WTG.

Land use	Summary
	Thunderbolts Way also has a tourism offering, as it functions as a scenic route from Sydney to the New England Tablelands and Queensland for those wanting to avoid the Pacific Highway and the New England Highway. Oxley Wild Rivers National Park is a main attraction of the region, which draws tourism through its many natural and cultural features. Accordingly, the *Plan of Management* (NSW NPWS, 2005) for the National Park lists recreation and tourism opportunities as one of its key values, which include: • Easily accessible lookouts and associated facilities at spectacular escarpment locations; • A range of short to long day and overnight walks; • Self-reliant recreation in the extensive network of gorges and wilderness areas; • Swimming, canoeing, rafting and 'liloing' along the creeks and rivers; and • Extended horse riding, bicycling and walking on the Bicentennial National Trail. Apsley Falls is considered one of the most popular locations and viewpoints within the national park, as it contains sealed 2WD access, walking tracks, septic toilets, and drinking water. Other popular sites within Oxley Wild Rivers National Park include: • Budds Mare campground, which offers an unsealed 2WD road, picnic area, walking track to Riverside campground, and views across the Apsley River and Macleay Gorges Wilderness; • Tia Falls, which is located among swimming holes, a gorge and a waterfall and offers an unsealed 2WD road, carpark, walking track, lookouts, separate picnic area with tables, gas barbecues and toilets; and • The Green Gully track, which is a 65 km walking track through the Apsley-Macleay Gorges.
Aviation activities	The Project Area is located within 30 nm (55.56 km) of Armidale Airport. In addition, the following aviation activities and operations are known to be undertaken in the areas surrounding the Project Area: • Aerial firefighting operations including firebombing activities; • Aerial application operations though fertiliser, pest and crop spraying on agricultural lands; • Emergency services operations including the Royal Flying Doctor Service; and • Military operations involving helicopters and the use of high-speed low-level military jet aircraft.
Existing electricity transmission network	An existing 330 kV transmission line is located approximately 20 km from the north west corner of the Project Area. The line is referred to as Line 85 and is owned and operated by TransGrid. The Project will connect to the existing TransGrid network through the construction of a new 330 kV overhead transmission lines and a new switching station located south of Uralla.

The development of a wind farm and ancillary infrastructure does not present any conflicts with its current, or potential future land uses. The Project Area is zoned RU1 – Primary production, and the land is currently used for grazing. Wind farms are very much compatible with existing farming operations as the turbines occupy only a small amount of land, and landowners can continue normal grazing or cropping activities adjacent to these.

Some sections of the Project Area border the Oxley Wild Rivers National Park, which is zoned C1 – National Parks and Nature Reserves. The development of the Project does not present a conflict to the existing or future use of this National Park. The Project is not proposed to be built on land that has any values that are like of the National Park. The project Area has largely been cleared and disturbed through past agricultural practices. As such, there is no risk that the Project is on land that may one day be incorporated into the National Park.

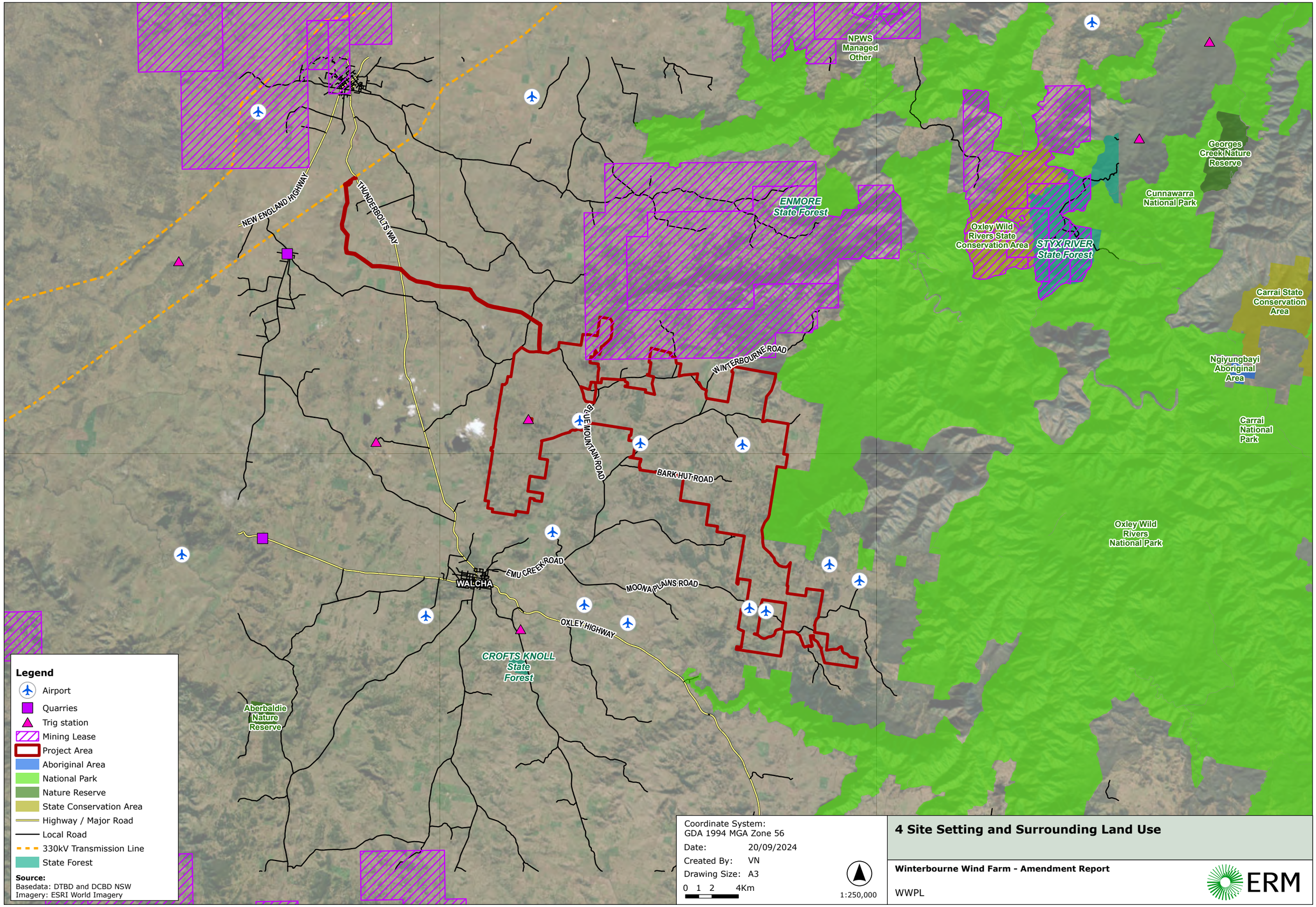


3 Land Zoning of the Project Area

Winterbourne Wind Farm - Amendment Report

WWPL

ERM



Coordinate System:
GDA 1994 MGA Zone 56

Date: 20/09/2024

Created By: VN

Drawing Size: A3

0 1 2 4Km

1:250,000

4 Site Setting and Surrounding Land Use

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

LAND DETAILS

The land within the Project Area is primarily freehold with a few Crown land and roads parcels. Land tenure of the Project Area, transmission line easement and relevant road upgrades are shown in **Table 3**.

The Applicant has entered "Option to Lease" and/or "Option for Easement" agreements with 45 landholders / entities hosting infrastructure (encompassing 32 landowner groups). Cadastral boundaries for the Project Area are shown in **Figure 5**.

TABLE 3 LAND TITLE OF THE PROJECT AREA

Landowner Group	Lot	DP	Title
Project Area			
Landowner Group 1	5	866652	Freehold
Landowner Group 2	98, 99, 100	1128816	Freehold
	48	756473	Freehold
Landowner Group 3	89	756474	Freehold
Landowner Group 4	80, 105	756504	Freehold
Landowner Group 5	1	1154216	Freehold
	91, 92, 93, 94, 96	755820	Freehold
	1, 2	207146	Freehold
Landowner Group 6	95, 96, 97	1128816	Freehold
Landowner Group 7	1	590453	Freehold
	2	710615	Freehold
	3	1221142	Freehold
	50, 58, 81, 95, 117, 118	756477	Freehold
Landowner Group 8	2	529780	Freehold
	47, 95	756504	Freehold
	351	873508	Freehold
	1, 2, 3, 4	1090942	Freehold
Landowner Group 9	1	120126	Freehold
	70	661944	Freehold
	37, 38, 39, 44, 45, 46, 67, 68, 112, 113, 123	765477	Freehold
	3	1111348	Freehold
	1	1221141	Freehold

Landowner Group	Lot	DP	Title
Landowner Group 10	1	131437	Freehold
	2	247741	Freehold
	6, 7, 24, 29, 68, 69, 70, 71, 72, 77, 83, 89	756504	Freehold
	1	1175912	Freehold
Landowner Group 11	34, 51, 52	756476	Freehold
	352	873508	Freehold
	123	1062583	Freehold
Landowner Group 12	2	595834	Freehold
	81	756504	Freehold
	1	1210945	Freehold
Landowner Group 13	1	127753	Freehold
	2	211479	Freehold
	26, 28, 38	756473	Freehold
	103, 109	756474	Freehold
	53, 84, 85, 86, 87	756477	Freehold
	8	1144370	Freehold
	2	1192373	Freehold
	11	1199615	Freehold
	120	804549	Freehold
Landowner Group 14	131, 132	756477	Freehold
	3	1238969	Freehold
	6	1147105	Freehold
Landowner Group 15	1	1069933	Freehold
Landowner Group 16	29, 32, 33, 36, 37	756473	Freehold
Landowner Group 17	46	756473	Freehold
	1	595834	Freehold
	2	1234912	Freehold
	51	1126596	Freehold
Landowner Group 18	1, 2	360166	Freehold
	20	756504	Freehold
	3	234456	Freehold

Landowner Group	Lot	DP	Title
Landowner Group 19	99	756504	Freehold
	4	234456	Freehold
	1	576324	Freehold
	1	211106	Freehold
	1, 2	810885	Freehold
	3	618977	Freehold
	7	866652	Freehold
	1	529780	Freehold
Landowner Group 20	55, 101, 102	756504	Freehold
Landowner Group 21	65, 104, 106, 107, 108, 119, 120, 140, 141,462	756492	Freehold
	53	756476	Freehold
	1	344471	Freehold
	5, 12, 13, 17, 18, 19, 60, 68, 69, 70, 72, 73, 74, 75, 76, 77, 101, 121	755820	Freehold
	2	344472	Freehold
Landowner Group 22	1	512960	Freehold
Landowner Group 23	2	512960	Freehold
	117	756492	Freehold
	33, 50	756476	Freehold
Landowner Group 24	B	381236	Freehold
	335, 336, 337, 364, 366, 369, 399	756502	Freehold
Landowner Group 25	1	1221143	Freehold
Landowner Group 26	10	1204696	Freehold
Transmission Line and Switching Station			
Landowner Group 27	92, 115, 116, 117, 129, 146, 180, 183, 189, 198, 199, 302, 303	755836	Freehold
	1	184356	Freehold
	1	126202	Freehold
	9	1237026	Freehold
	127	755829	Freehold
	2	1243987	Freehold
Landowner Group 28	114	755829	Freehold
	205, 206	755846	Freehold
Landowner Group 29	14, 33, 34, 39, 40, 42, 78, 87	755820	Freehold

Landowner Group	Lot	DP	Title
Landowner Group 30	45, 154, 155	755820	Freehold
Landowner Group 31	1	172254	Freehold
	1	1241971	Freehold
Landowner Group 32	B	372668	Freehold
Relevant Transport Route Road Upgrades			
N/A	7010	1058937	Crown Land
N/A	7031	1058953	Crown Land
N/A	5A	38704	Freehold
N/A	1	835733	Freehold
N/A	7016	94120	Crown Land
N/A	1	529780	Freehold
N/A	39	756504	Freehold
N/A	1	784322	Freehold
N/A	52	517948	Freehold

CROWN LAND

Broadly speaking, Crown land refers to any land which is held by the Crown and is not held in freehold by another person. Crown land is regulated by relevant State government legislation, principally the *Crown Land Management Act 2016* (NSW) and the *Roads Act 1993* (NSW) and certain requirements must be met before Crown land can be dealt with by, for example, being leased or sold. There are several parcels of Crown land where road upgrades are proposed (**Figure 6**), as well as several Crown Roads.

NEW ENGLAND HIGHWAY
THUNDERBOLTS WAY
BLUE MOUNTAIN ROAD
WINTERBOURNE ROAD
BARK HUT ROAD
EMU CREEK ROAD
WALCHA
MOONA PLAINS ROAD
OXLEY HIGHWAY

Legend

- Project Area
- DCDB_placepoint
- Highway / Major Road
- Local Road
- Cadastre

Landowner

- Landowner Group 1
- Landowner Group 2
- Landowner Group 3
- Landowner Group 4
- Landowner Group 5
- Landowner Group 6
- Landowner Group 7
- Landowner Group 8
- Landowner Group 9
- Landowner Group 10
- Landowner Group 11
- Landowner Group 12
- Landowner Group 13
- Landowner Group 14
- Landowner Group 15
- Landowner Group 16
- Landowner Group 17
- Landowner Group 18
- Landowner Group 19
- Landowner Group 20
- Landowner Group 21
- Landowner Group 22
- Landowner Group 23
- Landowner Group 24
- Landowner Group 25
- Landowner Group 26
- Landowner Group 27
- Landowner Group 28
- Landowner Group 29
- Landowner Group 30
- Landowner Group 31
- Landowner Group 32

Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Imagery

Coordinate System:
GDA 1994 MGA Zone 56
Date: 20/09/2024
Created By: VN
Drawing Size: A3
0 1 2 4Km
1:160,000

5 Land cadastre - project area

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

NEW ENGLAND HIGHWAY
THUNDERBOLTS WAY
BLUE MOUNTAIN ROAD
WINTERBOURNE ROAD
BARK HUT ROAD
EMU CREEK ROAD
WALCHA
MOONA PLAINS ROAD
OXLEY HIGHWAY

Legend
- Project Area
- Highway / Major Road
- Local Road
- Cadastre
- Crown Land

Source:
Basedata: DTBD and DCBD NSW
Imagery: ESRI World Imagery

Coordinate System:
GDA 1994 MGA Zone 56
Date: 20/09/2024
Created By: VN
Drawing Size: A3
0 1 2 4Km
1:160,000

6 Land cadastre - Crown land and paper roads

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

0526676_WWF_PDC_R0.aprx/6 Land cadastre - Crown land and paper

ENVIRONMENTAL SETTING

The Project Area has historically been used for agricultural purposes, noting land clearing of the area to allow for agricultural utility as shown in **Figure 7**.

The Project Area is characterised by hills and ridgelines that rise out of the Walcha Plateau.

The Project Area is located within the Macleay River catchment. While there are a number of small local creeks present within the Project Area, for much of the year they may not have running water. There are no wetland areas or lakes (other than small farm dams) within the Project Area.

The Soil and Land Capability Mapping data for NSW (OEH, 2012) suggests that there is a range of the land and soil capability (LSC) classes within the Project Area, as discussed in Section 6.8.3.2 of the EIS.

A search of the *Australian Soil Classification (ASC) Soil Type Map of NSW* (OEH, 2017) reveals that the Project Area is largely dominated by the Kurosols soil type. Kurosols have strong texture contrast between A horizons and strongly acidic B horizons, and with low water holding capacity Kurosols are often acidic. They tend to have low fertility and land use is generally restricted to grazing pastures.

