

Hills of Gold Wind Farm Pty Ltd



Developed by Clean Energy Partners Pty Limited

Development Management by:



Hills of Gold Wind Farm

Amendment Report

20 December 2021 Project No.: 0550690



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20 December 2021

Hills of Gold Wind Farm

Amendment Report

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Acronyms and Abbreviations

Term	Description	
Amended Project	The Project as amended in this Amendment 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.	
Endangered Ecological Community (EEC)	An ecological community listed as protected by the NSW <i>Biodiversity Conservation Act 2016</i> .	
native	Flora or fauna species that existed in NSW before European settlement.	
negligible	Small and unimportant, such as to be not worth considering.	
offset (biodiversity)	One or more appropriate actions put in place in an appropriate location to counterbalance a development's impact on biodiversity values.	
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.	
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.	
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 PA encompasses the parcels of land associated with the Development Footprint, as shown in <i>Figure 3-1</i> of Appendix A.	
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 will involve the construction of up to 70 wind turbine generators (as proposed in the EIS) and up to 65 wind turbine generators (as proposed in this Amendment Report) and associated infrastructure.	
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 <i>Environment Protection and Biodiversity Conservation Act</i> 1999.	
threatened species	A species listed as protected by the EPBC Act or the BC Act	
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.	

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 (NSW).

Approval for the Project is sought under the State Significant Development (SSD) 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 State Environmental Planning Policy (SEPP) (State and Regional Development) 2011.

An Environmental Impact Statement (EIS) (ERM, 2020) 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 NSW Department of Planning, Industry and Environment (DPIE).

Since the completion of the EIS, and receipt of agency and community submissions during its public exhibition, and based on additional engagement with agencies and the community, a number of key changes have been made to the Project to further reduce the impacts of the Project. The proposed Project amendments are in direct response to concerns raised by agencies, community organisations and the public and have been carefully designed and sited to further minimise impacts, particularly in relation to biodiversity, visual and traffic issues, in consultation with the local community and relevant landholders. In summary, the Project has been refined and amended to materially reduce impacts by:

- the removal of five proposed wind turbine generators (WTGs) and associated access roads and ancillary infrastructure, with the result that the maximum number of WTGs proposed has reduced from the maximum of 70 WTGs assessed in the EIS down to a maximum of 65 WTGs;
- minor relocations to three WTGs 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.

This Amendment Report assesses the environmental, social and economic impacts of the amendments proposed to the Project against the baseline impacts of the Project as described and assessed in the EIS. The assessments contained in this Amendment Report confirm that the Project amendments will materially reduce the impacts of the Project including by:

- reducing the Development Footprint by approximately 41% from 513 ha to 300 ha with a corresponding reduction in biodiversity impacts;
- reducing the native vegetation which is required to be removed to accommodate the development footprint by approximately 36% to 132.43 ha. This represents a total reduction of 75 ha from the Project as described and assessed in the EIS;
- further reducing the extent to which the Project will impact to koala habitat by 28%;
- avoiding potentially serious and irreversible impacts and/or significant impacts to cave dwelling microbats;
- reducing the visual and aviation night lighting impacts of the Project;
- reducing the traffic and heritage impacts of the Project; and

preserving access to local goods and services within Nundle and reducing the impacts of Project traffic on residential dwellings within Nundle by the proposed inclusion of a temporary dedicated works vehicle car park in Nundle to reduce traffic congestion at local and tourist features and amenities, and proposed pedestrian crossing, subject to agreement with Tamworth Regional Council.

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

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 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 the 35% reduction by 2030 which is regarded by many as the minimum necessary to contain global warming;
- 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 life time 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; 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 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 the strong majority of 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 (WEP).

ENGIE ANZ, a joint venture between ENGIE S.A. and Mitsui & Co. Ltd, owns the Project. ENGIE S.A. is a global company with extensive experience in the energy sector and more than 103 gigawatts of installed power generation capacity, including 25% in renewables such as wind and solar photovoltaic technologies. This makes ENGIE S.A. the world's largest independent power producer with a presence in 70 countries and 170,000 employees. ENGIE S.A.'s long-term goal is to accelerate the transition to a carbon-neutral economy. To accomplish this, in Australia and New Zealand, the ENGIE ANZ joint venture has 1,200 MW of low carbon generation capacity and a publically announced portfolio of approximately 800MW, with additional earlier stage projects in the development portfolio.

The contact details for the Proponent are:

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

Level 33, Rialto South Tower

525 Collins Street

Melbourne VIC 3000

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 EP&A Act as the Project is declared to be SSD under the *State Environmental Planning Policy (State and Regional Development) 2011*.

In support of the SSD application, an Environmental Impact Statement (EIS) (ERM, 2020) 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 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 has prepared a Submissions Report which responds to the issues raised in agency and community submissions. This Amendment Report should be read in conjunction with the Submissions Report (ERM, 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 that does not rely on the proposed New England REZ network expansion to achieve NSW Electricity Roadmap objectives;
- has significant wind resources as determined from detailed 10-year site studies;
- has demonstrated significant support for renewable energy including 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.



1.4 **Project Amendments**

Since the EIS was exhibited, the Project has been revised and refined to further minimise 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. Some key amendments relate to input from:

- DPIE requests to assess visual impacts on key non-associated dwellings or recent development approved dwellings;
- DPIE Biodiversity Conservation Division (BCD) on biodiversity impacts;
- Hills of Gold Preservation Inc and other community organisations on biodiversity impacts and soil & water risks;
- Tamworth Regional Council concerns on Devil's Elbow constructability, visual impact and heritage, traffic route through Tamworth, biodiversity impacts and traffic impacts in Nundle;
- Nundle Business and Tourism Marketing Group and individual submission concerns on the impacts of traffic through Nundle;
- Muswellbrook Shire Council concerns of route selection and impacts to council owned and operated roads;
- Transport for NSW concerns and recommendations on transport route selected; and
- community concerns for impacts of aviation night lighting.

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 and the associated Submissions Report also update the mitigation measures proposed for the updated Project to ensure all remaining 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 impacts, particularly in relation to biodiversity, visual and traffic issues, in consultation with the local community and relevant landholders. In summary, the Project has been refined and amended to materially reduce impacts by:

- cumulative impact associated with visual amenity, biodiversity impacts and soil erosion risk led to the removal of five proposed wind turbine generators (WTGs) and associated access roads and ancillary infrastructure, with the result that the maximum number of WTGs proposed has reduced from the maximum of 70 WTGs assessed in the EIS down to a maximum of 65 WTGs;
- targeted erosion risk, designed earthworks reductions, and biodiversity assessment led to minor relocations to three WTGs locations;
- avoiding biodiversity impacts led to minor relocation of a portion of the transmission line route;
- concerns from Nundle businesses and residents, heritage impacts and Tamworth Regional Council feedback led to changes to the transport routes, site access arrangements and Devil's Elbow bypass road optimisation;
- additional hazards and risk assessment and design refinement led to minor amendments to ancillary infrastructure, siting and configurations;
- aviation night lighting impacts led to further consultation with CASA, an agreed reduced night lighting plan from 70 WTGs to 28 WTGs, lower intensity night lighting and a commitment to install light shielding, if night lighting is a condition of the Project's consent; and

 further transmission line design to determine targeted opportunities to avoid biodiversity impact along the transmission easement resulted in the reduction of 38.9 ha of native vegetation impacts (45.3% reduction).

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

- reducing the Development Footprint by approximately 213 ha with a corresponding reduction in biodiversity impacts;
- reducing the development footprint avoided native vegetation clearing by approximately 75.3 ha
 or 36% of previously assessed impact. Of the avoided native vegetation 54.6 ha is of moderate to
 high condition, demonstrating targeted project amendments to avoid this condition class;
- avoiding impact to 7.3 ha of Threatened Box Gum Woodland and revised impact is no longer significant to the species;
- avoiding direct impacts to all threatened bat species roosting habitat and two species foraging habitat;
- a material reduction of 14 ha or 28% of potential Koala habitat and increases in commitments to "spot and relocate" into >3,000 high quality habitat in neighbouring properties;
- reducing visual impact to neighbouring properties through layout change and commitments to provide visual screening where it has been assessed as effective;
- designing the Project layout to generally avoid all potential environmentally sensitive class 7 and class 8 soils;
- reducing visual impacts to nearby and distance communities associated with an updated aviation night lighting plan, reduced lighting intensity and light shields;
- reducing potential indigenous heritage impacts by avoiding areas of potential significance along Head of the Peel Road;
- reduction in daily construction traffic trips from 502 to 311 vehicles per day, being a reduction of 38%;
- avoiding residential areas of Nundle and communities in Tamworth, Dungowan, Woolomin and Piallamore for oversized and over mass transport loads;
- reducing congestion within Nundle from project traffic due to proposed Project vehicle parking restrictions and temporary carpark;
- improvements to public infrastructure through bridge upgrades on Lindsay Gap Road, and road widening, surface sealing and improved safety measures on Morrisons Gap Road; and
- improvements to safety within Nundle with a committed new pedestrian crossing (subject to Council approval).

2. STRATEGIC CONTEXT

This chapter provides an update to the strategic context to the Project since the finalisation of EIS, noting changes to NSW Government policy and strategy.

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 this, 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 Addendum LVIA confirms that:

- no existing non-associated dwellings will be subject to high visual impacts as a result of the Project once mitigation measures are applied; and
- 10 existing non-associated dwellings (and two approved dwelling locations which may or may not ultimately be constructed) will be moderately visually impacted by the Project once mitigation measures are applied, only two of which are within 2 km of a turbine.

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 New England region has been identified in the NSW Transmission Infrastructure Strategy (DPE, 2018) and the NSW Electricity Infrastructure Roadmap (DPIE, 2020) as one of the Renewable Energy Zones (REZs) to be created and fast-tracked in NSW, others being the Central-West Orana, Illawarra, South-West and Hunter-Central Coast regions of NSW. While the extent and details of the New England REZ are still being finalised, it confirms that the region is suitable for renewable energy projects. The draft New England REZ map identifies the Project as being outside but in proximity to the proposed 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 Renewable Energy Zone and Hills of Gold Wind Farm

The Project also aligns with both the New England North West Regional Plan 2036 (DPE, 2017), 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. Accordingly, unlike other projects in the New England area, the Project is not reliant on the development of the proposed 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). 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 2023) and help ensure Australia is best placed to deliver on critical global greenhouse gas milestones in 2030.

Proposed amendments to State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) seek to manage emerging potential land use conflicts associated with utility-scale solar and wind energy developments near certain regional cities. The proposed amendments to the ISEPP relating to emerging potential land use conflicts do not apply to regional towns in proximity to the Project and, accordingly, will not apply to the Project. However, as outlined in Section 2 of the EIS and further discussed below 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's Renewable Energy Target;
- Reducing Greenhouse Gas emissions under the Paris Agreement;
- 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);
- 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 emission avoided in the order of 608,000 tonnes per annum, supporting Australia's recent commitments of net zero 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;

- 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 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, 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 Australian Government's Commitments

The Federal Government committed to achieving net zero greenhouse gas emissions by 2050 ahead of the G20 Summit in Rome and the Glasgow United Nations climate discussions (COP26). The Project will assist in delivering on this key commitment for Australia.

