Hills of Gold Wind Farm Pty Ltd

Hills of Gold Wind Farm

Amendment Report No. 2

7 November 2022

Project No.: 0550690

Developed by Clean Energy Partners Pty Limited

Development Management by:

SOMEVA RENEWABLES

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ERM

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7 November 2022

Hills of Gold Wind Farm

Amendment Report No. 2

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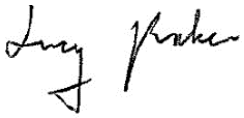

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CONTENTS

List of Tables

List of Figures

Acronyms and Abbreviations

Term	Description
AEMO	Australian Energy Market Operator
AIA	Aviation Impact Assessment
Amendment Report 2021	Hills of Gold Amendment Report (ERM, 2021)
Amended Project	The Project as amended in this Amendment Report
Amendment Report	This report
BC Act	NSW *Biodiversity Conservation Act 2016*
BCS	Biodiversity, Conservation & Science Directorate
BESS	Battery Energy Storage System
BHGNR	Ben Halls Gap Nature Reserve
CCC	Community Consultative Committee
CHAR	Cultural Heritage Assessment Report
Construction Compound	Construction compound is the temporary construction site associated with the works including hard standings, lay down and storage areas, vehicle parking, areas for welfare facilities including offices and canteen and washroom facilities, workshop facilities and temporary fencing.
Development Footprint	The Development Footprint is the area in which physical disturbance is proposed for the development of the Project, including the Permanent Development Footprint and Temporary Development Footprint.
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
DPIE	former NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
Endangered Ecological Community (EEC)	An ecological community listed as protected by the NSW *Biodiversity Conservation Act 2016*.
EP&A Act	*Environmental Planning & Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPA	NSW Environment Protection Authority
FCNSW	Forestry Corporation of NSW
FTE	Full Time Equivalent
GHG	Greenhouse gas
GW	Gigawatts
km	Kilometre
LGA	Local Government Area
LLS	NSW Local Land Services
LLS Act	NSW *Local Land Services Act 2013*
m	Metre

Term	Description
Mt	Megatonnes
MW	Megawatt
native	Flora or fauna species that existed in NSW before European settlement.
negligible	Small and unimportant, such as to be not worth considering.
NEM	National Electricity Market
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
offset (biodiversity)	One or more appropriate actions put in place in an appropriate location to counterbalance a development's impact on biodiversity values.
OSOM	Over size / over mass
Permanent Development Footprint	This is the area of land that will be subject to permanent alteration as a result of installation and operation of Project infrastructure.
Plant Community Type (PCT)	From BBAM (2014): A NSW plant community type identified using the PCT classification system.
population	A group of animals or plants of the same species, potentially capable of interbreeding and sharing the same habitat in a particular area at a particular time.
Project Area	The term Project Area refers to the area in which the Proponent has applied to develop the Project. The Project Area encompasses all the parcels of land associated with the Development Footprint as shown in Appendix B of the Amendment Report (2022). An indicative Project Area is shown in Figure 3-1 of Appendix A.
Proponent	Hills of Gold Wind Farm Pty Ltd
REZ	Renewable Energy Zone
RFI	Request for Information
SAII	Serious and irreversible impacts
SoHI	Statement of Heritage Impact
SSD	State Significant Development
Submissions Report	The Submissions Report prepared for the Project
Tamworth LEP 2010	*Tamworth Regional Local Environmental Plan 2010*
Temporary Development Footprint	This is the area of land that will be subject to temporary alteration during the installation of Project infrastructure, and rehabilitated following completion of construction.
the Project	In this report, the Project refers to the proposal by the Proponent to construct and operate the Hills of Gold Wind Farm.
the Project Team	The Project Team consists of, Hills of Gold Wind Farm Pty Ltd (the Proponent), ENGIE, Someva (Development Managers), Environmental Resources Management Australia Pty Ltd (ERM) and their in-house and external technical specialists.
Threatened Ecological Community (TEC)	An ecological community listed as protected by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
threatened species	A species listed as protected by the EPBC Act or the BC Act

Term	Description
Total Economic Impact	The direct effect of the initial increase in demand and the associated flow-on effects throughout the economy. For example, the direct manufacture of WTGs requires the purchase of steel and other materials from suppliers, these suppliers would then need to restock to meet commitments to other customers creating a production induced flow-on effect in the economy.
TRC	Tamworth Regional Council
TTPP	The Transport Planning Partnership
UHSC	Upper Hunter Shire Council
WTG	Wind turbine generator
2022 ESOO	2022 Electricity Statement of Opportunities (AEMO, 2022)

EXECUTIVE SUMMARY

Hills of Gold Wind Farm Pty Ltd (the Proponent) proposes to construct and operate the Hills of Gold Wind Farm (the Project), located on the ridge line between Hanging Rock and Crawney Pass in the Northern Tablelands region of New South Wales.

Approval for the Project is sought under the State Significant Development provisions (Division 4.7) of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as the Project is declared to be SSD under Section 2.6 of *State Environmental Planning Policy (Planning Systems) 2021*.

An Environmental Impact Statement (EIS) was prepared for the Project in accordance with the requirements of the *Environmental Planning and Assessment Regulation 2000*. The EIS was publicly exhibited between 2 December 2020 and 29 January 2021 by the former NSW Department of Planning, Industry and Environment (DPIE) (now known as NSW Department of Planning and Environment [DPE]).

The Proponent prepared a Submissions Report which responded to the issues raised in agency and community submissions. An Amendment Report (Amendment Report 2021) was also prepared. The Project has since been amended further in response to Requests for Further Information from the former DPIE.

This Amendment Report assesses the environmental, social and economic impacts of the amendments proposed to the Project as described and assessed in the EIS, Submissions Report and Amendment Report 2021.

The assessments contained in this Amendment Report confirm that the Project amendments will reduce the potential impacts of the Project including by:

- Removing the construction of Devil's Elbow bypass road and potential impacts to the Black Snake Gold Mine curtilage, which is a key concern of Tamworth Regional Council (TRC);
- Removing the requirement for retaining walls along Morrisons Gap Road, and reduce traffic along Morrisons Gap Road which is a key concern of TRC;
- Increasing the separation distance between turbines on the boundary with the Ben Halls Gap Nature Reserve, improving biodiversity outcomes;
- Creating a 1.2 km buffer through the removal of WTG 41 to reduce bird and bat barrier effects and in response to NSW National Parks and Wildlife Service (NPWS) aerial firefighting concerns;
- Providing greater certainty to the proposed curtailment for potential impacts to threatened bat species; and
- Option of reducing haulage by trucks through the township of Nundle and the broader local and regional road network through sourcing material from a quarry in proximity to the Project (9 km north of WTG 69).

In addition, this Amendment Report updates the mitigation measures proposed for the Project to ensure that all remaining impacts are appropriately managed and mitigated throughout the Project life cycle.

While there are some inevitable impacts associated with all wind farm projects, the impacts associated with the refined and amended Project have been fully assessed and confirmed to be significantly outweighed by the strong public benefits which the Project will deliver. These include:

- Generating enough renewable energy to power approximately 182,000 typical homes on an average day. The Project will provide a significant amount of the new generation capacity which will be required when the 2,000 MW Liddell Power Station located in the NSW Hunter Valley closes in early 2023. Accordingly, the Project will help ensure the security of electricity supply for NSW and help manage the cost of electricity for consumers.

- Providing dispatchable energy through the proposed large-scale battery energy storage system of 100MW/400MWh helping to meet peak electricity demands.
- Saving 608,000 tonnes of carbon emissions per annum and assisting the NSW and Federal Government to meet greenhouse gas targets. In particular, the Federal Government has recently committed to achieving net zero greenhouse gas emissions by 2050. If approved, the Project could be constructed and operational well before the critical global milestone of 2030, assisting NSW and Australia to achieve a 35% reduction by 2030.
- Enabling effective utilisation of the best wind energy resource in the NSW Hunter/New England region.
- Material direct investment within the domestic economy with the Project representing a capital investment of at least $332 million and an ongoing operational investment of $17 million per annum. This direct investment in NSW and the broader region will also bring material benefits to the Tamworth Local Government Area (LGA) and align with the Tamworth Regional Blueprint 100.
- Material employment generation, with the creation of 615 Full Time Equivalent (FTE) jobs through both years of the construction period, and 76 FTE jobs during the operational phase (across professional, scientific and technical industry sector) including 16 ongoing site based jobs for the lifetime of the project.
- Providing a diversified income stream for rural landholders and neighbours through payments to host landholders and the Neighbour Benefit Sharing Program.
- Community enhancement funding of $3,000 per turbine per annum for the operational life of the Project, as well as an additional construction sponsorship fund of $150,000 to support community initiatives during construction.
- Contributing to NSW and Commonwealth renewable energy targets, without depending on the network expansion proposed in the New England area and in alignment with the NSW Electricity Roadmap NSW Electricity Roadmap.

In addition, to further support the local community, if the Project is approved and constructed, ENGIE's energy retailer will offer an exclusive electricity plan to the residents within the Nundle, Hanging Rock & Crawney area. Under this exclusive electricity plan, ENGIE will cover the wholesale cost component of all electricity used by residents within the Nundle, Hanging Rock & Crawney area, enabling them to further benefit from the proximity of the Project by saving on their energy bills.

The local community has demonstrated significant support for renewable energy including this Project. This is evidenced by the fact that the Project has received more supporting submissions than any other wind farm in NSW to date as well as the results of a recent survey of local business owners which found that most businesses with a shopfront in Nundle and Hanging Rock expressed support for the Project, including 90% of businesses with a shop front directly on the proposed transport route.

Overall, it is considered that this Project is consistent with the objectives of the EP&A Act and is strongly in the public interest.

1. INTRODUCTION

1.1 The Proponent

Hills of Gold Wind Farm Pty Ltd (the Proponent) is seeking to construct and operate the Hills of Gold Wind Farm (the Project), located on the ridge line between Hanging Rock and Crawney Pass in the Northern Tablelands region of New South Wales (NSW).

The Proponent is Hills of Gold Wind Farm Pty Ltd (ABN: 28 1451 733 24), formerly known as Wind Energy Partners Pty Ltd.

ENGIE Australia & New Zealand, a joint venture between ENGIE S.A. and Mitsui & Co. Ltd, owns the Project. ENGIE is a global reference in low-carbon energy and services. Together with our 101,500 employees, our customers, partners and stakeholders, we are committed to accelerate the transition towards a carbon-neutral world, through reduced energy consumption and more environmentally-friendly solutions. Inspired by our purpose (“raison d’être”), we reconcile economic performance with a positive impact on people and the planet, building on our key businesses (gas, renewable energy, services) to offer competitive solutions to our customers. In Australia, ENGIE has 1,100MW of low-carbon generation capacity and more than 2,000MW of renewable energy under development. Our retail business, Simply Energy, has more than 740,000 gas and electricity customer accounts.

The contact details for the Proponent are:

Hills of Gold Wind Farm Pty Ltd (formerly Wind Energy Partners Pty Ltd)

Level 23, 2 Southbank Boulevard

Southbank VIC 3006

1.2 Previous Steps in the Assessment Process

Approval for the Project is sought under the State Significant Development (SSD) provisions (Division 4.7) contained in Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) as the Project is declared to be SSD under Section 2.6 *of State Environmental Planning Policy (Planning Systems) 2021*.

In support of the SSD application, an Environmental Impact Statement (EIS) (ERM, 2020) was prepared for the Project in accordance with the requirements of Environmental Planning and Assessment Regulation 2000 (EP&A Regulation). The EIS was publicly exhibited between 2 December 2020 and 29 January 2021 by the former NSW Department of Planning Industry and Environment (DPIE).

During the public exhibition period, 624 submissions were received from members of the public, community organisations and government agencies (excluding duplicates and one submission from "Department of Transport" about the abolition of Roads and Maritime Services). Further, additional comments were also received from DPIE and through ongoing consultation with agencies and community groups.

Hills of Gold Wind Farm Pty Ltd prepared a Submissions Report (ERM, 2021) which responded to the issues raised in agency and community submissions. An Amendment Report (Amendment Report 2021) (ERM, 2021) was also prepared to refine and amend the Project in the following ways:

- Removal of five proposed wind turbine generators (WTGs) and associated access roads and ancillary infrastructure;
- Minor relocations to three WTG locations;
- Minor relocation of a portion of the transmission line route;
- Minor amendments to the location and configuration of ancillary infrastructure;
- Changes to the transport routes and site access arrangements, including the optimisation of the Devil’s Elbow bypass road; and

- Revising design and construction delivery methodologies to significantly reduce overall traffic volumes and the Development Footprint.

There has been three Requests for Information (RFI's) prepared by the (former) DPIE. The RFIs are summarised as follows:

- On 11 October 2021 DPIE requested information on transport, visual impact, biodiversity, noise, aviation, soil, water and consultation aspects of the Project. The Hills of Gold Wind Farm Amendment Report 20 December 2021 provided a response to this RFI.
- On 9 February 2022 DPIE requested information on transport, visual impact and biodiversity impact aspects of the Project. A separate Hills of Gold Wind Farm Response to Request for Additional Information was issued on the 25 March 2022.
- On 31 March 2022 DPIE requested information on consultation and visual impact aspects of the Project. They also requested information on the Voluntary Planning Agreement and the retaining walls proposed at Morrisons Gap Road.

This Amendment Report should be read in conjunction with the EIS, Submissions Report and Amendment Report 2021.

1.3 Project Overview

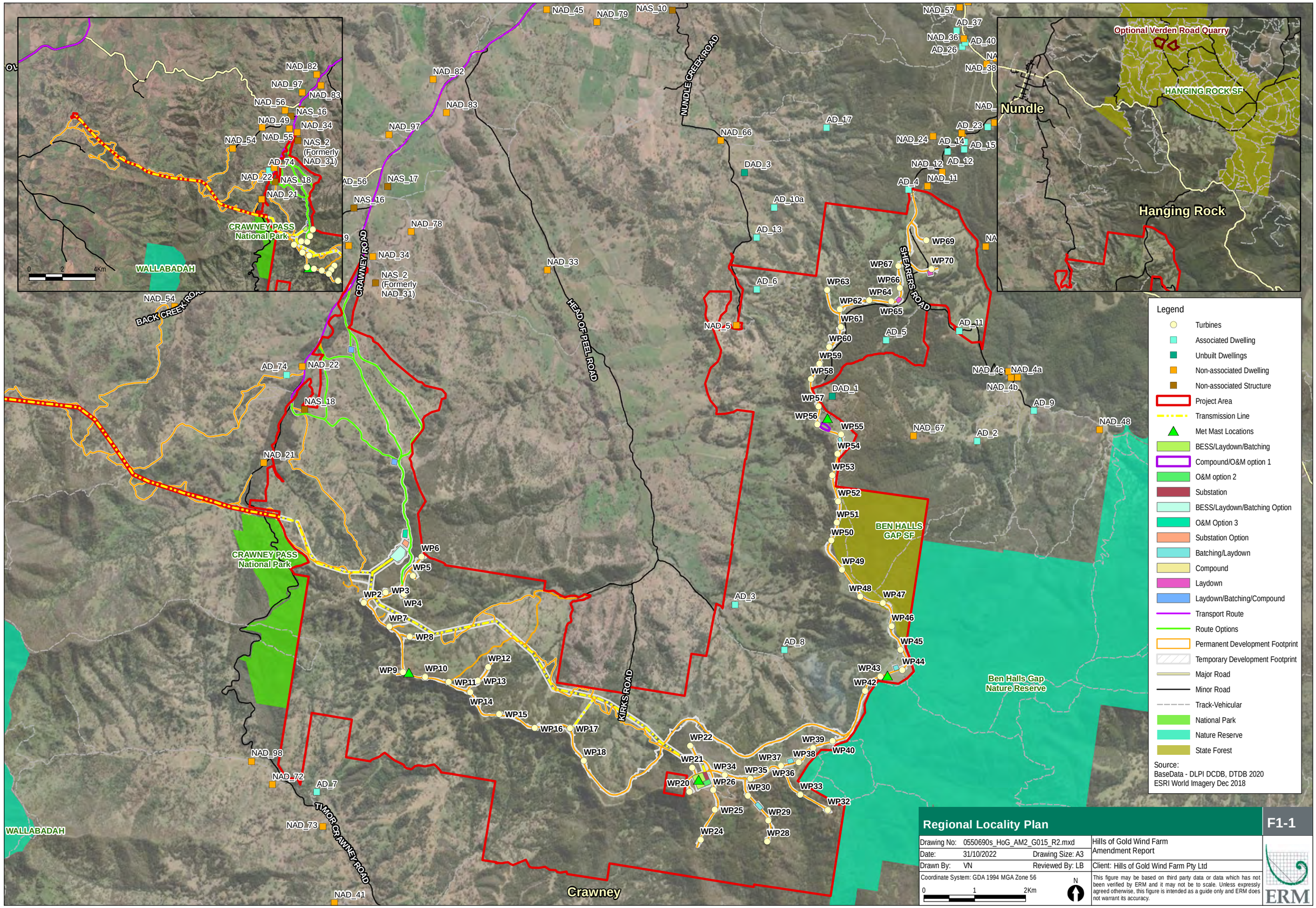
The Project involves the construction, operation and decommissioning of a wind farm including wind turbine generators and associated infrastructure including a battery energy storage system, electrical substation, operations and maintenance facility, electricity infrastructure, internal access roads, external road upgrades and temporary construction works and facilities.

The Project is optimally located in an area which:

- Is relatively isolated and sparsely populated, away from regional townships and major regional cities;
- Is located with existing transmission infrastructure and is not reliant on the development of the New England Renewable Energy Network Expansion;
- Has significant wind resources as determined from detailed 10-year site studies;
- Has demonstrated significant support for renewable energy including for this Project which has received more supporting submissions than any other wind farm in NSW (see Submissions Report for details); and
- Will bring material benefits to the Tamworth LGA and aligns with the Tamworth Regional Blueprint 100.

A plan of the Project in its regional setting is provided in **Figure 1.1**.

The Project will provide regional jobs and economic benefits for communities in and around Nundle, Hanging Rock and Crawney, while producing significant volumes of renewable electricity. The Project will also support the Commonwealth and NSW Governments in achieving their respective renewable energy and greenhouse gas emission reduction targets, and it will support a transition to a low carbon economy while contributing to the long-term reduction in the cost of power.



Regional Locality Plan

F1-1

Drawing No:	0550690s_HoG_AM2_G015_R2.mxd		Hills of Gold Wind Farm Amendment Report
Date:	31/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: LB	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

ERM

1.4 Project Amendments

Since the EIS was exhibited, the Project has been revised and refined to further minimise potential environmental impacts and respond to key feedback from the public, host landholders, community organisations and government agencies. The amendments made to the layout have responded to key issues raised during consultation with agencies, community and organisation submissions.

This Amendment Report outlines the amendments made to the Project, confirms how the amendments proposed address key concerns raised by agencies, community organisations and the public and updates the assessment contained in the EIS to reflect the updated Project. In addition, this Amendment Report also updates the mitigation measures proposed for the updated Project to ensure all remaining potential impacts of the Project are appropriately managed and mitigated throughout the life cycle of the Project.

The Project refinements and amendments have been carefully designed and sited to reduce potential impacts, particularly in relation to biodiversity, visual and traffic issues, in consultation with the local community and relevant landholders.

The justification of the Project refinements and amendments is further discussed in **Section 8**.

2. STRATEGIC CONTEXT

2.1 Summary of Strategic Context

The Project Area is located within the New England region, approximately 5 km south of Hanging Rock and 8 km south-east of Nundle. The Project Area is located over three Local Government Areas (LGAs), being the Tamworth Regional LGA, Upper Hunter Shire LGA, and the Liverpool Plains LGA. The nearest major township is Tamworth, located approximately 60 km north-west.

A key early consideration in site selection for the Project was the excellence of the wind resource in the region combined with the relatively low number of existing residential dwellings within 5 km of the Project. There are 56 existing dwellings within 5 km (35 of which are non-associated dwellings). Of these, there are 10 existing dwellings within 2 km (of which six are non-associated dwellings). Most of these dwellings are located on Morrisons Gap Road and Barry Road, and are generally screened from the Project by topography and vegetation.

The NSW Government has confirmed that the New England region is ‘energy rich’ and is among the best known regions for wind energy in NSW. The NSW Electricity Strategy (DPIE, 2019a) and Electricity Infrastructure Roadmap (DPIE, 2020a) identify the New England region to be one of five REZs to be created in NSW, with others being declared/proposed in the Central-West Orana, Illawarra, south west and Hunter-Central Coast regions of NSW.

REZs combine wind, solar, hydroelectric and energy storage, together with high-voltage transmission lines, to generate and deliver clean, renewable energy. By connecting multiple generators and storage in the same area, REZs capitalise on economies of scale to deliver cheap, reliable and clean electricity for homes and businesses in NSW. The REZs will play a significant role in delivering renewable energy generation and storage to help replace existing fossil fuel power stations as they come to their end of operational life.