FIGURE 7 CLEARED AGRICULTURAL LAND IN THE PROJECT AREA

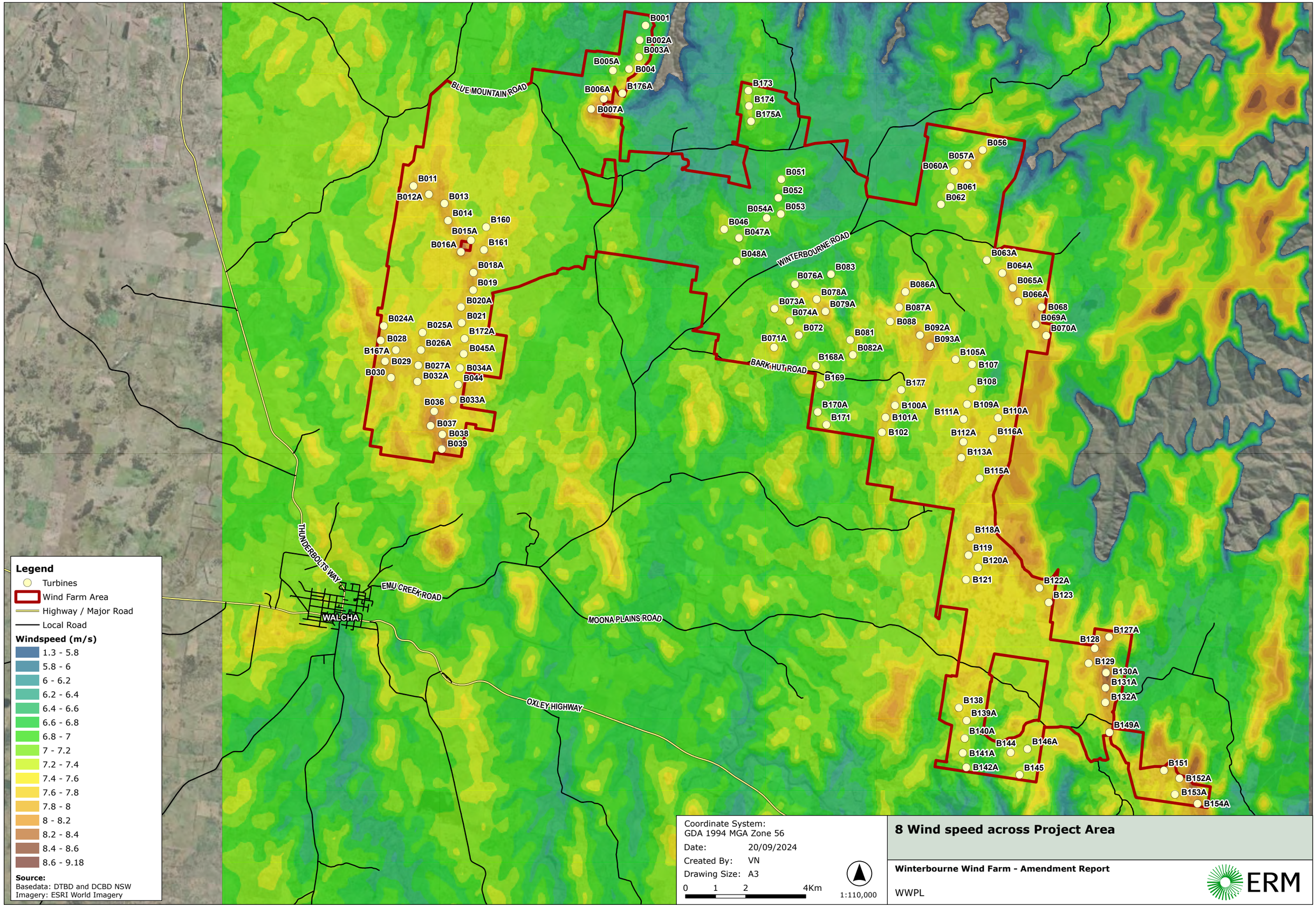
WIND RESOURCE

The Australian Energy Market Operator (AEMO) (2020) defines a candidate REZ as an area having annual average wind speeds above 6 metres per second (m/s). Comparatively, the U.S Energy Information Administration (2021) defines optimal wind energy zones areas where annual average wind speed is at least 6.5 m/s.

The Applicant has been monitoring the wind resource of the Project Area since 2009 using onsite meteorological monitoring masts. The Project Area consists of elevated ridgelines with areas of good exposure to prevailing wind directions. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2012) has stated that in Australia, most wind farms are situated along ridgelines or coastal cliffs to take advantage of the strong wind resources offered along the high terrain and coastal cliffs, respectively. Ridgelines take advantage of the acceleration of the wind due to the sudden change in topography.

As seen in **Figure 9**, the WTG layout has been designed to capture high and consistent wind speeds, typically between 6.5 and 9.5 m/s. Generally, the WTGs are proposed to be located on hilltops and ridgelines where the wind speed tends to be higher, and the winds blow more steadily. The placement of the wind turbines in these locations is critical to the viability of the Project. The prevailing wind directions reinforce the suitability of the location and orientation of the turbines in this proposal. However, their location also considers the location of nearby residential dwellings to minimise potential noise and visual impacts, and areas of high biodiversity value to minimise impacts to flora, fauna and vegetation communities.

Monitoring data collected over many years reveals that the daily wind profile in Walcha is highly complementary to wind energy generation; that is, the wind tends to be stronger at night and in the morning, and relatively lower during the day. This means that the proposed Project will, on average, generate energy during periods when solar energy production tends to be low or zero, which will help to ensure diversity in the generation mix as the energy system transitions from fossil fuels to renewable resources.



8 Wind speed across Project Area

Winterbourne Wind Farm - Amendment Report

WWPL

ERM

NEARBY MAJOR PROJECTS

The Project Area is within proximity to several SSD electricity generation projects, which are identified as proposed, under construction, or operational. These include, but are not limited to, wind farms, solar farms, BESS facilities, and a pumped hydro energy storage project.

Section 6.11 of the Amendment Report provides a detailed discussion of the cumulative impacts of the Project in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2021d).

POTENTIAL DWELLINGS

APPROVED DWELLINGS AND DWELLINGS UNDER ASSESSMENT

Based on a review of publicly available development application records on the Walcha Council and Uralla Shire Council websites where the following approved dwelling occurs within a 5 km radius of a proposed turbine:

- One dwelling has been approved in the past 5 years. The potential dwelling was approved in 2021 with respect to Lot 351 DP1146040; and
- No development applications for potential dwellings within 5 km of a proposed turbine location are currently under assessment.

The noise and visual impacts with respect to the one potential dwelling that has been approved were assessed. The one potential dwelling was assessed as achieving the operational noise criteria and having a low visual impact rating (without any mitigation measures).

DWELLING ENTITLEMENTS

Wind Energy Guideline for State significant wind energy development by NSW Planning and Environment, December 2016 states that DPE and the consent authority will consider existing dwelling entitlements on land within the vicinity of the wind energy project in the assessment and determination of wind energy projects.

Existing dwelling entitlements are available under the provisions of Walcha LEP and Uralla LEP and the provisions of Part 3D Inland Housing Code of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* (Inland Housing Code). Exercising existing dwelling entitlements requires development consent under the EP&A Act.

The controls for establishing existing dwelling entitlements in the Walcha LEP, Uralla LEP and the Inland Housing Code are multifaceted and not simply determined by lot size. Additional development standards require the consideration of (among other matters) provisions of previous repealed versions of the LEPs, lot aggregations as at a date in 1995 in the case of Walcha LEP and 1975 in the case of Uralla LEP (existing land holdings). Records of dwelling entitlements are not readily available to the public. Similarly, an assessment of compliance with the requirements and standards of the Inland Housing Code cannot reasonably be undertaken in the absence of detailed information on house designs, site conditions and compliance with standards.

Potential dwelling entitlements were determined by identifying all lots within a 5 km radius of any proposed turbine locations and excluding:

- Crown land or State-owned land;
- Lots with associated dwellings;
- Lots with existing dwellings that have been assessed in the EIS and, where relevant, this Amendment Report;

- Lots that do not meet the applicable minimum lot size development standard for the erection of dwelling houses under clause 4.2A of the Walcha LEP and Uralla LEP;
- Lots that do not have direct access to a public road or formed Crown road; and
- Lots with over 66% bushfire prone land within the relevant lot.
- Applying the above criteria, 15 lots were identified.

Of the 15 lots, 13 lots were assessed as fully achieving the operational noise criteria, with two lots (Lot 64 DP756477 and Lot 30 DP756476) assessed as partially achieving the operational noise criteria.

Potential visual impact at these 15 lots is more difficult to assess given that the potential location, orientation, elevation, design and surrounding vegetation of future dwellings is unknown. However, it is reasonable that mitigation methods may be incorporated into the design process for any future development applications for a dwelling on any of these lots to reduce visual impacts to an acceptable level.

PROJECT COMPONENTS AND LAYOUT

OVERVIEW

The Project Area encompasses approximately 21,844 ha. **Figure 2** shows the Project layout including the WTGs, access tracks and supporting infrastructure. The layout of Project infrastructure was determined considering:

- Maximising exposure to the wind resource through suitable positioning of WTGs onsite including elevated locations within the Project Area and suitable spacing between WTGs to reduce turbulence (i.e. "wake effect");
- Minimising environmental impacts and protecting sensitive areas and receptors identified through specialist assessments (including but not limited to biodiversity, heritage, visual and noise related issues); and
- Optimising accessibility of Project components through identifying topographic constraints and strategically positioning Project components to minimise earthworks required during construction.

WIND TURBINE GENERATORS

The Project will involve the construction and operation of up to 118 WTGs within the Project Area. The indicative WTG model is the Vestas V162-6.2 MW, which based on current technology represents the 'worst-case' impact assessment for the Project, for example in the modelling of noise and visual impacts on nearby receivers. The WTGs will be semi-variable speed, pitch-regulated machines with the rotor and nacelle mounted on a tower with an internal ladder or service lift. The exact size and type of WTG will be based on subsurface soil conditions and the results of geotechnical surveys undertaken during the detailed design phase, prior to commencement of construction at each WTG site.

Figure 10 illustrates typical components of a WTG. **Table 4** details specifications of the indicative WTG model. **Table 5** provides the central coordinates and maximum elevation of the WTGs, and **Table 6** provides coordinates of ancillary infrastructure.

TABLE 4 INDICATIVE WTG MODEL SPECIFICATIONS

Feature	Specifications
Model	Vestas V162-6.2 MW
Power regulation	Pitch regulated with variable speed
Operating data *Rated power* *Cut-in wind speed* *Cut-out wind speed* *Wind class* *Standard operating temperature range*	 6,200 kW 3 m/s 25 m/s International Electrotechnical Commission (IEC) S -20 to 45 degrees Celsius
Sound power *Maximum*	 104.8 dB(A)
Rotor *Rotor diameter* *Swept area* *Aerodynamic brake*	 162 m 20,612 m^2 Full blade feathering with 3 pitch cylinders
Tip height	230 m
Hub height	149 m
Electrical *Frequency* *Converter*	 50/60 Hz Full scale
Gearbox *Type*	 Two planetary stages

TABLE 5 WTG COORDINATES

WTG No.	***Coordinates (GDA94 zone 56)***		***WTG No.***	***Coordinates (GDA94 zone 56)***	
	X	***Y***		***X***	***Y***
B001	375828.00	6590869.00	***B081***	382630.00	6580415.00
B002A	375630.95	6590380.85	***B082A***	382718.74	6579911.25
B003A	375607.17	6589817.19	***B083***	381990.96	6582601.00
B004	375275.00	6589423.00	***B086A***	384465.43	6582015.12
B005A	374739.02	6589367.21	***B087A***	384254.99	6581497.31
B006A	374437.76	6588434.78	***B088***	383962.00	6581030.00
B007A	374015.23	6588094.06	***B092A***	384948.94	6580575.21
B011	368111.42	6585529.00	***B093A***	385283.59	6580201.25
B012A	368617.23	6585250.70	***B100A***	384120.92	6578237.75
B013	369137.00	6584946.00	***B101A***	383806.31	6577835.78
B014	369258.79	6584380.91	***B102***	383689.00	6577341.00
B015A	370020.49	6583728.37	***B105A***	386132.84	6579765.06
B016A	369686.44	6583340.09	***B107***	386685.00	6579594.00
B018A	370103.07	6582648.43	***B108***	386692.94	6578781.82

WTG No.	Coordinates (GDA94 zone 56)		WTG No.	Coordinates (GDA94 zone 56)	
	X	Y		X	Y
B019	370091.17	6582073.80	B109A	386514.93	6578268.93
B020A	369691.00	6581508.00	B110A	387546.14	6577821.74
B021	369712.00	6580984.00	B111A	386399.51	6577778.75
B024A	367118.68	6580874.55	B112A	386396.15	6577024.91
B025A	368409.88	6580658.72	B113A	386326.36	6576502.46
B026A	368356.23	6580073.19	B115A	386933.87	6575815.68
B027A	368271.86	6579562.57	B116A	387375.31	6577122.25
B028	367018.00	6580394.00	B118A	386628.78	6573856.53
B029	367163.13	6579706.89	B119	386565.88	6573252.83
B030	367362.24	6579161.96	B120A	386885.00	6572842.00
B032A	368242.26	6579026.12	B121	386483.00	6572440.00
B033A	369429.82	6578426.62	B122A	388921.34	6572161.12
B034A	369657.81	6579480.47	B123	389233.12	6571683.64
B036	368798.75	6578040.75	B127A	391236.10	6570529.56
B037	368676.55	6577561.90	B128	390760.00	6570151.00
B038	369072.40	6577273.08	B129	390556.00	6569657.00
B039	369053.00	6576781.18	B130A	391137.03	6569348.80
B044	369592.00	6578929.00	B131A	391119.41	6568847.22
B045A	369779.28	6579952.87	B132A	391112.44	6568357.69
B046	378440.00	6584091.00	B138	386244.46	6568183.94
B047A	378931.22	6583806.58	B139A	386501.85	6567755.66
B048A	378855.92	6583032.62	B140A	386438.60	6567164.81
B051	380341.00	6585758.00	B141A	386376.00	6566677.00
B052	380240.00	6585140.00	B142A	386494.59	6566201.13
B053	380324.00	6584604.00	B144	387968.00	6566691.00
B054A	379849.79	6584469.35	B145	388261.00	6565947.00
B056	387034.33	6586730.30	B146A	388526.47	6566811.77
B057A	386537.93	6586232.30	B149A	391248.10	6567360.70
B060A	386087.71	6586021.70	B151	393063.00	6566093.97
B061	385968.00	6585507.00	B152A	393577.09	6565837.32
B062	385648.58	6584921.05	B153A	393427.30	6565304.60
B063A	387172.80	6583064.29	B154A	394179.80	6564992.30

WTG No.	Coordinates (GDA94 zone 56)		WTG No.	Coordinates (GDA94 zone 56)	
	X	Y		X	Y
B064A	387688.24	6582634.46	B160	370523.23	6584164.40
B065A	388036.05	6582144.80	B161	370453.72	6583408.31
B066A	388212.53	6581686.18	B167A	367522.85	6580074.78
B068	388994.20	6581507.71	B168A	381493.59	6579550.37
B069A	388799.49	6580925.37	B169	381630.99	6578923.00
B070A	389151.90	6580561.06	B170A	381548.14	6578015.92
B071A	380100.04	6580159.18	B171	381841.90	6577595.01
B072	380924.00	6580571.00	B172A	369807.09	6580456.74
B073A	380114.11	6581450.74	B173	379245.00	6588702.00
B074A	380620.85	6581041.67	B174	379266.00	6588197.00
B076A	380792.50	6582265.60	B175A	379333.59	6587680.54
B078A	381514.88	6581759.14	B176A	375056.00	6588610.73
B079A	381804.65	6581363.32	B177	384328.22	6578748.36