Further, if approved, the Project could be constructed and operational well before the critical global milestone of 2030, assisting NSW and Australia to achieve the 35% reduction by 2030 which is regarded by many as the minimum necessary to contain global warming,

2.2.1.1 Net Zero Plan Stage 1: 2020-2030

The Net Zero Plan Stage 1: 2020–2030 (DPIE, 2020) sets the foundation for NSW's action on climate change and how the NSW Government will deliver on its objective to achieve net zero emissions by 2050. The Plan is the NSW Government's overarching strategy to reduce emissions and mitigate the impacts of climate change.

In September 2021, the NSW Government announced ambitious new emission reductions, with an updated objective to reduce emissions by 50% below 2005 levels by 2030 under the Net Zero Plan Stage 1: 2020 – 2030 Implementation Update (September 2021).

This Project will give effect to the Net Zero Plan, including the NSW Government's updated 2030 50% target through a reduction in greenhouse gas emissions by approximately 608,000 tonnes per annum. NSW total emissions in 2019 were 136.6 Mt CO 2-e (Department of Industry, Science, Energy and Resources, 2019), being a decline of 17.2 % on 2005 levels. NSW is still some way off achieving the 2030 50% reduction target. Shovel ready renewable energy projects are required to achieve the NSW government targets.

2.2.1.2 NSW Electricity Infrastructure Roadmap

The NSW Electricity Infrastructure Roadmap (the 'Roadmap), released in November 2020 is the NSW Government's plan to transform the NSW electricity sector into one that is clean, cheap and reliable. The Roadmap builds on the NSW Electricity Strategy (2018) and the NSW Transmission Infrastructure Strategy (2019). It sets NSW on a plan to replace its ageing coal-fired power stations with a coordinated portfolio of generation, storage and network investment (DPIE, 2021a). The Roadmap emphasises the need to transition to renewable energies, noting four of the State's five coal fired power stations are expected to close within the next 15 years, starting with Liddell Power Station in early 2023, followed by Vales Point B (2028), Eraring (2031) and Bayswater (2035). These power stations currently provide around three quarters of NSW's electricity supply and two thirds of the firm capacity needed during heat waves (DPIE, 2020). EnergyAustralia also announced in September 2021 an accelerated closure date for the Mt Piper Power Station, the youngest of NSW's coal fired generation plants, by three years, to 2040.

Enabled by the Electricity Infrastructure Investment Act 2020 (NSW) (EII Act), the Roadmap sets out a coordinated framework to support \$32 billion in private investment in at least 12 gigawatts of renewable generation infrastructure; and at least 2 gigawatts of long duration storage infrastructure supporting network infrastructure by 2030 ((DPIE, 2021b).

As part of this Roadmap, the NSW Government continues to commit to Renewable Energy Zones (REZ), which will expand transmission and generation capabilities in strategic areas across NSW including the New England region of NSW. The Roadmap reinforces the key role of renewable energy zones and associated projects in delivering not only renewable energy and the transition from coal fired power generation, but also provide for regional growth and long-term jobs in regional NSW.

The Roadmap will also reduce NSW electricity emissions by 90 million tonnes by 2030, helping deliver on NSW's ambitions to reach net zero emissions by 2050 and the updated objective to reduce emissions by 50% below 2005 levels by 2030 ((DPIE, 2021b).

The Roadmap also includes provisions for the Transmission Development Scheme and the Electricity Infrastructure Investment Safeguard, which aim to remove barriers to investment and maximise REZ benefits and investment.

The site chosen for the Project is in close proximity to the proposed New England REZ. Whilst the Project is in proximity to the proposed New England REZ, it is also consistent with the NSW Government's recognition of the majority of renewable projects are located outside of the REZs.

2.2.1.3 Proposed New England Renewable Energy Zone

The NSW Government's Electricity Strategy and Electricity Infrastructure Roadmap set out a plan to deliver proposed renewable energy zones in the State's Central – West Orana, New England and South-West regions, building on the NSW Transmission Infrastructure Strategy and supporting the AEMO's Integrated System Plan. Further Renewable Energy Zones are planned for the Hunter – Central Coast and Illawara regions (NSW Government, 2021).

As stated above, these proposed REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Central-West Orana, New England and South-West REZs are expected to unlock a significant pipeline of large-scale renewable energy and storage projects, while supporting up to \$20.7 billion of private sector investment in our regions and over 5,000 construction jobs at their peak (NSW Government, 2021).

A draft New England Renewable Energy Zone declaration was placed on public exhibition for four weeks until 12 November 2021, with the final declaration expected in late 2021. The REZ declaration will formalise the REZ under the Electricity Infrastructure Investment Act 2020. It sets out the intended network capacity (size), geographical area (location) and infrastructure that will make up the REZ.

The proposed New England Renewable Energy Zone is expected to generate up to 8,000 MW of electricity. The currently proposed geographical area of the REZ under the draft declaration is detailed in Figure 2-2, with the indicative location of the Project highlighted.



Figure 2-2: New England Renewable Energy Zone Geographic Area under the draft Declaration (NSW Government, 2021) and proximity of the Project.

The Project is located in close proximity to the south west of the boundaries of the proposed New England REZ. The Project will connect to the existing Liddell to Tamworth 330kV transmission line, which also 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 Energy Zone to major demand centres and involves the upgrade of existing transmission lines between Liddell Power Station, Muswellbrook and Tamworth substations.

Energy Demand

The Australian Energy Market Operator's (AEMO) 2021 Electricity Statement of Opportunities provides updated forecasts for demand and supply of electicity (AEMO, 2021). The 2021 report noted:

- electricity consumption is forecast to decline in the next five years, as distributed solar uptake continues;
- later in the decade, growth in electricity demand is forecast to return, driven by the commercial sector and an acceleration in the rate of electrification, particularly electric vehicles (EVs);
- in the longer term, the potential for accelerated deployment of Distributed Energy Resources (DER), hydrogen, and electrification (high scenarios), combined with industrial load closures and sluggish economic growth drive lower electricity demand scenarios;
- maximum electricity demand continues to soften over the next five years, then increases from 2025-26 through growth in residential and commercial sector demand; and
- with the sustained uptake of distributed solar, minimum demand forecasts also show a rapid decline.

The Project will help to meet the forecast increasing demand for energy in the NEM as forecast demand increased from 2025-2026 onwards through production of renewable energy.

Energy Transition 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 Australian Energy Market Operator's 2021 Electricity Statement of Opportunities report also notes the substantial pipeline of future projects in various stages of development. These projects total 121 GW and are spread across all regions, including NSW (refer Figure 2-3).



Figure 2-3: Proposed projects by type of generation and NEM region, beyond those already committed (AEMO, 2021)

NSW Covid-19 Economic Recovery Strategy

A key focus of the NSW Government is to "restart" the NSW economy through its NSW COVID-19 Economic Recovery Strategy. Job creation and "shovel ready" projects in regional NSW are key features of the Strategy. The Strategy expressly refers to "accelerating existing and emerging industries" as part of the "pathway to zero emissions" in its plan to secure recovery from the COVID-19 pandemic and grow the economy.

This Project would give effect to the objectives of the Strategy as it is a project that would:

- create jobs and economic growth in regional NSW; and
- accelerate the pathway to zero emissions.

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 (ERM, 2020).

Table 3-1:Overview of Project Amendments in Comparison to Exhibited
Project

Project Component	Exhibited Project (EIS)	Amended Project
Project Layout and Com	ponents	
WTG dimensions (maximums)	Hub Height of 150 m Tip Height of 230 m	No change
Project Area	As shown in Figure 3-1. 8,315 ha (inclusive of TL and Switching station)	No change
Project Layout	 See Figure 3.1 in the EIS. The Project layout remains subject to ongoing detailed design and micro-siting of: WTGs by up to 100 m; and all other Project infrastructure, including cabling and access tracks, within the assessed study area. Subject to ensuring that micrositing 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. The BESS, substation, switching station and O&M facility will not be microsited within the identified flame zone. 	 See Figure 3-1a below. The Project layout remains subject to ongoing detailed design and micro-siting of: WTGs by up to 100 m; and all other Project infrastructure, including cabling and access tracks, within the assessed study area. Subject to ensuring that micrositing 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. The BESS, substation, switching station and O&M facility will not be microsited within the identified flame zone.
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 updated Table 3.4 in Appendix A.
Internal Road Network	Refer to Figures 3-1 to 3-5 of EIS	 Refer to Figure 3-1a and Figure 3-1b for updates to internal road network. Changes include that: the internal road from the Project Area near the top of Head of Peel Road into the Project Area will no longer to be used by construction or operational traffic. Rather, it will only be used for emergency vehicle access only. internal road alignments have been varied to reduce clearing and the

Project Component	Exhibited Project (EIS)	Amended Project
		 service amended location of three WTGs. internal roads servicing the five removed WTGs have been deleted from the Project.
WTG Layout	WTG coordinates as detailed in Table 3-1 and presented in Figures 3-1 to 3-5 of EIS of the EIS.	Five turbines and the associated hardstand areas have been removed being WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31. WTG 47 location relocated by approximately 209 m to: Easting (m): 327,034.8232 Northing (m): 6,502,705.0191 WTG 50 location relocated by approximately 137 m to: Easting (m): 325,872.1500 Northing (m): 6,504,011.0169 WTG 12 location relocated by approximately 50 m to: Easting (m): 319,126.2648 Northing (m): 6,501,524.1736 No other changes to WTG locations have been made. Amended WTG coordinates are detailed in Table 3-1 in Appendix A. Refer to Figure 3-1a for updated WTG locations.
Monitoring Masts	Decommissioning of the three current monitoring masts and installation of up to five additional monitoring masts for power testing.	Decommissioning of the three current monitoring masts and installation of up to 10 additional monitoring masts for power testing (including five additional as part of this Amendment Report). The five additional temporary monitoring masts proposed as part of this Amendment Report will be located at a WTG location. The temporary monitoring masts will be installed and removed shortly before the WTG installation for power curve verification.
Access and Road Upgrades	In the original EIS, Head of Peel Road was proposed as the alternate route from Nundle (20% traffic).	Morrisons Gap Road will now be the only access point to Project Area as amended in Figure 3-1c. Head of Peel Road will be used as emergency vehicle access only. No construction or operational traffic will use this route. No road upgrades will occur on the Head of Peel Road or Kirks Road.
Transport Route	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.	 New option for the transport of various Project components through Muswellbrook. The following transport options are no longer proposed as part of the Project: tower option via Tamworth; and Head of Peel Road route ('Southern Route') and associated alternate routes through Nundle including Happy Valley Road, Jenkins St, Gill St, Innes St. Some private land previously identified as being required for upgrades proposed