The New England REZ map identifies the Project as being outside but in proximity to the New England REZ. Notwithstanding the Roadmap’s recognition of the role of REZ’s in transforming the NSW electricity sector, the NSW Government has also acknowledged that a large portion of existing solar and wind development remains located outside REZs (approximately 70%) and continued development outside of the REZs will be required to support a transition to renewable energy (DPIE, 2021c). Accordingly, whilst the Project is in close proximity to the New England REZ, its location outside the mapped margins of the REZ remains consistent with the NSW Government’s recognition that the majority of renewable projects are located outside of the REZs.

Specifically, the Project site has been demonstrated to have access to a stronger wind speed than the rest of the New England REZ as can be seen in **Figure 2.1**.

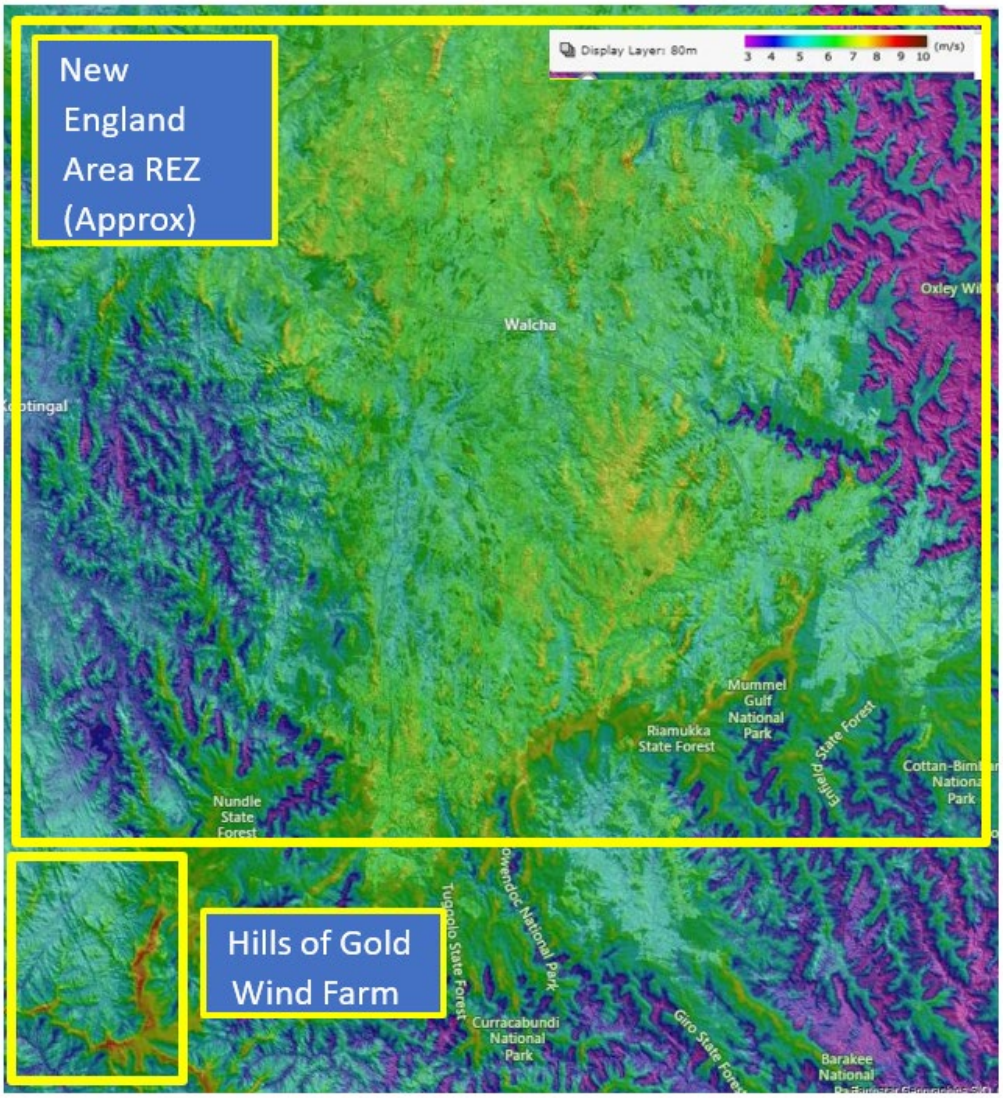


Figure 2.1 Wind Resource Map, New England REZ and the Project

The Project also aligns with both the New England North West Regional Plan 2041 (DPE, 2022), which has a vision for fast-tracked renewable energy development in the region, and the Tamworth Regional Blueprint 100 (Tamworth Regional Council, 2020) which seeks to drive economic growth in the region.

The Project will connect to the existing Liddell to Tamworth 330 kV transmission line, which dissects the New England REZ, and aligns with the identified Queensland-NSW Interconnector upgrade. The Queensland–NSW Interconnector is one of four priority transmission projects identified in the NSW Transmission Infrastructure Strategy, helping to transport energy from the New England REZ to major demand centres and involves the upgrade of existing transmission lines between Liddell Power Station, Muswellbrook and Tamworth substations.

Unlike other projects in the New England area, the Project is not reliant on the development of the New England Renewable Energy Network Expansion that “will take a number of years to design and build” according to the New South Wales government (NSW Government, 2021). Infrastructure Partnerships Australia (2022) have identified the expected construction commencement of projects in the New England REZ as July 2031.

Therefore, if approved, the Project will provide clean, timely renewable energy to help replace electricity generation removed from the national network (AGL’s Liddell power station is expected to close by early 2023 and Origin’s Eraring power station by as early as 2025) and help ensure Australia is best placed to deliver on critical global greenhouse gas milestones in 2030.

The Project has been designed to minimise potential land use conflicts while delivering broader public benefits in the context of supporting State and Commonwealth strategies and renewable energy targets, as well as Australia's international obligations to reduce greenhouse gas emissions, meeting future energy demands, and contributing to economic development in the region.

As defined in the EIS and further discussed below, the Project aligns with international, Commonwealth and NSW Government policy and strategic vision, including:

- United Nations Sustainable Development Goals;
- The Commonwealth Renewable Energy Target;
- Reducing Greenhouse Gas emissions in line with the Federal Government *Climate Change Bill 2022*;
- Contributing to the National Electricity Market;
- NSW Electricity Strategy;
- NSW Electricity Infrastructure Roadmap;
- NSW Net Zero Plan Stage 1: 2020 – 2030;
- NSW Transmission Infrastructure Strategy;
- NSW New England Renewable Energy Zone;
- NSW COVID-19 Economic Recovery Strategy;
- New England North West Regional Plan;
- Hunter Regional Plan; and
- Tamworth Regional Blueprint 100.

The Project will:

- Support the transition being undertaken in the energy sector away from a centralised system of large fossil fuel generation, towards a decentralised system of widely dispersed, renewable energy production;
- Help contribute to meet increasing energy demand, provision of dispatchable energy through the proposed large scale battery energy storage system (BESS) which will assist in managing ongoing electricity demand peaks;
- Provide necessary alternative electricity production given the forecasted retirement of coal-fired power stations;
- Avoid risks to the supply of power arising from the need to expand the electricity network prior to constructing further renewable energy projects in the region;
- Contribute to GHG emissions avoided in the order of 654,400 tonnes per annum, supporting Australia’s recent commitments of net zero emissions by 2050;
- Provide a significant amount of the new generation capacity which will be required when the 2,000 MW Liddell Power Station located in the NSW Hunter Valley closes in early 2023;
- Contribute materially to NSW and Commonwealth renewable energy targets;
- Deliver economic benefits to regional and local communities, including:

  - Material direct investment, with the Project expected to include a minimum capital expenditure of $332 million (within the domestic economy) with ongoing operational expenses of $17 million per annum. This direct investment in NSW and the broader region will also bring material benefits to the Tamworth LGA and align with the Tamworth Regional Blueprint 100 (Tamworth Regional Council, 2020);

- Material employment, with the creation of 615 Full Time Equivalent (FTE) jobs through both years of the construction period, and 76 FTE jobs during the operation (across professional, scientific and technical industry sector) and 16 site based jobs for the life of the Project;
- Providing a diversified income stream for rural landholders and neighbours through payments to host landholders and the Neighbour Benefit Sharing Program;
- Further community enhancement funding of $3,000 per turbine per annum for the operational life of the Project, as well as an additional construction sponsorship fund of $150,000 to support community initiatives during construction; and
- contributing to NSW and Commonwealth renewable energy targets, without depending on the network expansion proposed in the New England area and in alignment with the NSW Electricity Roadmap.

In addition, to further support the local community, if the Project is approved and constructed, ENGIE's energy retailer will offer an exclusive electricity plan to the residents within the Nundle, Hanging Rock & Crawney area. Under this exclusive electricity plan, ENGIE will cover the wholesale cost component of all electricity used by residents within the Nundle, Hanging Rock & Crawney area, enabling them to further benefit from the proximity of the Project by saving on their energy bills.

2.2 Updates to the Strategic Context

Since the completion of the EIS in November 2020, and the Amendment Report 2021, the NSW and Federal Government's objectives and strategies for reducing emissions and climate change mitigation have continued to evolve through updated emission reduction targets and new strategies, as discussed below.

2.2.1 Federal Government Commitments

The Federal Government *Climate Change Act 2022* outlines Australia's greenhouse gas emissions reduction targets of a 43% reduction below 2005 levels by 2030 and net zero by 2050. The Project will assist in achieving this target by providing an estimated reduction in greenhouse gas emissions of approximately 0.65 Mt CO_2-e per annum.

If approved, the Project could be constructed and operational before 2030, which is the year that many nations have pledged significant greenhouse gas emissions reductions relative to 2005 levels.

2.2.2 NSW Government Commitments

2.2.2.1 New England Renewable Energy Zone

The New England REZ was declared by the Minister for Energy and Environment in December 2021. The declaration begins the process of formalising the REZ under the *Electricity Infrastructure Investment Act 2020*, establishes EnergyCo as the Infrastructure Planner for the REZ, and sets the intended network capacity. The declaration of the New England REZ also supports the implementation of the Australian Energy Market Operator's (AEMO) Integrated System Plan.

The Project is strategically located in close proximity to the southwest of the boundaries of the New England REZ, and aligns with the strategic objectives of the New England REZ as identified above. The Project will deliver affordable clean energy, contribute to the diversification of the NSW energy sector, and facilitate the expansion of electrical transmissions capabilities and opening up new parts of the National Electricity Market (NEM) for energy generation. The Project has been optimised to make the most of the wind resources, allowing clean, reliable energy that can be matched with transmission and demand.

2.2.2.2 Energy Demand and Security

Traditionally, NSW's electricity needs have been met by coal-fired generation and some gas peaking power plants. While wind and solar power has increased, fossil fuel generation continued to produce

over 70% of electricity in the NEM in 2020, (Australian Energy Regulator, 2021). However, this trend is reversing and over the next two decades, 16 gigawatts (GW) of thermal generation (61% of the current coal fleet in the NEM) is expected to retire and over 26–50 GW of new large-scale wind and solar capacity is forecast to come online (Australian Energy Regulator, 2021).

The AEMO *2022 Integrated System Plan* (AEMO, 2022) has attributed the optimal development pathway for the NEM as a nine-fold increase in utility-scale variable renewable energy.

The AEMO's *2022 Electricity Statement of Opportunities* (2022 ESOO) provides updated forecasts for demand and supply of electicity. The 2022 ESOO included the following findings:

- Increased consumption and maximum demands are forecast, including from industrial load expansions, increasing the required generation commitment and further challenging forecast reliability in some regions;
- In the short to medium term, without additional investment beyond present commitments, reliability gaps are forecast in NSW from 2025-26;
- In the longer term, indicative reliability gaps are forecast in all NEM mainland regions before 2031-32.

The 2022 ESOO ultimately signals:

> *A need to urgently progress anticipated generation, storage and transmission developments … to support the energy transition underway. With the NEM expected to experience a cluster of five announced coal-fired generator retirements in the next decade, and needing resilience for potential future closures as well, the investment need is pressing and widespread across the NEM (p. 5).*

A media release dated 4 October 2022 from the NSW Government Treasurer and Minister for Energy highlights that recent world events has put an "enormous pressure on power prices" and shows the need to "fast track plans to replace ageing power stations and reduce reliance on generation that relies on volatile international commodity prices" (NSW Government, 2022).

The Project will help to meet the forecast increasing demand for energy in the NEM to address reliability challenegs and support the energy transition underway. Once the Project has been approved with notice to proceed, only 24 months is anticipated until testing and completion, supporting the NEM in its call to urgently progress projects.

3. DESCRIPTION OF AMENDMENTS

3.1 Overview

An overview of the amendments to the Project is provided in **Table 3-1**, providing a comparison between the amended Project to the original exhibited Project as outlined in the EIS and the Amendment Report 2021.

Table 3-1 Project Amendments in Comparison to Previous Proposal

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
Project Layout and Components			
WTG dimensions	Hub height: 150 m Tip height: 230 m	No change	No change
Project Area	8,315 ha (inclusive of TL and Switching station)	No change	There is an increase in the Project Area to 8,732 ha associated with optionality for the substation / BESS, footprint for the Crawney Road private access, and extraction area for the optional proposed quarry.
Project Layout	See Figure 3-1 of the EIS, noting ongoing detailed design and relocation allowance of: ■ Up to 100 m for WTGs; and ■ Within the assessed study area for all other Project infrastructure including cabling and access tracks (excluding substation / BESS / switching station within the identified flame zone). ■ Subject to ensuring that relocation allowance does not result in greater impacts than assessed in the EIS and complies with all conditions imposed on any development consent granted for the Project.	See Figure 3.1 of Appendix A, noting ongoing detailed design and relocation allowance of: ■ Up to 100 m for WTGs; and ■ Within the assessed study area for all other Project infrastructure including cabling and access tracks (excluding substation / BESS / switching station within the identified flame zone). ■ Subject to ensuring that relocation allowance does not result in greater impacts than assessed in the EIS / Amendment Report and complies with all conditions imposed on any development consent granted for the Project.	Refer to Figure 3-1, noting: ■ Removal / relocation of turbines as detailed below; ■ Optionality for the siting of the substation and BESS; ■ Addition of an optional quarry located 9 km north of WTG 69 within the Hanging Rock State Forest (Verden Road Quarry); Ongoing detailed design and relocation allowance of: ■ Up to 100 m for WTGs; and ■ Within the assessed study area for all other Project infrastructure including cabling and access tracks (excluding substation / BESS / switching station within the identified flame zone).

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
			■ Subject to ensuring that relocation allowance of turbines does not result in greater impacts than assessed in the EIS / Amendment Report / Addendum Amendment Report and complies with all conditions imposed on any development consent granted for the Project.
Development Footprint	■ Permanent Development Footprint: approximately 242 ha. ■ Temporary Development Footprint: approximately 271 ha. ■ Total development footprint approximately 513 ha. ■ Refer Table 3-2 of the EIS.	■ Revised Permanent Development Footprint: approximately 100 ha. ■ Revised Temporary Development Footprint: approximately 200 ha. ■ Revised Total development footprint approximately 300 ha. ■ Refer Table 3.4 of Appendix A of the Amendment Report 2021.	■ Permanent Development Footprint: approximately 145 ha. ■ Temporary Development Footprint: approximately 302 ha. ■ Total development footprint approximately 447 ha. ■ Further detail is provided in Table 3.4 of the updated Project description attached in Appendix A.
Internal Road Network	■ Refer Figures 3-1 to 3-5 of the EIS.	■ Refer to Figures 3-1 to 3-5 of Appendix A of the Amendment Report 2021.	■ Refer to Figure 3.1 and Figure 3.2. ■ Additional site entrance road of Crawney Road into the Project Area, accessing through either: ■ Option A (turn off 1): Middle of Crown Land (Lot 7301 DP 1136648) into the existing host landowner property (Lot 120 DP 755349); or ■ Option B (turn off 2): Southern end of Crown Land (Lot 7301 DP 1136648) into the existing host landowner property (Lot 120 DP 755349); or ■ Option C (turn off 3): Crown Land (Lot 7302 DP 1136648) into the existing host landowner property (Lot 1 DP 210662), and a new internal road within western portion of the Project Area.
WTG Layout	■ WTG coordinates as detailed in Table 3-1 and presented in Figures 3-1 to 3-5 of EIS.	■ Five turbines and the associated hardstand areas removed being WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31. ■ WTG 47 location relocated by approximately 209 m.	■ Removal of WTG 41. A total of 64 WTG's remain in the Project layout. ■ Relocation of WTGs 2, 3, 4, 10, 11, 32, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 64, 70 within 350 m of the previous location. A table

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
		■ WTG 50 location relocated by approximately 137 m. ■ WTG 12 location relocated by approximately 50 m. ■ Updated WTG coordinates provided in Table 3-1 of Appendix A of the Amendment Report 2021.	showing WTGs that have been relocated with the distance and direction is provided in Table 3-3. ■ Refer to Figure 3.3 for updated location of WTGs.

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
Transport Route, Access and Road Upgrades	■ The transport route from the Port of Newcastle to the Project Area included options for towers via Tamworth. ■ The heavy vehicle transport route was detailed in Section 12.4 and Appendix G of the EIS. ■ In the original EIS, Head of Peel Road was proposed as the alternate route from Nundle (20% traffic) along with Barry Road and Morrisons Gap Road (including Devil's Elbow bypass road).	■ Barry Road / Morrisons Gap (including Devil's Elbow bypass road) were the only proposed access to the Project Area (Head of Peel Road to be used for emergency access only). Minor traffic for construction of the transmission line and switching station would use other local roads for accessing these locations as required. ■ New option for the transport of various Project components through Muswellbrook. ■ Removal of tower option via Tamworth and Head of Peel Road route.	■ No change to the transport route from the Port of Newcastle to Nundle. ■ Retain the use of Barry Road / Morrisons Gap Road access for general construction traffic, heavy vehicle, and some packed-down returning OSOM loads. Minor roadside upgrades to Barry Road for safety at existing Devil's Elbow hairpin (for further consultation with TRC). ■ Removal of the proposed Devil's Elbow Bypass Road. ■ Removal of the proposed retaining walls on Morrisons Gap Road for road widening, with only minor road widening now proposed along Morrisons Gap Road for improve road user safety. ■ Additional alternate transport route and access to Project Area via Crawney Road (for all project vehicle types including OSOM), including additional 5.8 km of existing road use on Crawney Road, of which 2.1 km is to be sealed beyond the Head of the Peel turn-off (to site entrance Option A). Access to the Project Area through Crown Land (Lot 7301 DP 1136648) into the existing host landowner property (Lot 120 DP 755349). ■ Options for OSOM and construction traffic through Nundle to split the transport volumes and maintain existing levels of service on local roads.
Devil's Elbow	■ Alignment of Devil's Elbow detailed in Appendix G of the EIS	■ An optimised Devil's Elbow bypass road been included in the Project taking into account submissions, further design considerations and the results of the geophysical survey results. ■ Refer Figure 3-20b of Appendix A of the Amendment Report 2021.	■ Removal of Devil's Elbow bypass road.

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
Transmission Line	■ Refer to Figures 3-1 to 3-5 of EIS.	■ Minor realignment of the Transmission Line in proximity to WTGs 12 and 2. ■ Refer to Figure 3-1 of Appendix A of the Amendment Report 2021 for updated Transmission Alignment.	■ Optionality to include minor changes to the Transmission Line route to connect to the proposed substation optional locations. ■ Widening of the Transmission Line route easement from 60 m to 90 m (only in the section between the current Substation location and the new optional western Substation location). ■ Optionality for transmission towers as well as monopoles.
Substation, BESS Layout	■ Refer to Figures 3-1 to 3-5 of EIS Total area approximately 6.32 ha.	■ Minor adjustment to the configuration of the substation, O&M and BESS. ■ Further, optionality for O&M location, with second siting option included at new compound area between WTGs 55 and 56. It is not proposed that the size of the O&M facility will increase from that previously assessed. ■ No change to total area for these components.	■ Optionality for substation and BESS location with second siting option to be included from alternate Crawney Road access (including use of this for temporary concrete batch plant and satellite site office/construction compound location during construction). ■ There is an increase in the area of the Substation and BESS to 11.09 ha on accounts of terrain differences and required earthworks. The Development Footprint considers both options.
Project Construction			
Duration and Staging	■ Construction activities will be progressive across the Project Area over a period of approximately 18 – 24 months.	■ No change	■ No change
Construction Hours	■ As defined in Section 3.3.2 of the EIS: Monday to Friday: 7.00am – 6.00pm; Saturday: 8.00am – 1.00pm; and no works on Sunday or public holidays. Some out of hours work may be required.	■ No change	■ No change
Construction Workforce	■ Up to 216 full time equivalent (FTE) workers as outlined in Section 3.3.3 of the EIS (direct jobs).	■ Up to 211 FTE workers (direct jobs)	■ No change

Project Component	Exhibited Project (EIS)	Project Amendments (Amendment Report, Dec 2021)	Further Project Amendment (October, 2022)
Project Operation and Decommissioning			
Operational and Maintenance Workforce	■ Operational workforce of up to 31 FTE workers (direct jobs)	■ Operational workforce of up to 28 FTE workers (direct jobs). Clarity provided that 28 FTEs is based on direct jobs created in the Technical, Scientific and Professional areas. Of the 28 FTEs, 16 are expected to be based on site.	■ No change
Decommissioning and Rehabilitation	■ As outlined in Section 3.6 of the EIS, including preparation of an Environmental Management Strategy inclusive of Decommissioning and Rehabilitation.	■ No change	■ No change

3.2 Detailed Description of Project Amendments

Please see **Table 3-2** below which provides a detailed description of each of the amendments. An updated consolidated and detailed description of the amended Project is included in **Appendix A** of this Amendment Report. As demonstrated below, the Project has been amended to materially reduce the environmental impacts of the Project based on the key issues identified in agency and community submissions.