TABLE 6 ANCILLARY INFRASTRUCTURE COORDINATES

Ancillary Infrastructure	Coordinates (GDA94 zone 56)		Ancillary Infrastructure	Coordinates (GDA94 zone 56)	
	X	Y		X	Y
Contractor Laydown #1	370115.93	6583323.07	BESS	372026.77	6583002.66
Contractor Laydown #2	369093.7	6580045.5	West Substation	371943.00	6583164.00
Contractor Laydown #3	371752.50	6582749.94	East Substation	382517.00	6579028.00
Contractor Laydown #4	375038.97	6585941.46	Switchyard	356058.00	6601369.00
Contractor Laydown #5	379689.22	6584280.94	Met Mast 1	367401.47	6578783.97
Contractor Laydown #6	380132.23	6579941.42	Met Mast 2	391188.85	6567893.25
Contractor Laydown #7	381093.08	6581797.97	O&M Building	372116.74	6583059.36
Contractor Laydown #8	383305.27	6579960.96	West Compound (Main)	372179.63	6582959.58

Ancillary Infrastructure	Coordinates (GDA94 zone 56)		Ancillary Infrastructure	Coordinates (GDA94 zone 56)	
	X	Y		X	Y
Contractor Laydown #9	384308.04	6578995.48	***Central Compound (Fly)***	382617.19	6579074.79
Contractor Laydown #10	384619.34	6583353.88	***East Compound (Fly)***	386751.52	6567149.67
Contractor Laydown #11	386500.45	6578447.57	***Concrete Batch Plant (West)***	371799.84	6582893.99
Contractor Laydown #12	387468.55	6572174.01	***Concrete Batch Plant (Central)***	383250.68	6579872.90
Contractor Laydown #13	386775.95	6567230.45	***Concrete Batch Plant (South)***	386603.57	6567346.28
Contractor Laydown #14	391317.21	6567588.81			

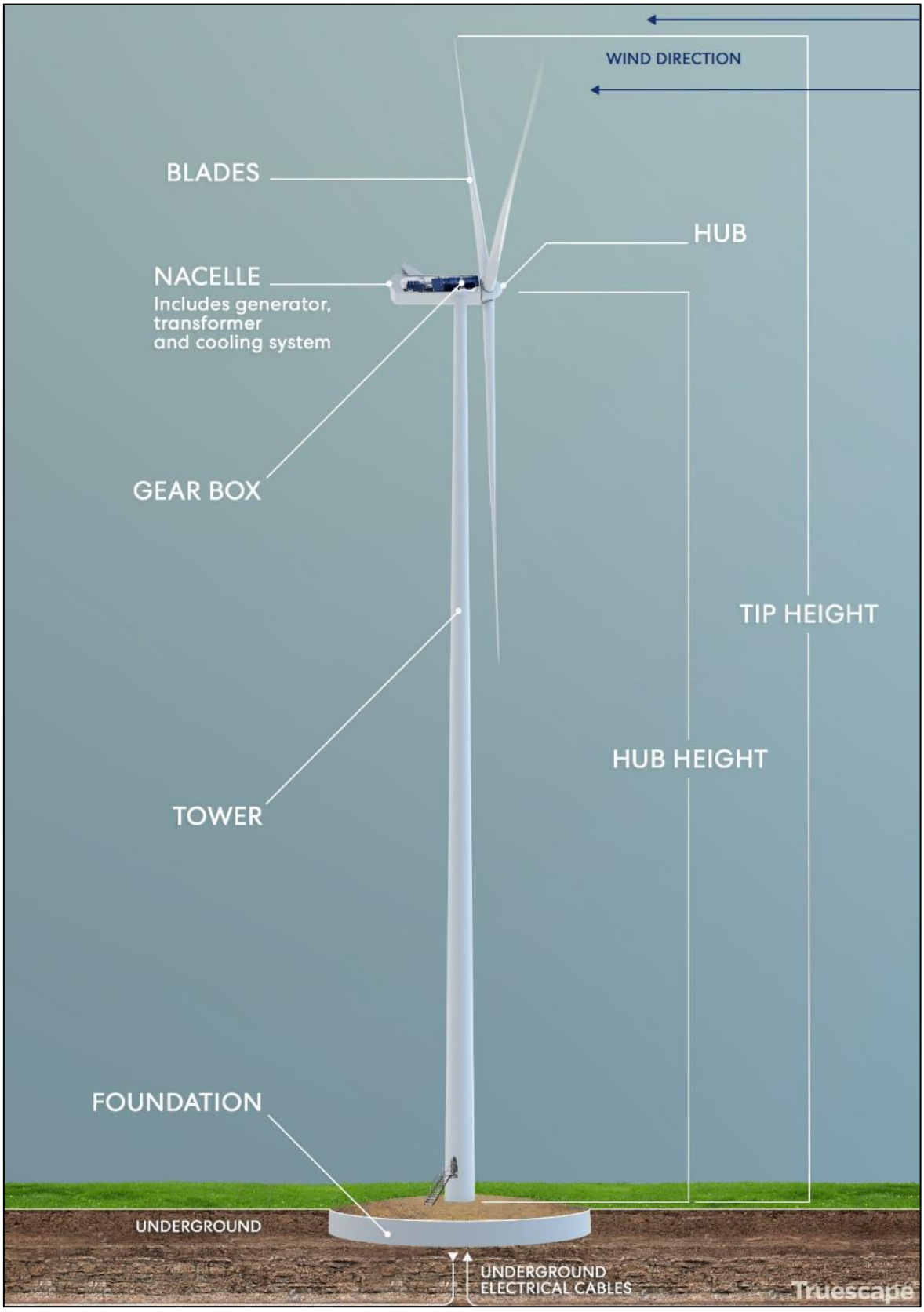


FIGURE 9 TYPICAL COMPONENTS OF A WTG (INDICATIVE, NOT TO SCALE)

The final WTG model may differ, depending upon the outcomes of the assessment and approval process as well as latest technology that may also be suitable for the site, and accordingly will be confirmed during the detailed design phase of the Project. The selected WTG model will comply with the relevant building standards and codes, including:

- IEC WT 01:2001 System for Conformity Testing and Certification of Wind Turbines — Rules and procedures;
- IEC 61400-1:2005 Wind turbines Part 1: Design requirements;
- IEC 61400-12-1:2005 Wind turbines Part 12-1;
- IEC 61400-23 WTG systems – Part 23;
- IEC 62305-1/3/4 Protection against lightning; and
- IEC 61400-4:2012 Wind turbines — Part 4: Design requirements for WTG gearboxes.

To achieve visual consistency through the landscape, the WTGs will include:

- Uniformity in the colour, design, height and rotor diameter;
- Use of simple muted colours and non-reflective materials to reduce visibility and avoid drawing the eye (i.e. RAL 7035 light grey);
- Avoidance of unnecessary lighting, signage and logos; and
- Serrated blades to minimise noise attenuation.

TOWERS

The WTG tower consists typically of composite metals and may consist of around seven individual flanged sections which are bolted together. The tower could also consist of a concrete bottom section with upper tubular steel sections. The tower supports the WTG nacelle, rotor hub and blades. The towers include an internal ladder and service personnel lift. Each tower is assembled onsite and anchored to a concrete foundation.

FOUNDATIONS

The exact size and type of tower foundation will be based on subsurface soil conditions and the results of geotechnical surveys undertaken during the detailed design phase, prior to commencement of construction at each WTG site.

The three common types of foundations used for WTGs are gravity foundations, rock anchors and pile foundations or a combination of these depending on geotechnical conditions. The most common type of foundation is the gravity foundation in which an area is excavated suitable to support the burying of a "pedestal" design of concrete and reinforced steel sufficient to create a stable foundation. These are typically 3-5 m deep and 20 to 30 m in diameter depending on the tower design. The volume can be between 600-900 m^3 depending on the turbine, geotechnical conditions and other environmental factors.

WTG foundations are excavated using mechanical equipment, assisted by controlled blasting if required due to ground conditions. The exact design of the WTG foundations will depend on localised geotechnical conditions and the final type of foundation adopted. Topsoil and spoil from excavations will be stockpiled for reuse to backfill over the foundation and for vegetation rehabilitation of the Project Area. Excess materials will be utilised at other parts of the Project Area or exported offsite for beneficial reuse at an approved location or licensed landfill facility. **Figure 11** shows a typical gravity foundation**.** The gravity foundation is then backfilled so that only the connection to the base tower section is visible above ground as shown in **Figure 12**.

FIGURE 10 TYPICAL FOUNDATION IN CONSTRUCTION

FIGURE 11 TYPICAL FOUNDATION POST-CONSTRUCTION

NACELLE

The nacelle is the housing that sits on the top of the turbine tower and accommodates the generator, gearbox, transformer, control systems, and pitch and yaw drives. The nacelle structure consists of a cast iron base frame and a rear girder structure. The base frame is the foundation for the drive train and transmits forces from the rotor to the tower through the yaw system. The bottom surface is machined and connected to the yaw bearing and the yaw gears are bolted to the base frame. The crane girders are attached to the rear structure.

The nacelle cover is attached to the nacelle structure. The nacelle cover is made of fibreglass. Hatches are positioned in the floor for lowering or hoisting equipment to the nacelle and evacuation of personnel. The roof section is equipped with skylights. The skylights can be opened from inside the nacelle to access the roof and from outside to access the nacelle. Access from the tower to the nacelle is through the base frame.

WIND TURBINE ROTOR AND ROTOR NACELLE ASSEMBLY

The rotor includes the three blades and the hub which connects the blades to the gearbox. The blades consist of fibreglass reinforced with epoxy, carbon fibre and a solid metal tip. A central WTG control unit (microprocessor) controls the rotational speed of the rotor, and the pitch of the blades based on the prevailing wind conditions. The blades are continuously positioned to optimise the pitch angle, enabling the rotor to maximise energy production and ensure the safe and reliable operation of the WTG. At wind speeds of 25 m/s the microprocessor controls the pitch of the blades to stop the WTG rotating, which minimises wear on the turbine components.

The rotor is connected to the gearbox through a main shaft and bearing made of cast iron. The main shaft transfers force to the bearing and torque to the gearbox, and the main gear converts the rotation of the rotor to generator rotation which generates electricity. The main shaft, gearbox, generator and transformer are enclosed within the nacelle and are collectively called Rotor Nacelle Assembly. The transformer is required to 'step-up' the voltage of the electricity produced by each WTG to the onsite distribution voltage of 33 kV.

HARDSTANDS

A permanent hardstand will be constructed adjacent to the base of each WTG to enable the assembly and erection of the tower, nacelle and blade components. Each hardstand will consist of gravel, which will be compacted and graded suitably to form a roughly rectangular area for storage of WTG equipment and crane assembly prior to installation. The hardstand area will be level with the WTG foundation with a bearing capacity of 250 kPa. In addition, the hardstand will also include arrangements for crane boom assembly and support pad to store blades prior to construction.

The towers, nacelles and blades will be lifted off delivery trucks using mobile cranes. Larger cranes will then assist in the installation of the tower sections, nacelle and blades.

The total area of permanent hardstands will be approximately 94.4 ha, where each hardstand per WTG will be approximately 0.8 ha subject to the topography of the surrounding land.

Figure 13 illustrates an example hardstand area at the Cherry Tree Wind Farm in Victoria.

A portion of the hardstand will be maintained during Project operations to allow for maintenance and future decommissioning of the WTGs; however, there may be an opportunity to revegetate the assembly portions of the hardstand to allow grazing activities to resume in these areas if not required for wind farm operations.

FIGURE 12 TYPICAL HARDSTAND AREA

ELECTRICAL RETICULATION

TRANSMISSION LINE

High Voltage Transmission

A 330 kV single or double circuit, three phase, twin conductor bundle overhead transmission line connection will connect the on-site substations to a new switchyard approximately 7 km south of Uralla, NSW, with a length of approximately 44 km. These are components of the Project to which this application relates.

The indicative design of the overhead 330 kV transmission line is:

- Approximately 40 m high, single circuit lattice steel tower, spaced approximately 500 m apart, subject to terrain and final design;
- Towers generally require concrete footings for each of the four legs and a temporary disturbance area of approximately 30 m in diameter during construction;
- Twin aluminium conductor bundles attached to ceramic insulators in the centre and the ends of the tower cross arm;
- Each conductor bundle will include orange balls for visual identification and an earth shield wire/s, protecting the line from lighting strikes; and
- 60 m wide easement with unformed access tracks up to 3 m wide (equivalent to a farm track) to facilitate operational access by TransGrid (for maintenance, repair and hazard reduction).

Figure 14 provides an example of the typical steel lattice tower structure proposed for the transmission line.

It may also be possible to utilise a monopole design in place of a steel lattice tower (refer **Figure 15**). Monopoles would be up to 50 m high and spaced approximately 200-250 m apart, subject to terrain. The monopoles would utilise a concrete footing.

Access to the transmission line for construction will be via existing property accesses and farm tracks.

For the safe operation of the transmission line, certain activities will be restricted within the easement area such as planting and growing trees, construction of buildings, or erection of antennae or masts. The transmission line will not affect the ongoing use of the land for agricultural purposes such as grazing.

FIGURE 13 TYPICAL STEEL LATTICE TOWER STRUCTURE

FIGURE 14 TYPICAL STEEL POLE STRUCTURES

Medium Voltage Reticulation

The internal electrical reticulation network, which connects the WTGs to the north and south onsite substations, will comprise about 210.5 of 33 kV electrical cable consisting of about 25.6 km of overhead and 184.9 km of underground cables. WTGs are connected in strings (typically between 3 to 6 WTGs per string), which are then connected to the onsite substations. Underground cabling will be in subsurface trenches, which generally run parallel to access tracks. Where deviation from the access tracks is required due to geotechnical or other constraints, or to reduce overall cable length, these deviations will be positioned to minimise impact to ecological and heritage areas of high significance.

The trenching for underground electrical cabling will be approximately 0.6 m wide per circuit by 1.0 m deep, located within a works area of approximately 5 m to accommodate the mobile plant and stockpiling of spoil and bedding sand. Trenches will be progressively backfilled during the construction works.

Prior to excavating the cable trench, the topsoil is stripped and windrowed separately from excavated subsoils to preserve soil structure and the seedbank. The electrical reticulation is placed on bedding sands at approximately 750 mm below ground level. Once the cables are installed, another layer of sand may be placed above the cable prior to the trench being backfilled with excavated material with topsoil respread providing a soil profile that assists revegetation of the disturbed areas. Cables will be protected in accordance with *Australian Standard (AS) 3000:2007 Electrical Installations*.

Where ground conditions are not suitable for open cut trench installation, or to reduce biodiversity impact, overhead 33 kV electricity lines will be installed using steel poles spaced about 200 to 250 m apart.

Telecommunications

Telecommunications ensure the secure control of the WTGs and substations. This includes emergency shutdowns and management of any maintenance requirements. Fibre optic cables will be installed with the electrical reticulation system.

ONSITE SUBSTATIONS

Two 33/330 kV substations will be constructed in the development footprint to transform the 33 kV received from the internal electrical reticulation network to the 330 kV transmission voltage.

While the design is yet to be finalised, it is expected that each substation would occupy an area of 100 m x 100 m (approximately 1 ha) and will contain transformers, associated high voltage switchgear and control and protection equipment as well as a communication tower, and drainage and oil containment system. A security fence will surround the substations. Gravel hardstand will be placed under and around the substation compounds to restrict vegetation growth and provide a safe working environment in accordance with the relevant Australian Standards.

Internal structures within the fenced substation compounds will include:

- Control building/control room, switch room with a height of 5 m;
- Two 33/330 kV power transformers with a height of 10 m;
- Approximately six lightning protection masts which are 25 m high;
- Associated high voltage switchgear including busbars, circuit breakers, disconnectors – approximately 10 m high;
- A communication tower (up to 80 m high); and
- A 20 m bushfire APZ will surround the substation.

SWITCHYARD

A switchyard with approximate dimensions of 200 m by 250 m for physical electrical components including required earth works will be located within a site with a maximum expected area of 5 ha. The switchyard will connect the Project transmission line to the adjacent 330 kV TransGrid Tamworth to Armidale overhead transmission line network. Road access to Thunderbolts Way will be required for the switchyard.