Project Component	Exhibited Project (EIS)	Amended Project
		along Morrisons Gap Road has also now been confirmed as no longer being required and so has been removed from the Project.
		Additional laybys for OSOM traffic on Lindsay Gap Road and Morrisons Gap Road have been added, to make a total of five proposed laybys on the transport route for the Project, to allow existing road users to pass slower moving Project traffic. A pedestrian crossing and temporary construction car park in Nundle has been added to the Project, subject to further consultation with Tamworth Regional Council. The revised transport route for the Project is shown in Figure 3.1c and detailed in the updated Project Description in Appendix A
Devil's Elbow	Alignment of Devil's Elbow detailed in Appendix G of the EIS	An optimised Devil's Elbow bypass road has been included in the Project taking into account submissions, further design considerations and the results of the geophysical survey results. The revised alignment outlined in Figure 3-1c.
Transmission Line	Refer to Figures 3-1 to 3-5 of EIS	Minor realignment of the Transmission Line in proximity to WTG12 and WTG 2. Refer to Figure 3-1a for updated Transmission Line alignment.
Temporary Concrete Batching Plants	Two temporary concrete batching plants located at specific locations	All construction laydown areas, with the exception of those along Morrisons Gap Road, have the optionality to locate the two temporary concrete batching plants during construction.
BESS, Substation and O&M Facility 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.
Construction Compound	Construction compound at the start of the Project Area from Head of Peel Road. Refer to Figures 3-1 to 3-5 of EIS.	The construction compound at the start of the Project Area from Head of Peel Road has been relocated adjacent to WTG 56. It has reduced in size from 4.27ha to 1.59ha. Refer to Figure 3-1b.
Project Construction	1	
Duration and Staging	Construction activities will be progressive across the Project Area over a period of approximately 18 – 24 months	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 change

Project Component	Exhibited Project (EIS)	Amended Project		
	 no works on Sunday or public holidays. Some out of hours work may be required. 			
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)		
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.		
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		

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 including amended Project layout figures. As demonstrated by Table 3-2 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.

Project Amendment	Description, Justification and Outcomes	Reference
Relocation of WTG 47	The amended Project incorporates the relocation of WTG 47 by approximately 209 m to the north east of the exhibited location. WTG 47 has been relocated to reduce the extent of required vegetation clearing and earth works on steeper slopes during construction, thereby reducing biodiversity impacts.	Figure 3-1a
Relocation of WTG 50	WTG 50 has been relocated by approximately 137 m to the north - east of the exhibited location, and the existing hardstand area proposed has been reoriented to avoid impacts to the bat habitat buffer area, thereby reducing biodiversity impacts.	Figure 3-1a
Modification of Hardstand for WTG 2	The hardstand area location has been optimised to avoid direct native vegetation and associated habitat clearing.	Figure 3-1a
Modification of Hardstand and Turbine Location 12	WTG 12 has been relocated by approximately 50 m to reduce the extent of required earthworks and cut to fill extents, thereby reducing biodiversity impacts.	Figure 3-1a
Removal of WTG 19	WTG 19 has been removed to reduce the visual impact to non- associated dwelling 69. The hardstand road required to access this turbine has been removed, with further biodiversity benefits.	Figure 3-1a
Removal of WTG 23	WTG 23 has been removed to reduce the visual impact to non- associated dwelling 69, the risk of impact to bat habitat and Koala habitat, reduce significant bulk earth works associated with hardstands and associated roads and therefore reduce biodiversity impacts.	Figure 3-1a
Removal of WTG 1	WTG 1 has been removed due to direct impacts associated with native vegetation and indirect impacts to fauna, in particular bats, Koalas, and Greater Gliders. This further reduces visual impacts associated with dwellings in the Upper Hunter Shire Council region. The road required to access this turbine has also been removed, further reducing biodiversity impacts.	Figure 3-1a
Removal of WTG 27	WTG 27 has been removed to reduce risk of indirect impacts to bat habitat, reduce native vegetation impacts and associated indirect fauna impacts. The removal of this turbine further reduces visual impacts associated with to non-associated dwelling 69 and other dwellings on the Upper Hunter Shire Council (UHSC). The road required to access this turbine has also been removed, further reducing biodiversity impacts.	Figure 3-1a
Removal of WTG 31	WTG 31 has been removed to reduce risk of indirect impact to bat habitat and reduce biodiversity impacts. The UHSC requested that this turbine was removed. The road required to access this turbine has also been removed, with further biodiversity benefits.	Figure 3-1a
Monitoring Masts at WTG Location prior to WTG Installation	Decommissioning of three current monitoring masts and installation of up to 10 additional monitoring masts for power testing. The five additional temporary masts to those proposed in the EIS have been assessed as part of this Amendment Report and will be located at a WTG location with a maximum height of approximately 150 m AGL, equivalent to the hub height of the final selected WTG model. All temporary masts proposed will be placed on the same location as an approved WTG prior to its installation and removed shortly before WTG installation.	The exact number and location will be defined at the detailed design stage.
Minor Transmission Line Realignment	A portion of the transmission line within the Project Area, to the north of WTG 12 and west of WTG 2, has been realigned to	Figure 3-1b

Table 3-2: Project Amendments

Project Amendment	Description, Justification and Outcomes	Reference
	reduce vegetation clearing during construction, thereby reducing biodiversity impacts.	
Reduced removal of Transmission Vegetation	Portions of the vegetation previously assessed to be removed for transmission line has been reassessed by AECOM based on further refinements made to the design to identify native vegetation that can remain, thereby reducing the amount of vegetation to be cleared and reducing impacts on biodiversity.	Considered in updated BDAR, Appendix D of the Amendment Report.
Internal Access Track Realigned and Modified as Emergency Access Only	 Access Track realignment Sections of access track have been realigned to reduce the construction footprint and avoid biodiversity impacts. These sections are located between: WTG 16 to 17 WTG 17 to 18 WTG 46 to 48 WTG 66 to 67 Access Track The internal road from the Project Area near the southern end of Head of Peel Road into the western area of the Project Area has been modified and will now be used for emergency access only, which reduces impacts to biodiversity, vegetation clearing and earthworks. This results in an overall reduction in disturbance footprint of approximately 20 hectares. 	Figure 3-1b and Figure 3-1c
Traffic Access to Project Area	All Project traffic will now access the Project Area via Morrisons Gap Road only. The Head of Peel Road is no longer proposed to be used for Project related construction and operational traffic and will be for emergency use only. As a result, the road upgrades and associated clearing previously proposed along the Crawney Road / Head of Peel access route ('Southern Route') will not be undertaken.	Figure 3-1c
Transport Route Updates	 The transport route for OSOM from the Port of Newcastle to the Project Area has been amended by the following: removal of the tower route option via Tamworth; removal of the Head of Peel Road route ('Southern Route') (as stated above) and associated alternate routes through Nundle including Happy Valley Road, Jenkins St, Gill St, Innes St; some private land previously identified as being required for upgrades proposed along Morrisons Gap Road has also now been confirmed as no longer being required and so has been removed from the Project; inclusion of route optionality in Muswellbrook; additional laybys for OSOM traffic on Lindsay Gap Road and Morrisons Gap Road, to make a total of five proposed laybys on the transport route for the Project, to allow existing road users to pass slower moving Project traffic; and addition of a pedestrian crossing and car park in Nundle subject to further consultation with Tamworth Regional Council. The benefits of these amendments include significantly reduced biodiversity impacts, reduced impacts of project OSOM vehicles passing through residential town areas, and reduced traffic impacts of OSOM vehicles to public road users. 	Figure 3-1c Updated Project Description in Appendix A
Devil's Elbow Bypass Road Optimisation	The Devil's Elbow Bypass Road has been optimised to further reduce and avoid heritage and biodiversity impacts. The EIS incorporated a Historic Heritage Impact Assessment and Statement of Heritage Impact (SoHI) (ERM, 2020) (Appendix N of the EIS). The SoHI confirmed that the Devil's	

Project Amendment	Description, Justification and Outcomes	Reference
	Elbow bypass as detailed in the EIS would have a negligible impact on the setting of the LEP listed Black Snake Gold Mine, but would have the potential to impact archaeological features, such as potential mine shaft entries and tunnels. The assessment recommended a geophysical and / or geotechnical assessment be undertaken to determine if there are any subsurface voids beneath the proposed upgrade or other anomalies that may be indicators of archaeological features. In line with this recommendation, the <i>Devil's Elbow Bypass</i> <i>Road – Geophysical Interpretative Report</i> (Coffey, 2021) (provided in Appendix O of the Amendment Penert) used	Figure 3-1c Appendix O Appendix P, providing concept designs (subject to further refinement during detailed design).
	electrical resistivity testing in March 2021 to assess potential for subsurface voids relating to abandoned mine workings, and other possible anomalies that may indicate the presence of archaeological features.	
	The investigation identified three resistivity anomalies (referred to as Areas 1, 2 & 3). While it is possible that these areas are the result of natural geological processes unrelated to the Black Snake Gold Mine, it is considered they are likely to be associated with abandoned (historic) mine workings such as tunnels. Based on Coffey's extensive tunnel design experience it is expected that these potential tunnel areas would be very unlikely to be structurally impacted by road excavation so as to cause any subsidence or collapse provided that they have at least 5 m of sound rock cover and span less than 4 m and measures such as heavy blasting are avoided. Based on the outcomes of the geophysical assessment (Coffey, 2021) Catcon and WGA (Wallbridge Gilbert Aztec) redesigned and realigned the road such that the potential void locations identified are limited to within areas of fill so as to avoid the risk of removing earth support. The realigned and redesigned bypass road is identified in Figure 3-1c. A number of structural engineering solutions have been recommended by Coffey to ensure structural integrity of any subsurface voids in proximity to the works, and these will be confirmed during detailed design where necessary.	
	In addition, the SoHI was updated to include assessment of indirect impacts following a request from Tamworth Regional Council (ERM, 2021) The findings of the Updated SoHI (provided in Appendix Q to this Amendment Report) confirm that the road works will have no impacts on the listed heritage values of the former Black Snake Gold Mine.	
	Impacts associated with the exhibited Project footprint in the EIS at Devil's Elbow comprised approximately 17 ha of native vegetation generally in high condition. Selection of a proposed route (from the larger potential area identified in the 17 ha) and substantial design revisions have reduced this impact to 2.5 ha of native vegetation removal, leading to direct and indirect benefits to previously impacted vegetation and habitats in this area. This includes avoidance of Box Gum Woodland Critically Endangered Ecological Community and habitat for Koala. Further information regarding the optimised design is provided within the Submissions Report.	
Ancillary Infrastructure Amendments	Relocation of laydown and batching plant at top of Head of Peel Road As a result of the removal of the Head of Peel access to the Project Area, the construction laydown area and batching plant at the top of the Head of Peel Road access route has been relocated to the footprint of the BESS / substation. This amendment will result in no additional environmental impacts.	Figure 3-1b
	Substation, BESS and O&M configuration Following further substation design works, the configuration of the BESS, substation and O&M facility has been slightly	Figure 3-1b