Table 3-2 Project Amendments

Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
Alternate transport route to the Project Area from Nundle via Crawney Road, refer Figure 3.1.	■ This Project amendment is an additional 5.8 km of existing road use on Crawney Road beyond the Head of the Peel turn-off previously proposed in the EIS. This provides the following three options for access to the Project Area: – Option A (turn off 1): through the northern portion of Crown Land (Lot 7301 DP1136648, Crown Land, part of Travelling Stock Route R339) into the existing host landowner property (Lot 120 DP 755349); – Option B (turn off 2): through the southern portion of Crown Land (Lot 7301 DP1136648, Crown Land, part of Travelling Stock Route (TSR) (R339) into the existing host landowner property (Lot 120 DP 755349); – Option C (turn off 3): through Crown Land (Lot 7302 DP11366448, Lot 26 DP 755349 and Lot 1 DP 210662), into the existing host landowner property (Lot 3 1103716)). Lot 7302 is Crown land, part of Travelling Stock Route R339. Lot 26 is also Crown land, but does not form part of the TSR. ■ The Project is committed to sealing the unsealed portion of Crawney Road to the turn off the road, i.e. in the case that Option A is selected following detailed design, this would involve 2.1 km of road sealing or up to 4.8km for Option C. ■ There is an additional 6.1 km of farm tracks to be upgraded. ■ Lot 7301 DP1136648 and Lot 7302 DP1136648 are both Crown Reserve managed by Local Land Services and is reserved for the purposes of a Travelling Stock Route and Access (R339). ■ Lot 7301 DP1136648 and Lot 7302 DP1136648 is subject to the Gomeroi Native Title Claim and an Aboriginal Land Claim, both currently undetermined. This is subject to engagement with the Gomeroi and negotiation of an Indigenous Land Use Agreement (ILUA). ■ This route will be used for all over size / over mass (OSOM) deliveries with an option for hub delivery to the Project Area and low loader trailers exiting the Project Area (nacelle and transformer trailers) utilising the existing Morrisons Gap Road/Barry Road route. Minor road	■ The amendment is in response to feedback from TRC regarding the Devil's Elbow bypass road. This alternate access will negate the requirement for the Devil's Elbow bypass road and retaining walls on Morrisons Gap Road. ■ Creates a loop around the project site, improving site ingress and egress for bushfire safety and any emergencies. ■ Creates an opportunity to split construction traffic reducing impacts of all traffic using one route to access and leave the Project Area. ■ Crown Lands has confirmed LLS as managers of Lot 7301 DP1136648 and Lot 7302 DP1136648 and the pathway for application of a Crown Land license. ■ Local Land Services are the current managers of Lot 7301 DP1136648 and Lot 7302 DP1136648 and have completed a site visit and survey of the 3 routes considered. Feedback is provided in **Section 5**. ■ NTS Corporation representing the Gomeroi Native Title Claim and Gomeroi members have been informed of the proposed changes. ■ Nungaroo Local Aboriginal Land Council have been informed of the	■ Swept path (within updated Route Survey) and Traffic and Transport Assessment ■ Biodiversity ■ Aboriginal Cultural Heritage ■ Historic Heritage ■ Visual ■ Noise

Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
	works within the road reserve of the existing Devil's Elbow is proposed to improve road safety. ■ The route will also be an optional construction traffic route for light vehicles, along with the existing Barry Road and Morrisons Gap Road route. Proposed traffic splits will maintain the current level of service on the existing road network. ■ All existing Project commitments remain except for the upgrades associated with the Devil's Elbow bypass road and retaining walls proposed for Morrisons Gap Road. This removes the requirement to include Crown Lot 440 DP 822503 within the application.	changes to the transport route and land required. ■ Site surveys are complete with Gomeroi and Nungaroo Registered Aboriginal Parties.	
Nundle Transport Route Options, refer Figure 3.2.	■ Revised swept path analysis has been completed and a previously assessed route as presented in the EIS has been reassessed with modifications proposed due to a combination of technical, community and tenure concerns. ■ The proposed amendment to the transport route includes: – after the right hand turn off Oakenville Street onto Herron Street / Innes Street a right onto Jenkins Street, heading south to Crawney Road. It has been confirmed this route can transport all OSOM excluding blades without private land encroachment if an alternate blade route is used for blades. Otherwise transport of blades along this route will require use of private land (all landowners have provided in principal agreement). – the reinstatement of the blade route as proposed in the EIS, being Oakenville Street, Old Hanging Rock Road, Happy Valley Road, River Road, Jenkins Street and Crawney Road. – the removal of the right turn onto Gill Street, right onto Point Street and left onto Crawney Road from the EIS.	■ Given feedback during the EIS phase, the Proponent has sought options to minimise traffic along Jenkins St between Oakenville and Innes St. ■ Options create an opportunity to split traffic. ■ Feedback considered during public exhibition of this route. ■ Further consultation undertaken in May as summarised in **Section 5**.	■ Swept path and Traffic and Transport Assessment ■ Historic Heritage ■ Biodiversity

Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
Removal of wind turbine generator (WTG) 41 and the relocation of 20 turbines, refer Figure 3.3.	■ WTG 41 is proposed to be removed to create a 1.2 km buffer along Ben Halls Gap Nature Reserve that will: ○ reduce bird and bat barrier effects; and ○ reduce NPWS aerial firefighting concerns. ■ 20 turbines (WTGs 2, 3, 4, 10, 11, 32, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 64, 70) are to be relocated within 350 m of the previous location. ■ The relocation of these turbines is in response to ongoing discussions with BCD and will create greater buffers in proximity to the boundary with Ben Halls Gap Nature Reserve and habitat contributing to collision risk.	■ This is in response to engagement with BCS relating to potential impact to four microbat species at risk of serious and irreversible impacts (SAII), and potential barrier impacts to fauna relating to turbine spacing. ■ Removal of WTG 41 created the greatest potential for reducing barrier effects of the turbines located near Ben Halls Gap Nature Reserve (BHGNR). ■ Movement of other turbines was based on increasing separation distances with BHGNR and native vegetation identified as potential habitat such that turbines meet the conditions for reduced collision risk. ■ Reduces 8 turbines to Low Collision Risk from Moderate ■ Updated project commitments following bat activity assessment in BDAR results in all Low Collision Risk post mitigation ■ BCS have been consulted to project changes and further assessment undertaken. ■ NPWS have been consulted on changes.	■ Biodiversity ■ Visual ■ Noise ■ Aviation
Amended access track location, refer Figure 3.1	■ Amended access track location.	■ This is to facilitate greater flexibility to the construction of the transmission line and with feedback from host landowners affected.	■ Biodiversity

Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
Optionality for transmission towers.	■ Inclusion of towers for the transmission line to provide optionality. Towers are expected to increase the overhead line spanning opportunity and reduce the number of structures required.	■ This is in response to feedback received from construction contractors. ■ The use of towers can reduce the height of poles used and creates potential for greater separation distances and longer spans. ■ Allows potential for reduced development footprint in detailed design and reduced number of poles.	■ Visual
Transmission Line Easement, refer Figure 3.5.	■ Additional transmission line easement to ensure suitable collocated easement for 33kV and 330kV powerlines running in parallel, in the event that new optional western Substation and BESS location is selected following Detailed Design.	■ This is to allow operational efficiency and maintenance to occur in accordance with Transgrid feedback. Previously underslung overhead 33kV lines are being proposed to run in parallel in a separate easement. ■ Changes also consider the alternate substation location and overhead 33kV lines required to the new substation location, increasing the required width of the easement with multiple circuits required to reach the new location. ■ These changes have been consulted with Upper Hunter Shire Council (UHSC), TRC and the community through the CCC and Community Information Hub.	■ Biodiversity ■ Aboriginal Heritage ■ Visual
Switching Station Footprint.	■ Increase in the size of the switching station footprint from 2 ha to 4 ha.	■ This is to allow greater flexibility during detailed design and construction.	■ Biodiversity ■ Aboriginal Heritage ■ Bushfire

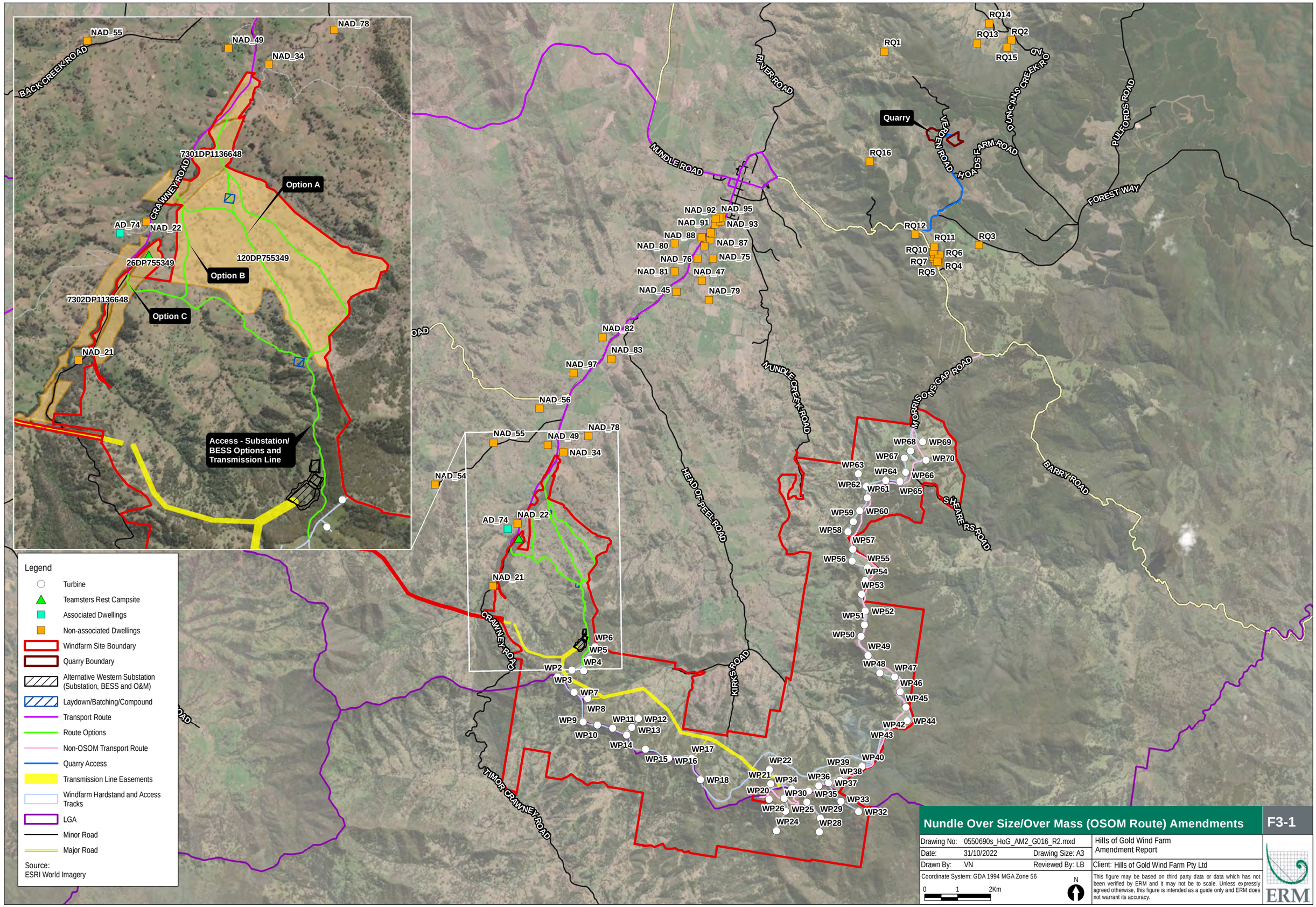
Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
Optionality for substation, BESS location, refer Figure 3.4. Refer Figure 3.1 for road access off Crawney Road.	■ Associated with the proposed alternate access along Crawney Road, the Project seeks optionality for the location of the substation and Battery Energy Storage System (BESS) (and associated ancillary works including batching plant and temporary compound) closer to the Crawney Road alternative transport route to facilitate easier access for maintenance during operations and to minimise the extent of road upgrades in final design. The siting of the optional location/s are located over 3 km from the Teamsters Rest campsite which is adjacent to the east of Crawney Road. The siting of the optional location/s are subject to further assessment and are presented in Figure 4 and includes access off Crawney Road through Lot 26 DP 755349 and Lot 7302 DP1136648, both Crown allotments.	■ This is in response to feedback received from construction contractors. ■ Access proposed off Crawney Road creates an option to locate the substation closer to public road which provides improved access and reduced earthworks associated. ■ Allows flexibility for contractors to design roads not required to delivery transformers along complex terrain and flexibility to design higher grades for turbine components which result in reduced earthworks and associated environmental impacts (however the assessment remains worst case). ■ DPE confirmed presence of Teamsters Rest campsite and requested consideration that the siting of the optional location/s avoid this site. Changes were made to a previous location based on this feedback.	■ Visual ■ Noise ■ Biodiversity ■ Aboriginal cultural heritage ■ Swept path and Traffic Impact Assessment ■ Bushfire
Optional Verden Road quarry expansion, refer Figure 3.6.	■ Option to include a quarry as part of the Project. Quarrying activities involve expanding an existing Forestry Corporation of New South Wales (FCNSW) quarry located 9 km north of WTG 69 within the Hanging Rock State Forest, along Verden Road (Verden Road Quarry). ■ Quarry operations are confined to Lot 254 DP755324 and Lot 6711 DP1204174. Lot 6711 DP1204174 is a Crown allotment. ■ Extraction limit of up to 500,000 tonnes per annum to enable supply of a range of quarry products solely for construction of the Hills of Gold Wind Farm.	■ Sourcing material from a quarry located in proximity to the Project would reduce haulage by trucks through the township of Nundle and significantly reduce impacts to the broader local and regional road network. ■ The quarry site is an existing small quarry managed by FCNSW. The site is already heavily disturbed. (No	■ Visual ■ Noise ■ Air Quality ■ Biodiversity ■ Aboriginal heritage ■ Historic heritage ■ Traffic and Transport Impact Assessment ■ Soil and Water

Further Project Amendment (October 2022)	Details	Justification and Consultation Undertaken	Technical Assessments to support further Project Amendment (October, 2022)
	■ Expansion of an existing FCNSW quarry operations area of approximately 13.2 ha, which includes the extraction pit, processing and stockpiling areas, overburden / topsoil emplacement areas and surface water management structures and is known as the "Western Operation Area". ■ A back up "satellite" quarrying area located on the hill immediately to the east of the existing quarry. This site has an area of approximately 9.9 ha, which includes the extraction pit, processing and stockpiling areas, overburden / topsoil emplacement areas and surface water management structures and is known as the "Eastern Operation Area". Note, this area would only be used should the quarry materials demand from the Project exceed anticipated extraction from the Western Operation Area.	biodiversity, visual, noise or heritage impacts are anticipated as a result of the proposed further quarrying at this location.) ■ The community, DCCEEW, EPA, DPE, UHSC, and TRC have been consulted about the optional proposed quarry (refer **Section 5**).	

Table 3-3 Amended WTG Relocation

WTG	New Easting (m)	New Northing (m)	Distance (m)	Direction	Justification
WP2	316684.50	6502788.66	84.89	South	Where possible turbines were relocated such that the rotor swept area was >100 m from retained (confirmed) hollow-bearing trees, to minimise the potential for disturbance to nesting birds, should the habitat be utilised for such purposes in the future. A separation distance of 100 m is based on the BAM requirement for species polygons for threatened owls to extend 100 m (radius) from potential/confirmed nest trees. Other turbines were located to maximise the separation distance for tree canopies and other habitat features to ensure they present no more than a 'low risk' of collision.
WP3	317114.92	6502995.81	90.21	North	
WP4	317469.36	6502963.71	63.86	North	
WP10	317887.87	6501330.80	156.27	East	Movement of this turbine allowed for spacing of 400 m between turbines. This is considered to substantially reduce the potential for barrier effect (barriers to species movements) across the subject land more broadly.
WP11	318351.00	6501230.88	103.18	East	Where possible turbines were relocated such that the rotor swept area was >100 m from retained (confirmed) hollow-bearing trees, to minimise the potential for disturbance to nesting birds, should the habitat be utilised for such purposes in the future. A separation distance of 100 m is based on the BAM requirement for species polygons for threatened owls to extend 100 m (radius) from potential / confirmed nest trees. Other turbines were located to maximise the separation distance for tree canopies and other habitat features to ensure they present no more than a 'low risk' of collision.
WP32	325798.17	6498717.02	40.76	North West	
WP35	324282.23	6499334.71	60.87	West	WTG 35 – WTG 47 allowed for turbines adjacent to BHGNR to achieve a minimum 400 m spacing (WTG 38 – WTG 47), and create a 1.2 km east-west corridor between turbines WTG 40 and WTG 42. This amendment is considered to substantially reduce the potential for barrier effect (barriers to species movements) adjacent to BHGNR, considered a higher risk areas, and across the subject land more broadly.
WP36	324596.53	6499496.90	38.75	West	
WP37	324878.10	6499587.77	107.19	South West	
WP38	325225.13	6499653.51	178.04	South	
WP39	325513.04	6499939.81	30.84	West	
WP40	325893.75	6500074.08	20.70	South West	
WP42	326534.09	6501059.67	191.07	North	
WP43	326836.91	6501337.75	242.18	North East	
WP44	327265.10	6501463.66	341.53	East	
WP45	327228.78	6501866.26	347.03	North	

WTG	New Easting (m)	New Northing (m)	Distance (m)	Direction	Justification
WP46	327057.45	6502328.60	269.28	North	
WP47	326887.11	6502787.84	169.35	North West	
WP64	326612.34	6508724.20	97.06	East	This turbine was relocated such that the rotor swept area was >100 m from retained (confirmed) hollow-bearing trees, to minimise the potential for disturbance to nesting birds, should the habitat be utilised for such purposes in the future. Also this was located to maximise the separation distance for tree canopies and other habitat features to ensure they present no more than a 'low risk' of collision.