BATTERY ENERGY STORAGE SYSTEM (BESS)

A BESS will be located adjacent to the north substation, occupying an area of approximately 100 m x 100 m. Indicatively, the BESS would utilise lithium-ion technology with a rated capacity of up to 100 MW / 200 MWh (subject to detailed economic and technical considerations). The BESS will likely utilise a pre-assembled and pre-tested, fully integrated system that includes the battery modules, inverters, thermal management system, circuit breakers and other controls.

A battery Heating, Ventilation, and Air Conditioning (HVAC) system will actively cool the BESS. The BESS will be temperature monitored, and the automated control system will stop its operation if the temperature exceeds pre-set levels to prevent overheating (e.g. if all air conditioning units fail). The BESS will include a gravel surface and a 20 m APZ to minimise the risk of fire escaping from the facility and the risk of external fire affecting the facility.

The model and design specification of the BESS will be determined during detailed design. However, the final model and design specifications will remain within the specifications assessed in the State Environmental Planning Policy (SEPP) *SEPP33 Preliminary Hazard Analysis* (PHA) (Sherpa, 2021). **Table 8** provides indicative specifications of the BESS. The typical layout of the BESS is provided in **Figure 16**.

TABLE 7 INDICATIVE BESS DESIGN

Item	Information
Indicative technology	Lithium-ion
Battery enclosure	Outdoor rated cabinets on concrete pad with a gravel bench around it and a security fence. Approximate size of enclosure is 100 m x 100 m
Battery quantity (no. of cabinets, modules)	▪ 100 MW / 200 MWh system ▪ Each cabinet is 1.25 MW / 2 hours (so 2.5 MWh within each cabinet) ▪ 80 cabinets ▪ Each cabinet has 15 battery modules and 22 inverter modules ▪ Output is 480 V, with external medium voltage transformers to step up to 33 kV
Battery HVAC system type	▪ Battery modules, inverters, thermal management and cooling system, and LV circuit breakers, fully integrated and tested at the factory ▪ The thermal system includes fully enclosed loop liquid thermal management system, includes ethylene glycol 50/50 mix that runs through battery modules and inverters
Fire protection system	To create a significant fire in the BESS, the enclosure of the battery unit needs to be subject to an extreme external event, such as direct exposure to a large prolonged fire or severe physical impact. A single cell thermal runaway does not propagate to neighbouring cells as demonstrated in testing per UL and IEC standards. Validated large-scale fire testing has shown that in the event of a fire, the battery storage systems perform in a safe and controlled manner, consuming themselves slowly without explosive bursts, deflagrations, or unexpected hazards, and without propagating to neighbouring enclosure units (TESLA, 2020).

Item	Information
	Installation, operations and maintenance of the battery storage system will be conducted by trained personnel in accordance with relevant procedures. Technical guidance on firefighting measures will be incorporated into an Emergency Response Plan and Fire Management Plan to be prepared prior to construction commencing. Water spray has been deemed safe as an agent for use on exposed Tesla Energy Products and is considered the preferred agent for suppressing lithium-ion battery fires (TESLA, 2020). A cooling water supply will be located onsite.

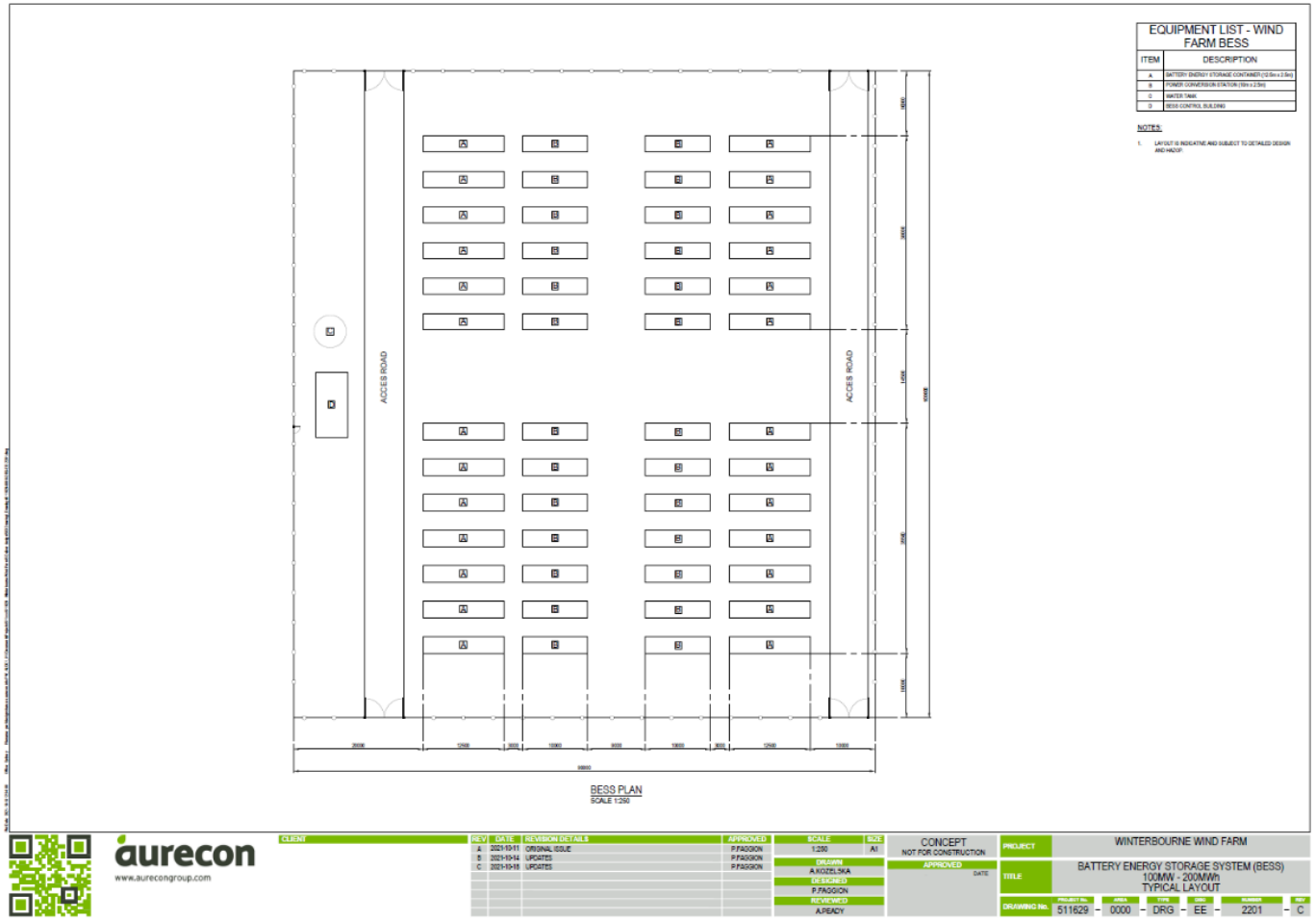


FIGURE 15 BESS 100MW/200MWH TYPICAL LAYOUT

INTERNAL ACCESS TRACKS

The construction and maintenance of the Project will require construction of up to approximately 115.3 km of new private access tracks within the Project Area. These tracks will connect to existing Council roads. The tracks will provide ongoing access to the WTGs and other Project infrastructure including the transmission line. Where practicable, the internal access track network will be aligned along the route of existing farm tracks to reduce impacts to biodiversity and to provide upgraded access for ongoing agricultural activities.

The internal access tracks will typically be 5.5 m trafficable width on straights, with localised widening on curves and where required to support transportation of the over-dimensional WTG component vehicles. The internal access tracks will be constructed using unsealed pavements and will be generally in accordance with the *Australian Road Research Board Unsealed Roads Manual*.

The updated Traffic and Transport Impact Assessment (Appendix I) shows the internal access track network.

PERMANENT OPERATIONS AND MAINTENANCE FACILITY

A permanent site O&M facility, approximately 50 m by 40 m, will be constructed to provide for all operations and maintenance activities associated with the Project. The O&M facility will be located next to the north substation, BESS and laydown area. **Figure 17** provides an example of a typical O&M facility**.** The buildings of the O&M facility will contain the control room, switch room, and storage shed with workshops. An indicative layout/plan for the O&M Facility is provided in **Figure 18**.

The control room will contain an office, communications equipment, and staff amenities (toilet, kitchen, first aid, potable water supply, etc.). Guttering and a water tank will collect rainwater.

The compound will include a static water supply for firefighting/bushfire management (may be part of above water supply) as well as a septic system. The control room, switch room and storage shed will each contain essential fire safety equipment, including fire extinguishers and hose reels.

Adequate rubbish waste/facilities providing appropriate waste stream separation using onsite skip bins emptied weekly or as required. Waste will not be retained permanently onsite.

Car parking facilities for employee and service vehicles will be located adjacent to the building. The parking and vehicle manoeuvring areas will be sealed with crushed road base or asphalt.

During the long-term operational phase, the O&M facility will cater for approximately 16 permanent staff. Whilst most activity is anticipated to occur during business hours Monday to Friday, access to the Project Area will be required on a 24-hour basis, seven days a week.

The O&M facility will be constructed of low-combustibility or non-combustible materials in accordance with the *National Construction Code* (ABCB, 2022). The office within the O&M facility will be an insulated, free standing construction with steel frame affixed to a concrete base. The building will utilise Colorbond cladding in a colour shade designed to match the surrounding landscape. Internal walls will be wooden frame with insulation. The walls will be clad in plasterboard and painted a shade of white.

The O&M facility warehouse and workshop will be an insulated, free standing construction with steel frame affixed to a concrete base. The building will utilise Colorbond cladding that will be a colour shade designed to match the surrounding landscape. The building will include a large roller shutter door leading externally. The building will also include a climate controlled insulated room consisting of wooden frame clad in plasterboard within the outer shell for storage of smaller components. Additionally, there will be a double skinned/bunded container set on a concrete base for the storage of oils, greases and other liquid substances with a safety shower on the outside of the building.

All buildings will be powered by single phase (240 V) electricity with Wi-Fi internet either by 4G or satellite connectivity and water via tanks that are filled by rain water collected from the roofs or trucked in. The water tanks will be serviced by UV filtration. All buildings will be installed to relevant state and federal safety and environmental regulations and signed off for occupancy.

FIGURE 16 EXAMPLE O&M FACILITY

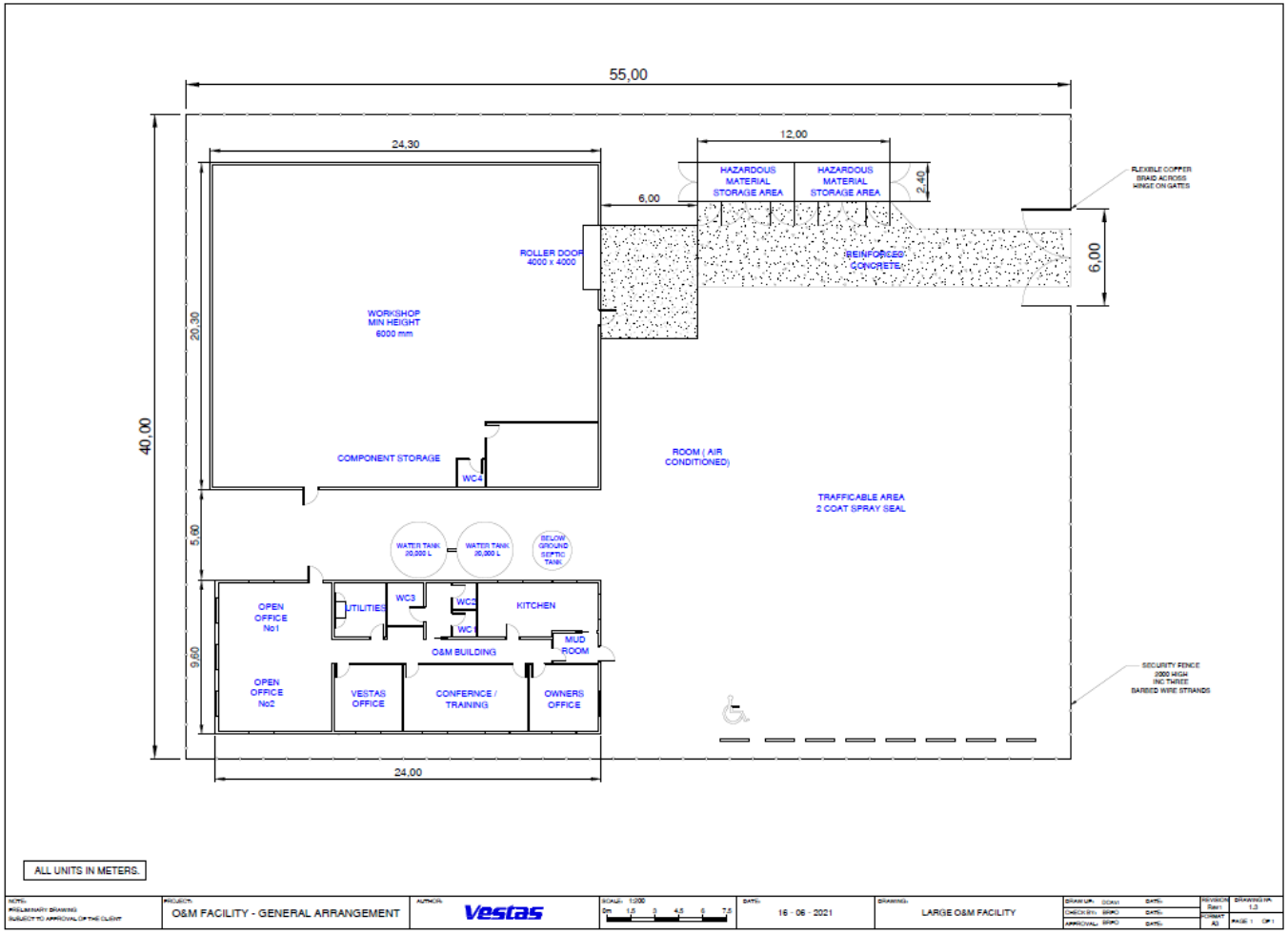


FIGURE 17 INDICATIVE LAYOUT/PLAN OF O&M FACILITY

METEOROLOGICAL MONITORING MASTS

The Project includes the commissioning and decommissioning of up to four temporary meteorological monitoring masts (met mast) for power testing and installation of up to two permanent met masts. Each met mast will be located close to a WTG location and will have a maximum height of approximately 149 m AGL, equivalent to the hub height of the installed WTGs. The permanent met masts assist in verifying the performance of the WTGs during commissioning and operation of the Project.

The met masts will be of welded steel lattice construction with hot dip galvanised surface treatment, built on a concrete based and supported by guy wires. The met masts consist of a buried concrete base foundation and guy wires which are attached to buried anchor points. These will be marked using three-dimensional coloured objects attached to the wire or cables (for example spheres or pyramids) if necessary. The Project also includes the decommissioning and removal of four existing met masts used during project development to measure the wind resource within the Project Area.

LIGHTING

Maintenance lighting will be installed at the substations and at the O&M facility for night work including emergency operations. All maintenance lighting will be designed to reduce disturbance to neighbouring properties and will be used only when there are staff onsite or during emergencies. Continuously operating security lighting would be installed on posts up to 3.5 m high adjacent to security fencing and O&M facility.

TEMPORARY FACILITIES

Construction of the Project will require a range of temporary buildings and facilities for construction personnel and equipment. These will include a construction compound (including site offices, car parking, and amenities for the construction work force), mobile concrete batching plants, laydown and storage areas for the temporary storage of construction materials, plant, equipment and WTG components, and temporary power supply for construction.

Chain link fencing up to 2 m high and CCTV may be used around the temporary construction compounds, concrete batching plants, and materials storage and laydown areas, as required.

All temporary facilities will be removed and will be revegetated / remediated following commissioning, or as agreed with by the landowner.

MICRO-SITING

The proposed layout is indicative and subject to detailed design, which will incorporate detailed geotechnical investigations and selection of the final WTG model.

To facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of WTGs by up to 100 m radius from the locations identified in the Amendment Report is sought. Other Project infrastructure components, including substations, switchyard, maintenance building, temporary facilities, cabling and access tracks, may also be micro-sited within the assessed study area subject to ensuring that micro-siting does not result in greater impacts than assessed in this Amendment Report and complies with all conditions imposed on any development consent granted for the Project.

The assessment has considered the area potentially subject to micro-siting, by applying a 100 m buffer around the proposed project infrastructure for critical aspects.

The ability to micro-site is required to allow for design refinements to avoid unnecessary excavation, vegetation clearing, to benefit constructability, plant and equipment access, and make general design refinements without the need to modify the application. Micro-siting does not jeopardise the assessment of impacts as the areas within which micro-siting may occur were assessed.

PROJECT CONSTRUCTION

DURATION AND STAGING

Construction activities will be progressive across the Project Area over a period of up to 52 months, with peak activities to occur over approximately 20 months. Key construction processes, generally in the order that they will occur, include:

- Mobilisation of earthwork plant and equipment;
- Construction of access tracks and hardstand areas;
- Installation of site compounds and concrete batching plants;
- Delivery of WTG and other Project components;
- Construction of met mast footings and WTG footings;
- Construction of substation and switchyard compounds;
- Erection of met masts and WTG components;
- Installation of substation and switchyard infrastructure;
- Installation of internal electricity network (underground cables/overhead power lines); and
- Site rehabilitation and revegetation.

Construction of the substation, 330 kV transmission line connection and switchyard will be undertaken in parallel with the installation of the WTGs and construction of the O&M facility. Construction and operation of the Project may be staged in response to market drivers and specific construction work packages. If construction and / or operation is to be undertaken in stages, notification of such will be provided to DPHI.

Construction of the wind farm may be staged subject to factors including but not limited to the availability of contractors, equipment, workers and housing, equipment transport constraints, equipment and contractor pricing, energy market pricing and availability of energy offtake, project funding requirements, the final project as approved, and relevant development consent conditions. Some of these factors can only be determined after development consent and with further refinement of project design, procurement and commercialisation. Subject to these factors, if a decision is made to stage the project, the project would likely be constructed in two stages, with the western and northern portions of the project constructed as a first stage, and the southern portion of the project constructed as a second stage. This strategy would allow for construction of the two proposed substations and the transmission line during the first stage to enable connection of the Project Area to the existing grid. The turbines to the south of the southern substation could then be delivered as a second stage, if required, based on the factors outlined above.

CONSTRUCTION HOURS

Construction of the Project will generally occur as follows:

- Monday to Friday: 7.00 am to 6.00 pm;
- Saturday: 8.00 am to 6.00 pm; and
- No works on Sunday or public holidays.

These hours are generally in accordance with the *Interim Noise Construction Noise Guideline* (DECC, 2009), with some extended on Saturdays.

Some out-of-hours work may be required, including:

- Logistics and safety requirements imposed by relevant regulatory authorities (e.g., NSW Police);
- Blade and tower transport outside of peak traffic conditions on state and regional roads;
- Emergency work to avoid the loss of lives, property, and/or to prevent environmental harm;
- Works that do not cause noise emissions above 35 dB(A) at any non-associated dwellings not located on the site;
- Weather conditions such as high winds during the day necessitating WTG crane lifts at night;
- Temperature conditions requiring concrete pours during the early morning; and
- Extended concrete pours into the evening to complete a foundation.

If a need to work outside the recommended standard hours is identified, it would be carried out in accordance with the Environmental Management Strategy (EMS) and associated sub-plans.

CONSTRUCTION WORKFORCE

Up to 390 FTE construction jobs will be generated.

TRANSPORT ROUTE AND SITE ACCESS

OSOM TRANSPORT ROUTE FROM THE PORT OF NEWCASTLE

The Port of Newcastle will likely be utilised for import and unloading of WTG components. Due to the size of the WTG components and some substation components, restricted access vehicles (RAVs) will be required for transportation from the Port of Newcastle to the Project Area. RAV deliveries are OSOM and require permits that specify the designated route for travel, the number of escorts required and the time in which the RAVs can travel through certain road zones.

Major WTG components to be transported from the Port of Newcastle include:

- Blades;
- Hubs;
- Nacelles;
- Power trains;
- Cooler tops; and
- Tower segments.

There would also be a small number of OSOM deliveries associated with large substation equipment (e.g., battery storage, transformers), O&M facility, and water tanks.

In addition, cranes will be required to move onto the Project to erect the WTG. A number of these will also be transported using RAVs.

The proposed OSOM delivery route from the Port of Newcastle to the Project has been separated into two routes:

- Components including blades, motors and small components under 5.2 m overall height: the transport route would be via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Thomas Mitchell Drive, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Stair Street, Dartbrook mine access Road, New England Highway, Staces Road, Thunderbolts Way and Jamieson Street; or
- Components including towers and motors over 5.2 m overall height: the transport route would be via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street, Dartbrook Mine access Road, New England Highway, Staces Road, Thunderbolts Way and Jamieson Street.

All RAVs will use New England Highway then follow Staces Road to Thunderbolts Way and subsequently south to Jamieson Street and onto Ohio Road and Emu Creek Road to access the Project Area.

Whilst RAVs will contribute a smaller percentage of trips to the Project during the construction period, they will be the most critical from a vehicle access perspective and will require some road and intersection upgrades to the existing network.

Heavy vehicles will be required to transport materials and equipment associated with the Project construction. It is anticipated that heavy vehicles will consist of vehicles up to and including 19.0 m long semi-trailers and B-Doubles (standard vehicles) and 'truck and dogs' concrete trucks and water tankers. The use of temporary onsite concrete batching plants will reduce the number of external concrete truck movements to and from the Project Area.

SITE ACCESS FROM WALCHA

Light vehicles comprising light trucks for smaller deliveries and cars, four-wheel drives and utility vehicles attributed to Project personnel will frequent the Project Area during construction and operation of the Project. All vehicles will access the Project from Thunderbolts Way via Jamieson Street, Ohio Road, and Emu Creek Road. The operations and maintenance facility and main construction compound will be located off Blue Mountain Road adjacent to the north substation and BESS facility. Two satellite construction compounds will be located off Bark Hut Road and Moona Plains Road.

ROAD UPGRADES

RJA (2024) completed a route survey along the transportation routes from the Port of Newcastle to Jamieson Street in Walcha. This includes a swept path analysis for the transportation of the 79.3 m long blades at key locations along the access route in order to identify 'pinch points' and areas where vehicles are able to pull over for fatigue breaks or emergency parking. RJA have identified several road upgrades to facilitate the proposed OSOM movements, as presented in **Appendix I**.

Public road upgrades would be required to cater for the delivery of blades, nacelles and towers, and include public roads. The upgrades are required to ensure sufficient space for oversized vehicle passage, including intersection widening, trimming and removal of vegetation, removable signs and infrastructure, and the relocation of overhead wires. Required public roads upgrades remain subject to further detailed design and assessment.

For the purposes of the Project, The Applicant assumes that all road upgrades between the Port of Newcastle and the intersection of Denman Road and Bengalla Road in Muswellbrook Shire LGA will be addressed by EnergyCo and/or Transport for NSW (per the NSW Government media release 18 June 2024). The Applicant further assumes that other developers pursuing approved wind farm projects at nearby locations will have undertaken road upgrades through pinch points in the Muswellbrook LGA to facilitate similarly sized WTG components (e.g., Hills of Gold Wind Farm, Thunderbolt Wind Farm; refer **Section 5.11.2** of the Amendment Report). Alternatively, EnergyCo and/or Transport for NSW may undertake such road upgrades prior to such road upgrades being required by the Applicant.

Table 8 summarises the road upgrades required between Tamworth and the Project site that the Applicant will be responsible for. Refer to Section 9 and 10 of **Appendix I** for details.

TABLE 8 ROAD UPGRADES REQUIRED BETWEEN TAMWORTH AND THE PROJECT AREA

Route 1 KM Index	Location	Proposed Road Upgrade / Commentary
321.0	New England Highway and Calala Land Tamworth	Several signs to be made removable and a tree removed
321.5	New England Highway and Wilburtree Street at Tamworth	Signs may need to be relocated or made removable
322.0	New England Highway onto the heavy vehicle bypass at Scott Road	OSOM vehicles will travel across two private lots (Lot 5A DP 38704 and Lot 52 DP 517948). One pole will need to be relocated and extra hardstand added on the median strip. One or more trees may need to be removed. Some signs will need to be made removable.
324.0	Scott Road on Murray Street	Upgrade works as necessary at roundabout. Two palm trees will need to be removed along with signs to be made removable. Some hardstand will need to be added.
324.2	Murray Street onto New England Highway	Signs to be made removable and no parking areas to be put in place. Some hardstand to be added in the median strips.
408.0	New England Highway and Staces Road, Uralla	Hardstand required on outside of corner.
409.0	Easements between Staces Road and Thunderbolts Way, Uralla	950 m of road to be built through easement.
410.0	Easements onto Thunderbolts Way, Uralla	Significant road widening and tree removal required.
448.0	Thunderbolts Way and Jamieson Street, Walcha	Several signs to be relocated/removed.

TEMPORARY MOBILE CONCRETE BATCHING PLANTS AND ROCK CRUSHING

The foundations for each WTG will be constructed with steel reinforced concrete. Concrete and aggregate will also be used as required for electrical infrastructure, internal access tracks, the O&M facility, and Project substations and switchyard. Up to three temporary mobile concrete batching plant and rock-crushing facilities will be established within the Project Area. While the exact details of the facilities will be determined during the detailed design phase, typically the area required for the plant and storage of materials will be approximately 100 m by 100 m.

The temporary mobile concrete batching plants will be designed to produce sufficient concrete quantity for one foundation per working day, and will comprise:

- Cement silos;
- Stockpile areas for the storage of the aggregates, sand and other raw materials;
- Water tanks;
- Wastewater settling pit (to recycle water and prevent cement wash out overflowing onto unsealed ground and entering waterways);
- Parking for truck mixers and pumps;
- Fuel bunker and bunded area for concrete additives; and
- Rock crushing facility.

The sand and cement needed for concrete production will be sourced locally where possible. It is anticipated that aggregates will be able to be supplied from the on-site quarry.

It is anticipated the cement will be stored in a silo adjacent to the batching process machinery. Concrete agitator trucks will transfer the concrete from the batch plant to the WTG foundation locations.

It is anticipated that water required for concrete batching will be sourced from existing bores within the Project Area, subject to appropriate licencing. This water will be delivered to the batch plants using water trucks. Alternatively, and only if required, water may be sourced offsite and delivered to the batching plant

Given the demand for concrete and rock for access road and hardstand construction crushing operations will exceed the license threshold of 150 tonnes per day or 30,000 tonnes per year. Therefore, an Environmental Protection Licence (EPL) from the EPA (under the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act), will be required. The daily onsite rock crushing capacity will be quantified following pre-construction geotechnical assessments to determine the availability of suitable onsite material.

RESOURCE REQUIREMENTS

Construction materials including gravel, aggregate and sand will be required for the concrete batch plant and construction of hardstands to support Project infrastructure, including internal access tracks and installation of electrical cabling. It is anticipated that the road formation will be constructed using a cut and fill balance with excavated materials used for the final hardstand surfaces of the roads, crane pads and laydown areas. The cut / fill volumes are estimated to be approximately 1,734,920 m^3 and 1,617,710 m^3 of material, respectively.

The Amended Project includes a temporary, on-site quarry as development that is ancillary to the Project. The estimated demand of quarry materials (e.g., road base/capping; concrete aggregates; gabion/drainage rock/ TR sand) for the Project is 1 Mt for the construction period and most of this material could be supplied from the on-site quarry.

Approval for the extraction of up to 500,000 tonnes per annum of material from the quarry for the Project is being sought as development that is 'ancillary development' to Electricity Generation Works as part of an amendment to the Project subject to development application number SSD-10471. An Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act) would also be sought for the quarry's operation.

The quarry would be located within the Project area on Lot 95 DP1128816, which is immediately adjacent to the access track for turbines B177, B100A, B101A and B102. The quarry site has direct access to Bark Hut Road.

Detailed site geological and geotechnical investigations indicate that the quarry resource is suitable to produce a range of products, including road-base, concrete aggregates, and drainage rock. These materials are required for construction of the local public road upgrades, internal access tracks, turbines foundations and hardstand areas and other civil works associated with the Project.

Construction equipment such as excavators, bulldozers, trenching machines and trucks will be sourced locally from the New England region, subject to availability and cost considerations. Further, steel used for concrete foundations will be sourced from within NSW, subject to cost and availability.

Approximately 800 megalitres (ML) of water would be required during the construction phase (4 years), primarily for concrete, road works and earthworks, and dust suppression. Water for road works and dust suppression can be of lower quality than is required for concrete production. Water required for construction will be supplied from existing groundwater bores (subject to water license permissions).

A small amount of potable (drinking) water (approximately 3 ML) would be collected in rainwater tanks from temporary site compound buildings or imported during the construction period on an as-needs basis to top up the water tanks.

Potable water will also be required for staff amenities during operation and will be collected in rainwater tanks installed at the O&M facility.

TEMPORARY SITE OFFICE, CAR PARKING AND STORAGE

A temporary construction site office will be erected and maintained for the duration of the construction phase at one or more of the three compound sites. In addition, temporary contractor parking and facilities and equipment laydown and storage areas are proposed.

POST CONSTRUCTION SITE REHABILITATION

The Project Area will be progressively rehabilitated throughout the course of construction. When construction is completed, all temporary plant and equipment will be removed, and disturbed areas will be revegetated and rehabilitated in consultation with Associated landholders hosting infrastructure. Adequate sediment, soil and erosion controls will be put in place during ground disturbing works and rehabilitation activities in accordance with the *Managing Urban Stormwater: Soils and Construction- Volume 1* (The 'Blue Book') (Landcom, 2004).

Post-construction rehabilitation requirements and processes will be detailed in the EMS to be prepared prior to commencement of construction of the Project and undertaken in accordance with relevant conditions of the development consent for the Project.

DEVELOPMENT FOOTPRINT

The Development Footprint for the Project includes the Permanent and Temporary Development Footprints. The Temporary Development Footprint is the area of land that will be temporarily disturbed during construction of the Project and rehabilitated following construction, whilst the Permanent Development Footprint is the area of land that will remain disturbed throughout the operational life of the Project.

PROJECT COMMISSIONING

The commissioning of the Project will involve checks on all high voltage equipment prior to connection to the existing TransGrid transmission line network. Once the electrical reticulation network has been successfully energised, each WTG will be separately commissioned.

PROJECT OPERATION

Upon commissioning, the Project will be operational 24 hours per day, seven days per week. The Project will be monitored and controlled by a remote supervisory control and data acquisition (SCADA) from a control room located within the O&M facility. Where required, assistance from an offsite SCADA engineering team may be sought. The SCADA system is designed to maximise the power output, allow for remote control of the WTGs and monitor the efficiency of the power plant.

While the wind farm will be monitored remotely, the WTG and other equipment will require regular maintenance. Site maintenance will be undertaken by site staff on an ongoing basis with activities scheduled consistently throughout the year. Site maintenance will include maintenance of the WTGs, reticulation network, access roads, substations, and transmission line.

Most repairs can be undertaken during routine maintenance; however, circumstances may arise where additional specialist technical maintenance staff are required (e.g. such as unplanned equipment failure). For some WTG components, maintenance or replacement may need to be undertaken using a crane.

Daily maintenance will occur during standard working hours. Outside of emergencies or major asset inspection or maintenance programs, night works or work on Sundays or public holidays will be minimal.

WORKFORCE

Approximately 16 long-term service and maintenance jobs will be created during Project operation to be based in the Walcha area. Operation of the Project will require a range of skills including engineering, trades (electrical, mechanical, construction), operators and administrative staff.