Project Amendment	Description, Justification and Outcomes	Reference
	amended to accommodate changes in size to the substation. The overall area of these facilities remains the same and will result in no additional environmental impacts.	
	Optionality of O&M to between WTG 55 and WTG 56 Based on feedback in the Hazards and Risk Report a second siting option for the operations and maintenance facility has been included between WTGs 55 and 56. Both options would have the same footprint area. Only one O&M location will be constructed and this amendment will result in no additional environmental impacts.	Figure 3-1b
	Laydown Area and Concrete Batching Plant Optionality Inclusion of the option for any laydown area (with the exception of laydowns along Morrisons Gap Road) to host the two temporary concrete batching plants required for construction. This amendment will result in no additional environmental impacts.	Figure 3-1b
	Additional Temporary Construction Compound location An additional temporary construction compound location is proposed adjacent to WTG 56 to optimise efficiency and safety of project construction. This amendment will result in no additional environmental impacts.	Figure 3-1b
Refinements to Morrisons Gap Road Upgrades	Some private land previously identified as being required for road upgrades proposed along Morrisons Gap Road has also now been confirmed as no longer being required and so has been removed from the Project to reduce private landholder impacts. The proposed road upgrades along Morrisons Gap Road also widen sections of the existing narrow road to improve safety conditions along the road for local residents, in response to feedback received from residents along this route.	Appendix B
Aviation Night Lighting Plan	Aviation night lighting impacts led to further consultation with CASA, an agreed reduced night lighting plan from 70 turbines to 28, lower intensity night lighting and a commitment to install light shielding should night lighting be a condition approval. Any required aviation lighting will be operated in accordance with CASA requirements.	Appendix J
Biodiversity Stewardship Sites	There have been eight (8) neighbouring landowners identified who could potentially host a biodiversity stewardship site to deliver a wildlife corridor. Biodiversity stewardship sites will be established in accordance with legislative requirements. The potential for establishing a wildlife corridor between Ben Halls Gap Nature Reserve and Crawney Pass / Wallabadah Nature Reserve as part of the biodiversity stewardship sites will be investigated. This wildlife corridor could provide enhanced connectivity between three NSW State Nature Reserves or National Parks including Ben Halls Gap Nature Reserve.	







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 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, subject to the further updates outlined below.

A statutory compliance table for the Project, as amended, is provided in Appendix S.

4.2 Relevant Project Amendment Considerations and Changed Statutory Context

4.2.1 Devil's Elbow Bypass Road - Crown Land and Native Title

The optimisation of the Devil's Elbow Bypass Road as described and assessed in this Amendment Report means that some areas of Crown land will be impacted. This enlivened new statutory requirements relevant to the Project under the *Crown Land Management Act 2016* and the *Native Title Act 1993* (Cth).

In order to further avoid impacts to heritage assets around the Devil's Elbow, the amended Project has updated the road bypass design, which extends onto an area of Crown Land (Lot 440, DP 822503). All required access rights under the Crown Land Management Act 2016 will be secured prior to relevant works commencing. The Proponent is aware of a Native Title Claim by the Gomeroi people over the relevant Crown Land Lots. Accordingly, the Proponent has commenced engagement to reach an Indigenous Land Use Agreement (ILUA) with the Native Title claimant under the *Native Title Act 1993* (Cth).

4.2.2 State Environmental Planning Policy (Koala Habitat Protection) 2020 and State Environmental Planning Policy (Koala Habitat Protection) 2021

The EIS considered the provisions of the *State Environmental Planning Policy (Koala Habitat Protection) 2019.* This SEPP is no longer relevant to the Project.

Since the submission of the EIS, two new SEPPs for Koalas have been made, being:

- 1. State Environmental Planning Policy (Koala Habitat Protection) 2020 (2020 Koala SEPP); and
- 2. State Environmental Planning Policy (Koala Habitat Protection) 2021 (2021 Koala SEPP).

The 2020 Koala SEPP, and not the 2021 Koala SEPP, applies to land zoned RU1 and RU3. The key infrastructure for the Project is located in RU1 and RU3 zones.

The 2020 Koala SEPP primarily only imposes specific requirements which apply where a local council is the consent authority. The Independent Planning Commission is the consent authority for this Project. Accordingly, only the aims of the policy are of relevance to the Project. The aims of the 2020 Koala SEPP are as follows:

This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline—

(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and

(b) by encouraging the identification of areas of core koala habitat, and

(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.

The impacts to Koala habitat are comprehensively assessed in the updated BDAR in Appendix D. During flora and fauna surveys carried out between 2018 and 2020 and 1014 infrared motion detected camera trap nights, two Koalas were spotted in the Project Area. This is in addition to the 7 Koalas that were recorded within 10 km of the Project site. The area has not been identified as core Koala habitat and areas proposed to be impacted are generally of low quality or fragmented. As a result of the refinements made to the Project as presented in this Amendment Report, the impacts of the Project to Koala habitat have been materially reduced by 14 ha or 28%. This significantly reduces the potential impacts of the Project on Koalas.

There remains extensive suitable high condition habitat in neighbouring properties and over 3,000 ha in neighbouring nature reserves suitable for Koala relocation if found prior to construction. The Project has further committed to best practice processes for minimising the unavoidable residual impacts of the clearing including through the development of detailed management plans and protocols to be implemented before and during clearing of potentially relevant vegetation. The following commitments have been made to further avoiding impacts to Koala:

- A Biodiversity Management Plan including:
 - presenting Plans showing areas to be cleared and areas to be protected, including exclusion zones and protected habitat features, and areas for native vegetation rehabilitation or re-establishment. This will be key to minimising impacts to Koala and Spotted-tailed Quoll;

- vegetation clearing protocols, including staged habitat removal (including of wombats, Koala, and other fauna) and any specified seasonal limits on clearing activities;

- maintaining areas of habitat connectivity for as long as is practicable through or around the construction area, protected by suitable fencing, to allow movement of fauna such as Koala and Spotted-tailed Quoll;

- maintaining isolated paddock trees within the development footprint where possible to provide refuge to locally occurring fauna species (incl. Koala);

- protocols for the salvage and relocation of woody debris, tree hollows and bush rock;

- requirements for temporary fencing and regular inspections to minimise the risk of fauna injury / mortality (particularly Koala and Spotted Tailed Quoll) due to vehicle strike or entrapment in deep excavations;

- fauna handling and unexpected threatened species finds procedures;

- ensure construction and operation personnel are educated on the presence of fauna such as Koala and Spotted-tailed Quoll in the locality, how to manage potential interactions, and to be aware of the potential for vehicle strikes when driving through the sites (particularly after dark);

- revegetation with Koala feed tree species where appropriate;

- design of operational fencing layout to ensure fauna (incl. Koala and Spotted-tailed Quoll) can continue to move through the landscape, and if they enter the wind farm are able to self-relocate back into surrounding landscape by providing egress opportunities. Ensure fauna are prevented from accessing higher traffic areas or other potentially hazardous area, and are funnelled towards areas of potential habitat rather than towards the operational wind farm, or into dead-ends and bottle-necks; and

- establishment of Biodiversity Stewardship sites on neighbouring properties.

4.2.3 New Electricity Infrastructure Investment Act 2020

On 9 November 2020, the NSW Government released its Electricity Infrastructure Roadmap, which set out a framework to deliver a modern electricity system, which could set NSW up to be a "global energy superpower". Subsequently, the *Electricity Infrastructure Investment Act 2020* was enacted. The new Act provides a power for the Minister to declare "renewable energy zones" (REZs).

The objects of the new Act include:
- (a) to improve the affordability, reliability, security and sustainability of electricity supply, and
- (b) to co-ordinate investment in new generation, storage, network and related infrastructure, and
- (c) to encourage investment in new generation, storage, network and related infrastructure by reducing risk for investors, and
- (d) to foster local community support for investment in new generation, storage, network and related infrastructure, and
- (e) to support economic development and manufacturing, and
- (f) to create employment, including employment for Aboriginal and Torres Strait Islander people, and
- (g) to invest in education and training, and
- (h) to promote local industry, manufacturing and jobs, and
- (i) to promote export opportunities for generation, storage and network technology.

While the New England REZ has not been declared as of the date of this Amendment Report, it has been announced that the Minister will declare a REZ in the New England area. The Project is located in the New England area, adjacent to the proposed REZ and would give effect to the objects of the Act in that it will, among other things:

- create early "wins" with a Project that does not rely on the New England REZ Network Expansion;
- improve grid stability including through the BESS;
- support economic development;
- create employment; and
- promote local industry in anticipation of further projects in the area.

4.2.4 Proposed Amendments to the State Environmental Planning Policy (Infrastructure) 2007

Between 13 September 2021 and 11 October 2021, the Department of Planning, Industry and Environment (DPIE) exhibited an Explanation of Intended Effect relating to proposed changes to the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) to ensure renewable energy projects are built in the right places, to allow room for regional cities to grow and develop.

In the Explanation of Intended Effect, the NSW Government acknowledged that a large portion of existing solar and wind development is currently located outside REZs (approximately 70%) and that continued development outside of the REZs will be required to support a transition to renewable energy (DPIE, 2021c).

The proposed changes include specific matters for consideration that will apply to utility scale solar and wind energy developments near certain regional cities. The regional cities include Albury, Armidale, Bathurst, Dubbo, Griffith, Orange, Tamworth and Wagga Wagga. The matters for consideration would apply to land within 10 km of land zoned B3 Commercial Core and within five (5) km of any residential land zoned R1 General Industrial, R2 Low density residential and R3 Medium density Residential.

The proposed amendments to the ISEPP relating to emerging potential land use conflicts do not apply to regional towns in proximity to the Project. Nonetheless, it is noted that the Project has been sited and designed to minimise potential land use conflicts to the extent practicable.

5. CONSULTATION AND ENGAGEMENT

5.1 Overview

Since lodgement of the EIS in November 2020, the Proponent has continued to actively consult with community members, community organisations, councils, and relevant government agencies.

The Submissions Report provides further detail regarding consultation and engagement activities, and interactions with Project amendments and re-assessment of impacts. This includes:

- Section 2.1 details the process the Project has undertaken for the integration of engagement, submissions / concerns into Project design and amendment and reassessment of impacts;
- Section 4.1 details engagement activities undertaken with Councils;
- Section 4.2 details engagement undertaken with various NSW and Commonwealth agencies; and
- Section 4.3 details engagement undertaken with community organisational and community members.

An overview of the engagement undertaken is provided below, with further detail in the Submissions Report.