BACK CREEK ROAD
CRAWNEY ROAD
7301DP1136648
Option A
Option B
Option C
120DP755349
26DP755349
7302DP1136648
Access - Substation/ BESS Options and Transmission Line
NAD_55
NAD_49
NAD_78
NAD_34
NAD_54
AD_74
NAD_22
NAD_21
MUNDLE ROAD
RIVER ROAD
MUNDLE CREEK ROAD
HEAD OF PEEL ROAD
KIRK'S ROAD
TIMOR CRAWNEY ROAD
Quarry
VEHICLE ROAD
HOADS FARM ROAD
DUNCANS CREEK RO
PULFORDS ROAD
FOREST WAY
MORRISONS GAP ROAD
BARRY ROAD
SHEARERS ROAD
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RQ2
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RQ4
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RQ11
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RQ14
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WP70
Legend
Turbine
Teamsters Rest Campsite
Associated Dwellings
Non-associated Dwellings
Windfarm Site Boundary
Quarry Boundary
Alternative Western Substation (Substation, BESS and O&M)
Laydown/Batching/Compound
Transport Route
Route Options
Non-OSOM Transport Route
Quarry Access
Transmission Line Easements
Windfarm Hardstand and Access Tracks
LGA
Minor Road
Major Road
Source:
ESRI World Imagery
Nundle Over Size/Over Mass (OSOM Route) Amendments
F3-1
Drawing No: 0550690s_HoG_AM2_G016_R2.mxd
Date: 31/10/2022
Drawing Size: A3
Drawn By: VN
Reviewed By: LB
Hills of Gold Wind Farm
Amendment Report
Client: Hills of Gold Wind Farm Pty Ltd
Coordinate System: GDA 1994 MGA Zone 56
0 1 2Km
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This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
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Alternate Blade Route

Legend
- Transport Footprint
- Alternative Footprint
- Transport Route
- Heritage Item
- Major Road

Source:
ESRI World Imagery

Nundle OSOM Route Amendments

F3-2

Drawing No:	0550690s_HoG_AM2_G017_R1.mxd		Hills of Gold Wind Farm Amendment Report
Date:	27/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: LB	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

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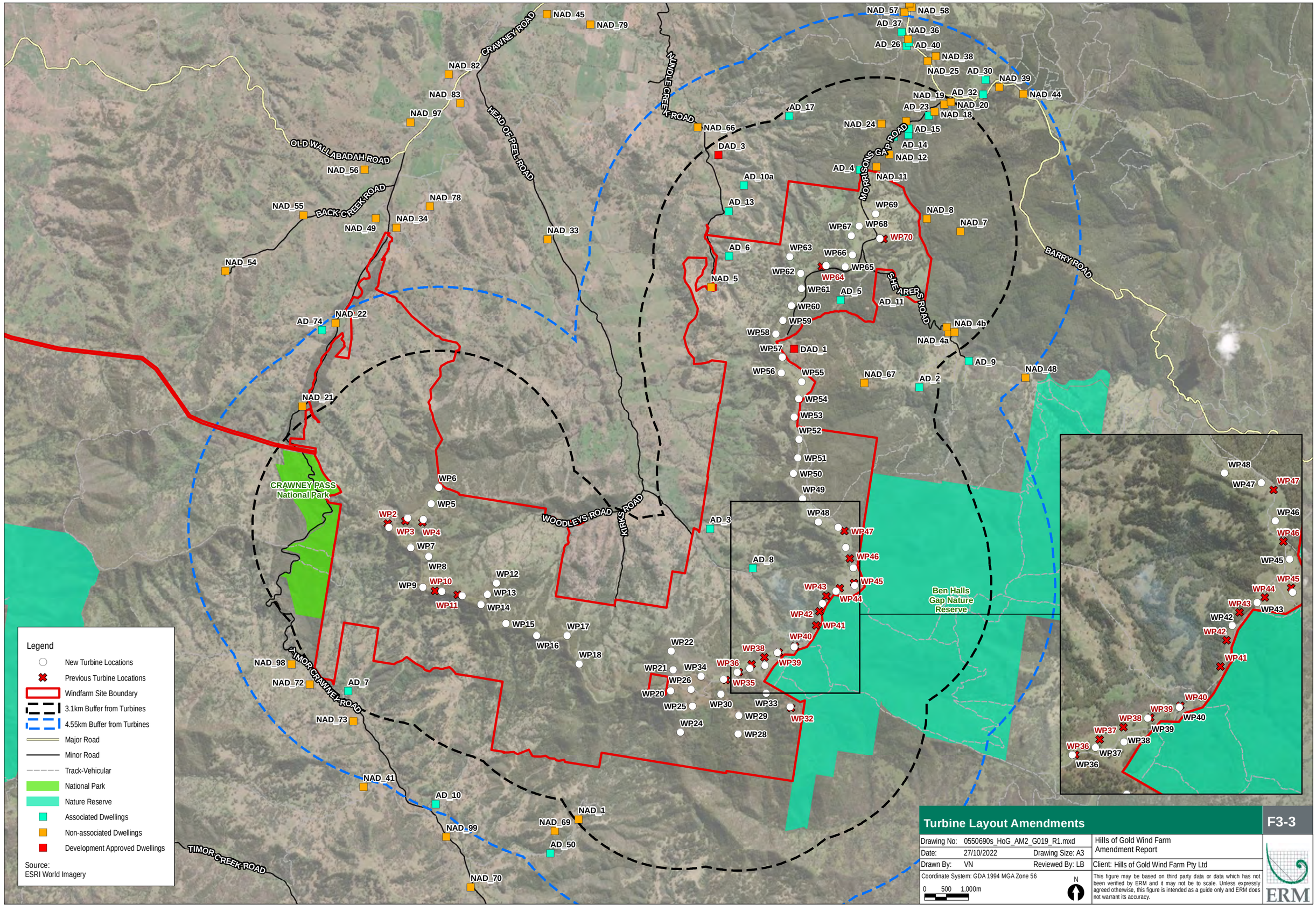
CRAWNEY ROAD
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WINDLE CREEK ROAD
OLD WALLABADAH ROAD
BACK CREEK ROAD
MORRISONS GAP ROAD
SHEARERS ROAD
BARRY ROAD
WOODLEYS ROAD
KIRKS ROAD
TIMOR CRAWNEY ROAD
TIMOR CREEK ROAD
CRAWNEY PASS National Park
Ben Halls Gap Nature Reserve
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NAD_79
NAD_82
NAD_83
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AD_50
NAD_70
WP48
WP47
WP46
WP45
WP44
WP43
WP42
WP41
WP40
WP39
WP38
WP37
WP36
Legend
New Turbine Locations
Previous Turbine Locations
Windfarm Site Boundary
3.1km Buffer from Turbines
4.55km Buffer from Turbines
Major Road
Minor Road
Track-Vehicular
National Park
Nature Reserve
Associated Dwellings
Non-associated Dwellings
Development Approved Dwellings
Source:
ESRI World Imagery
Turbine Layout Amendments
F3-3
Drawing No: 0550690s_HoG_AM2_G019_R1.mxd
Date: 27/10/2022
Drawing Size: A3
Drawn By: VN
Reviewed By: LB
Hills of Gold Wind Farm
Amendment Report
Client: Hills of Gold Wind Farm Pty Ltd
Coordinate System: GDA 1994 MGA Zone 56
0 500 1,000m
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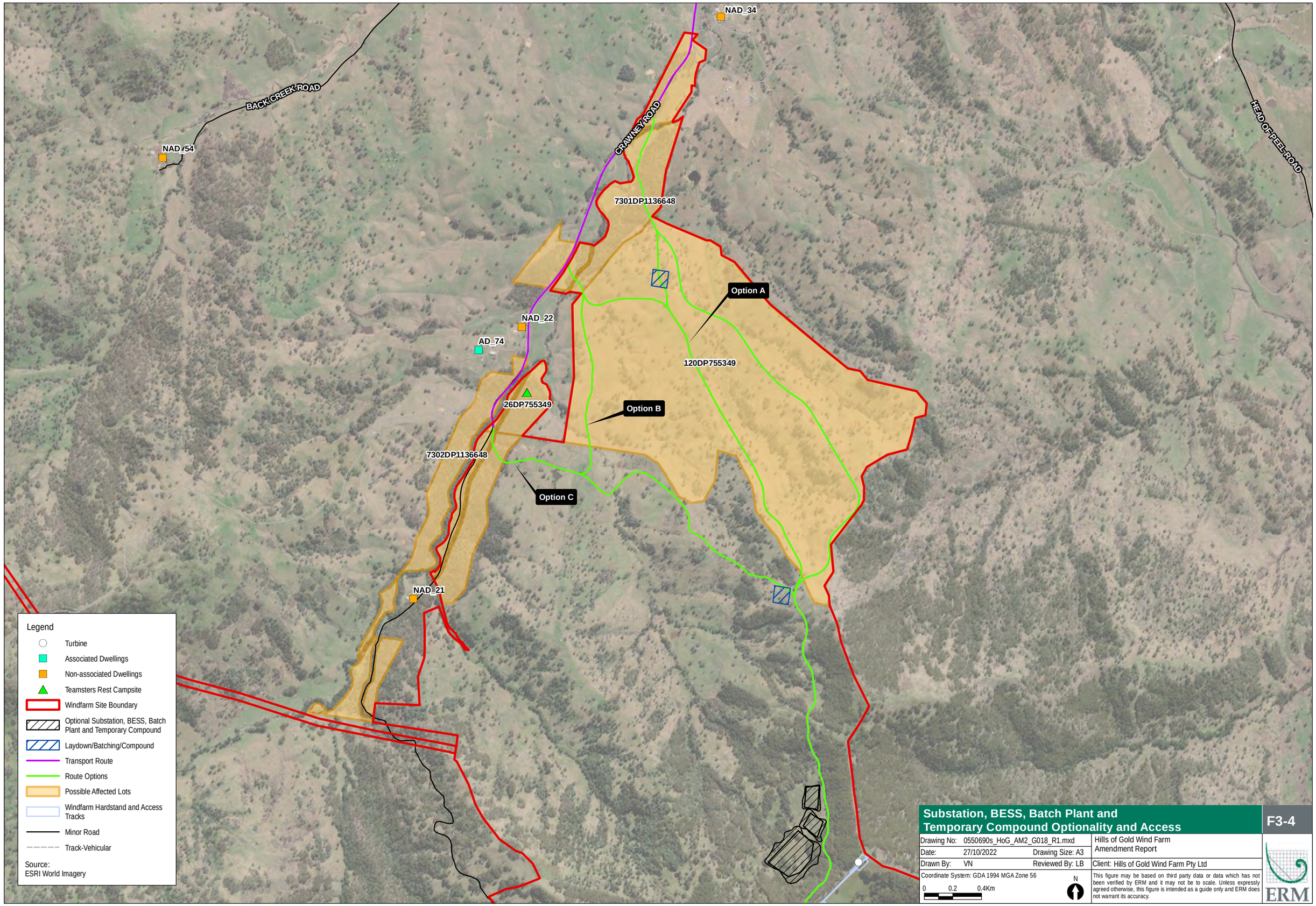
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
ERM



Substation, BESS, Batch Plant and Temporary Compound Optionality and Access

F3-4

Drawing No:	0550690s_HoG_AM2_G018_R1.mxd		Hills of Gold Wind Farm Amendment Report
Date:	27/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: LB	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

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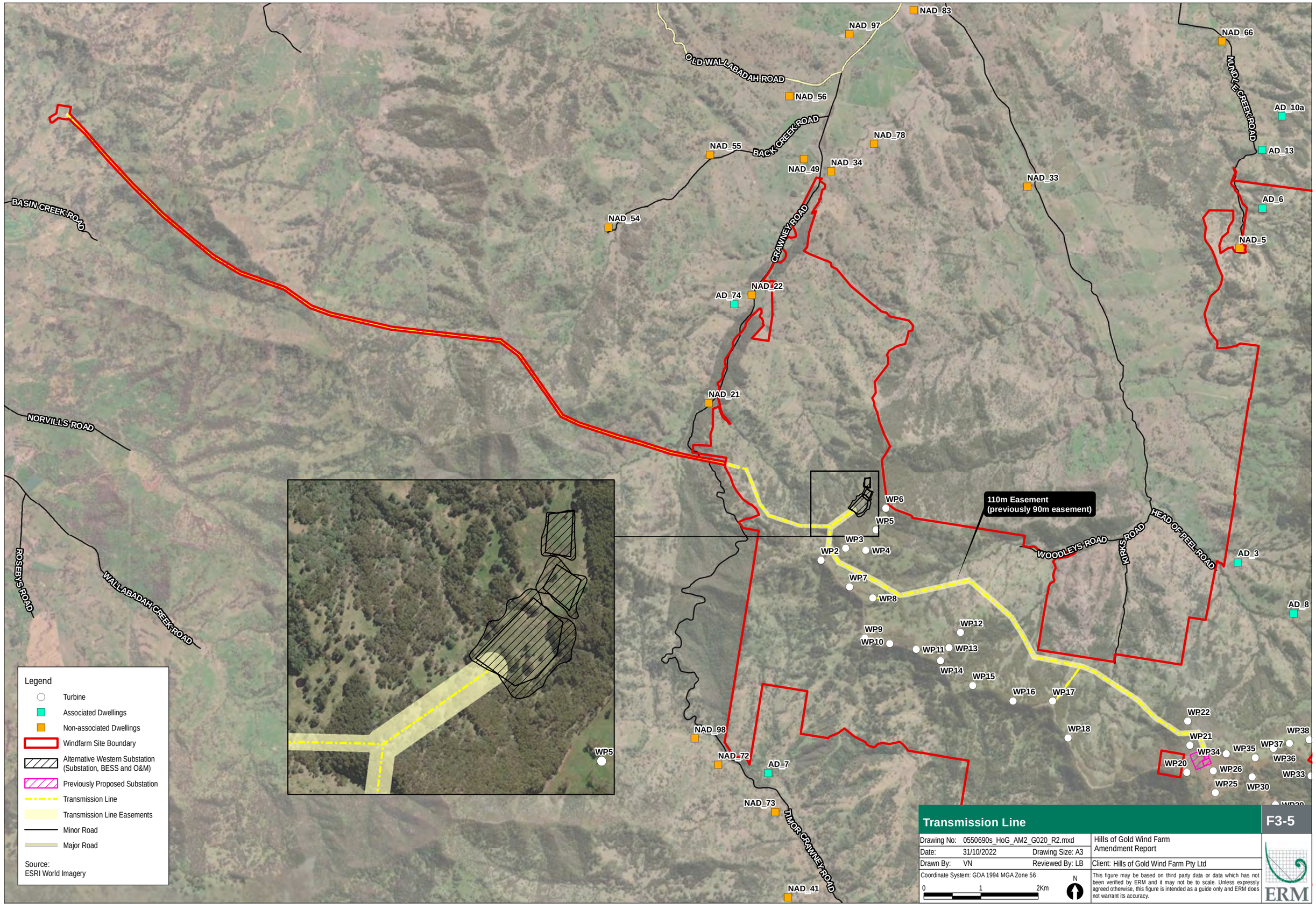

Transmission Line

F3-5

Drawing No:	0550690s_HoG_AM2_G020_R2.mxd	Hills of Gold Wind Farm Amendment Report	
Date:	31/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: LB	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

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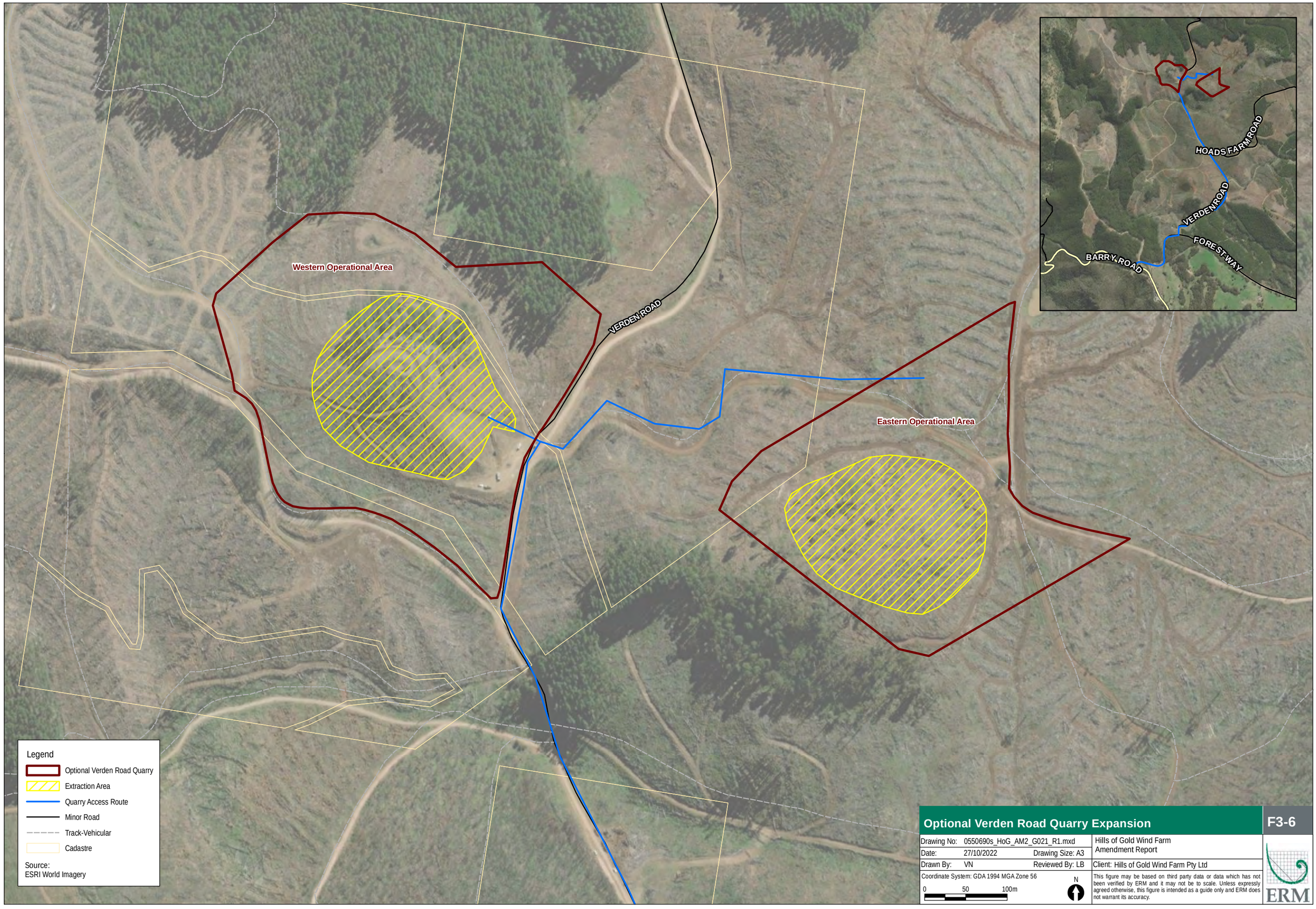

Optional Verden Road Quarry Expansion

F3-6

Drawing No:	0550690s_HoG_AM2_G021_R1.mxd		Hills of Gold Wind Farm Amendment Report
Date:	27/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: LB	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

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4. STATUTORY CONTEXT

4.1 Overview

This Amendment Report has been prepared in accordance with the *State Significant Development Guidelines – Preparing an Amendment Report, Appendix D to the State Significant Development Guidelines* (DPIE, 2021).

Section 6 of the EIS and Chapter 4 of the Amendment Report 2021 details the statutory context of the Project including Commonwealth, State and local government legislation and policies of relevance to the Project. The statutory approvals required for the Project, as amended, remain unchanged to that previously considered in the EIS and Amendment Report 2021, subject to the further updates outlined below.

A summary of statutory compliance for the Project, as amended, is provided in **Appendix D**.

4.2 Relevant Project Amendment Considerations and Changed Statutory Context

4.2.1 Nundle Over Size/Over Mass (OSOM Route) Amendments - Crown Land and Native Title

The proposed amendment of the use of an additional 5.8 km of existing road on Crawney Road (refer **Figure 3.1**) results in the following Crown land to be impacted:

- Option A (turn off 1): northern portion of Crown Land (Lot 7301 DP1136648);
- Option B (turn off 2): southern portion of Crown Land (Lot 7301 DP1136648); and
- Option C (turn off 3): Crown land Lot 7302 DP11366448 and Lot 26 DP755349.

Lot 7301 DP1136648 and Lot 7302 DP1136648 are both Crown Reserve managed by Local Land Services and is reserved for the purposes of a Travelling Stock Route and Access (R339). Crown Lands has confirmed that a Crown Land license is required.

The proposed amendments mean that there is no longer a requirement to include Crown Lot 440 DP822503 in the application.

Lot 7301 DP1136648 is subject to the Gomeroi Native Title Claim and an Aboriginal Land Claim, both currently undetermined. This is subject to engagement with the Gomeroi and negotiation of an Indigenous Land Use Agreement (ILUA) (refer **Section 5**).

4.2.2 Optional Verden Road Quarry Expansion

The supply of quarry materials is an important aspect of the wind farm project. The Project has the option of obtaining those materials from a commercial quarry or to optimise benefits to the Project and the community by undertaking quarrying activities at the Verden Road Quarry for the supply of materials as an ancillary aspect of the project, subject to final determination of viability. The optional expansion of a quarry is located about 9 km north of WTG 69 within the Hanging Rock State Forest.

Verden Road Quarry is located at Lot 254 DP755324 and Lot 6711 DP1204174, which is Crown land managed by the Forestry Corporation of NSW (FCNSW).

The quarry site currently supports an existing, small (< 30,000 tonnes per annum) FCNSW quarry operation, which utilises the material for upgrade and maintenance of roads and tracks within the Hanging Rock State Forest.

An option is to expand the quarry to extract up to 500,000 tonnes per annum of materials for use by the Project, shown in Figure 3.6. The land is described as follows:

- Lot 113 DP755324 – Licence Area only;

- Lot 254 DP755324 – Western Operations Area / Eastern Operations Area; and
- Lot 6711 DP1204174 – Eastern Operations Area.

The Western Operation Area has an area of approximately 13.2 ha, which includes the extraction pit, processing and stockpiling areas, overburden / topsoil emplacement areas and surface water management structures. The Eastern Operation Area is located on the hill immediately to the east of the existing quarry. This site has an area of approximately 9.9 ha, which includes the extraction pit, processing and stockpiling areas, overburden / topsoil emplacement areas and surface water management structures. Note, this area would only be used should the quarry materials demand from the Project exceed anticipated extraction from the Western Operation Area.

The quarry is on land zoned RU3 Forestry under the *Tamworth Regional Local Environmental Plan 2010* (Tamworth LEP 2010). Uses authorised under the *Forestry Act 2012* are permitted without consent in the zone.