The O&M facility will provide an office and other staff amenities (i.e., toilet, kitchen, first aid, potable water supply etc.). Permanent parking facilities will be provided adjacent to the O&M facility to accommodate up to 20 light vehicles onsite. Carpooling arrangements to minimise light vehicle traffic generation will be implemented where practicable.

DECOMMISSIONING AND REHABILITATION

The WTGs have an expected operating life of up to 30 years, at the end of which there are three main options for consideration:

- Continue the use of the site as a wind farm using the existing WTGs (subject to condition of equipment);
- Replace the WTGs with technology current at that time and continue the use of the site as a wind farm for a further term; or
- Decommission the Project and remove the WTGs and ancillary infrastructure in accordance with the Environmental Management Strategy (EMS) which will be prepared for the Project.

When decommissioning occurs:

- Key stakeholders including landholders will be consulted;
- All above ground structures not required for the ongoing agricultural use of the land, including the WTGs, transformer stations, and substation, will be removed and the land rehabilitated to ensure it can be returned to agricultural use;
- Access tracks and hardstands not requested by the landowner to be retained will be removed and land rehabilitated and returned to agricultural use;
- Below ground infrastructure, including cabling and the WTG foundations, will be left *in situ* to avoid further disturbance and minimise clearing of revegetated areas. The infrastructure will be removed to a minimum of 0.5 m below the ground surface and where required will be covered in clean fill material and topsoil prior to revegetation. Rehabilitated areas will be adequately graded to reflect the slope of the surrounding area and to mitigate the risk of soil erosion.

All materials removed from the Project Area will be sorted and packaged for reuse and/or recycled where possible in accordance with the waste hierarchy.

A Decommissioning and Rehabilitation Plan will be prepared for the Project no less than five years prior to decommissioning and / or in accordance with any project approval requirements. It is anticipated that the decommissioning and rehabilitation phase would take up to 18 months to complete, with the Project Area being returned, as far as practicable, to its condition prior to the commencement of construction.

The Applicant has entered long-term lease agreements with the associated landholders for the construction and operation of the Project. The terms of these agreements make express provision for the Applicant's decommissioning obligations. Until decommissioning is complete, lease fees are payable to the associated landholders.

A preliminary Decommissioning and Rehabilitation Assessment has been prepared for the Project and was included in as Appendix S of the EIS.

INDICATIVE TIMELINE

The construction phase of the Project is expected to last approximately 52 months. Following set up of temporary construction compound areas and ancillary facilities, the upgrade of existing access tracks and construction of new access tracks will be the first construction activities, followed by the phasing of the WTG assembly and installation.

Table 9 outlines an indicative timeline for the proposed Project.

TABLE 99 INDICATIVE TIMELINE

Stage of Proposal	Estimated Date of Completion
Construction start	2026
Mechanical completion	Late 2029
Testing/commissioning completion	Early 2030
Decommissioning	2060 or later subject to approval

FUTURE LAND SUBDIVISION

TransGrid requires freehold title to the switchyard lot(s) in order to proceed with the construction of the relevant electrical connections and infrastructure. The Project would require the future creation of title(s) in a subdivision of Lot 114 of DP755829 to enable land ownership of the switchyard assets to be transferred to TransGrid. TransGrid will obtain freehold title through either transfer, dedication or acquisition.

The Project may require the creation of title(s) to enable land ownership of the substation assets as follows:

- North substation: Lot 1 of DP1090942; and
- South substation: Lot 95 of DP1128816.

COMMUNITY BENEFIT FUND

Since exhibition of the EIS in 2022, the Applicant has maintained dialogue with both Walcha Council and Uralla Shire Council regarding the VPA for the Project.

In 2024, the proposed VPA was placed on public exhibition by Walcha Council and Uralla Shire Council. Following the public exhibition of the proposed VPA by each local council, the terms of the VPA were agreed by the Applicant, Walcha Council and Uralla Shire Council.

On 24 August 2024, the Applicant entered into a VPA governed by Subdivision 2 of Division 7.1 of Part 7 of the EP&A Act with Walcha Council and Uralla Shire Council.

The VPA establishes (amongst other things) two CBFs, comprising:

- A CBF for the purpose of providing funding within the Walcha LGA; and
- A CBF for the purpose of providing funding within the Uralla Shire LGA.

The Applicant has committed to making an initial contribution (indexed to CPI) in accordance with the VPA in the amount of $1,000,000 (excluding GST).

Following the initial contribution, the Applicant will also make further contributions (indexed to CPI) in accordance with the VPA in the amount of $750,000 per annum (excluding GST) for the life of the Project and an additional $1,000 per annum (excluding GST) for every installed one (1) megawatt over 600 MW for the Project.

Based on the VPA, the allocation of funds from the Applicant to the two CBFs will be split as follows:

- 90% of funds to the CBF for the Walcha LGA; and
- 10% of funds to the CBF for the Uralla Shire LGA.

This allocation of funds has been informed by the relative geographic and infrastructure split of the Project within each LGA.

Walcha Council and Uralla Shire Council must each establish a community advisory committee. The committee for each council will make recommendations for the expenditure of monetary contributions made in connection with renewable energy developments, including the allocation of funds from the relevant CBF.

APPENDIX B UPDATED MITIGATION AND MANAGEMENT SUMMARY

TABLE B-1 UPDATED MITIGATION AND MANAGEMENT MEASURES

Environmental Aspect	Mitigation Measure	Document Reference
Development	• Construct, operate, maintain and decommission the Winterbourne Wind Farm generally in accordance with the 'Project Description'.	**EIS** – Section 3
	• Seek relevant approvals and post-approvals in accordance with **Section 4.3**.	**EIS** – Section 4.3
General	• An Environmental Management Strategy (EMS) will be developed to guide proposed activities associated with the construction, operation and decommissioning and rehabilitation of the Project.	**EIS** – Section 7.6
Biodiversity	• A Biodiversity Management Plan (BMP) will be prepared in consultation with relevant regulators prior to construction. Measures that will be adopted within the BMP to minimise the impact on biodiversity are detailed in **Table 6-11**.	**EIS** – Section 6.1.5, Table 6-11
	• A Bird and Bat Management Plan will be developed in consultation with relevant regulators.	**EIS** – Section 6.1.5
	• For residual impacts that cannot be avoided or fully mitigated, offsets will be required to ensure no net loss of biodiversity.	**EIS** – Section 6.1.6
	<u>Removal of native and threatened species habitat and habitat features</u> • Residual impacts on habitat will be offset through the Biodiversity Offset Scheme. • Where vegetation is to be removed, it will be undertaken in accordance with specifications provided in a vegetation clearing protocol, detailed within the BMP. • Plain wire perimeter fencing (not barbed-wire fencing) will be used to avoid potential entrapment of fauna on fences. • 'Environmental Sensitive No-Go Zones' will be established around areas of retained vegetation, threatened fauna habitat and threatened flora locations outside the Development Footprint.	**Amendment Report** – Section 5.1 **Amended BDAR**

	<u>Impact to native vegetation</u>
	• To avoid unnecessary removal or damage to retained vegetation, the limit of clearing will be clearly demarcated and signed as 'Environmental Sensitive No-Go Zones' prior to the commencement of clearing, as detailed in the BMP. This will include the following measures:
	  ° Vehicles or machinery will not be permitted to park within or drive through areas of retained vegetation.
	  ° Construction materials will not be stockpiled or stored within areas of retained vegetation.
	  ° Ancillary facilities, such as site compounds and construction zones, will not be located beyond the limits of clearing.	

Environmental Aspect	Mitigation Measure	Document Reference
	◦ Temporary fencing and signage will be maintained throughout construction. ◦ Site inductions will be given to all personnel and visitors to ensure all site workers and visitors are aware of any No-Go Zones. ◦ Clear boundaries on the eastern side of the Project Area will be established to ensure no impacts to Oxley Wild Rivers National Park.	
	<u>Light, noise and dust</u> • The BMP will include measures to avoid light encroachment on adjacent habitats such as the Oxley Wild Rivers National Park by restricting construction works to daylight hours as much as possible and incorporating sensitive lighting arrays that shield the adjoining native vegetation and habitat from stray light, with low-level lighting installed for all required external lighting. • All construction activities will be undertaken with the objective of preventing visible dust emissions from construction activities. The Applicant will implement programs to monitor the generation of dust during construction activities.	
	<u>Invasive flora and pathogens</u> • To minimise the spread of weeds throughout the Project Area and surrounding patches, appropriate weed control activities will be undertaken in accordance with State and regional weed management plans. • To comply with the objectives of the Northern Tablelands Regional Strategic Weed Management Plan 2017-2022 (LLS, 2017), the following measures will be implemented as part of the Pest Control Management Program: ◦ Initial weed treatment - Including eliminating woody species and targeting infestations of exotic herbs. In particular, High Threat Exotic weed species occurring within the subject land will be managed to prevent further spread. Prior to any vegetation clearance, High Threat Exotic weeds should be demarcated for these to be disposed of separately from native material. ◦ Containment – Follow-up monitoring and maintenance will be undertaken in areas of the development site that have received past primary weeding treatments to contain re-emergence of weed species. ◦ Minimisation – Minimisation of weed species that cannot be effectively controlled on the site, such as exotic grasses, will be prevented from further spread through construction and operational phase site hygiene procedures. • A pathogen management protocol will be implemented. Infection of native plants by *Phytophthora cinnamomic* is listed as a key threatening process under the BC Act and EPBC Act. The risk of spreading pathogens and the mitigation measures required on site will be regularly communicated to staff and contractors during inductions and toolbox talks.	
	<u>Increased pest species presence</u>	

Environmental Aspect	Mitigation Measure	Document Reference
	• Feral pest management programs will be developed and implemented for the Project, with focus on Feral Cats and European Foxes. All control methods will be completed in accordance with relevant legislation / standard operating procedures, including but not limited to the following: ◦ Northern Tablelands Regional Strategic Pest Animal Management Plan 2018 - 2023 (LLS, 2018); ◦ NSW Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Cats (NSW DPI, 2022); and ◦ NSW Threat Abatement Plan: Predation by the Red Fox (Vulpes vulpes) (NSW OEH, 2010).	
	<u>Erosion and sediment</u> • A site-specific Erosion and Sediment Control Plan will be developed and implemented to minimise erosion and sediment control risks. The Plan will include arrangements for managing wet weather events, and working with high surface water levels, including monitoring of potential high-risk events and specific controls and follow-up measures to be applied in the event of wet weather to avoid adverse impacts to hydrological processes, wetlands and ephemeral creek lines.	
	<u>Turbine strike</u> • The final BBAMP will be prepared in consultation with the BCS–Biodiversity, Conservation and Science, part of the DCCEEW NSW–following approval of the Project.	
	<u>Additional measures (affected SAII entities)</u> • The Applicant will regenerate up to 15 ha in aggregate of the two affected SAII entities within the local area to an extent that meets or exceeds the woody component lost through clearing for the Project. This additional measure aims to locally compensate for the loss of the woody component of vegetation associated with these PCTs (i.e., higher condition state VZs).	
Noise	<u>Pre-construction noise assessment</u> • A pre-construction noise assessment will be made based on the final turbine selection, layout and turbine-specific sound power levels. • Operational noise monitoring will be carried out following commissioning of the Project to verify compliance with the noise criteria.	**EIS** – Section 6.2, Table 6-22
	<u>Update assessment as required</u> • The assessment of noise from the substations and BESS facility will be updated should the size of the BESS or substation transformer(s) be increased or if the actual sound power levels of the specified equipment are materially different from the information assumed in the NVIA.	
	<u>"Feasible and reasonable" noise control strategies</u> • Implement "feasible and reasonable" noise control strategies to minimise noise during construction as described in **Table 6-22**.	

Environmental Aspect	Mitigation Measure	Document Reference
	<u>Scheduling</u> • Construction works, including heavy vehicle movements into and out of the site, will generally be restricted to the hours between 7.00 am and 6.00 pm Monday to Friday, and between 8.00 am and 6.00 pm on Saturdays. • Works conducted outside of these hours will be limited to activities as described in **Table 6-22** and will be carried out in accordance with the EMS and associated sub-plans prepared for the Project (i.e. Noise Management Plan).	
	<u>Location of fixed noise sources</u> • Locate fixed noise sources such as crushing and screening plant, concrete batching plant, generators and compressors at the maximum practicable distance to the nearest dwellings, and where possible, use existing topography (or raw or processed materials) to block line of sight between the fixed noise source and the dwelling.	
	<u>Acoustic screens</u> • Provide acoustic screens or mounding for fixed crushing and screening plant and concrete batching plant wherever these noise sources are located within 2,400 m of a non-involved dwelling and where there is no intervening topography between the noise source and the non-involved dwelling, in accordance with the requirements described in **Table 6-22**.	
	<u>Enclose generators and compressors</u> • Provide proprietary acoustic enclosures for site compressors and generators located within 2,400 m of a non-involved dwelling as described in **Table 6-22**.	
	<u>Alternative processes</u> • Investigate and implement alternative processes where feasible and reasonable as described in **Table 6-22**.	
	<u>Site management</u> • Carry out site management as described in **Table 6-22**.	
	<u>Equipment and vehicle management</u> • Carry out equipment and vehicle management as described in **Table 6-22**.	
	<u>Community consultation</u> • Implement noise related elements into the overall community consultation process.	
	<u>Traffic management</u>	

Environmental Aspect	Mitigation Measure	Document Reference
	• Care will be taken, particularly through towns and around site entry and exit points, to avoid excessive acceleration of trucks and the use of truck engine brakes in close proximity to dwellings and that such behaviour will be reinforced through worksite induction training.	
	<u>Reduce construction traffic noise</u> • In accordance with the general principles of dealing with temporary construction noise impacts as compared to permanent operational noise, where the NSW Road Noise Policy criteria are exceeded (during the peak construction period), the mitigation measures as described in **Table 6-22** will be employed to reduce construction traffic noise.	
	<u>Construction vibration</u> • If construction activities producing high levels of vibration occur within 100 m of a dwelling, such as upgrading existing roads (which may be within 25 m of the closest dwelling), a monitoring regime will be implemented during these times to ensure compliance with DECC 2006.	
	<u>Blasting</u> • Given the range of factors associated with both the generation and control of blasting, in the event of blasting occurring, a monitoring regime will be implemented to ensure compliance with the Australian and New Zealand Environment Council (ANZEC) – *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground* vibration (ANZECC, 1990).	
Landscape and Visual	<u>Project Layout and Design – Wind Farm Layout and Size</u> The following principles will guide the design process of the Project: • Controlling the location of different turbine types, densities, and layout geometry to minimise the visual impacts. • The lines of turbines will reflect the contours of the natural landscape as best as possible. • Ensure the turbines are evenly spaced to give a regular pattern creating a better balance within the landscape.	**EIS** – Section 6.3, Table 6-26
	<u>Project Layout and Design – Wind Turbine Design and Colouring</u> The turbines will have a light grey (RAL 7035) finish and consist of three blades. The following factors have been considered in the Project design to achieve a visual consistency through the landscape: • Uniformity in the colour, design, rotational speed, height, and rotor diameter. • The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye. • Blades, nacelle, and tower to appear as the same colour. • Avoidance of unnecessary lighting, signage, logos.	

Environmental Aspect	Mitigation Measure	Document Reference
	Screen Planting • Visual screen planting is a beneficial mitigation method which will be used to assist in reducing the visual impact of the Project. In circumstances where residences are subject to a high level of visual impact, screen planting will assist in mitigating views of turbines from residential properties. • To achieve visual screening between the intrusive element and the residence, tree planting will be undertaken in consultation with the relevant landowners to ensure that desirable views are not inadvertently eroded or lost in the effort to mitigate views of the turbines.	
	Residence Supplementary Planting • Due to the vegetated character of areas surrounding the Project Area, the Project is likely to be fragmented or screened by vegetation from many dwellings. Where turbines are located close to the dwelling or existing vegetation is thin, the supplementary planting mitigation method will be employed to further reduce potential visibility and ensure longevity of the intervening vegetation.	