5.2 Council Engagement

Several meetings and correspondence have been held with councils, including:

- Tamworth Regional Council: several meetings and correspondence has been undertaken from December 2020 – December 2021, primarily to discuss Council concerns relating to traffic and transport, Devil's Elbow bypass road alignment, biodiversity, decommissioning, soils and water, heritage and the Community Enhancement Fund (CEF);
- Upper Hunter Shire Council: meetings to primarily discuss the CEF approach and Voluntary Planning Agreement (VPA) offer;
- Muswellbrook Shire Council: meetings and correspondence to primarily discuss traffic and transport, VPA offer and confirmation of Council's withdrawal of objection to the Project; and
- City of Newcastle: meeting to discuss traffic and transport.

5.3 Regulatory Engagement

Several meetings and email correspondences have also occurred between agencies and the Project since lodgement of the EIS. This includes:

- DPIE: discussion relating to further assessments to be contained in the Amendment Report and Response to Submissions Report, including those further requested assessments detailed in DPIE RFI dated 12/10/2021;
- Transport for NSW: discussion relating to the transport route;
- Office of the Australian Energy Infrastructure Commissioner: discussion relating to blade throw;
- National Parks and Wildlife Service (NPWS): to discuss NPWS submission and response;
- NSW Rural Fire Service: correspondence regarding the Bushfire Risk Assessment and potential use of Devil's Elbow bypass road;
- DPIE Environment, Energy and Science (EES): Biodiversity Conservation Division (BCD): to discuss approach to addressing EES submission;
- Civil Aviation Safety Authority (CASA): regarding obstacle lighting and approval of Obstacle Lighting Plan; and
- Port of Newcastle (PoN): meeting regarding delivery into PoN and associated traffic and transport matters.

5.4 Community Engagement

Ongoing targeted stakeholder engagement has continued since lodgement of the EIS. The key ongoing community engagement activities undertaken are outlined in Table 5-1.

Stakeholder	Interaction record	Description
Nundle and Hanging Rock residents	41 face-to-face interactions with Community members through door knocking	December 2020 / January 2021: Regular door knocks were conducted during the public exhibition of the EIS for residences in Nundle and Hanging Rock (December 2020 / January 2021). The door knocks were an opportunity to communicate key project information, and to distribute posters which contained a summary of the EIS.
		A number of follow up meetings, phone calls and emails were also exchanged with residents to discuss the Project and status of ongoing assessment.
Nundle Community Information Hub (Dec 2020, Jan 2021 and Nov 2021)	Approximately 150 interactions with members of the Nundle and Hanging Rock Community	A Community Information Hub in Nundle was opened during public exhibition between December 2020 and January 2021. A drop in Community Information Hub was set up in Nundle prior to response to submissions from the 8th to the 10th of November 2021 and the 15th to 17th of November 2021. Project fact sheets with key updates to the Project were distributed and discussed with the local community.
Hanging Rock Community Drop-In BBQ	Approximately 25 community members in attendance	A Community drop-in session and BBQ was held at the Hanging Rock Hall on the 15th of November 2021. There was discussion amongst community members about the Project broadly.
Timor Community Information Hub	Three community members attended	The Information Hub was set up at the Timor Community Hall on the 11th of November 2021. Project fact sheets with key updates to the Project were available for the local community.
Project Newsletters	Issue 4: 154 people reached Issue 5: 159 people reached Issue 6: 189 people reached	Issue 4: April 2021 – Hills of Gold Wind Farm Newsletter Issue 5: August 2021 – Hills of Gold Wind Farm Newsletter Issue 6: November 2021 – Hills of Gold Wind Farm Newsletter
Project Media	9+ news articles 4+ TV segments 4+ radio segments	The Project has featured in the Northern Daily Leader (6 articles), The Australian (1 article) and The Guardian (2 articles) newspapers, with multiple articles. A digital article was published on Renew Economy and there have been several TV news stories on the Project through Prime7 News, NBN News Tamworth and NBN News Coffs Harbour. The project has also been featured on ABC New England North West several times, as well as 88.9FM and 92.9FM. Paid print media on ENGIE involvement in renewables in the region through Northern Daily Leader and local radio advertisements.
Project Flyer	Displayed between 2 December 2020 until 29 January 2021	Project posters summarise technical chapters in the EIS were on display in the in the Community Information Hub.
Neighbour Consultation since Public Exhibition (within 5 km of the project)	Since the beginning of public exhibition	Neighbours within 5 km have continued to be consulted and updated on Project updates. This has occurred through email updates and phone calls, with any specific updated assessments being shared with neighbours.

 Table 5-1:
 Targeted Stakeholder Engagement Overview

Stakeholder	Interaction record	Description
	there have been 64 phone calls 62 emails 12 face-to-face meetings	
Community Consultative Committee	The meeting minutes with the presentation delivered and a summary of conversation are uploaded to the Hills of Gold Energy website after each meeting.	Extraordinary CCC Meeting, 29 th September 2021, held remotely via Dial-in Teleconference to provide an update to the project amendments and response to submissions reporting.
NTS Corporation		 28 January 2021, Consultation with Gomeroi applicant Rose Nean 14 April 2021, Meeting held to discuss the Gomeroi Native Title Claim and future engagement with claimant in relation to the Project. 17 April 2021, Meeting with community in Timor to discuss Project with Gomeroi applicant present. April-December 2021 Regular calls and emails to NTS Corporation regarding the Gomeroi Native Title Application.

Stakeholder	Interaction	Description
	record	
Timor/Crawney Residents	25 Community members in attendance.	17 April 2021: BBQ with residents of the Timor/Crawney community including a presentation and Q&A session. The Project team provided written responses to questions that required technical responses following this meeting
	Follow up emails with sharing minutes and answering community questions.	
Hills of Gold Preservation Inc.	1 face-to-face meeting	 4 May 2021: Meeting with members to discuss concerns raised through public exhibition and introduce members of the ENGIE Project Team. Broad aspects of the Project were discussed. Members of the group were present at the meeting of CCC members mentioned above.
Nundle Tourism and Business Marketing Group	1 face-to-face meetings	4 May 2021: Meeting with members to discuss concerns affecting businesses in the Nundle and Hanging Rock area, particularly focused on impacts of traffic and transport and existing tourism operators. Members of the group were present at the meeting of CCC members mentioned above.
Friends of the Wind Farm	3 face-to-face meetings	 11 January 2021 BBQ with members of the association to provide an update on the Project and respond to queries. A set of meeting actions were provided by residents and the project provided responses. 18 January 2021 BBQ: A meeting with project supporters at the Nundle Bowling and Recreation Club. 4 May 2021: Meeting with members to introduce members of the ENGIE Project Team and to provide a Project update with Q&A session.
Local Businesses	30 emails 43 phone calls	A business survey was sent to Nundle and Hanging Rock business owners on the 10 th of August who operate shop fronts or businesses out of their home. At the completion of the survey, 53 responses were received, there were several agricultural businesses who submitted a survey, which accounts for the larger number of submissions. When looking at the 53 responses, there were 61.5% of businesses in support and 38.5% of businesses not supportive of the Project. When reviewing the data and identifying, which businesses have an ABN and a shopfront in Nundle, there is 66.7% support and 33.3% not supportive businesses. 67% of respondents supported one or more of the transport amendments made as a result of earlier consultation. The dedicated route to use Barry Road and avoid residential parts of Nundle and a temporary car park received the strongest support. Follow up calls and meeting were held with businesses that indicated interest in more Project information.
Transport Update	22 emails 4 phone calls	Email campaign to all residents on Morrisons Gap Road and Shearers Road residents. Further to the email existing safety concerns were along Morrisons Gap Road were raised by residents. Consultation with businesses along the transport route through business survey. 90% of businesses directly along the transport route expressed support for the Project. The Project is committing to improved communication protocols, such as communication of the latest delivery

Stakeholder	Interaction record	Description
		schedules including expected component types, days and times and duration of deliveries will be provided to the local community. This will occur through:
		 Website updates including fact sheets.
		 Community information boards within Nundle and Hanging Rock.
		 A text message service for those registered.
		A permanent community hub will be established in Nundle during construction and a local person (from within the LGA where possible) will be employed to assist in providing information about the Project including transport delivery times to the community.
		 Provision of major activity notices to residents along Shearers Road and Morrisons Gap Road, one week in advance.
Biodiversity Stewardship Program	 3 face- to-face meetings Emails and phone calls 	The Project has been investigating the potential for Biodiversity Stewardship Sites on land surrounding the Project to create a wildlife corridor between Ben Halls Gap Nature Reserve and Crawney Pass / Wallabadah Nature Reserve. There have been eight (8) landowners identified who could host a biodiversity stewardship site at present. The Project is seeking to enter into agreements with neighbouring landowners.

In addition, a combination of calls and meetings have been held with a number of key businesses within Muswellbrook LGA affected by the proposed transport route, including:

- Maxwell Underground Mine;
- Mt Arthur Mine;
- New Hope Bengalla Mine;
- Mt Pleasant Mine;
- Mangoola Mine;
- Dartbrook Underground Mine;
- Coolmore Stud;
- Darley Woodlands Stud;
- Edenglassie Stud; and
- Balmoral Stud.

Please refer to the Submissions Report for further detail regarding consultation and engagement activities, and interactions with Project amendments and re-assessment of impacts.

5.5 Key Issues Raised and Project Response

Chapters 5 and 6 and Appendix B of the Submissions Report provide considered responses to agency, community organisation and community submissions following EIS exhibition and from further consultations and discussed how the Project has responded through Project amendments, resulting in a significantly reduced development footprint and associated reduced environmental, social and economic impacts, including reduced biodiversity, visual, traffic, aviation and heritage impacts.

5.6 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 the Hills of Gold Community Consultative Committee;
- 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;
 - 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

The section demonstrates the significant reduction in environmental impacts achieved through the design changes proposed to the Project and the further assessments completed. It supports this with a detailed summary of findings of the detailed assessments undertaken of the proposed amendments and refinements to the Project. It also provides details of the revised mitigation measures proposed based on the Project amendments and refinements and issues raised in submissions.

The Project has been designed so that the majority of the direct impacts to vegetation within the development footprint will be to exotic grassland and disturbed native vegetation. The 132.43 hectares of native vegetation which is contained in the amended development footprint represents 0.6% of the approximately 21,540 hectares of native vegetation contained within the NSW *Biodiversity Assessment Method* (BAM) landscape assessment buffer area of 1,500 m and by avoiding native vegetation, an additional 75.27 ha of native vegetation and potential for threatened fauna species has been avoided.