Section 11 of the *Forestry Act 2012* provides that one of FCNSW's functions is to "take or authorise the taking of forest materials" from this land and forest materials are defined in the Act as "rock, stone, clay, shells, earth, sand, gravel or any like material". The Forestry Act sets out a regime for licensing forestry activities including the taking of timber, forest products and forest materials. It also regulates the use of forestry areas for non-forestry purposes. The Forestry Act limits the application of the EP&A Act in certain circumstances where an integrated forestry operations approval is in effect (see s 69W). Therefore, the proposed quarry expansion is permitted without consent under Tamworth LEP 2010.

Australian Resource Development Group Pty Limited (ARDG) will enter into a Deed of Agreement for a Forest Materials Licence with FCNSW prior to undertaking any quarry development. It has already obtained a Forest Permit, being an agreement with FCNSW enabling ARDG to access the quarry site and undertake certain activities.

In any event, despite the application of the Tamworth LEP 2010 and the Forestry Act, the quarry forms part of the SSD project as an ancillary aspect of that project by operation of:

- The EP&A Act, Section 4.38(4) which provides that if part of a single proposed development that is SSD requires development consent and another part may be carried out without consent, that other part of the proposed development (i.e. the quarry) is taken to be development that may not be carried out except with development consent; and
- The State Environmental Planning Policy (Planning Systems) 2021, Section 2.6(2) which has the effect that if a single proposed development the subject of one development application comprises development that is only partly SSD, the remainder of the development is also declared to be SSD (s 2.6(2)).

4.2.3 Alternative Western Substation & BESS

One of the proposed amendments to the Project is the use of an alternate transport route to the Project Area from Nundle via Crawney Road. Associated with this alternate route, an option has been introduced that proposes to site the substation and BESS (and ancillary works) closer to the Crawney Road alternative route.

The proposed siting of the optional location/s are subject to further assessment, and includes access off Crawney Road through either Lot 7301 DP1136648, or Lot 26 DP755349 and Lot 7302 DP1136648, all Crown allotments (refer **Figure 3.4**).

The proposed substation would be on Lot 3 DP1103716, 331 Crawney Road Crawney. This lot is zoned RU1 Primary Production under Tamworth LEP 2010.

The use of rural land for *electricity generating works* is permitted with consent under Division 4, Section 2.36 of *State Environmental Planning Policy (Transport and Infrastructure) 2021*. Under this Division:

"electricity generating works means a building or place used for the following purposes, but does not include a solar energy system—

(a) making or generating electricity,

(b) electricity storage."

4.2.4 Revised Temporary Transport Route

One of the proposed amendments to the Project is the construction of a temporary transport route through allotments within the township of Nundle. The road would traverse the curtilage of the *Peel Inn,* listed as a local heritage item on the Tamworth LEP 2010. Several additional locally listed heritage items are also in the immediate vicinity of the Project Area. As such, the proposed works will need to consider the provisions of the NSW *Heritage Act 1977.* The provisions have been considered in the Statement of Heritage Impact (SoHI) attached in **Appendix M**.

5. CONSULTATION AND ENGAGEMENT

5.1 Overview

Since lodgement of the EIS in November 2020 and the Amendment Report in December 2021, the Proponent has continued to actively consult with community members, community organisations, councils, and relevant government agencies. Consultation relating to the proposed amendments is ongoing.

5.2 Engagement Carried Out

5.2.1 Regulatory Engagement

A number of regulatory agencies were consulted in regard to the proposed amendments, through email, phone calls, and meetings, including:

- Department of Climate Change, Energy, the Environment and Water (DCCEEW): consultation has been undertaken regarding the proposed amendments since lodgement of the EPBC Act Referral Application.
- DPE: an email summarising the optional proposed quarry was provided to DPE on the 27 July 2022. The email included locations and photos of the optional proposed quarry, and listed the technical assessments proposed to support the Amendment Report. A meeting with DPE was held on the 30 August 2022 to discuss the proposed amendments more broadly. Feedback was provided to the Proponent from DPE on 8 September 2022 via a phone call. A further project briefing meeting was held with DPE to discuss project amendments on 18 October 2022.
- DPE – Crown Lands: consultation has been undertaken regarding Lot 7301 DP1136648 and Lot 7302 DP1136648. A meeting was held with DPE – Crown Lands on 11 July 2022. This consultation has confirmed that Lot 7301 DP1136648 and Lot 7302 DP1136648 are:
  - Crown Reserves for the purposes of a Travelling Stock Route (TSR) and Access, managed by Local Land Services
  - Subject to the Gomeroi Native Title Claim and an Aboriginal Land Claim, both currently undetermined. Consultation with the Gomeroi is being undertaken who have been supportive of the Project to date, seeking to transfer ILUA negotiations to Crown Lot 7301 DP1136648 and Lot 7302 DP1136648;
  - It is likely that authorisation to use the reserve/s will be required under the *Crown Land Management Act* through Crown Lands. As part of the consideration of a licence, concurrence of Local Land Services would be required.

- Feedback was sought on design considerations for the current proposed route and whether shorter routes across Crown Land could be considered. This has been taken into consideration and consultation with LLS and DPE - Crown Lands is ongoing.

- Local Land Services: an email summarising access through the Crown Lot 7301 DP1136648 was provided to LLS on the 27 June 2022. A subsequent site visit was undertaken with two LLS team members on the 7 June 2022 to consider access through Lot 7301 DP1136648 and Lot 7302 DP1136648. Three options for access through crown lots were investigated. The outcome of this was:
  - The existing farmers access would be most beneficial to use and upgrade (Option A or Option C), where possible.
  - Improving vehicle access through these reserves is a general benefit to LLS, however minimising impact to stock access across the Travelling Stock Route (TSR) is a key objective. Road crossing locations for stock should be considered during Detailed Design, where possible.
  - There is a creek crossing a short distance into the reserve off Crawney Road (Wombramurra Creek) which requires a suitable crossing to be designed and installed, such as box culverts. LLS noted that crossings should be designed and installed in line with good industry practise and relevant DPI guidelines.
  - Alternate access locations were inspected further south down Lot 7301 where it appeared that less vegetation existed (Option B), however this option was not recommended by LLS for the following reasons:
    - Section 75 of LLS Act only allows approval of one access through the reserve, and there already exists an access. Therefore, utilising Option B would involve construction of a new greenfield access road including creek crossing, and may require the removal of the existing farm access road (Option A).
    - There would be greater environmental impact to create a new greenfield access than to upgrade the existing access (Option A).
    - The terrain appears most suitable at the existing access.
  - The environmental values of the reserves were discussed, including preserving the Objectives of C2 Land Zoning (Environmental Conservation under the Tamworth LEP 2010.
    - Offsetting any access road impacts to vegetation in the reserves with further tree planting or improvement to riparian areas was discussed, however LLS suggested that this may not be a priority in Lots 7301 and 7302 given the established vegetation that exists.
    - As an alternative, LLS suggested that the Proponent could commit to improving weed control in the reserve. Some areas of Blackberry and St. John's Wort have been observed in the area. A weed control program could involve:
      - weed spraying contractor engaged on a campaign of approximately 2 times per year for approximately 2 days of spraying.
      - This is especially relevant to Lot 7301. The Proponent could further consult with LLS on this to see if this could be integrated into LLS' existing weed control programs.
  - LLS encouraged the Proponent to continue consultation with LLS, including provision of detailed designs for the proposed road for review, after development approval is granted.

- DPE - BCS: consultation has been undertaken regarding concerns raised by BCS in their advice received on 1 of February.

- A meeting was held with BCS on the 11 March 2022 and again on the 13 May 2022 in which further assessment and results of assessment with proposed commitments was discussed.
- The consultation resulted in the removal of WTG 41, relocation of turbines along BHGNR, assessment of Serious and Irreversible Impact to threatened bat species, assessment of moderate risk of impact turbines and commitments for further mitigation within the BBAMP and Owl survey methodology.
- The agreed actions have been completed and a technical note has been shared with BCS on the 8 July 2022 for further discussion.
- Further consultation was undertaken on 16 August 2022 to discuss methods for finalising the requirements for impact assessment for threatened owl species.

- NSW EPA: an email summarising the optional proposed quarry was provided to NSW EPA on the 27 September 2022. The email included locations and an aerial of the optional proposed quarry, and listed the technical assessments proposed to support the Amendment Report. Extractive industries and possibly crushing, grinding and separating will also need to be included as scheduled activities on the Environment Protection Licence. NSW EPA confirmed they will provide a formal response once this Amendment Report is submitted.

5.2.2 Council Engagement

The Proponent notified TRC of the proposed amendments via email and subsequently presented to TRC on 16 August 2022. The presentation included a photo of the proposed quarry location and area, and listed the technical assessments proposed to support the Amendment Report. The presentation included actions to provide TRC road survey and transport corner designs which is ongoing.

Further, an email was provided to Upper Hunter Shire Council (UPHSC) on 9 October 2022 to notify of the proposed amendments and offered opportunity to present to UPHSC. No response was received from UPHSC at the time that this Amendment Report was submitted.

5.2.3 Community Engagement

Ongoing consultation with the community in Nundle and along Crawney Road has commenced and will continue regarding the Project amendments. This included:

- Opening the Hills of Gold Wind Farm Community Information Hub in September 2022 on the corner of Jenkins Street and Oakenville Street, Nundle (refer **Figure 5.1**). Among the Project information provided in the Community Hub is a scale model display of the Project Area and turbine layout. The community information hub is staffed by a local Nundle resident.
- A letter and map showing an overview of the proposed amendments was posted to all residential addresses in Nundle and Hanging Rock in early September.
- Drop-in information sessions were held for three hours each morning of 7-9 June 2022, at two local cafes in Nundle. Each session was attended by around 10 residents.
- Evening drop-in sessions were held in Timor, Hanging Rock and Nundle, 7-9 June 2022. While the Timor event was not well attended, around 25 residents attended the Hanging Rock session, and about 45 attended the evening session in Nundle, including a number of Crawney Road residents.
- At each information session the Project team advised that an alternate route was being investigated, and that while a number of studies were yet to be conducted, the Proponent felt it important to advise the community early of this potential change to the Project, and potential delays to the planning process.
    - Key feedback from the information sessions regarding the alternate transport route included:
        - Discussion on traffic volumes on Crawney Road, the need to avoid school bus times and consideration of bridge upgrades;

- The potential use of previously cleared privately-owned land;
- Concerns over further delays to the Project, and the sense of wanting an outcome one way or another to the planning application;
- Questions regarding upgrades to Barry Road and Devil's Elbow and if Tamworth Regional Council would be making those upgrades.

- Members of the Project team visited landowners whose land would be required for the alternate route. All landowners advised they were willing to work with the Project to negotiate land access to their properties.
- Meetings were held with both the State Member for Tamworth, Kevin Anderson MP and Tamworth Regional Council Mayor Russell Webb on 23 June 2022. In both meetings, the proposed alternate Crawney Road route was presented, with discussion focused on further studies required, particularly related to heritage and biodiversity.
- A presentation was given to the Nungaroo Aboriginal Lands Council on 27 June 2022 and discussions have taken place with the Gomeroi Native Title applicant group representatives. The Proponent has asked for two representatives from both the Land Council and Native Title group accompanied the Project team on a site visit and walkover as part of the Amended CHAR. Both groups have advised they remain supportive of working with the Proponent with a commercial agreement to be developed with Nungaroo and an Indigenous Land Use Agreement (ILUA) to be entered into with the Gomeroi.
- A virtual meeting was held with the Community Consultative Committee on 13 October 2022 to discuss the proposed amendments.

Figure 5.1 Community Information Office

5.3 Key Issues Raised and Project Response

Table 3-2 provides a summary of the key issues raised from consultation and how the Project has responded through Project amendments, where in summary, the proposed amendments will:

- Remove the construction of Devil's Elbow bypass road and potential impacts to the Black Snake Gold Mine curtilage, which is a key concern of TRC;
- Remove the requirement for retaining walls along Morrisons Gap Road, and reduce traffic along Morrisons Gap Road which is a key concern of TRC;
- Increase the separation distance between turbines on the boundary with the Ben Halls Gap Nature Reserve, improving biodiversity outcomes including a 1.2 km buffer created through the removal of WTG 41 to reduce bird and bat barrier effects and in response to NPWS aerial fire fighting concerns;

- Provide greater certainty to the effectiveness of smart curtailment strategies for potential impacts to threatened bat species;
- Relocation of 20 turbines to reduce the pre- mitigation bird and bat collision risk of 7 turbines to low risk with all turbines low risk post smart curtailment mitigation; and
- Reduce haulage by trucks through the township of Nundle and significantly reduce impacts to the broader local and regional road network through the option of sourcing material from a quarry in proximity to the Project (9 km north of WTG 69).

5.4 Future Engagement

Ongoing engagement with stakeholders continues to be undertaken during the assessment phase of the SSD application. This engagement will include:

- Ongoing meetings with Tamworth Regional, Upper Hunter, Muswellbrook Shire and Liverpool Plains councils;
- Project updates to any future Hills of Gold Community Consultative Committee established;
- Updates to local business chamber and other special interest groups; and
- Continuation of consultation with community and regulatory stakeholders via the following forums;
  - quarterly Project newsletters;
  - community events hosted in conjunction with local community groups and organisations;
  - permanent community information hubs;
  - face-to-face meetings with community members;
  - email campaigns with key updates;
  - website updates; and
  - Community Consultative Committee ongoing meetings.

If the Project is approved, ongoing engagement with stakeholders will continue in the lead up to construction and through the construction, operational and decommissioning phases of the Project. In addition to the continuing engagement activities listed above, further key engagement actions will include:

- A local project representative engaged to communicate with the community and be the main point of contact for information;
- SMS service with transport updates on the delivery times for OSOM for community members; and
- A dedicated complaints register for community members to express any concerns to the Project.

6. ASSESSMENT OF IMPACTS

6.1 Biodiversity

6.1.1 Relevant Project Amendments

Project amendments relevant to potential biodiversity impacts include:

- Overall change to Development Footprint;
- Removal of WTG 41 and the relocation of 20 turbines;
- Removal and realignment of internal road networks;
- Transport route changes including the removal of Devil's Elbow upgrade and assessment of access of Crawney Road;
- Transmission line realignment and change of width to 90 m (from 60 m);
- Access tracks to transmission line;
- Ancillary infrastructure amendments including optionality for substation, BESS location; and
- Optional quarry expansion.

6.1.2 Additional Surveys Completed following EIS

- Field survey of relocated site access route from Crawney Road, ancillary transmission line areas and the proposed quarry in May and September 2022 by senior botanists/ecologists; and
- Nocturnal bird surveys undertaken between 5-9 September 2022 (4 nights)

6.1.3 Assessment of Impacts

An Updated BDAR has been prepared to support this Amendment Report, and is provided in **Appendix E**.

As summarised in Section 3, a number of design amendments have been made to the Project following exhibition of the EIS in 2020 and the Amendment Report 2021. **Table 6-1** below summarises the reduced biodiversity impacts resulting from these amendments from the original EIS submitted in 2020.

Table 6-1 Summary of Amendment Impact and Benefit

Project Amendment	Impact / Benefit
Development footprint revision	**BENEFIT:** Substantial reduction in direct impacts to biodiversity values have been realised through detailed design revision and footprint/infrastructure amendments. This is combined with a material reduction in the indirect impacts arising from the removal and relocation of turbines as well as a reduction in bulk earthworks and associated project infrastructure.
Removal of WTG 41 and relocation of WTG 35 – 47	**BENEFIT:** Removal of WTG 41 and relocation of WTG 35 – WTG 47 allowed for turbines adjacent to BHGNR to achieve a minimum 400 m spacing (WTG 38 - 47), and create a 1.2 km east-west corridor between turbines WTG 40 and WTG 42. This amendment is considered to substantially reduce the potential for barrier effect (barriers to species movements) adjacent to BHGNR, considered a higher risk area, and across the subject land more broadly.
Relocation of WTG 2, 3, 4, 11, 32, 36, 64 and 70	**BENEFIT:** Where possible turbines were relocated such that the rotor swept area was >100 m from retained (confirmed) hollow-bearing trees, to minimise the potential for disturbance to nesting birds, should the habitat be utilised for such purposes in the future. A separation distance of 100 m is based on the

Project Amendment	Impact / Benefit
	BAM requirement for species polygons for threatened owls to extend 100 m (radius) from potential/confirmed nest trees. Other turbines were located to maximise the separation distance for tree canopies and other habitat features to ensure they present no more than a 'low risk' of collision.
Removal and realignment of internal road networks	**BENEFIT:** Removal of internal roads will directly and indirectly benefit previously impacted biodiversity values due to a reduction in vegetation clearing, bulk earthworks and fragmentation of vegetation and habitats.
Key Intersection, Devil's Elbow and Morrison Gap Road design update	**BENEFIT:** Impacts associated with the exhibited project footprint in the EIS at Devil's Elbow comprised approximately 17 ha of native vegetation which is generally in high condition. Substantial design revisions and a new bypass reduced the impact assessed in this location down to 2.5 ha of native vegetation. However, following feedback and consultation with Council, the proposed site access via Barry Road/Morrison Gap Road has been removed from the project, along with the proposed upgrades to Devil's Elbow. This has substantially reduced impacts to high condition vegetation, comprising Box Gum Woodland Critically Endangered Ecological Community and supporting habitat for threatened fauna species. Changes to the proposed site access have also reduced previously assessed impact to native vegetation and habitats at the corner of Barry Road/Morrison Gap Road to only minor trimming being required.
Transport Route Updates	**BENEFIT:** Overall, the refined transport route represents a reduction in biodiversity impacts, particularly with the replacement of access via Devil's Elbow and Barry Road/Morrison Gap Road with the access via Crawney Road with the remaining impacts fully assessed in the updated BDAR. The project has retained three options for access to the Project to retain flexibility in final design. The impacts of each of these is presented in the Amended BDAR.
Ancillary Infrastructure Amendments	**IMPACT:** Flexibility has been incorporated to locate the BESS/Batching/Substation either near WTG 20 and WTG 26, or north-west of WTG 5 and WTG 6. Locating infrastructure near WTG 20 and WTG 26 will require a 330 kV overhead line with parallel overhead 33kV, locating infrastructure near WTG 5 and WTG 6 will instead require approximately 9 km of multiple 33 kV overhead lines, which are lower than 330 kV lines, and do not allow for the same span over vegetation and gully areas. The use of the 33kV line is considered the worst case scenario, and as such the impact assessment has been updated based on this eventuality.
Optional quarry expansion	**NEGLIGABLE IMPACT:** The proposed optional quarry expansion site/s are located within Hanging State Forest, in an active pine (*Pinus radiata*) plantation area, that has recently been highly disturbed, subjected to bushfire impacts in 2019, and subsequently remaining areas salvaged and harvested. Small areas of native vegetation to the south of the eastern operations area would remain and managed at the request of FCNSW. Impacts of the quarry site/s on biodiversity would be negligible. **BENEFIT:** Sourcing construction materials from the Verden Road Quarry would significantly reduce construction traffic through Nundle and on the local and regional road network. This would result in very significant, tangible benefits for the local and broader community.

Table 6-2 below provides further detail relating to the analysis of options for site access from Crawney Road. The areas and impact considered include only those relevant to each of the three options between Crawney Road, and the location where all three options merge to the single confirmed access footprint, approximately 1.2 kilometres north of the operational and maintenance facility.

Only one of these options will be constructed pending further optimisation during detailed design of the overall footprint with input from construction contractors and in compliance with stated impacts associated with the Project.

Table 6-2 Options Analysis for Western Site Access from Crawney Road

Option	Total native veg impact	PCTs / TECs impacted	% condition impacted	Other considerations
Option A (northern option)	3.80 ha	PCT 486, PCT 541, PCT 599 (Box Gum Woodland CEEC)	High – 20%, Moderate - 2%, Low – 78%	■ Includes an existing creek crossing to be improved ■ Impacts upon high condition Box Gum Woodland ■ Occurs furthest from known records of Booroolong Frog
Option B (central option)	2.87 ha	PCT 486, PCT 541, PCT 599 (Box Gum Woodland CEEC)	Moderate – 15%, Low – 85%	■ Requires construction of a new creek crossing within the area known to support Booroolong Frog records ■ Only impacts upon low condition Box Gum Woodland
Option C (southern option)	1.38 ha	PCT 486, PCT 541	High – 49%, Moderate - <1%%, Low – 51%	■ Requires replacement of an existing creek crossing within the area known to support Booroolong Frog records ■ Avoids impacts to Box Gum Woodland

Table 6-3 provides an options analysis for the ancillary infrastructure for the substation, O&M, BESS / Laydown / Batching, however only one of these options will be selected.