	Onsite Mitigation Methods – Non-associated Dwellings
	• Non-associated dwellings within 3,100 m:
	  ◦ Screen planting was identified as a potential mitigation for four (SR007; SR240; SR262; SR268).
	  ◦ Supplementary planting has been suggested for five (SR207; SR216; SR272; SR274; SR298).
	• Non-associated dwellings between 3,100 m – 4,550 m:
	  ◦ Screen planting was identified as a potential mitigation for six (SR075; SR087; SR088; SR092; SR117 SR359).
	  ◦ Supplementary planting has been suggested for five (SR006; SR050; SR093; SR289; SR350).	

	Night Lighting – Aviation Hazards Lighting To assist in the amelioration of the effect of Aviation Hazards Lighting, the following mitigation measures are proposed subject to CASA requirements: • If used, air navigation lights are required to be spaced over the array, particularly at the extremities. They are not required on every tower. Careful consideration will be given to the turbines upon which aviation lighting is installed to avoid unnecessary impact upon residences. • Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night. • Use of the lowest candela intensity allowed by CASA.	

Environmental Aspect	Mitigation Measure	Document Reference
	• According to the CASA requirements, shielding may be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal. • No light will be emitted at or below 10° below horizontal.	
	<u>Night Lighting – Ancillary Structures</u> • Security lighting throughout the wind farm, switching station and the substation will be minimised to decrease the contrast between the wind farm and the night-time landscape of the area. • Motion detectors will be used to activate night-time security lighting when required. • Lighting will be designed to ensure it does not spill onto nearby roads or residences.	
	<u>Ancillary Infrastructure – Transmission Lines</u> • Where possible underground cabling will to be used to connect WTGs to Project substations. • The route for any proposed overhead transmission lines will be chosen to reduce visibility from surrounding areas. • The route for any proposed overhead transmission lines will be chosen to minimise vegetation loss. • Subtle colours and a low reflectivity surface treatment will be used on power poles to ensure that glint is minimised.	
	<u>Ancillary Infrastructure – Access Roads</u> • Where possible the Project will utilise or upgrade existing roads, trails, or tracks to provide access to the turbines to reduce the need for new roads. • Allow for the provision for downsizing roads or restoring roads to existing condition following construction where possible. • Any new roads will minimise cut and fill and avoid the loss of vegetation. • Utilise local materials where practical.	
	<u>Ancillary Infrastructure – Ancillary Structures</u> • Siting will consider minimising vegetation loss. • Screen planting will further reduce residual visual impacts. • Controlling the type and colour of building materials used with a recessive colour palette will to be used which blends into the existing landscape. • Unnecessary lighting, signage on fences, logos will be avoided. • Any proposed buildings will be sympathetic to existing architectural elements in the landscape. • Cut and fill, and loss of existing vegetation will be minimised throughout the construction process.	

Environmental Aspect		Mitigation Measure	Document Reference
		• Boundary screen planting which will be utilised to ameliorate potential visual impacts resulting from the construction of ancillary structures with a small vertical scale such as collector substations, switching stations and the O&M building.	
Traffic		• A Traffic Management Plan (TMP) will be prepared prior to construction. The contractor would be responsible for obtaining all required approvals and permits from TfNSW and local Councils and for complying with conditions specified in the approvals. The TMP will provide additional information regarding the traffic volumes and distribution of construction vehicles that is not available at this time, including: ° Road transport volumes, distribution and vehicle types broken down into: - Hours and days of construction. - Schedule for phasing/staging of the Project. ° The origin, destination, and routes for: - Employee and contractor light traffic. - Heavy vehicle traffic. - Oversize and overmass traffic. • Measures that will be adopted within the TMP to minimise the impact of construction traffic along the road network are detailed in **Table 6-31**.	**EIS** – Section 6.4, Table 6-31
		• Additional mitigation and management measures, as described in **Appendix I**, include: ° Expand the Traffic Management Plan to include maps of primary haulage routes highlighting critical locations, induction processes for drivers, and a complaints resolution process; ° Implement a carpooling program to support sharing of vehicle trips for the workforce travelling to and from the site; and ° Implement a driver code of conduct to manage vehicle access to and from the site, ensure only designated routes are used and vehicles abide by delivery schedules, and avoid heavy vehicle movements during peak school bus times.	**Amendment Report** – Section 5.6
Hazards and Risks	Aviation	<u>Designed air routes</u> • To accommodate the WTGs at 230 m AGL, engagement with the operators of air route W128 LSALT will occur to increase it by 200 ft from 5,900 ft to 6,100 ft AMSL.	**EIS** – Section 6.5.1, Table 6-34
		<u>Notification and reporting</u> • 'As constructed' details of WTGs including coordinates and elevations will be provided to Airservices Australia. • Department of Defence will be consulted if there is any subsequent modification in the WTG height or scale of development.	

Environmental Aspect		Mitigation Measure	Document Reference
		• Any obstacles above 100 m AGL (including temporary construction equipment) will be reported to Airservices Australia NOTAM office until they are incorporated in published operational documents. • Details of the Project will be provided to local and regional aircraft operators prior to construction in order for them to consider the potential impact on their operations. Specifically, details will be provided to the NSW Regional Airspace and Procedures Advisory Committee for consideration by its members in relation to VFR transit routes in the vicinity of the wind farm. • To facilitate the flight planning of aerial application operators, upon request details of the Project (including location and height information of WTGs, met masts and overhead transmission lines) will be provided to landowners within Project Area so that, when asked for hazard information on their property, the landowner may provide the aerial application pilot with all relevant information.	
		<u>Aerial operations</u> • Engage with local aerial agricultural operators and aerial firefighting operators in developing procedures for such aircraft operations in the vicinity of the Project. • Engage with the operators of ALAs in close proximity to the wind farm to develop a mitigation plan. This may include suspending the relevant WTG's operation (dependent on wind direction and wind speed) for the period that the ALAs are in use for take-off and landing.	
		<u>Marking of turbines</u> • The rotor blades, nacelle and the supporting tower of the WTGs will be painted light grey (RAL 7035), typical of most WTGs operational in Australia. No additional marking measures are required for WTGs.	
		<u>Lighting of turbines</u> • The Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft.	
		<u>Micro-siting</u> • Micro-siting of the WTGs and met masts will occur within 100 m of assessed location. • The micro-siting of the WTGs and met masts is not likely to result in a change in the maximum overall blade tip height of the Project.	
	Bushfire	• A Bushfire Emergency Management and Operational Plan (BFEMOP) will be prepared in consultation with relevant stakeholders. The BFEMOP will outline appropriate management bushfire protection measures for the life of the Project.	**EIS** – Section 3, Section 6.5.2

Environmental Aspect		Mitigation Measure	Document Reference
		• In the event of a fire, the AC circuit breaker in the substation will be closed remotely by operational staff. TransGrid will also be able to shut off the supply from outside the Project Area if required. WTGs are fitted with a variety of control systems, which can be activated in the event of extreme weather conditions (such a high wind speeds or high temperatures), localised fire, or overheating. WTGs can also be shut down if they exceed the tolerance of their design specifications. • Engage with FRNSW and NSW RFS to develop operational procedures for remote shutdown to allow for aerial firefighting over WTGs.	
		• An APZ will be established at the respective location of work, at the appropriate time, prior to commencement of activities, and maintained for the life of that component. The APZs would be maintained to the standard of an IPA for the life of the development. • A 20 m bushfire APZ will surround the substation, switchyard, and BESS, as described in Section 3. • For other components described in Table 5.1 of **Appendix K**, an APZ no less than 10 m in width will be provided, thus providing a defendable space around key infrastructure and temporary construction facilities. Where forest / wooded vegetation is present adjacent to the infrastructure, an increased 20 m wide APZ will occur. • Table 5.1 of Appendix K further describes how the Project will comply with the APZ specifications contained in PBP 2019 (NSW RFS, 2019).	
		• Landscaping will be considered throughout the design process and further enforced throughout the construction and operational phases of the Project. If landscaping or revegetation of areas within the Project Area are required, they will be located and designed to reduce the risk of flame contact and radiant heat to both Project infrastructure and other key assets.	
		• Property access and internal access arrangements will comply with the specifications of Table 7.4a of PBP 2019 (or otherwise, the NSW RFS Fire Trail Standards (NSW RFS, 2016), to ensure access to the Project Area is suitable for emergency response vehicles.	
		• In accordance with Table 5.3d of PBP 2019, a water supply no less than 20,000 L will be provided to improve property protection measures and/or to act as a static water supply for emergency services in consultation with NSW RFS.	
		• Structures for the storage of essential equipment installed onsite will be non-combustible, or otherwise structures will incorporate basic ember protection measures.	
		• Additional protection measures for the Project as listed in **Table 6-35** will be implemented.	

Environmental Aspect		Mitigation Measure	Document Reference
	Blade Throw	• IEC Standards as listed in **Section 10.3.4** will be used for the design and construction of the Project which will reinforce the confidence that blade throw will represent a very low risk. • Inspection and Testing Procedures will be initiated and audited during the construction and commissioning phase. Once testing finds all WTG components including the blades are passed, the WTG will be commissioned for operation. • Implement a high quality, comprehensive and robust operations and maintenance program to ensure that WTG faults are prevented or detected and rectified quickly, minimising the risk of occurrence of a serious or dangerous problem (refer **Section 10.3.4**).	**EIS** – Section 6.5.3
	SEPP 33 / Preliminary Hazard Analysis	• Consult with FRNSW during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included. These may include: (i) type of firefighting or control medium (ii) demand, storage and containment measures for the medium. The above aspects will form an input to the Fire Safety Study which may be required as part of the development consent conditions, for review and approval by FRNSW. • Review the investigation reports for the 'Victorian Big Battery Fire' (occurred on 31 July 2021) and implement relevant findings for the Project. • A range of mitigation and management measures for each of the identified hazards and events will be implemented as discussed in the PHA (**Appendix M**) and summarised in **Section 6.5.4**.	**EIS** – Section 6.5.4
	Electromagnetic Interference	<u>Radiocommunication towers</u> The following mitigation hierarchy will be followed in consultation with the operators: • Technological "fix" (e.g. increasing the signal strength from the affected tower or alternative towers or installing a signal repeater or additional tower on the opposite side of the Project Area.) to existing services will be progressed in preference to Project changes to minimise potential impacts. • If this does not result in minimal impacts, project changes may be employed including relocating WTGs to be further from the affected tower or removing WTGs from the Project.	**EIS** – Section 6.5.5, Table 6-41
		<u>Fixed point-to-point links</u> During detailed design, consultation with the operators will occur. If there is a potential for interference from the WTGs, the following mitigation hierarchy will be followed in consultation with the operators: • Technological fix: Upgrading the equipment for the affected link, rerouting the link via an existing or new tower, or replacing the link with an alternative communication technology. • Slightly relocate WTGs B154, B138, B139, and B152 as proposed by the Telco Authority and outlined in Section 4.2.2 of **Appendix N**. • Avoid interference to the point-to-point links operated by the NPWS and Walcha Council by moving WTGs outside of the diffraction exclusion zones established by DNV and shown in Figure 6 and Figure 7 of **Appendix N**.	

Environmental Aspect		Mitigation Measure	Document Reference
		In consultation with NSW RFS, identify and rectify interference of NSW RFS point-to-point links after construction of the Project. • No WTGs will be located within 600 m of BOM's point-to-point link which crosses the Project Area.	
		<u>Fixed point-to-multipoint type</u> • If interference is experienced after the Project is operational, mitigation options will be employed in consultation with the operator to resolve, including: rerouting the links, installing additional towers, or replacing the affected links with alternative communications infrastructure.	
		<u>Emergency services</u> • Point-to-point links: As per mitigation for point-to-point links above. • Mobile telephony systems: If interference is experienced after the Project is operational, the Proponent will engage with the operator to increase signal strength from affected tower or alternative towers, install signal repeater, and/or install additional tower. These mitigation measures also apply for mobile broadband services.	
		<u>Meteorological radar</u> • The BoM will be notified prior to any planning shutdown of the Project to allow calibration of systems. • The Proponent will collaborate with BoM in the event of severe weather conditions.	
		<u>Satellite television and internet</u> • If interference is experienced after the Project is operational, in consultation with the operator: redirect satellite dish to alternative satellite, install larger or higher quality satellite dish, change location or height of satellite dish.	
		<u>Radio broadcasting</u> If interference is experienced after the Project is operational, in consultation with the operator: • AM signals: install a higher quality antenna at affected location. • FM signals: install higher quality antenna at affected location, increase signal strength from affected tower, move tower to a new location, install signal repeater, install additional tower.	

Environmental Aspect		Mitigation Measure	Document Reference
		<u>Television broadcasting</u> If interference is experienced after the Project is operational, in consultation with the operator: • Realign the antenna at affected dwelling to existing tower. • Redirect antenna to alternative tower. • Install more directional or higher gain antenna. • Change location of antenna. • Install cable or satellite television. • Install relay transmitter.	
	Human Health / EMF	• The Project has been designed to implement prudent avoidance by incorporating significant setbacks between residential dwellings and Project components which will generate ELF EMF, as further detailed in **Section 6.5.6**.	**EIS** – Section 6.5.6

Aboriginal Heritage		<u>Aboriginal Cultural Heritage Management Plan</u>
		• An Aboriginal Cultural Heritage Management Plan (ACHMP) will be prepared prior to the commencement of construction as part of Environmental Management Strategy.
		  ◦ The ACHMP will detail measures to protect Aboriginal heritage sites, including temporary fencing, test excavations and salvage (if required), a strategy for the long-term management of any Aboriginal heritage items collected from the test excavations or salvage works, an unexpected finds procedure and other contingency and reporting procedures.
		  ◦ The fate of the artefacts salvaged under an approved ACHMP would be determined in consultation with the RAPs and the details provided in the ACHMP.
			EIS – Section 6.6

		<u>Management and Mitigation of Recorded Aboriginal Sites</u>
		• The following management options will be adopted in terms of best practice and desired outcomes:
		  ◦ Avoid impact by altering the development project, or in this case, by avoiding impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.
		  ◦ If impact is unavoidable then approval to disturb sites under the authority of an ACHMP must be sought from DPE.
		• The following sites recorded during the OzArk survey will require the mitigation and management measures described in **Table 6-51**: Yalgoo IF-1; Bywell OS-2; Green Range OS-1; Green Range OS-3 with PAD; Table Top Rd IF-1; Woodburn IF-1; Tarwonga ST-1; The Ranch OS-1 with PAD; The Ranch IF-1; Queenlee OS-1 with PAD; Queenlee E-1; and Talisker ST-1.	