6.1 Biodiversity

6.1.1 Relevant Project Amendments

Project amendments relevant to potential biodiversity impacts include:

- relocation of WTG 47 209 m to the north east of the original location in the EIS;
- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and location of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27, WTG 31 from the Project;
- modification to hardstand at WTG 2;
- transmission line realignment (north of WTG 12 and to the west of WTG 2);
- reduction in transmission line native vegetation removal as a result of ongoing detailed design;
- realignment and modification of sections on internal access tracks;
- removal of Head of Peel Road transport route and associated road upgrades;
- modifications to OSOM transport route from the Port of Newcastle to the Project Area;
- modifications to Devil's Elbow Bypass Road alignment; and
- ancillary infrastructure amendments (including temporary concrete batching plant locations, optionality for new O&M location, construction compound and additional met masts).

6.1.2 Assessment of Impacts

As summarised in Section 1.4, a number of design amendments have been made to the Project following exhibition of the EIS. Table 6-1 below summarises the reduced biodiversity impacts resulting from these amendments. The locations of the amended designs and a summary of the reduction in impacts are also presented in Figure 6-1 below.

Project Amendment	Impact/benefit
Removal of WTG 1	The removal of WTG 1 benefits locally occurring threatened and non-threatened fauna species including microbats, Koala, Greater Glider, as well as avoiding impacts to approximately 2 ha of high condition PCT 1194 vegetation. Removal of this turbine from the Project also reduces potential connectivity impacts as the turbine was an outlier on the south-western extent of the array, and its removal ensures that the turbines now occur in a more linear arrangement which reduces connectivity impacts on vegetation.
Removal of WTG 19	The removal of WTG 19 results in an increased separation distance from $1 - 1.5$ km between turbines in this location, to approximately 2.1 km between turbine WP18 and turbines WTG 20-22, reducing habitat connectivity impacts. This is a material benefit in this area where moderate condition habitats occur on either side of the ridgeline. The removal of WTG 19 also allows for an approximate 600 metre reduction of impacts to intact native vegetation to the south of the Development Footprint.
Removal of WTGs 23, 27 and 31	All three of these turbines were assessed as high risk turbines relating to potential impacts to biodiversity values. WTG 23 was the southern outlier turbine located in high condition intact native vegetation considered likely to support habitat for threatened species. WTG 27 was located in close proximity to confirmed potential microbat breeding habitat, and WTG 31 occurred in proximity to modelled large forest owl breeding habitat as the Project has been assessed on the conservative basis that large forest owls may utilise the Project Area despite none being detected during extensive survey efforts. The removal of these three turbines will substantially reduce the impacts of the Project to biodiversity values utilising the habitats along this southern portion of the wind farm, both directly though a reduction in vegetation removal, and indirectly through a reduction in potential collision risks, breeding habitat disturbance, and connectivity impacts.
Reorientation of WTG 2 hardstand	This reorientation complements the reduction of impacts associated with the removal of WTG 1 and reduces impacts to high condition PCT 1194 by another 0.3 ha (on top of the 1 ha reduction highlighted above from the removal of WTG 1).
Relocation of WTG 47	The relocation of WTG 47 increases buffer distance from retained native vegetation on the escarpment and reduces native vegetation clearing. This reduces impacts to biodiversity values.
Relocation of WTG 50	WTG 50 was originally assessed as a high risk turbine. The relocation of WTG 50 avoids indirect impacts to the confirmed microbat potential breeding habitat that occurs to the south-west of the turbine and hardstand location. The turbine, turbine blade and zone of disturbance are now all located well outside the 100 m BAM prescribed microbat breeding habitat buffer to further reduce potential collision risks, and potential vibration impacts during construction.
Monitoring Masts at WTG Location prior to WTG Installation	Up to 10 monitoring masts are now proposed with the exact number and location being confirmed at the detailed design stage. No additional impacts will result, as the 5 new proposed monitoring masts will be temporary and located within assessed turbine footprints.
Transmission Line Realignment	Relocation of approximately 3 km of the transmission line corridor in this area has reduced impacts to patches of high condition native vegetation and relocated the footprint predominantly in areas of exotic grassland, further to the south and closer to the turbines. This design revision has resulted in materially reduced direct impacts to native vegetation and habits, including mapped habitat for Koala and Spotted-tailed Quoll.
Removal of Transmission Vegetation	Portions of the vegetation previously assessed to be removed within the transmission line easement have been confirmed as able to remain based on further detailed design following a targeted study by (AECOM, 2021) to identify native vegetation that will remain un-impacted due to the height of the overhead power lines where they span across valleys. The lines in these areas have now been confirmed to remain well over the height of the mature vegetation, enabling the vegetation to be retained and further reducing biodiversity impacts.

Table 6-1: Design amendments and biodiversity impact / benefit

Project Amendment	Impact/benefit
Traffic Access to Project Area	Use of Head of Peel Road as emergency vehicle access only will reduce the number of waterway crossings and impacts to native vegetation clearing that would otherwise have been required.
Removal and Realignment of Internal Road Networks	Sections of access track between WTG 16 to WTG 17, WTG 17 to WTG 18, WTG 46 to WTG 47, WTG 66 to WTG 67 and the Transverse Track have been refined to avoid biodiversity impacts and following contractor input on reducing earthworks and required width of footprint. Removal of internal roads no longer required as a result of the turbine removals outlined above will directly and indirectly benefit previously impacted biodiversity values due to reductions in vegetation clearing and bulk earthworks and resulting fragmentation of vegetation and habitats.
Key Intersection, Devil's Elbow bypass and Morrison Gap Road design update	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 have reduced the impact assessed in this location down to 2.5 ha of native vegetation, leading to direct and indirect benefits to previously impacted vegetation and habitats in this area. This includes Box Gum Woodland Critically Endangered Ecological Community and habitat for threatened fauna species. Previously exhibited impacts considered a number of design options of which only one was intended to be constructed. The final route selected presented the lowest impact option and was further refined to avoid impacts.
Transport Route Updates	Refinement of designs ensure a more accurate assessment of impacts. Overall, the refined transport route represents a reduction in biodiversity impacts with the remaining impacts fully assessed in the updated BDAR.
Ancillary Infrastructure Amendments	Changes to the location of temporary concrete batching plant locations, optionality for a new O&M location, alternate construction compound and additional met masts have overall, resulted in a reduction to previously presented impacts on biodiversity values.









6.1.3 Additional Surveys Completed following EIS

The following additional field surveys, desktop assessment and detailed analysis was completed following the preparation of the original Biodiversity Development Assessment Report (BDAR) completed in 2020 as presented in the EIS to further assess the impacts of the Project, including the proposed amendments outlined in this Amendment Report, and are reported on in the amended BDAR (Appendix D:

- An additional 24 BAM plots were collected in March 2021. This included collection of data to support the design refinements proposed to the Devil's Elbow bypass and Morrison Gap Road upgrades, as well as additional data to enable improved calculation of vegetation integrity across the development footprint;
- Additional geomorphological assessment was carried to assess the potential for microbat roosts and breeding habitat. In addition, a microbat cave roost inspection was carried out between 29 March 2021 and 1 April 2021. All high priority areas that were identified via desktop as having a sudden change in elevation (ie potential large caves, and cliff lines) were visually inspected from the nearest accessible point to identify any roosting sites;
- Based on feedback that the surveys carried out as part of the original BDAR, which did not identify any large forest owls (Barking Owl, Powerful owl, Sooty owl and Masked owl), may not have been sufficient to fully exclude the possibility that large forest owls may utilise the Project Area, a further large forest owl habitat suitability mapping and assessment was carried out. This assessment conservatively assumed the presence of large forest owls and assessed the updated Project on this basis;
- The BAM recognises that there are some types of serious and irreversible impacts that require further assessment via what is termed a 'serious and irreversible impact' (SAII) assessment. SAII assessments were completed for both the Box Gum Woodland TEC and conservatively for cave roosting microbat species. However, subsequent design refinements made to the Project mean that an SAII assessment for microbats is no longer required;
- An assessment of the impacts of the updated Project was undertaken in accordance with the BAM, as well as further detailed assessment of indirect impacts to threatened species was completed; and
- A qualitative risk assessment was also completed for impacts associated with potential bird and bat blade strike, as well as a turbine specific risk assessment. Additional operational mitigation measures have been provided to manage these potential impacts from high and moderate risk of impact turbines.

6.1.4 Assessment of Impacts

A full assessment of the amended Project is provided in the amended BDAR in Appendix D. The impact assessment has continued to conservatively include assessment of a worst-case scenario covering direct impacts associated with habitat loss and indirect impacts associated with construction and operation of the Project. This section:

- summarises the results of detailed assessments presented in the updated BDAR, including in the summary in Table 6-2 below;
- compares the impacts of the amended Project as assessed in the updated BDAR to the impacts
 of the original project as assessed in the original BDAR in Table 6-3 below; and
- demonstrates the significant reduction in biodiversity impacts achieved through the design changes proposed to the Project and the further assessments completed.

Biodiversity	Potential Impact	Infrastructure Type	Proposal	Phase
Value			Construction	Operation
Direct Impacts	1	1		
Native vegetation and ecosystem credit species habitats	Clearing of 132.43 ha of native vegetation.	All	\checkmark	
Threatened Ecological Communities	Clearing of 23.36 ha of Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	Wind turbine infrastructure Temporary construction footprint Transmission line Transport route upgrades Internal roads Ancillary Infrastructure	4	
	Clearing of 6.07 ha of White Box Yellow Box Blakely's Red Gum Woodland	Transmission line; Transmission line access tracks Transport route upgrades	✓	
Threatened fauna habitat – Species credit species and MNES	Clearing of 19.68 ha of foraging habitat for Large- eared Pied Bat	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary	✓	
	Clearing of 19.68 ha of foraging habitat for Eastern Cave Bat	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary	✓	
	Clearing of 18.14 ha of habitat for Eastern Pygmy- possum	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary	✓	
	Clearing of 36.44 ha of habitat for Koala	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary Haul route upgrades	~	
	Clearing of 0.17 ha of habitat for Border Thick- tailed Gecko	Transmission line Transport line access tracks Transport route upgrades	✓	
	Clearing of 3.97 ha of breeding habitat for Southern Myotis	Wind turbine infrastructure Transport route upgrades Internal roads	~	

Table 6-2:	Potential	Impacts	to Biod	iversity
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Biodiversity	Potential Impact	Infrastructure Type	Proposal	Phase
Value			Construction	Operation
	Clearing of 32.30 ha of habitat for Greater Glider	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary Transport route upgrades	~	
	Clearing of 40.67 ha of habitat for Spotted-tailed Quoll	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary Transport route upgrades	¥	
	Clearing of 16.06 ha of habitat for Squirrel Glider	Wind farm infrastructure Transmission line Transmission line access tracks Internal roads Ancillary Transport route upgrades	~	
	Clearing of 1.99 ha of habitat for Barking Owl	Internal roads	~	
	Clearing of 0.99 ha of habitat for Masked Owl	Internal roads	✓	
	Clearing of 1.99 ha of habitat for Powerful Owl	Internal roads	✓	
	Clearing of 1.99 ha of habitat for Sooty Owl	Internal roads	✓	
	Clearing of 0.64 ha of impact for Booroolong Frog	Transmission line and access tracks	✓	
Indirect impacts	·	·	·	·
Threatened	Collision risk for birds and	Wind farm infrastructure		√