Table 6-3 Options Analysis Infrastructure: Substation, O&M, BESS/Laydown/Batching

Project component	Native veg impacts previous footprint	Native veg impacts October 2022 footprint	Comments
Ancillary infrastructure: Substation, O&M, BESS/Laydown/Batching	Total native veg impacts: 7.55ha Total impact to DNG/Low condition: 6.83ha Total impact to High condition: 0ha Total impacts to exotic vegetation: 1.19ha Total impacts to TEC vegetation: 0.71ha (Ribbon Gum EEC)	Total native veg impacts: 12.96ha Total impact to DNG/Low condition: 8.16ha Total impact to High condition: 3.62ha Total impacts to exotic vegetation: 0ha Total impacts to TEC vegetation: 0ha	Only one of these options will be selected but impacts in the BDAR are assessed as cumulative.

Table 6-4 below highlights the reduction of impact the project revisions have had on native vegetation since the EIS presented publicly exhibited in 2020.

Table 6-4 Revised Direct Vegetation Impacts

Vegetation condition class	2020 BDAR Area (ha)	Updated BDAR Area (ha)	% Reduction	% of mapped vegetation
Planted or urban vegetation	7.39	0.84	89	0.2
Exotic grassland	272.36	235.78	13	55.2
Derived Native Grasslands	30.91	39.43	-28 (increase)	9.2
Native vegetation – Low condition	37.11	33.64	9	7.9

Vegetation condition class	2020 BDAR Area (ha)	Updated BDAR Area (ha)	% Reduction	% of mapped vegetation
Native vegetation – Moderate condition	73.8	63.29	14	14.8
Native vegetation – High condition	64.88	54.19	16	12.7
TOTAL	**486.45**	**427.16**	**12**	**100.0**

The ongoing project amendments have reduced the impacts to native vegetation, because of clearing by a total of 17%, with a reduction of 16% occurring in areas of high condition native vegetation. As a result, a total of 16.16 hectares of native vegetation (varying in condition from low to high) will no longer be impacted by the Project.

Table 6-5 demonstrates the reduction in residual impacts required to be offset under the Biodiversity Offset Scheme since the EIS presented publicly exhibited in 2020 and following implementation of all efforts made to avoid and minimise impacts, to ensure no net loss to biodiversity.

Table 6-5 Reductions in Project Refinements

Relevant matter	Details	2020 BDAR Direct impacts	2022 (October) Updated BDAR Direct impacts	Change in direct impacts
Native vegetation communities and ecosystem credit species habitats.	Direct loss of native vegetation communities associated with site clearing	207.7 ha	190.54 ha	-17.16 ha
Threatened ecological communities	Direct loss of Ribbon Gum—Mountain Gum—Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	57.43 ha	27.24 ha	-27.24 ha
	Direct loss of White Box Yellow Box Blakely's Red Gum Woodland and derived native grassland	13.33 ha	8.15 ha	-5.18 ha
Habitat for threatened fauna species – species credit species	Large-eared Pied Bat*	61.08 ha	19.75 ha foraging habitat 0 ha breeding habit	-41.33 ha
	Eastern Cave Bat*	62.49 ha	19.75 ha foraging habitat 0 ha breeding habitat	-42.74 ha
	Large Bent-winged Bat*	23.12 ha	0 ha (breeding habitat)	-23.12 ha
	Little Bent-winged Bat*	23.12 ha	0 ha (breeding habitat)	-23.12 ha
	Southern Myotis	2.21 ha	3.97 ha	1.76 ha
	Eastern Pygmy-possum	30.42 ha	22.36 ha	-8.06 ha
	Koala	50.76 ha	46.28 ha	-4.48 ha
	Squirrel Glider	26.20 ha	17.50 ha	-8.70 ha

Relevant matter	Details	2020 BDAR Direct impacts	2022 (October) Updated BDAR Direct impacts	Change in direct impacts
	Booroolong Frog	1.59 ha	0.95 ha	-0.64 ha
	Border Thick-tailed Gecko	0.17 ha	0.67 ha	0.50 ha
	Powerful Owl	Assessed as not present as none were observed during surveys	17.32 ha	N/A
	Sooty Owl	As above	1.99	N/A
	Barking Owl	As above	84.63	N/A
	Masked Owl	As above	16.35	N/A
	Greater Glider	N/A	36.28	N/A
	Spotted-tailed Quoll	N/A	45.62	N/A
Total reduction				**-202.47 ha**

As a result targeted field survey, significant refinement has been achieved for previously assumed potential roosting / breeding habitat locations for cave dwelling bats including the threatened Eastern Cave Bat, Large Bent-winged Bat, Little Bent-winged Bat and Large-eared Pied Bat within and surrounding the development footprint. The former conclusion of a potential significant impact to Large-eared Pied Bat has been updated to unlikely based on a lack of optimal breeding habitat and removal and relocation of high risk turbines.

Substantial work has been undertaken to minimise the potential for operation impacts to the above listed microbat species, as well and bird and bat species generally. This work has included substantial project redesign to maximise turbine spacing to minimise the potential for operational turbines creating barriers to species movement, and to minimise the risk of fauna colliding with turbines and turbine blades.

It can be seen from **Table 6-5** above that assumed impact to Barking Owl, Masked Owl and Powerful Owl have increased from those previously assessed. This has occurred following a consultation with BCS, and a requirement to conservatively assume all areas containing potentially suitable hollow-bearing trees initially be included in the species polygons, which were then refined based on targeted surveys undertaken in September 2022. Previous assumptions of presence were restricted to areas considered to provide the highest potential for owl breeding habitat, comprising forested gullies supporting dense intact vegetation (DEC 2006), whilst this was considered appropriate for Sooty Owl, it was requested by BCS that all areas supporting potential nest trees (hollows >20 centimetres in diameter), be conservative assumed to be habitat, irrespective of landscape position, to determine an upper quantum of impacts.

This upper quantum of impacts is considered to substantially overestimate of the actual impact to each of the target species' breeding habitat. Home ranges of breeding individuals have been reported as; 255 hectares for Barking Owl (Taylor et al 2002, NPWS 2003), 350 hectares for Powerful Owl (Kavanagh 1997, DEC 2006), and at least 400 hectares for Masked Owl (DEC 2006), suggesting very few pairs would occur within, and surrounding, the subject land during breeding season. It should also be noted that targeted survey undertaken to date over eight separate nights, across three seasons have recorded one Masked Owl individual, and no evidence of Barking Owl, Powerful Owl or Sooty Owl. Further assessment is provided in Section 5 and Section 8 of this BDAR.

The following biodiversity values were identified in the subject land through a desktop study and targeted field investigations.

- Topography:
  - The topography includes a range of plateaus, ridgelines, and escarpments. The ridgetop where the WTGs will be installed is relatively flat.
- Vegetation:
  - The majority (55.5 % or 236.62 ha) of the mapped vegetation within the development footprint is composed of exotic grassland or planted/urban vegetation, with 44.5 % of the mapped vegetation being classified as native vegetation.
  - The 190.54 ha of mapped native vegetation within the development footprint, occurs across 19 separate PCTs with varying levels of disturbance and condition, stratified into 45 vegetation zones.
  - The mapped native vegetation (190.54 ha) represents 2.7% of the approximate 7091 ha contained within the assessment area.
- Communities and species:
  - A total of 24 Plant Community Types (PCTs) were identified and mapped within the subject land, of these PCTs 19 will be impacted by the project.
  - Two State-listed Threatened Ecological Communities (TECs) were identified and mapped within the development footprint, White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland, Critically Endangered) (8.05 ha) and Ribbon Gum - Mountain Gum - Snow Gum Grassy Forest/Woodland (Endangered) (27.24 ha).
  - One nationally-listed Critically Endangered Ecological Community (CEEC) was identified and mapped, within the development footprint, White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland) (8.05 ha).
  - A total of 12 state-listed BAM species credit fauna species were recorded or assumed to be present, including three bats, three arboreal mammals, one amphibian, one reptile, and four birds.
  - Five nationally-listed threatened fauna either occur or are highly likely to occur, Koala, Large-eared Pied Bat, Greater Glider, Spotted-tailed Quoll and Booroolong Frog.
  - No migratory fauna flightpaths or routes were observed or mapped throughout the assessment area.
  - Nankeen Kestrel, Brown Goshawk and Wedge-tailed Eagles are present onsite, and while not listed these species, are protected and considered subject to potential collision risk.

6.1.4 Mitigation and Management Measures

The mitigation and management measures outlined in the previous BDAR largely remain unchanged with the addition of the following measure:

- Proactive and reactive (triggered) 'smart turbine curtailments' to reduce the potential for operation impacts to threatened and non-threatened bird and bat species.

This is further detailed in Section 8.10 of the Updated BDAR (refer **Appendix E**).

6.2 Noise and Vibration

6.2.1 Relevant Project Amendments

Project amendments with potential noise and vibration impacts are:

- A further reduction in the number of WTGs by one and the relocation of 20 turbines;
- An additional option for the substation and BESS facility to be located near the proposed Crawney Road site entrance;
- Addition of a temporary optional Verden Road quarry expansion, which will operate during construction; and
- Additional potential concrete batching locations.

6.2.2 Assessment of Impacts

A Noise and Vibration Assessment has been prepared by Sonus (2022) to support this Amendment Report, and is provided in **Appendix F**.

Sonus (2022) found that the proposed Project amendments do not change the outcomes of the 2020 assessment, with the exception that noise from the temporary concrete batching location "G" may exceed 35 dB(A) at three non-associated dwellings.

Noise levels from operation of the optional quarry have been predicted at the residences in the vicinity. Predictions have been made based on manufacturer's sound power level data for the specific equipment which is proposed to be used at the quarry during its operation. In addition to the equipment noted above, trucks will be used to transport quarry product.

The sound power level of these trucks will be far less than that of the processing equipment and would not increase the noise levels based on their continual operation. The predicted noise level from activity within the quarry (at a separation distance of approximately 2000m) is 37 dB(A) or less when the drill rig is not operating and 42 dB(A) when it is operating.

Based on the predicted noise levels, it is expected that:

- During standard hours the noise from the optional quarry activity will not be greater than the 45 dB(A) management level at non-associated dwellings.
- Activity outside of standard hours (Saturday afternoons 1:00pm to 6:00pm) will potentially be at noise levels greater than the 35 dB(A) management level.

The noise from turbine and substation / BESS operation and other construction activities, including the optional quarry, and blasting and traffic on roads, is predicted to achieve the requirements under the SEARs.

6.2.3 Mitigation and Management Measures

Sonus (2022, **Appendix F**) has made the following recommendations:

- Additional acoustic treatments should be considered for the temporary concrete batching location "G", or the location should not be used outside the recommended standard hours contained in the NSW Governments *Interim Construction Noise Guideline* (2009) (Construction Noise Guideline); and
- Normal activity at the quarry should be restricted to the "recommended standard hours" under the Construction Noise Guideline to ensure that the activity achieves the management levels. Any activity outside of this should be low noise impact works, such as maintenance.

6.3 Landscape and Visual

6.3.1 Relevant Project Amendments

Project amendments with potential landscape and visual impacts are:

- Alternate transport route to the Project Area from Nundle via Crawney Road;
- Removal of WTG 41 and the relocation of 20 turbines;
- Additional transmission line easement width;
- Access tracks for transmission line;
- Optionality for substation, BESS location;
- Optionality for installation of transmission towers or transmission poles; and
- Optional Verden Road quarry expansion.

6.3.2 Assessment of Impacts

6.3.2.1 Alternate Transport Route to the Project Area from Nundle via Crawney Road

The existing landscape character around the potential alternate transport routes is generally defined by an undulating terrain with vegetation scattered across large paddocks. Vegetation along Crawney Road is generally thick and dense and the canopy cover helps limit views within the road corridor.

Images 01 and 02 of the Addendum LVIA (refer **Appendix G**) show the existing character of Crawney Road. An assessment based on topography alone suggests that certain parts of all route options that are closer to the proposed western connector road are likely to be visible along Crawney Road because of their elevated position. However, existing vegetation patches will filter most views towards the alternative routes (refer to Image 01). All road turnoff options are likely to be screened by existing roadside vegetation along Crawney Road (refer to Image 02). Route options 2 and 3 are likely to cause minimal visual impacts because majority of the views towards these routes are screened by existing vegetation. The elevated position of route option 1 will, however, allow partial views of this route.

Majority of the views from Crawney Road are likely to be screened by existing vegetation and it is likely that very few parts of Crawney Road will allow views of the alternative routes. Considering that the proposed routes will serve as access routes that will facilitate maintenance and construction, their character is likely to be similar to existing low use farm roads in the area. The potential visual impacts are, therefore, likely to be low

6.3.2.2 Removal of WTG 41 and the Relocation of 20 Turbines

Figures 2a and 2b of **Appendix G** compares the Zone of Visual Influence (ZVI) models for the proposed turbine layout amendments against the turbine layout proposed in the Amendment Report 2021. The ZVI models are based on topography alone to represent visibility in a bare-ground scenario, i.e., a landscape without vegetation or structures.

The amended turbine layout presents similar results to the previous turbine layout. The ZVI model (refer Figure 2b of **Appendix G**) indicates that highest level of visibility is likely to be experienced from lands around the Peel River / Head of Peel Road. The landform character around Head of Peel Road allows most views of the Project.

The level of visibility around other areas such as the northern end of Morrisons Gap Road, areas surrounding Crawney Road and further north to Nundle is likely to be similar to those identified in the Project EIS. Receptors within and around the township of Nundle are likely to experience similar visual impacts.

Although the ZVI model indicates that the potential visibility of turbines has slightly increased for dwelling NAD_49, the overall visual impacts on the dwelling are likely to the similar to those identified in the Project EIS. A comparison between the previous layout and the amended layout indicates that there is no change in the distance between NAD_49 and the nearest turbine (WTG 6). Application of the multiple wind turbine tool also indicates that views of the Project are likely to be available in one (1) 60 degree sector, which is deemed acceptable in accordance with the *Wind Energy: Visual Impact Assessment Bulletin December 2016*.

6.3.2.3 Additional Transmission Line Easement Width

The addendum LVIA (refer **Appendix G**) considered topography alone and does not account for intervening elements such as vegetation and structures in its visual assessment of the additional transmission line easement.

It found that that parts of the proposed transmission line will likely be visible, although the transmission line has been sited on an undulating terrain which is densely vegetated. Existing screening factors will play an important role in limiting views of certain extents of the transmission line.

Extents of the transmission line are likely to be visible along Crawney Road because of its lower elevation. An assessment based on topography alone identifies that the eastern section that connects to the optional BESS / Substation is likely to be visible along most parts of the road. The existing character of roadside vegetation on Crawney Road will, however, help limit views along this route.

Highest visibility of the transmission line is likely to occur on the north eastern side of the Project on the fringes of Schoefields Gap. These areas are located approximately 13 km north east of the proposed transmission line, and therefore, views of the transmission line will be distant, which in turn is likely to have low visual impacts.

The findings included in Appendix B of the Addendum LVIA illustrate that there would be only minor variation to the potential visual impacts caused by the widening of the transmission easement.

Further investigations were carried out by preparing two representative photomontages from NAD_34 and AD_76 to illustrate the potential visibility of the transmission line. These have been included in Appendix B of the Addendum LVIA (refer **Appendix G)**.

6.3.2.4 Optionality for Installation of Transmission Towers or Transmission Poles

The 60 m high double circuit steel transmission poles are likely to be visible more than the 50 m high steel transmission towers due to the height difference between the two options. However, it should be noted that the structure and design of steel transmission poles would cause lower glint and reflectivity as compared to steel transmission towers. The impact of both options on the existing visual character is generally low.

The potential visibility of the transmission line is limited for receptors located in the immediate vicinity of the easement. Views from public viewing locations are also likely to be limited by existing vegetation. The assessment concluded that it is likely that majority of the transmission line will be visible in areas that are located 13 km away. This assessment is based on topography alone and does not consider the impact of screening vegetation and structures.

It is likely that only the most elevated parts of the transmission easement will be visible from the nearest receptor (AD_74). Views of the cleared vegetation and transmission lines and poles will be visible from the dwelling. There will be very minor variation to the potential visual impacts that were assessed in 2020 LVIA.

It is likely that there will be very distant and minimal views of the easement from dwelling NAD_34. Views are likely to be unclear and the overall impact on the existing landscape character is assessed to be very low or negligible. No variation was identified to the potential visual impacts identified in 2020 LVIA.

6.3.2.5 Access Tracks for Transmission Line

The proposed access tracks have been sited to reduce potential vegetation loss and limit earth work requirements. The access road network has been aligned with existing farm access tracks where possible and have been sited to follow the existing course of undulations. The majority of the proposed access tracks emerge from Crawney Road, and Old Wallabadah Road.

The proposed access tracks are likely to be viewed as an extension of the existing network of farm roads. It is, therefore, likely that the tracks will be viewed as a part of the existing landscape character and therefore the potential visual impact will be low.

6.3.2.6 Additional Hardstand Areas to Ancillary Infrastructure

A viewshed map has been prepared to identify visual impacts on surrounding dwellings and public viewing locations (refer to Figure 7 of **Appendix G**). This assessment is based on topography alone and does not consider the impacts of screening elements such as vegetation and structures.

Ancillary infrastructure elements are likely to be visible on the north western side of the Project.

Non-associated dwellings NAD_22, NAD_49 and NAD_56 are likely to be impacted by this amendment. The impact on all other receptors will be negligible since views will be predominantly screened by topography and vegetation.

Figures 5, 6 and 7 of **Appendix G** show the existing character of dwellings NAD_22, NAD_49 and NAD_56. Aerial imagery indicates that dwellings NAD_22 and NAD_49 are likely to have limited views in the south because of the existing vegetation and structures that surround these dwellings. Dwelling NAD_56, on the other hand, is surrounded by scattered vegetation. Views of the infrastructure, however, will be distant.

There would be no variation to the visual impact of ancillary infrastructure (both temporary and permanent) with the inclusion of additional hardstand areas to NAD_22, NAD_49 and NAD_56.

Motorists travelling southwards along Crawney Road will likely have intermittent and temporary views of the infrastructure. The road is predominantly characterised by dense patches of roadside vegetation which will help screen these views.

6.3.2.7 Ancillary Infrastructure

Ancillary infrastructure such as access tracks, blade laydowns, internal pads, temporary ancillary infrastructure and transport swept paths are proposed as a part of the construction works required for the Project. The layout of these elements have been altered slightly.

The potential visual impacts associated with access tracks for transmission line construction are likely to be low because of the temporary nature of the proposed infrastructure. Further, the access tracks align with existing farm roads/routes, and therefore, the impact on existing character will be low.

Temporary blade laydowns, internal pads and transport swept path will not cause any variation to the potential visual impacts discussed in the 2020 LVIA. Any visual impacts associated with these elements will be low or negligible.

Potential visual impacts associated with temporary ancillary infrastructure such as batching / laydown areas are likely to occur during construction phase. The visibility of these elements will, however, be limited (as discussed in Section 5.1 and Figure 07 of **Appendix G**).

Although views towards temporary ancillary infrastructure and access tracks may be available during the construction phase, the impacts are likely to be limited by existing vegetation around various dwellings and public viewing locations such as Crawney Road. The distance of various receptors and the existing landscape character allow limited views of ancillary infrastructure, and therefore, visual impacts are likely to be low or negligible.

6.3.2.8 Optional Verden Road Quarry Expansion

The potential visual impacts of the quarry operations on surrounding public and private receptors are, likely to be very low or negligible due to the undulating character of the landscape and screening from vegetation, as further discussed in Appendix A of the Addendum LVIA (refer **Appendix G**).

6.3.3 Mitigation and Management Measures

As discussed in Section 3.3.9.8 of **Appendix A**, FCNSW has requested that at the completion of quarry operations that the site be handed back to it such that it can continue to operate the quarry site for its own benefit. Any rehabilitation of disturbed land within the Project Area would be undertaken in close consultation with FCNSW, who have indicated that some areas of the site be rehabilitated (where possible) and prepared for its previous land use as a pine plantation.

The Addendum LVIA (refer **Appendix G**) references the *Leading Practice Sustainable Development Program for the Mining Industry Handbook* (Commonwealth of Australia, 2016) as a guide for rehabilitation, and recommending that 'detailed investigations are carried out in the earlier phases of the Project for the implementation of a successful rehabilitation program' (p. 24).

Further, although minimal, any impacts generated by the amended transmission line easement can be mitigated through additional vegetation planting. It is recommended that subtle materials are utilised in order to limit glint and reflectivity caused by the infrastructure associated with the transmission line.

6.4 Traffic and Transport

6.4.1 Relevant Project Amendments

Project amendments with potential traffic and transport impacts are:

- Alternate transport route to the Project Area from Nundle via Crawney Road;
- Nundle Transport Route Options; and
- The optional Verden Road quarry expansion.

6.4.2 Assessment of Impacts

The Transport Planning Partnership (TTPP) has assessed the proposed amendments to the construction and transport operations for Project (refer **Appendix H**). Overall the proposed amendments to the proposed Project are expected to reduce the impacts on the road network compared to the previous proposal.