Environmental Aspect	Mitigation Measure	Document Reference
	Revised Aboriginal Cultural Heritage Assessment Report (ACHAR) The Aboriginal cultural heritage values identified within the Project Area can be appropriately managed by implementing the additional conservation measures set out in the revised ACHAR (**Appendix F**), as summarised below: ° If impact to four surface isolated find sites - Table Top Rd IF-1, Woodburn IF-1, Kambala IF-1, and Kambala IF-2 - and two artefact scatters - Green Range OS-3 with PAD [partial] and Millbank OS-1 - is likely during construction of the Project, the sites should be salvaged through the recording and collection of the surface artefacts prior to construction works proceeding, including: - Only the portion of Green Range OS-3 with PAD within the Project disturbance footprint will be salvaged. This portion does not include the PAD; - The recommended methodology for the salvage will be finalised through engagement with relevant parties and detailed in the ACHMP; - The salvage works will include the mapping, analysis, and collection of the surface artefact at the affected site. Results will be included in a brief report to preserve the data in a useable form and an Aboriginal Site Impact Recording Form (ASIRF) will be submitted to the AHIMS. ° Green Range OS-3 with PAD may be partially impacted by the Project. The portion of Green Range OS-3 with PAD that will not be harmed by the project is within a frequently ploughed paddock; therefore, surface artefacts are at risk from continued impacts from ploughing. It is recommended that the site be managed through the collection of surface artefacts (following the methodology set out in the ACHAR). Based on the results of the test excavation at Green Range OS-3 with PAD that demonstrated that the site is mostly a surface manifestation, this action will change the status of the site on the AHIMS register to 'destroyed'. ° The Project will consider funding additional research at Queenlee OS-1 with PAD and Queenlee E-1, subject to landowner consent. The research will involve non-invasive recording, mapping, and photography at each site; and ° All land-disturbing activities must be confined to within the Project disturbance footprint. Should the parameters of the proposed work extend beyond this, then further archaeological assessment may be required.	**Amendment Report** – Section 5.2
Historic Heritage	• In consultation with DPE, a Historic Heritage Management Plan (HHMP) will be prepared prior to construction as part of Environmental Management Strategy. • The HHMP will detail measures to protect historic heritage sites and provide an unexpected finds procedure and other contingency and reporting procedures.	**EIS** – Section 6.7
Soils and Water	• A Soil and Water Management Plan (SWMP) will be prepared prior to construction. The SWMP will be prepared by a suitably qualified person and be accompanied by Progressive Erosion and Sediment Control Plans (ESCP).	**EIS** – Section 6.8.5, Section 7.5

Environmental Aspect	Mitigation Measure	Document Reference
	• The SWMP and ESCP will include mitigation measures outlined in **Section 6.8.5**, including suitable measures to ensure activities associated with the Project do not impact on the integrity of the Oxley Wild Rivers National Park.	
	On-Site Quarry • The WMS design and management measures would be documented in the EMP prepared for the quarry operations on the site and implemented to minimise the potential impacts to the surrounding environment. The primary objective of the WMS design is to ensure that suspended solids and turbid water are not discharged from the quarry site. This would be achieved by the following design elements and mitigation measures to be implemented including the following: ◦ Regular inspections and pumping of the sediment basin will be conducted to maintain its design capacity for maximum effectiveness during design storm events. Water removed from the basin will be reused on-site for dust suppression or transferred to the extraction pit. There will be no off-site discharge of surface water from the WMS, and any sediment extracted from the basin will be reintegrated into the quarry product mix. ◦ To mitigate potential impacts from an unlikely exceedance of the design storm event that could exceed the basin's capacity, a constructed rubble-lined spillway will be included. ◦ Installation of all erosion and sediment control measures as the first step in the process for site establishment and land disturbance; ◦ Clearly identifying and delineating limited disturbance areas while minimizing all disturbed areas and stabilizing them as soon as practicable. ◦ Construction of clean water diversion mounds to direct clean water runoff from any undisturbed upslope area away from disturbed areas, where practical. The diversion structures will be designed to ensure effective segregation of runoff within the site and surface water flow from undisturbed areas outside the site; ◦ Dirty water diversion to direct runoff from disturbed areas into the sediment basin; ◦ Construction of catch drains and diversion drains/mounds to capture runoff from disturbed areas and direct runoff into the extraction area following completion of extraction operations. Any excess drainage will be directed to the sediment basin, which will be retained after completion of operations on the site; ◦ Construction of other temporary erosion and sediment control measures, where required, such as sediment fences within the catchment area while permanent soil and water management structures are being established; ◦ Construction of drainage controls such as table drains on hardstand areas and toe drains on stockpiles if required; ◦ An in-pit sump and/or sediment basin may be excavated to manage surface runoff from within the extraction area(s) if required;	**Amendment Report** – Section 5.10.4, Section 5.10

Environmental Aspect	Mitigation Measure	Document Reference
	◦ Regular maintenance of all controls and inspection of all works and after storm events to ensure erosion and sediment controls are performing adequately; and ◦ Immediate repair or redesign of erosion and sediment controls that are not performing adequately, as identified by field inspections. • All the mitigation structures described above will be subject to regular, scheduled inspection, detailed in the operational EMP for the site, to ensure they are maintained and working effectively. This would include inspection during and after rainfall events. • The following measures will be implemented in relation to quarry haul trucks leaving the site: ◦ All heavy vehicle loads will be covered prior to leaving the site (in accordance with TfNSW requirements); ◦ Draw bars and tail gates will be inspected for all heavy vehicles prior to leaving the site to ensure that any loose material is removed; and ◦ The measures described above will significantly reduce the risk of any loose material (if present) being trafficked onto Bark Hut Road and the local road network.	
Groundwater	<u>On-Site Quarry</u> • A groundwater monitoring program will be detailed in the EMP prepared for the quarry operations. • The monitoring program should be established prior to the commencement of the project. • Bores should continue to be monitored whilst they are not affected by the quarry operations. It is recommended that groundwater levels initially be monitored quarterly. Once groundwater inflows occur, it is recommended that the monitoring frequency increase to monthly. • It is recommended that water quality be monitored quarterly in all monitoring bores for the first two years after the project commences (or until they are affected by quarry operations). The monitoring program should be reviewed every two years to determine if monitoring results indicate that less frequent monitoring would still provide a reasonable level of data to enable the impacts to be reliably detected. • Once the quarry pit extends below the top of the confined aquifer, the monitoring program should also include monitoring of groundwater inflow into the quarry. Measuring groundwater take is a requirement from a licensing perspective and the measured inflows can also be used to calibrate the analytical model and provide updated predictions. Groundwater inflow rates should therefore be accurately recorded. • Groundwater quality monitoring requirements post closure should be reviewed as part of closure planning with a focus on understanding the impacts of groundwater recharge from a recovering pit lake on the local groundwater system. Groundwater levels should continue to be monitored in the post closure phase until groundwater levels stabilise and/or regulation requirements are met. Monitoring locations and frequency in the post closure period should be identified as part of the quarry closure planning process and be informed by monitoring undertaken during the life of	**Amendment Report** – Section 5.10.5, Section 5.10

Environmental Aspect	Mitigation Measure	Document Reference
	project, updated predictions of pit lake recovery and likely water quality and risks presented from pit lake recovery.	
Hydrology and Flooding	• The SWMP as outlined above will include measures to manage additional runoff from the surface of the Project components (e.g. hardstands and access roads). • Detailed design of the cross-drainage structures located along the Project infrastructure will be required at the next stage of the Project to meet the local and road authorities' requirements.	**EIS** – Section 6.9
Blasting	<u>On-Site Quarry</u> • A site-specific Blast Management Plan will be prepared by the Proponent and drill and blast contractor that will address all occupational health and safety (OH&S) requirements, including procedures for neighbour notification of blasting; • Utilising an appropriate charge mass design to avoid overcharging holes; • Employing a suitable initiation sequence to minimise the risk of blast-hole interactions, aiming for single-hole initiation; • Maintaining the use of quality stemming material and controlling stemming height to ensure proper confinement of explosive charges, thereby minimising high airblast overpressure emissions; • Ensuring the appropriate quality of stemming material and stemming height to facilitate the confinement of explosives, thereby minimising the risk of stemming ejection and/or flyrock incidents; • The proposed monitoring system for private residences should consist of two (2) monitoring stations to capture ground vibration and airblast overpressure impacts from blasting at the quarry site. The stations should be positioned near residences SR199 and SR259 to provide coverage for the north and east areas respectively; • Due to the proximity to a public road (Bark Hut Road), a Road Closure Management Procedure for the duration of the blast will be required. To ensure the safety of the public, the quarry will develop and implement this procedure as part of the Blast Management Plan and seek approval from Walcha Council as required; • The quarry will implement and maintain a suitable protocol, considering weather impacts and including the positioning of blasting sentries, to manage blasting operations and to minimise the impacts on the surrounding area; and • Establish a landowner notification system for each blast, for adjoining landowners. Determine notification preferences (e.g., phone/text/email) with each landowner. This should encompass scheduled blast dates and times, along with any updates or changes.	**Amendment Report** – Section 5.10.2, Section 5.10

Environmental Aspect	Mitigation Measure	Document Reference
Air Quality	• The EMS will include consideration of the management and mitigation of offsite dust emissions and provide guidance on how those environmental management measures will be implemented. • Measures as described in **Section 6.10.4** will be included in the EMS to reduce visible dust emissions and will be implemented where appropriate.	**EIS** – Section 6.10
Waste	• A Waste Management Plan (WMP) will be prepared to describe the measures to be implemented to manage, reuse, recycle and safely dispose of waste. Specific measures to be included in the WMP are described in **Section 6.11.4**. • Targeted management strategies for each waste type to be implemented will be undertaken as per **Table 6-68**.	**EIS** – Section 6.11
Socio Economic	• Implement a Community Benefit Fund prior to construction, as described in **Section 3.12**.	**EIS** – Section 3.12
	• Develop and implement a Procurement Policy prior to construction to maximise local employment, and regional business opportunities.	**EIS** – Section 6.12.5
	• Develop and implement a 'Workforce Accommodation Strategy' prior to construction that manages impacts to local short and long-term accommodation arrangements in surrounding towns.	
	• Develop and implement a 'Workforce Codes of Conduct' prior to construction, which apply to work sites.	

APPENDIX C UPDATED STATUTORY COMPLIANCE TABLE

TABLE C-1 UPDATED STATUTORY COMPLIANCE TABLE

Approval Category	Legislation	Summary	Where Addressed
Power to Grant Approval	EP&A Act	Approval for the Project is sought under Part 4, Division 4.7 of the EP&A Act, which outlines the approval pathway for development deemed to be SSD. The IPC is the consent authority for the Project under Section 4.5 (a) of the EP&A Act.	Section 4.1 of the EIS Section 4 of this report
	State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)	The Project is classified as SSD as it meets the provisions of Clause 2.6(1) of the Planning Systems SEPP: • It requires development consent • It is specified in Schedule 1, Section 20 (development for the purpose of electricity generating works that has a capital investment value of more than $30 million).	
	State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)	The Project meets the definition of "electricity generating works" as defined in Clause 2.35 of T&I SEPP.	
Permissibility	T&I SEPP	The permissibility of the Project is determined by Clause 2.36 of the T&I SEPP, which states that "electricity generating works" may be carried out with development consent on land within a prescribed rural zone.	Section 4.2 of the EIS
	Walcha Local Environmental Plan 2012 (Walcha LEP)	Under the Walcha LEP the Project Area is zoned RU1 – Primary Production, which is a prescribed rural zone.	
	Uralla Local Environmental Plan 2012 (Walcha LEP)	Under the Uralla LEP the Project Area is zoned RU1 – Primary Production, which is a prescribed rural zone.	
Other Approvals Required			
Consistent Approvals	*Roads Act 1993* (Roads Act)	Section 4.42 of the EP&A Act outlines that approvals for consent under section 138 of the Roads Act cannot be refused if necessary for carrying out an approved SSD and are to be consistent with the terms of the SSD approval.	Section 6.6 and Appendix I of this report

Approval Category	Legislation	Summary	Where Addressed
	Protection of the Environment Operations Act 1997 (POEO Act)	Under the provisions of schedule 1, section 16 of the POEO Act, activities requiring an EPL include crushing, grinding or separating of materials. Under the provisions of schedule 1, section 17 of the POEO Act, activities requiring an EPL include "electricity works (wind farms)". Accordingly, an EPL will be required for the Project.	Section 4, 6.10 and Appendix M of this report
Native Title	*Native Title Act 1993* (NT Act)	Under section 13 of the NT Act, an individual can apply to the Federal Court for a determination of native title. There are currently no native title claims over the Project Area.	Section 6.2 and Appendix F of this report
EPBC Act Approval	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Approval under the EPBC Act is required as the Project is declared to be a controlled action (EPBC Ref: 2020/8734). The action is to be assessed via accredited assessment under the EP&A Act.	Section 6.1 and Appendix D of this report
Other Approvals	*Water Management Act 2000* (WM Act)	Water supply will be obtained via existing water access licences under the WM Act.	Section 6.10 and Appendix M of this report
	Conveyancing Act 1919	The Project will require subdivision as described in Appendix A.	N/A
	Biodiversity Conservation Act 2016 (BC Act)	Given the Project is SSD, entry into the Biodiversity Offset Scheme is automatically triggered.	Section 6.1 and Appendix D of this report
	Local Government Act 1993 (LG Act)	Approval is required under section 68 of the LG Act to carry out water supply and sewerage work. Water tanks and septic or pump out sewage will be installed at the O&M Facility for which approval from Walcha Council will be sought.	Section 5 and Appendix A of this report
	Crown Land Management Act 2016 (CLM Act)	Access rights, in the form of easements or licences, will be obtained as required in relation to all Crown paper roads and land in accordance with the processes contained in the CLM Act	Section 5 and Appendix A of this report

Approval Category	Legislation	Summary	Where Addressed
Approvals not required under SSD	*Fisheries Management Act 1994;* *Heritage Act 1977;* *National Parks and Wildlife Act 1979;* *Rural Fires Act 1997;* *Water Management Act 2000*	Section 4.41 of the EP&A Act states the following approvals; permits, etc are not required for an approved SSD.	Section 4.3 of the EIS
Mandatory Considerations			
Considerations under the EP&A Act	EP&A Act	The Project is consistent with relevant Objects of the Act, pursuant to Section 1.3 of the EP&A Act.	Sections 5,6 and 7 of this report and the EIS
		Pursuant to Section 4.15 of the EP&A Act, the consent authority is required to take matters into consideration in determining an Application.	This table, and Sections 2,6 and 7 of this report and the EIS
Considerations under other legislation	BC Act	An amended BDAR pursuant to section 7.14 of the BC Act has been undertaken for the Project.	Section 6.1 and Appendix D of this report
	Civil Aviation Safety Regulations 1998	An amended AIA has been undertaken for the Project.	Section 6.7 and Appendix J of this report
	Radio Communications Act 1992	An amended EMI assessment has been undertaken for the Project	Section 6.8 and Appendix K of this report
Considerations under relevant EPIs	*State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP)	Chapter 4 Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP is not applicable to the Project. Notwithstanding, Koalas have been considered during the preparation of this report and the amended BDAR.	Section 6.1 and Appendix D of this report
	Walcha LEP; Uralla LEP	The Project meets relevant aims of the Walcha LEP and Uralla LEP under Section 1.2 – Aims of Plan.	Appendix C of the EIS
		The Project has undertaken technical studies to identify, avoid and mitigate impacts associated with the development of amended Project, as such the Project meets the relevant Objectives of the RU1 – Primary Production (Land Use Table).	Section 6 of this report

Approval Category	Legislation	Summary	Where Addressed
Considerations under Development Control Plans	Walcha Development Control Plan 2019 (Walcha DCP)	The Project is classified as SSD. As such, under section 2.10 of the Planning Systems SEPP the Walcha DCP does not apply and is not a mandatory consideration for the Project.	N/A
	Uralla Development Control Plan 2011 (Uralla DCP)	The Project is classified as SSD. As such, under section 2.10 of the Planning Systems SEPP the Uralla DCP does not apply and is not a mandatory consideration for the Project.	N/A

APPENDIX D AMENDED BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

APPENDIX E HAUL ROUTE BIODIVERSITY DUE DILIGENCE REPORT

APPENDIX F AMENDED ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT AND HISTORIC HERITAGE REPORT

APPENDIX G AMENDED NOISE IMPACT ASSESSMENT

APPENDIX H ADDENDUM LANDSCAPE AND VISUAL IMPACT ASSESSMENT

APPENDIX I AMENDED TRAFFIC IMPACT ASSESSMENT

APPENDIX J AMENDED AVIATION IMPACT ASSESSMENT

APPENDIX K AMENDED TELECOMMUNICATIONS AND ELECTROMAGNETIC INTERFERENCE STUDY

APPENDIX L ADDENDUM SOCIAL IMPACT ASSESSMENT

APPENDIX M QUARRY IMPACT ASSESSMENT

APPENDIX N CONSRUCTABILITY STATEMENT

ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
The Netherlands
New Zealand
Peru
Poland
Portugal
Puerto Rico
Romania
Senegal
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM's Sydney Office
Level 14, 207 Kent Street
Sydney NSW 2000

T: (02) 8584 8888
F: (02) 9299 7502
www.erm.com