Threatened fauna	Collision risk for birds and bats	Wind farm infrastructure		~
Native vegetation, threatened ecological communities and habitat for threatened species	Edge effects and impacts to habitat viability	All land in proximity to cleared areas	~	✓
	Disturbance of habitats from noise and light	All land in proximity to operational infrastructure which generates noise or requires night lighting	~	✓
	Disturbance from weeds, pests and pathogens	Wind farm corridor	~	✓
	Risk of fauna injury/ mortality	All lands	√	\checkmark

Biodiversity Value	Potential Impact	Infrastructure Type	Proposal Phase	
			Construction	Operation
Prescribed impac	ts	·		
Native vegetation,	Loss of habitat connectivity	Wind farm and transmission line corridor	~	~
threatened ecological communities and	Impacts to hydrology and water quality	Wind farm and transmission line corridor	✓	
habitat for threatened species	Impacts to karst, caves, crevices, cliffs and other geological feature of significance	Low potential for wind farm corridor	~	
Threatened fauna and	Impacts of wind turbine strikes on protected animals	Wind farm corridor		✓
migratory species	Impacts to flight paths for raptors and resident aerial species	Wind farm corridor		~
Other impacts				
Aquatic habitats	Impacts to hydrology and downstream water quality	Access/ transport routes	~	
	Impacts to fish passage	Access/ transport routes	\checkmark	

Direct Impacts

Direct impacts associated with the Project are primarily limited to the proposed clearing within the Development Footprint. As identified in Table 6-3 and Table 6-4, the amended Project has reduced the extent of vegetation clearing required by 39%, with a reduction of 42% occurring in areas of high condition native vegetation. As a result, a total of 74.26 hectares of native vegetation (varying in condition from low to high) will no longer be impacted by the Project.

Table 6-3:	Revised Direct Vegetation Impacts
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	1			
Vegetation Condition Class	2020 BDAR Area (ha)	Updated BDAR Area (ha)	% Reduction	% of Mapped Vegetation
Exotic Vegetation				
Planted or urban vegetation	7.39	0.24	97%	0.08%
Exotic grassland	272.36	164.48	40%	55.35%
Total Exotic Vegetation	279.75	164.72	41%	55.43%
Native Vegetation	<u>.</u>			
Derived Native Grasslands	30.91	29.06	6%	9.78%
Native vegetation – Low condition	37.11	19.28	48%	6.49%
Native vegetation – Moderate condition	73.8	46.18	37%	15.54%
Native vegetation – High condition	64.88	37.92	42%	12.76%
Total Native Vegetation	206.7	132.43	36%	44.57
TOTAL VEGETATION IMPACTS	486.45	297.16	39%	100%

The Project has been designed so that the majority of the direct impacts to vegetation within the development footprint will be to exotic grassland and planted vegetation. The 132.43 hectares of native vegetation which is contained in the amended development footprint represents 0.6 % of the approximately 21,540 hectares of native vegetation contained within the landscape assessment buffer area of 1,500 m.

A total of 29.43 hectares of the vegetation which will be directly impacted by the Development Footprint is associated with two threatened ecological communities (TECs) being White Box Yellow Box Blakely's Red Gum Woodland and Ribbon Gum-Mountain Gum-Snow Gum open forest or woodland (Table 6-4).

Based on the assessed extent of these TECs within the assessment area as addressed in full in Appendix D, the amended Project is unlikely to result in a significant impact to these TECs, as the areas impacted comprise a small fraction of the total expected extent within the broader landscape, and the Project will not substantially or significantly impact upon aspects such as connectivity, species composition or long-term viability of the TECs. Mitigation measures during detailed design will further reduce impacts to these TECs where possible and all impacts will be fully offset via biodiversity offset credits as required by the NSW Biodiversity Offset Scheme (BOS) to ensure no net loss to biodiversity.

Direct impact to Koala habitat has been reduced by 28% in the updated BDAR. During flora and fauna surveys carried out between 2018 and 2020 and over 1014 infrared motion detected camera trap nights, two adult Koalas (and one joey) were spotted in the Project Area and seven Koalas have been recorded within 10 km of the Project site.

There exists extensive suitable high condition habitat in neighbouring properties and over 3,000 ha in neighbouring nature reserves suitable for Koala to occur within and to maintain the local population. The Project has further committed to best practise for minimising the unavoidable residual direct impacts noted above including the development of management plans and protocols to be implemented before and during clearing of potentially suitable habitat. The establishment of Biodiversity Stewardship Sites on neighbouring properties will also provide high quality habitat.

It should be noted that the Project's impacts to both Koala and Spotted-tailed Quoll has conservatively been assessed as a significant impact in accordance with the EPBC Act. However as with impacted TECs all impacts will be fully offset via biodiversity offset credits, and through the establishment of biodiversity stewardship sites adjacent to the Project Area. These offsets, in accordance with the NSW BOS and Commonwealth EPBC Act Offsets policy, will ensure no net loss to biodiversity. Further information is provided below.

Table 6-4 demonstrates the overall reduction in unavoidable direct impacts of the amended Project. In particular, the amended Project now completely avoids impacting any potential roosting / breeding habitat locations (or within 100 m of any such habitat features) 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.

Relevant Matter	Details	2020 BDAR Direct Impacts	2021 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	132.43 ha	-75.27 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	23.36 ha	-34.07 ha

Table 6-4:	Summary of Direct Impact	S
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Relevant Matter	Details	2020 BDAR Direct Impacts	2021 Updated BDAR Direct Impacts	Change in Direct Impacts
	Direct loss of White Box Yellow Box Blakely's Red Gum Woodland and derived native grassland	13.33 ha	6.07 ha	-7.26 ha
Habitat for threatened fauna species – species credit species	Large-eared Pied Bat*	61.08 ha	19.68 ha foraging habitat 0 ha breeding habit	-41.4 ha
	Eastern Cave Bat*	62.49 ha	19.68 ha foraging habitat 0 ha breeding habitat	-42.81 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	18.14 ha	-12.28 ha
	Koala	50.76 ha	36.44 ha	-14.32 ha
	Squirrel Glider	26.20 ha	16.06 ha	-10.14 ha
	Booroolong Frog	1.59 ha	0.64 ha	-0.95 ha
	Border Thick-tailed Gecko	0.17 ha	0.17 ha	0 ha
	Powerful Owl, Sooty Owl, Barking Owl, Masked Owl	Not assessed as not located during surveys	1.99 ha based on assumed presence	No change. However, based the conservative assumption that this species is present despite not being located during surveys, 1.99 ha of potential habitat will be impacted.
Total Change	-275.88 ha	1	1	

Indirect Impacts

Overall, the indirect impacts of the amended Project have been notably reduced as compared to the Project as assessed in the original BDAR through the removal and/or relocation of numerous turbines.

It is noted that, by its nature as a wind farm, the amended Project still has the potential to cause indirect impacts to identified threatened and non-threatened bird and bat species recorded within the Development Footprint. Potential indirect impacts, many of which are considered uncertain in relation to the extent to which they may adversely impact microbat species (for example) during the operational phase of the project include:

loss of habitat connectivity;

- avoidance of areas of habitat due to air disturbance surrounding operational turbines; and
- turbine strike and possibly barotrauma (noting that a technical paper published in December 2020 in the journal PLOS One, by Lawson et al, describes how bat mortality as a result of barotrauma is unlikely to occur).

These indirect impacts were identified within the original EIS and are addressed in detail within the updated BDAR (Appendix D). The amendments proposed to the Project will reduce the risks associated with indirect biodiversity impacts including the loss of habitat connectivity as a result of air disturbance around operational turbines and the potential for and likely consequences of turbine strike and possibly barotrauma as compared to the original Project described in the EIS.

As outlined in Section 5.4.2 of the updated BDAR, rates of impact cannot be quantified for microbats in the same manner as they can for birds as to do so requires the number of individuals present within the Project Area to be determined, and microbats cannot realistically be counted. As such, the assessment of potential impacts to microbats as a result of turbine strike has been undertaken by way of a qualitative risk assessment to determine the likelihood of impact and the potential consequences of any impact that may occur. The Project specific risk assessment for turbine strike impacts for microbats is provided Table 56 of the revised BDAR and confirms that there is a moderate risk to a number of microbat species from turbine strike. This moderate level of risk may occur as a result of more frequent collisions for some species due to frequent flights within rotor swept height, or for other species may have a more substantial consequence to the local abundance of that species if repeated loss from turbine strike was to occur.

The Project SEARs and the BAM also require an impact assessment to migratory species and any resident raptors that may be subject to indirect impacts associated with blade strike during the operational phase of the project. The results of the bird utilisation survey and the Collision Risk Model are detailed within the revised BDAR (Appendix D) and indicate:

- that there is unlikely to be migratory bird species at risk of collision with turbines during the operation of the wind farm;
- there are three resident raptors species being the Wedge-tailed Eagle, Nankeen Kestrel and Brown Goshawk. The reduction in turbines from 70 to 65 will reduce the risk of turbine strike to these species and the revised assessment considers that it is unlikely that the Project will have a significant impact on the population of resident raptors; and
- As a precautionary approach, forest owl species have been assumed to be present within, and/or immediately surrounding, the Development Footprint (refer BDAR Section 5.4.2), even though were not detected during surveys conducted. These species have been included as part of the risk assessment and have all been assessed as low risk of impact through blade strike. This is due largely to their behaviour of flying within or just above the canopy, and therefore below rotor swept height.

Impacts to bird and bat species will be monitored and managed through an Operational Bird and Bat Adaptive Management Plan (BBAMP) that will reflect the baseline monitoring results and include an adaptive management approach to respond to any collisions and manage bird and bat blade strike risks.

Prescribed Impacts

A revised assessment of Prescribed Impacts arising from the Project as amended was undertaken in accordance with the BAM, with the following items addressed:

- impacts of development on the habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance;
- impacts of development on the habitat of threatened species or ecological communities associated with rocks;

- impacts of development on the habitat of threatened species or ecological communities associated with human made structures;
- impacts of development on the habitat of threatened species or ecological communities associated with non-native vegetation;
- impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range;
- impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities;
- impacts of wind turbine strikes on protected animals; and
- impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC.

As identified in Section 8.5 of the updated BDAR, there has been an overall reduction in prescribed impacts as a result of the amended Project.

MNES Significant Impact Assessment

Potential impacts of the amended Project on MNES have been updated and confirm that there remains the potential for significant impacts to two EPBC Act listed fauna species being the Koala and the Spotted-tailed Quoll. Significant impacts to all other EPBC Act listed entities have been avoided by the amended Project, demonstrating that the changes made to the Project have removed the potential for significant impacts to one TEC being the Box Gum Woodland and Large-eared Pied Bat which was identified in the original BDAR carried out before the Project was updated.