The TTPP assessment indicates that the new OSOM route would not have significant additional impacts compared with the previous proposal.

The estimated total number of oversize overmass (OSOM) vehicle trips are shown in **Table 6-6** and **Table 6-7** for trips to site and from site respectively.

Table 6-6 Estimated Number of OSOM Trips to Site by Route

Route	Name	Percentage	Number of Trips (one-way)
Route 1	Nundle Loop	100%	192
Route 2	Nundle Bypass	100%	1174
Route 3	Barry Road	0%	-
Route 4	Crawney Road	100%	1366
Total			**1366**

Table 6-7 Estimated Number of Trips from Site

Route	Name	Percentage	Number of Trips (one-way)
Route 1	Nundle Loop	0%	-
Route 2	Nundle Bypass	100%**	940
Route 3	Barry Road	50%*	426
Route 4	Crawney Road	100%**	940
Total			**1366**

**50% of the potential trips to use Barry Road to Return*

*** 100% of trips that can only return via Crawney Road plus 50% trips that could return in pack down via Barry Road*

Transportation of the components is forecast to be undertaken over a period of approximately 9 months. This equates to a total of 1366 OSOM movements to site over 9 months or an average of some 6 movements per day assuming 6 available transport days per week.

The forecast for light vehicles and general construction vehicles would now be split between Crawney Road and Morrisons Gap Road with 35% going south to Crawney Road and 65% using Morrisons Gap Road. The previous assessment assumed nearly 100% of traffic would use Barry Road.

The resultant peak hour traffic volumes on the two routes are shown in **Table 6-8** with the afternoon peak estimated to be the inverse.

Table 6-8 Traffic Splits Morning Peak Hour

	Route via Barry Road (vehicles per hour)		Route via Crawney Road (vehicles per hour)	
	To site	From site	To site	From site
Light vehicles	46	6	25	4
Heavy vehicles	6	6	4	4
Total	52	12	29	8
Combined two-way	64		37	

The revised assessment shows that the capacity of the road network would be unaffected and that the volumes are significantly below the prescribed environmental capacities. The amendments reduce the impacts on the road network through:

- Reduction in traffic forecast to use Barry Road and Morrisons Gap Road.
- The project will no longer require the Devils Elbow upgrade.
- Reducing the extent of upgrades required for Morrisons Gap Road.
- Reducing the number of vehicles forecast to use Barry Road which would reduce the risk of crashes on this road.
- Reducing the number of vehicles forecast to travel through the centre of Nundle due to the portion of traffic proposed to use the new Route 2 Nundle Bypass (irrespective of the positive impact reduction of the optional quarry, should that be also utilised).

6.4.2.1 Optional Verden Road Quarry Expansion

An option to source quarry material from the Hanging Rock State Forest is being considered. The proposed route from the quarry to the site is shown in **Figure 6.1**.

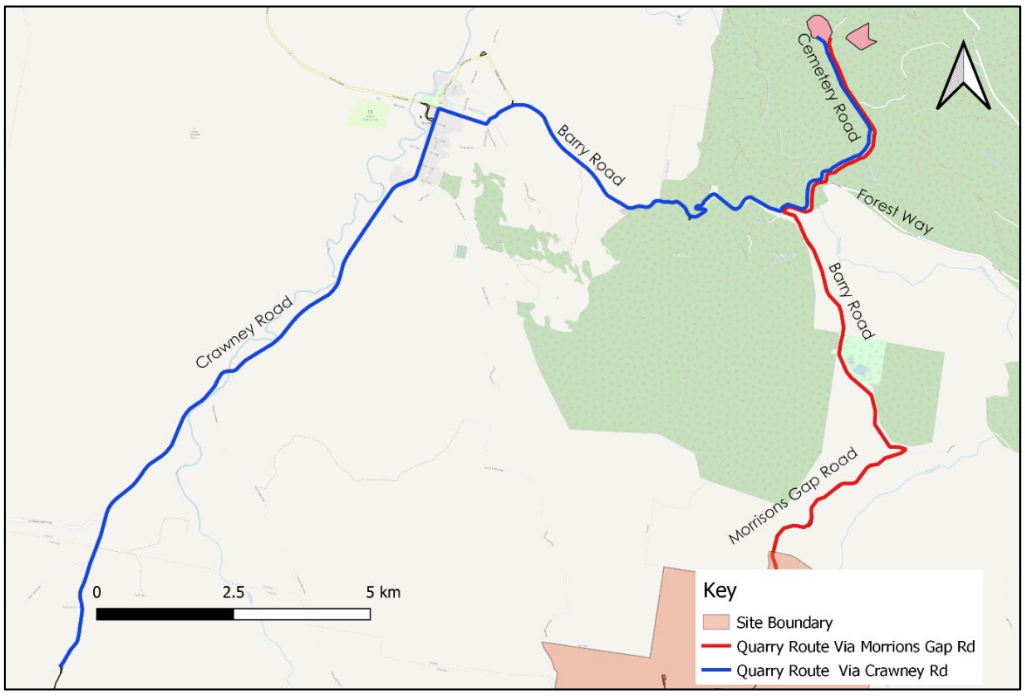
This quarry remains an option subject to further assessment for extent of project viability, and thus the previous traffic assessment has been maintained on a 'worst-case' of imported quarry materials from commercial locations. However, to demonstrate the reduction in traffic on local roads should this quarry be determined viable, the following assessment is provided for information purposes.

This option would reduce the haulage route distance for this material and reduce the impacts of the Project on the broader road network. It is forecast that this quarry option would significantly reduce the daily number of trucks travelling through Nundle compared to previous assessments.

There are two haulage routes from the proposed quarry to site:

- Via Barry Road and Morrisons Gap road, accessing the north of the Project (shown in red); and
- Via Barry Road travelling west towards Nundle and down Crawney Road to the southern site entrance (shown in blue). It is suggested that during the preparation of the projects Traffic Management Plan, Tamworth Regional Council is consulted to confirm their preference for these trucks either turning off Oakenville Street directly into Jenkins Street, or alternatively using Herron, Innes, Jenkins Street.

Figure 6.1 Proposed Route from Optional Verden Road Quarry to Site



For the purpose of this assessment, it is assumed 65% of quarry traffic would use the Option 1 route to the north, and 35% of traffic would use the Option 2 to the south/west.

Should the quarry become operational then it is suggested that it would operate from 7.00 am – 6:00 pm. The vehicles used to transport the rock material would be standard truck and dog vehicles.

It is estimated that in peak operation that there would be up to 14 truck trips per hour. That is 7 trips to and 7 trips from the site. Using this quarry site would minimise the impacts of the Project by sourcing material near the site and overall having the benefit of removing truck movements through Nundle and other local roads.

The ability to source material from this quarry could reduce the number of truck movements through Nundle by up to 40 truck trips a day (a trip is considered a one-way journey) assuming 65% of the 63 truck trips previously forecast would use Morrisons Gap Road.

6.4.3 Mitigation and Management Measures

The mitigation and management measures outlined in the previous TTPP assessments largely remain unchanged with the addition of the following measure:

- Hardstand laybys will be provided to allow for passing of wide vehicles during the movement of OSOM vehicles, as follows: three (3) laybys on Crawney Road; three (3) on Barry Road; and one (1) on Morrisons Gap Road. The location of the laybys are shown in Figure 8 of **Appendix H**.

The Proponent requested a road design consultant to investigate any additional commitments that could be made to improve safety at the existing Devil's Elbow hairpin alignment. The following suggestions were made, and the Proponent is prepared to investigate these further with TRC during detailed design of the Project:

- The existing alignment can cater for B-double movements, but minor road widening to allow some passing width for light vehicle could be investigated;
- Upgrading existing road safety barriers with a higher containment level barrier, and increasing the runout length (where possible) on both approach and departure sides would improve public safety;
- In addition to a barrier upgrade, other safety options could be investigated e.g. installation of rubble strips on the approaches to slow and warn vehicles of the tight bends; and
- Curved alignment markers (if not already present) could be considered to highlight the tight bend.

Road safety signage was not assessed by the road design consultant, however it was suggested that this is discussed further with local Council during detailed design.

6.5 Aviation Hazards

6.5.1 Relevant Project Amendments

Project amendments that pose potential aviation hazards are:

- WTG 41 is proposed to be removed to create a 1.2 km buffer along Ben Halls Gap Nature Reserve that will:
  - Reduce bird and bat barrier effects; and
  - Reduce NPWS aerial firefighting concerns.
- 20 turbines (WTGs 2, 3, 4, 10, 11, 32, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 64, 70) are to be relocated within 350 m of the previous location.

6.5.2 Assessment of Impacts

An Aviation Impact Assessment (AIA) was prepared in 2020 to accompany the EIS. An addendum to the AIA has been prepared to assess the amendments mentioned above and is provided in **Appendix J** (Aviation Projects, 2022). The assessment concludes that:

- The highest wind turbine, WTG 20, is not proposed to be relocated. This turbine remains the critical obstacle to aviation traffic.
- The proposed removal of WTG 41 and relocation of 20 WTGs will not alter the conclusions and recommendations of the original AIA.

- There are no changes to the impacts previously identified for obstacle limitation surfaces, flight procedure surfaces, grid and air route lowest safe altitudes, prescribed airspace or aviation navigation aids and communication facilities.

6.5.3 Mitigation and Management Measures

No changes are proposed to the mitigation and management measures detailed in the EIS and the Amendment Report 2021.

6.6 Bushfire

Despite the mitigation measures and treatments that are put in place, it is noted that some bushfire risk will always remain and that some of the infrastructure may be subject to direct flame contact. The absence of any identified hazard or asset on the Project site should not be interpreted as a guarantee that such hazards or impacts do not exist.

6.6.1 Relevant Project Amendments

Project amendments relevant to the bushfire assessment include:

- Creating a 1.2 km spacing between WTG 40 and WTG 42 through the removal of WTG 41 to reduce bird and bat barrier effects and in response to NPWS aerial firefighting concerns;
- Relocation of WTGs 2, 3, 4, 10, 11, 32, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 64, 70 within 350 m of the previous location.
- Additional internal road within western portion of the Project Area;
- Realignment of a portion of the transmission line within the Project Area to connect to the proposed substation optional locations and widening of the Transmission Line route easement from 60 m to 90 m;
- Optionality for substation and BESS location with second siting option to be included from alternate Crawney Road access (including use of this for temporary concrete batch plant and satellite site office/construction compound location during construction); and
- Optional expansion of a quarry located 9 km north of WTG 69 within the Hanging Rock State Forest (Verden Road Quarry).

6.6.2 Assessment of Impacts

The impact of relocating turbines have similar bushfire constraints to the previously assessed locations already addressed in the EIS and Amendment Report 2021. The amended assessment identifies that 39 of the 64 turbines have the potential for direct flame contact. This is the same number of turbines located within the flame zone as reported in the Hills of Gold Amendment Report No 1 and calculated in accordance with the Bushfire Attack Level (BAL) Method 2 calculations within Appendix B of AS3959. Detailed results are provided in **Appendix K**.

It is also recognised that the realignment of the transmission line and increase in the width of the easement from 60 m to 90 m wide results in a reduction of transmission line poles at risk of direct flame contact from 40 (65%) to 25 (40%). As per the original assessment in the EIS, all poles will be either concrete or galvanised steel poles. It is important to note that the maintenance of the full width of the transmission line easement including reduced fuel loads beneath transmission lines will continue to be the responsibility of the asset owner and must meet industry standards.

It is recognised that key assets that have the potential to influence the spread of fire include the switching station, substation, BESS and O&M buildings. While section 8.3.5 of Planning for Bushfire Protection requires a minimum 10 m wide asset protection zone for wind farm assets, as per the original assessment in the EIS, given the steep slopes and existing fire history within the adjacent

National Parks estates, the switching station, BESS, substation and the O&M building will have an increased minimum 20 m wide asset protection zone to ensure adequate defendable space around each of these assets. To further ensure that these significant assets are not at risk of direct flame contact, and based on the results of the amended flame length modelling, the second siting options for the infrastructure will require additional clearances as follows (refer to **Figure 6.2**):

- the alternative substation location will require a minimum 32 m buffer to the south; 21 m to the north, 60 m to the east and 32 m to the west;
- the alternate BESS / laydown / batching plant location will require an increased buffer distance of 38 m to the north, 50m to the south and 45 m to the west;
- O&M Option 3 will require an increased buffer distance of 27 m to the west and 20 m in all other directions; and
- Compound Option 1 and 2 will require a minimum 20 m buffer in all directions.

As described in Section 8.3.6 of NSW RFS Planning for Bushfire Protection 2019, mining (underground and open cut) and petroleum production most closely resembles the proposed operations of the proposed Verden Road Quarry. As a minimum, a 10 m wide asset protection zone should be provided. All quarry site infrastructure (plant and equipment), as well as the temporary demountable building (mobile crib room and toilet facilities) will be located within the quarry operations area which already provides this minimum area of defendable space and no further asset protection zone will be required. Section 8.3.6 of NSW RFS Planning for Bushfire Protection 2019 also states that a Bush Fire Emergency Management and Operations Plan should be prepared to cover any mining activities undertaken on bushfire prone land, with consideration to the same provisions detailed in Section 8.3.6 of NSW RFS Planning for Bushfire Protection 2019 for wind and solar farms. This requirement is already covered in the original EIS and does not present any additional mitigation or management to that already recommended.

6.6.3 Mitigation and Management Measures

Overall, the assessment confirms that the proposed amendments do not affect the findings and recommendations of the Bushfire Risk Assessment and the Head of Peel Road will remain accessible for use during an emergency. Site access points will be constructed as the first stage of development and the final design of access roads will enable safe access and egress for residents attempting to leave the area at the same time that emergency service personnel are arriving to undertake firefighting operations.

The only additional management measures recommended (above those already identified within the EIS and Amendment Report 2021) are to provide increased buffers around all alternate ancillary infrastructure to ensure that they are situated outside of the flame zone (refer **Section 6.6.2**). This will reduce (but not eliminate) the risk of direct flame contact.

It is also important that a Bushfire Emergency Management and Operations Plan is prepared prior to the commencement of any construction works in conjunction with relevant stakeholders, including local fire services, NSW RFS, NSW Fire and Rescue, NPWS, FCNSW, adjoining property owners and employees. This Bushfire Emergency Management and Operations Plan will also include management of the Verden Road Quarry as noted above.

HEAD OF PEEL ROAD

CRAWNEY ROAD

Legend

- Project Area
- Laydown/Batching/Compound
- BESS/Laydown/Batching Option
- O&M Option 3
- Substation Option
- Asset Protection Zones
- Transport Route
- Route Options
- Transmission Line
- Minor Road

Source:
ESRI World Imagery

Asset Protection Zones

F6-2

Drawing No:	0550690s_HoG_BFA2_G001_R0.mxd		Hills of Gold Wind Farm
Date:	25/10/2022	Drawing Size: A3	
Drawn By:	VN	Reviewed By: AA	Client: Hills of Gold Wind Farm Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

0 0.4 0.8Km

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ERM

6.7 Indigenous Heritage

6.7.1 Relevant Project Amendments

Project amendments with possible Aboriginal cultural heritage impacts are limited to changes to the temporary and permanent development footprints.

6.7.2 Assessment of Impacts

An Aboriginal cultural heritage assessment report (CHAR) was prepared in 2020 to accompany the EIS. The CHAR covered the temporary and permanent development footprint proposed in the EIS.

An Indigenous heritage advice letter was prepared in 2021 to accompany the Amendment Report 2021, which found that the proposed amendments did not change the conclusions of the CHAR.

The proposed Project amendments have altered both the temporary and permanent development footprint. An addendum to the CHAR has been prepared to support this Amendment Report and is provided in **Appendix L**.

The addendum found that the proposed changes to the temporary and permanent development footprint do not change the outcomes of the CHAR and Indigenous heritage advice letter.

6.7.3 Mitigation and Management Measures

The mitigation and management measures identified in the CHAR and EIS are still applicable. The addendum recommends one additional management measure:

- As a general practice it would be preferable from an Aboriginal heritage perspective for the proposed access routes within Survey Unit 1 to be cut along the side slopes, rather than on crests. Crests and saddles are more likely to retain evidence of Aboriginal occupation, especially in steep country to high elevations. These have some areas of level ground and often retain soils which may have archaeological material. Adoption of appropriate management procedures within the Cultural Heritage Management Plan should take into account this risk (such as procedures for encountering unexpected Aboriginal heritage objects) will be important where crests and ridges are unavoidable.

Survey Unit 1 comprised the proposed access routes, substation and BESS facility south of Crawney Road. The addendum to the CHAR contains further details of the survey area.

6.8 Historic Heritage

6.8.1 Relevant Project Amendments

Project amendments with potential historic heritage impacts are:

- Temporary transport route through allotments within Nundle;
- Optional Verden Road quarry expansion;
- Optionality for substation, O&M and BESS location; and
- Additional transmission line easement.

6.8.2 Assessment of Impacts

The following three (3) assessments relating to historic heritage have been prepared to support this Amendment Report:

- Statement of Heritage Impact (SoHI) – Peel Inn (refer **Appendix M**): assesses impact of temporary transport route on the Peel Inn curtilage and other locally listed heritage items in the vicinity of the Project Area;

- Historic Heritage Assessment – Optional Verden Road Quarry (refer **Appendix N**): examines historic heritage value of the Verden Road Quarry and assess impact to historic heritage values from proposed optional works;
- Historic Heritage Assessment Letter (refer **Appendix O**): Letter: provides an historical heritage assessment in relation to the proposed alternate transport route options, alternate western substation, O&M and BESS location, and transmission line widening amendments.

6.8.2.1 Statement of Heritage Impact – Peel Inn

The proposed route would traverse the curtilage of the *Peel Inn,* listed as a local heritage item in the Tamworth LEP 2010. Several additional locally listed heritage items are also in the immediate vicinity of the route.

The SoHI identifies that the proposed temporary road would have no impact to the heritage streetscape of Nundle. There will be a minor temporary impact to the aesthetic values of the Peel Inn within its listed curtilage. However, the proposed temporary road would have a negligible impact on the heritage significance of the Peel Inn and other heritage items in their entirety.

The SoHI concludes that the Project is also consistent with the Section 139(4) Excavation Permit Exceptions, which state that an excavation permit under the *Heritage Act 1977* is not required for disturbance or excavation of land, provided the proposal is for "*minor works or activities that have minimal impact on archaeological relics of local heritage significance".*

6.8.2.2 Historic Heritage Assessment – Optional Verden Road Quarry Optional Verden Road Quarry Expansion

The assessment concluded that the proposed optional quarry expansion and transport to the Project Area would not result in any negative impacts to nearby historic heritage items. There is low potential for intact historical archaeology related to 19th century mining activities being present within the site boundaries, and any potential evidence would have low integrity and therefore low research value due to the likely significant impact by FCNSW land management practices.

6.8.2.3 Historic Heritage Assessment Letter

No historic heritage sites or features within the Project Area were identified during this assessment. It was found that the proposed works for proposed alternate transport route options, alternate western substation, O&M and BESS location, and transmission line widening amendments would not result in impacts to any listed historic heritage items.

There is low potential for intact historical archaeology related to 19th century agricultural activities to be present within the Project Area, and any potential evidence would have low integrity and therefore low research value.

Although no historical heritage listings are within the Project Area, the Wombramurra Run has a long history associated with sheep grazing in the region. Historical artefacts or material may be unearthed unexpectedly. These could potentially be located on the ground surface or subsurface.

6.8.3 Mitigation and Management Measures

The SoHI (refer **Appendix M**) recommends the following mitigation and management measures:

Recommendation 1 – Avoidance of Ground Disturbance

Extensive ground disturbance for the construction of the temporary road is to be avoided. Consideration should be given for 'building up' the roadway within the block bound by Jenkins, Oakenville, Herring and Innes Streets, in preference to substantial excavation. Removal of top soil may be permitted, but cut and fill should be minimised.

Recommendation 2 – Heritage Induction

Prior to the commencement of works, all contractors should be briefed on the requirements of the *Heritage Act 1977,* and the Unexpected Finds Protocol, which is detailed in the SoHI.

Recommendation 3 – Unexpected Finds Protocol

In the event that relics are unexpectedly exposed, works should cease immediately. The management of relics should be in accordance with NSW Heritage guidelines and policies, as outlined in the Unexpected Finds Protocol.

Recommendation 4 – Ground Rectification

Following the use of the temporary road, the area should be returned to its pre-construction condition and made good (i.e. re-establishment of grass).

The Historic Heritage Assessment (refer **Appendix N**) recommends that all works be undertaken in accordance with the Non-Aboriginal Heritage Unexpected Finds Procedure, which is detailed in Section 8.2.1 of **Appendix N**.

Similar to the SoHI, the Historic Heritage Assessment Letter (refer **Appendix O**) recommends the inclusion of an Unexpected Finds Protocol in the Construction Environmental Management Plan for the Project.

6.9 Air Quality and Greenhouse Gas emissions

6.9.1 Relevant Project Amendments

Project amendments with potential air quality and greenhouse gas emissions impacts are limited to the optional expansion of the Verden Road Quarry to supply materials for the Project.

6.9.2 Assessment of Impacts

An Air Quality and Greenhouse Gas Assessment supports this Amendment Report and is provided in **Appendix P** The assessment involved identifying the key air quality issues, characterising the existing environment, quantifying emissions to air and modelling the potential impact of the Project on local air quality, including estimating greenhouse gas emissions.

The key outcomes of the assessment were as follows:

- The Project would not cause adverse impacts with respect to dust concentrations or deposition levels, based on modelling which showed compliance with air quality criteria at all sensitive receptors;
- Post blast fume emissions are not expected to result in any adverse air quality impacts, based on modelling which showed compliance with air quality criteria;
- Emissions from diesel exhausts associated with off-road vehicles and equipment are not expected to result in any adverse air quality impacts, based on modelling which showed compliance with air quality criteria; and
- Greenhouse gas emissions would be generated by machinery use at the quarry and by the transport of quarry materials to the Project Area. The assessment calculated that these two activities would generate average direct emissions of 1,525 tonnes of carbon dioxide equivalent (CO_2-e) per year. This represents less than 0.0003% of Australia's 2019 emissions. The calculation was based on the following parameters:
  - 6 km return distance over Verden Road;
  - Fuel consumption of 40 L/100 km; and
  - 68 return trips per day.

It is important to note that the operation of the wind farm is expected to reduce CO_2-e emissions by 654,400 tonnes per annum.

6.9.3 Mitigation and Management Measures

The assessment recommends the following standard management and mitigation measures:

- Minimising the area of disturbed land at any one time;
- Adopting controls for haul road dust emissions;
- Use of water sprays when drilling if / as required;
- Use of water sprays on stockpile areas if / as required;
- Visual monitoring to identify excessive dust generation;
- Planning and designing of operations to minimise fuel usage and to maximise energy efficiency;
- Maintenance of plant and equipment to minimise fuel consumption and associated emissions; and
- Training staff on improvement strategies to minimise fuel usage and maximise energy efficiency.

6.10 Soils and Water

6.10.1 Relevant Project Amendments

This section discusses potential soil and water impacts associated with the optional use of the Verden Road Quarry to supply materials to the Project.

6.10.2 Existing Environment

6.10.2.1 Topography, Landform and Drainage

The existing Verden Road Quarry (referenced in Section 6.9 only as 'the site') is located within the Peel River catchment. The Peel River is located approximately 3 km downstream from Nundle and 4.8 km to the west of the site. The Peel River catchment drains via overland sheet flow (when soils are saturated) to ephemeral drainage depressions on the southern side of the site. These drain to Quackanacka Gully, then to Burrows Creek, and then subsequently to the Peel River. The Peel River flows via Chaffey Dam and Tamworth to the Namoi River, with the confluence being located approximately 8 km downstream of Keepit Dam.

The site is centred on two prominent hills located at the western edge of a large (490 ha) basalt plateau, where the contact with older underlying basement rocks of the New England Orogen has been exposed by weathering and erosion. Both hills are located on an east-west oriented ridge that defines the boundary between the Folly Creek catchment (to the north) and Quackanacka Creek catchment (to the south). Drainage depressions across the site are ephemeral and typically shallow and poorly defined.

The hill which comprises the 'Western Operations Area' (refer **Figure 3.6**) is a prominent conical shaped feature that has a clear volcanic character / appearance (refer **Figure 6.3**). The hill covers an area of approximately 6 ha and has elevations ranging from 1,162 m Australian Height Datum (AHD) at its crest, to 1,108 m at its base. Slopes gradients are comparatively steep and range from 18˚ to 34˚.

The more prominent of the hills is located to the east and is covered by the 'Eastern Operations Area' (refer **Figure 3.6**). This hill covers an area of approximately 6 ha and has elevations ranging from 1,220 m AHD at its crest, to 1,166 m on the north-western flank, where a break in slope appears to define a geological discontinuity. Slope gradients range from 15˚ to 24˚ (refer **Figure 6.3**).

6.10.2.2 Geology and Soils

Regional mapping by the Geological Survey of NSW (NSW Seamless Geology Database Zone 56) indicates that the surface geology of the eastern half of the site corresponds with an area mapped as Tertiary-age Liverpool Range Volcanics. The basaltic volcanics correspond with higher topographic elevations across the site. In contrast, the geology of the western half of the site is dominated by sandstone, conglomerate and mudstone of the underlying Permian-age Andersons Flat Beds (Manning Group).

The two prominent hills within the site that are associated with the Western and Eastern Operations Areas are characterised by extensive outcrops of columnar-jointed olivine basalt (refer **Figure 6.5**). The basalt outcrops represent the core of high-level volcanic intrusions (plugs) that were emplaced into a volcanic vent environment within the older Andersons Flat Beds. Weathering and erosion have since partially exposed the vent environment.

Quarrying operations by FCNSW adjacent to the eastern edge of the basalt plug in the Western Operations Area have exposed a flanking zone of poorly sorted, boulder to cobble size fragmental basaltic breccias at elevations lower than the adjacent exposed basalt (refer **Figure 6.6**). These volcaniclastic breccias exhibit crudely developed bedding features that dip at 30 – 40˚ in an easterly direction. These rocks represent a talus apron that formed on the Tertiary land surface immediately adjacent to the volcanic vent, within which the basalt was emplaced.

FCNSW operations on the western flank of the hill covered by the Western Operations Area have also exposed highly weathered (clay-altered) basaltic tuffs that contain occasional clasts of pebble-sized basaltic material. The tuffs are likely to have been sourced from the adjacent volcanic vent.

Due to their propensity to weather, sedimentary rocks of the Andersons Flat Beds are poorly exposed across the site.

Soil development within areas mapped as Tertiary volcanics varies from shallow skeletal soils in areas of significant columnar jointed basalt outcrop, to heavy clay loams in areas of deeper weathering associated with basaltic breccias and tuffs. Soils associated with the older sedimentary rocks and serpentinite have been highly disturbed and modified as a result of long term FCNSW plantation activities.

Figure 6.3 Western Operations Area (a)*

** Oblique aerial view looking north of existing FCNSW quarry operation within proposed Western Operations Area. Note extensive outcrop exposure of columnar-jointed basalt within centre of hill (GR:327,945 mE 6,519,060 mN – looking N)*

Figure 6.4 Western Operations Area (b)*

** Outcrop exposure on crest of Western Operations Area looking east towards hill covered by Eastern Operations Area. Note existing FCNSW quarry processing area in mid-ground. (GR:328,114 mE 6,519,152 mN – looking E)*

Figure 6.5 Western Operations Area (c)*

**Outcrop exposure of columnar jointed olivine basalt on crest of hill within Western Operations area (GR:328086m E 6519148m N – looking NW)*

Figure 6.6 Western Operations Area (d)*

**Outcrop exposure of crudely bedded basaltic breccia on the eastern side of the hill within Western Operations area (GR:328181m E 6519127m N – looking N)*

6.10.3 Assessment of Impacts

6.10.3.1 Surface Water

While the site does not intersect any ephemeral or perennial watercourses, Quackanacka Gully is located approximately 150 m south of the site. Elevation over the site ranges between approximately 1086 to 1162 m AHD (Western Operations Area) and 1158 to 1220 m AHD (Eastern Operations Area). Drainage from disturbed areas of the site would be directed to sediment basins designed and constructed in accordance with *Managing Urban Stormwater: Soils and Construction* (Volumes 1 and 2E – Mines and Quarries) (Landcom, 2004 and DECC, 2008) ('Blue Book').

6.10.3.2 Site Water Balance

Site Water Demand

The quarry water demand will primarily be for activities associated with dust suppression of exposed operational areas of the site, processing operations, stockpiles (including maintaining product moisture content if required) and dust control on Verden Road and Forest Road, as required.

A worst-case daily site water demand has been estimated based on a daily production of approximately 2000 t/day, experience with quarry operations of a similar scale and assuming atmospheric conditions require daily dust suppression of exposed areas and roads. In summary, worst case daily usage is estimated as follows:

- Processing, stockpiling, exposed operational areas – 25 kL; and
- Verden Road and Forest Road – 15 kL.

Assuming production of 500,000 tpa, water demand is estimated to be approximately 10 ML pa, although as indicated, actual water demand will vary depending on rainfall patterns during operations.

Water Supply

Operational water requirements for the Project will be supplied via a combination of the reuse of any runoff captured from the operational disturbance areas (refer below and **Appendix Q**) and if required, water sourced externally from nearby dams in the Hanging Rock Sate Forest, under an agreement with FCNSW. Based on the storage capacity of the sediment basins located in each of the operational areas (refer **Appendix Q**), and an assessment of the availability of water in nearby dams located in Hanging Rock State Forest, it is concluded that sufficient water from these sources alone will be available for the operations.

Sediment Basin Design

Inflows to the quarry water balance include site rainfall/runoff from both disturbed and undisturbed areas in the site. An assessment of the site was undertaken in accordance with the 'Blue Book' to design the sediment basin components of a Water Management System (WMS) for the site.

A summary of the data used to determine the type and size of sediment basins for both the Western and Eastern Operations Areas is provided in **Appendix Q**.

Three (3) sub-catchments were identified in the Western Operations Area while two (2) sub-catchments were identified in the Eastern Operations Area. The assessment determined that based on the soil types on site, type-D sediment basins were required for each sub-catchment. Calculations to determine the basin sizes took into account total and disturbed catchment areas; design rainfall (5-day, 80th percentile); published rainfall erosivity applicable to the locality; RUSLE factors and length of operations (which assumed regular basin maintenance to ensure design basin capacity is maintained).

In summary, design sediment basins in the Western Operations Area (2805 m^3 – 3290 m^3) are larger compared to the Eastern Operations Area (1284 m^3 – 2173 m^3) due to the combination of generally steeper and longer slopes.

Other components of a WMS for the Project will also be designed to meet the requirements of Volumes 1 and 2E of the 'Blue Book'.

Impact Assessment

The optional expansion of the Verden Road Quarry has the potential to result in the following impacts on surface water resources:

- A very minor reduction in annual flows to the surrounding catchment as a result of runoff from the quarry WMS catchment being retained by the Project; and
- Adverse water quality impacts on downstream receiving waters during construction and operational phases.

It is considered that there will be negligible changes to annual flow volumes or availability of water for potential downstream water users in the other catchment areas intersected by the site.

A further potential impact includes the transport of sediment from exposed surfaces into the surrounding environment during periods of rainfall that exceed the design rainfall event (refer **Appendix Q**). To mitigate this potential impact, it is proposed that erosion and sediment control measures are implemented prior to commencing operations, which will be maintained during the construction and operational phase. With erosion and sediment controls in place, it is considered that potential adverse impacts to the water quality of the receiving environment downstream of the site are low.

6.10.3.3 Groundwater

The two hills covered by the Western and Eastern Operations Areas are relatively small in area (i.e. each approximately 6 ha) and are effectively 'superimposed' on the surrounding landscape. Consequently, the local groundwater table in the vicinity of these hills is located below the basal elevation of each hill.

Given that proposed extraction activities within the confined extraction footprints will not extend to depth below the base of each hill, proposed extraction activities will not intersect the local groundwater table. It should also be noted that the existing FCNSW quarrying operations have not intersected any groundwater to date.

Consequently, impacts on groundwater are considered unlikely during construction and operation and no groundwater interactions or adverse impacts are predicted as a result of the expansion of the Verden Road Quarry.

6.10.3.4 Contaminated Soils

The site has historically been used as a Pine plantation and discussions with FCNSW indicate that no potentially contaminating activities are known to have occurred within the site. Based on the land use history of the site, the potential for significant land contamination to be present is considered low.

The Project is not anticipated to result in any significant land contamination.

6.10.4 Mitigation and Management Measures

The WMS design and management measures would be documented in the Environmental Management Strategy (EMS) for the site and implemented to minimise the potential impacts to the surrounding environment. Mitigation measures to be implemented include the following:

- 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;
- Installation of all erosion and sediment control measures as the first step in the process for site establishment and land disturbance. Measures are to remain in place until the works are completed, and areas are stabilised as part of rehabilitation activities;
- 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 upslope of areas to be disturbed to direct clean water runoff 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 basins;
- 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 to augment the sediment basins, which will receive surface runoff from within the extraction area(s), and also reused for dust suppression on site if/when available;
- Regular maintenance of all controls and inspection of all works and after storm events to ensure erosion and sediment controls are performing adequately;
- Immediate repair or redesign of erosion and sediment controls that are not performing adequately, as identified by field inspections; and
- 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.

Fuel for mobile equipment will be stored on site in a mobile self-bunded / contained fuel storage unit, and only small quantities of grease and oil will be stored within the temporary site facilities. Contamination management controls will be implemented to minimise impacts, and include:

- Spill kits and clean up protocols will be established for the operations and detailed in the EMP; and
- If contaminated soils are uncovered during the works, all works within the vicinity would cease immediately and TRC notified.

7. UPDATED MITIGATION MEASURES

Mitigation and management measures for the Project were presented in Section 21 of the EIS.

The Project amendments do not generally alter the existing mitigation and management measures defined in the EIS and the Amendment Report 2021 despite the reduction in impacts resulting from the amendments to the Project presented in this Amendment Report. However, this Amendment Report has identified a number of additional measures which the Proponent proposes to implement in response to issues and concerns raised in submissions, as well as in response to the assessment of impacts for the Project amendments.

The updated mitigation and management measures table, inclusive of these additional measures proposed, are detailed in **Appendix C** of this Amendment Report.

8. JUSTIFICATION AND CONCLUSION

Since lodgement of the EIS, the Proponent has continued to consult with community members, community organisations, councils, and relevant government agencies. Some key amendments relate to input from:

- Tamworth Regional Council (TRC) relating to the Devil's Elbow bypass road and upgrades for retaining walls on Morrisons Gap Road;
- Biodiversity, Conservation & Science Directorate (BCS) relating to potential impact to four microbat species at risk of serious and irreversible impacts (SAII), potential barrier impacts to fauna relating to turbine spacing and the potential for owl habitat;
- NPWS relating to aerial firefighting capabilities;
- Transgrid relating to operational efficiency and maintenance of the transmission line network;
- Construction contractor's relating to optimised road, turbine, and substation infrastructure locations, and transmission infrastructure type;
- Crown Lands feedback on options to use traveling stock route reserves for access to the wind farm;
- Quarry consultant on a potential hard rock quarry opportunity nearby the Project; and
- Community concerns about traffic volumes along Jenkins St between Oakenville and Innes Street, and the broader local and regional road network generally.

In summary, the Project has been refined and amended to materially reduce potential impacts by:

- Removing the construction of Devil's Elbow bypass road and potential impacts to the Black Snake Gold Mine curtilage, which is a key concern of TRC;
- Removing the requirement for retaining walls along Morrisons Gap Road, and reduce traffic along Morrisons Gap Road which is a key concern of TRC;
- Optionality for the siting of the substation and BESS (and associated ancillary works including batching plant and temporary compound) closer to the Crawney Road alternative transport route to facilitate easier access for maintenance during operations and to minimise the extent of road upgrades in final design;
- Increasing the separation distance between turbines on the boundary with the Ben Halls Gap Nature Reserve, improving biodiversity outcomes;
- Creating a 1.2 km buffer through the removal of WTG 41 to reduce bird and bat barrier effects and in response to NPWS aerial firefighting concerns;
- Providing greater certainty to the proposed turbine curtailment strategy for potential impacts to threatened bat species; and
- Reducing general Project traffic and haulage by trucks through the township of Nundle due to the spreading of traffic across two main access routes, as well as the potential significant impact reductions to the broader local and regional road network through sourcing material from an optional Verden Road Quarry Expansion identified in proximity to the Project (9 km north of WTG 69).

The Project, as amended, has been carefully designed and sited to minimise impacts in consultation with the local community and relevant landholders. While, as with all wind farms projects, there are some inevitable impacts associated with the Project as outlined in the EIS, Submissions Report, Amendment Report 2021 and this Amendment Report, these impacts have been carefully considered for effective and viable mitigation measures to avoid as much as possible during construction and operation. These updated mitigation measures have been adopted as additional commitments to the

project amendments to demonstrate further intent to reduce impacts. A summary of these is provided in **Appendix C** of this Amendment Report.

As described in the EIS and Chapter 2 of this Amendment Report, the Project aligns with international, Commonwealth and NSW Government policy and strategic vision. The Project will:

- Support the transition being undertaken in the energy sector away from a centralised system of large fossil fuel generation, towards a decentralised system of widely dispersed, renewable energy production;
- Help contribute to meet increasing energy demand, provision of dispatchable energy through the proposed large scale BESS which will assist in managing ongoing electricity demand peaks;
- Provide necessary alternative electricity production given the forecasted retirement of coal-fired power stations;
- Avoid risks to the supply of power arising from the need to expand the electricity network prior to constructing further renewable energy projects in the region;
- Contribute to GHG emissions avoided in the order of 654,400 tonnes per annum, supporting Australia's recent commitments of net zero emissions by 2050;
- Provide a significant amount of the new generation capacity which will be required when the 2,000 MW Liddell Power Station located in the NSW Hunter Valley closes in early 2023;
- Contribute materially to NSW and Commonwealth renewable energy targets;
- Deliver economic benefits to regional and local communities, including:
  - Material direct investment, with the Project expected to include a minimum capital expenditure of $332 million (within the domestic economy) with ongoing operational expenses of $17 million per annum. This direct investment in NSW and the broader region will also bring material benefits to the Tamworth LGA and align with the Tamworth Regional Blueprint 100 (Tamworth Regional Council, 2020);
  - Material employment, with the creation of 615 FTE jobs through both years of the construction period, and 76 FTE jobs during the operation (across professional, scientific and technical industry sector) and 16 site based jobs for the life of the Project;
  - Providing a diversified income stream for rural landholders and neighbours through payments to host landholders and the Neighbour Benefit Sharing Program;
  - Further community enhancement funding of $3,000 per turbine per annum for the operational life of the Project, as well as an additional construction sponsorship fund of $150,000 to support community initiatives during construction; and
  - contributing to NSW and Commonwealth renewable energy targets, without depending on the network expansion proposed in the New England area and in alignment with the NSW Electricity Roadmap.

The site for the Project has been carefully selected to ensure its suitability for a wind energy project and ongoing refinements have been made to the Project to minimise potential impacts within the wind farm site and on the adjoining community while delivering broad public benefits as outlined above. The site is relatively isolated and sparsely populated while being within commuting distance to regional townships and major regional cities who will benefit from the increased economic activity. The strong support given to the Project from the majority of residents who live in the nearby Nundle and Hanging Rock communities demonstrates the broad community acceptance of the Project. However, it is acknowledged that some community members remain opposed to the Project and do not want a wind farm developed in the region despite the broad public benefits which it would bring.

Site suitability and the environmental, social and economic impacts of the Project have been fully assessed in line with all relevant guidelines, policies and criteria, including in relation to impacts on

biodiversity, visual, traffic and transport, noise, aviation, hazards, bushfire, soil and water and heritage. This Amendment Report demonstrates that potential impacts have been avoided, minimised or mitigated as far as reasonably practicable or feasible. The residual impacts of the Project on each of these issues have been confirmed to be able to be appropriately mitigated or offset by the detailed management measures proposed.

The Project represents a positive addition to the local and wider NSW economy, assists the Commonwealth and NSW Governments to fulfil their targets and policies to increase renewable energy supply, reduces carbon emissions and assists in meeting energy demand and providing necessary network stability.

The amendments made to the Project, as assessed in this Amendment Report, materially reduce the overall impacts of the Project. The remaining impacts will be mitigated or offset in accordance with the detailed mitigation measures proposed and the conditions imposed on any development consent granted for the Project.

The further assessment carried out has confirmed the overall public benefits of the amended Project in light of this, the Project is considered to be in the public interest.

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APPENDIX A Updated Project Description

APPENDIX B Updated Land Title

Appendix C Updated Mitigation Measures

APPENDIX D Updated Statutory Compliance

APPENDIX E Updated BDAR

Appendix F Noise and Vibration Assessment

APPENDIX G Landscape And Visual Assessment Addendum

APPENDIX H Traffic And Transport Assessment Addendum 2

APPENDIX I Route Study

APPENDIX J Aviation Assessment Addendum

Appendix K Flame Length Calculations

APPENDIX L Aboriginal Cultural Heritage Assessment - Addendum

APPENDIX M Statement of Heritage Impact – Peel Inn

Appendix N Historic Heritage Assessment – Optional Verden Road Quarry

APPENDIX O HISTORIC HERITAGE ASSESSMENT LETTER

APPENDIX P Air Quality And Greenhouse Gas Assessment

APPENDIX Q OPTIONAL VERDEN ROAD QUARRY EXPANSION BLUE BOOK SUMMARY WORKSHEET

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