Measures to avoid and minimise impacts to critical Koala habitat have been implemented as part of the ongoing design refinements made to the amended Project. As a result, impacts to Koala habitat have been reduced from the 50.76 ha assessed in the EIS down to a total of 36.44 ha (an 28% reduction in impacts) in the revised BDAR.

While the impact to Koala has been assessed as significant against the EPBC assessment requirements, it should be noted that during flora and fauna surveys carried out between 2018 and 2020 and over 1014 infrared motion detected camera trap nights, two adult Koalas (and one joey) were spotted in the Project Area and seven Koalas have been recorded within 10 km of the Project site. There exists extensive suitable high condition habitat in neighbouring properties and over 3,000 ha in neighbouring nature reserves suitable for Koala to occur within and to maintain the local population. The Project has further committed to best practise for minimising the unavoidable residual direct impacts noted above including the development of management plans and protocols to be implemented before and during clearing of potentially suitable habitat. The establishment of Biodiversity Stewardship Sites on neighbouring properties will also provide high quality habitat. There is expected to be no net loss of Koala habitat following implementation of Biodiversity Offset requirements.

A total of 40.67 hectares of Spotted-tail Quoll habitat is proposed to be removed as part of the amended Project, which is likely to adversely impact Spotted-tailed Quoll habitat within the immediate locality. However, there is still approximately 84,000 ha of native vegetation in the species' known habitat range which is considered to be adequate to enable local populations to successfully persist. Measures to avoid and minimise impacts to important Spotted-tailed Quoll habitat have been implemented during the design refinements made to the amended Project. Impacts to high and moderate condition PCTs which constitute Spotted-tailed Quoll habitat have been reduced by a total of 54.58 ha (a 57 % reduction in impacts).

Potential impacts to Koalas and the Spotted-tailed Quoll will be minimised through the construction phase of the Project will be minimised through implementation of the Biodiversity Management Plan that will target management actions specifically towards Koalas and Spotted-tailed Quoll including items such as pre-clearance surveys and exclusion fencing.

Residual Impacts and Biodiversity Offsetting

The amended assessment confirms that impacts have been avoided through project amendments and can be further avoided with best practise and recognised mitigation measures to mitigate or offset impacts. The unavoidable residual impacts of the Project will be reduced and mitigated with further detailed design with construction and operational impacts minimised through:

- the preparation and implementation of a Construction Biodiversity Management Plan; and
- an Operational Bird and Bat Adaptive Management Plan.

These plans will include the key measures outlined below and be prepared in consultation with BCD and to the satisfaction of the Secretary of the DPIE. Further details on the measures to be included in these plans is outlined below.

Any serious and irreversible Impacts to cave dwelling microbats and their potential breeding habitat have been avoided through the removal and relocation of specific turbines from the Development Footprint. The potential for serious and irreversible impacts to Box Gum Woodland CEEC remains, but has been further minimised through Project design so as to reduce worst case impacts, and the Proponent is committed to working to further and reduce assessed impacts as much as practicable during future design stages and as set out in the Mitigation and Management sections below.

Residual impacts will be offset in accordance with the NSW Biodiversity Offset Scheme and the EPBC Act Offsets Policy. Once these offsets are applied, no net loss to biodiversity is expected as a result of the Project.

In addition, the project commits to the establishment of local offset sites as Biodiversity Stewardship Sites and has commenced and yielded a number of viable opportunities. Key to establishing local offsets is the aim of improving biodiversity values, and in particular habitat connectivity, at the local scale to mitigate the Project's impacts and improve biodiversity values in the locality.

6.1.5 Mitigation and Management Measures

A number of mitigation measures have been updated, and/or expanded to provide more detail around commitments since EIS exhibition. These are outlined within Table 6-5 and discussed below.

Operational Turbine Specific Mitigation Measures

A set of new operational turbine specific mitigations measures and commitments, aimed at reducing turbine strike impacts, have also been developed since EIS exhibition and are presented below.

Mitigation measures for all turbines to ensure impacts associated with bird and bat blade strike are minimised:

- Development of a Bird and Bat Adaptive Management Plan (BBAMP) in consultation with BCD and to the satisfaction of the Secretary of the DPIE to be implemented throughout life of Project;
- Intensive further monitoring period for the first six months of operation will be included in the BBAMP, followed by regular bird and bat monitoring/mortality surveys for the life of the wind farm at frequencies based on the findings of each survey period and the adaptive management measures detailed in the BBAMP. The use of detection dogs during carcass surveys will be investigated and employed if found to be suitable and appropriate;
- Investigation into the need for, and effectiveness of, appropriate low wind speed operational curtailment strategies if required based on the results of ongoing bird and bat monitoring/mortality surveys (further detailed below). This may include measures such as prevention of blade rotation prior to electricity generation cut-in speeds, and/or increased night time cut-in speeds;
- Research into ongoing developments in bat and bird deterrent systems and the associated reduction of impacts, to establish whether implementation at the Project would be effective and practicable with the goal of integrating into the BBAMP if proven effective and justified based on the results of ongoing bird and bat monitoring/mortality surveys;

- Regular ongoing maintenance of rotor blades to improve ultrasonic bounce-back enabling microbat avoidance;
- Installation of lighting schemes that minimise insect attraction to turbines within rotor swept height; and
- Commitment to provision of data from ongoing bird and bat monitoring surveys and effectiveness
 of BBAMP to specialist research entities who are prepared to enter into appropriate agreements
 with the Project.

Frequency of bird and bat monitoring/mortality surveys will be developed in consultation Biodiversity, Conservation and Science Directorate (BCD), as part of the preparation and development of the BBAMP. Ongoing and potential timing amendments to monitoring will include inspections and reporting continued for the life of the wind farm, at intervals determined by the results of previous monitoring and in accordance with the BBAMP.

Turbines proximal to microbat roosting/breeding habitat - WTG 50:

Direct disturbance to roosting microbats as a result of ground vibration during breeding season (November to February) or winter torpor season (May to September) will be minimised as far as practicable. If construction works likely to result in ground vibration cannot practicably be avoided during these periods then monitoring of the presence of microbats within the habitat feature(s) near WTG 50 will be undertaken prior to any vibration-causing construction activities where required works coincide with breeding/torpor periods. If microbats are confirmed present prior to construction works commencing during these periods, monitoring will continue during and post-construction, and suitable impact mitigation measures will be investigated such as:

- investigation into a suitable maximum vibration level to prevent disturbance to roosting microbats;

- assessment of what activities or plant may cause this maximum vibration level to be triggered;

- at what distance (setbacks) unacceptable levels of vibration may be experience at the habitat location;

- Additional low wind speed seasonal curtailment strategy with increased night-time cut-in speeds will be implemented as required based on the results of ongoing bird and bat monitoring/mortality surveys. The strategy will be determined through measures such as analysis/comparison of microbat activity data with wind data or through undertaking a controlled experiment using (for example) a Before-After-Control-Impact (BACI) design, and implemented as part of the BBAMP; and

Increased frequencies of bird and bat monitoring/mortality surveys for at least months 7-30 of operation in relation to this turbine location. Following which, the results will determine the frequency with which surveys will be ongoing and detailed in the BBAMP.

Additional mitigation measures for moderate risk turbines (as updated in Table 61 of the revised BDAR in Appendix D):

- Increased frequencies of bird and bat monitoring/mortality surveys for at least months 7-18 of operation. Following which the results will determine the frequency with which surveys will be ongoing, and the requirement of any adaptive management strategies; and
- Potential implementation of seasonal low wind speed curtailment strategies dependent on the results of ongoing monitoring.

Further detail on the planned adaptive management strategy and the development and implementation of the Bird and Bat Adaptive Management Plan and Biodiversity Management Plan is provided in the revised BDAR in Appendix D.

ID	Impact	Project component	Mitigation measures	Timing	Responsibility
B5	Impacts to native vegetation, threatened ecological communities and habitat for threatened species	Entire development footprint	 Opportunities to further minimise impacts to native vegetation will continue to be explored during the detailed design. This will include measures to minimise the construction footprint and clearing requirements with a particular focus on the protection of hollow bearing trees and fauna movement corridors. 	Pre-construction/ construction	Contractor
			 Upon final design and an understanding of detailed impact, a Biodiversity Management Plan would be prepared and implemented. The Biodiversity Management Plan will address terrestrial and aquatic matters by including: 		
			Plans for the development footprint and adjoining area showing updated and current extents of native vegetation, flora and fauna habitat, threatened species and threatened ecological communities and measures to minimise impacts to these features.		
			Plans showing areas to be cleared and areas to be protected, including exclusion zones and protected habitat features, and areas for native vegetation rehabilitation or re-establishment. This will be key to minimising impacts to Koala and Spotted-tailed Quoll.		
			 Mapping and identification of individual tree hollows and termite mounds and measures to minimise impacts to these features. 		
			 Protocols for communicating biodiversity features to the design team during any turbine micrositing and design refinements to minimise and avoid impacts. 		
			 Pre-clearing protocols, including pre-clearing inspections, establishment of exclusion zones and on-ground identification of specific habitat features to be retained and/ or relocated. 		
			 Vegetation clearing protocols, including staged habitat removal (including of wombats, Koala, and other fauna) and any specified seasonal limits on clearing activities. 		
			 Maintaining areas of habitat connectivity for as long as is practicable through or around the construction area. 		
			 Maintaining isolated paddock trees within the development footprint where possible to provide refuge to locally occurring fauna species (incl. Koala). 		

Table 6-5: Revised mitigation measures

ID	Impact	Project component	Mitigation measures	Timing	Responsibility
			 Protocols for the salvage and relocation of woody debris, tree hollows and bush rock. 		
			Requirements for temporary deterrent fencing, signage and/or requirements to modify driver behaviour and regular visual inspections to minimise the risk of fauna injury / mortality (particularly Koala and Spotted Tailed Quoll) due to vehicle strike or entrapment in deep excavations, with details to be developed during the preparation of the BMP.		
			 Opportunity for egress to any species that may become trapped in any open excavation in the form of graded exits or tools to support climbing out. 		
			 Fauna handling and unexpected threatened species finds procedures. 		
			 Procedures detailing the management of pathogens such as chytrid fungus. 		
			 Rehabilitation, revegetation, reuse of soils and other habitat management actions. 		
			 Limit construction and operational traffic speed limits to minimise the potential for vehicle strike, and include sufficient signage on potential presence of threatened fauna species. 		
			Ensure construction and operation personnel are educated on the presence of fauna such as Koala and Spotted-tailed Quoll in the locality, how to manage potential interactions, and to be aware of the potential for vehicle strikes when driving through the sites (particularly after dark).		
			 Weed, pest and pathogen management requirements. 		
			 Monitoring during construction and post-construction. 		
			 Adaptive management measures to be applied if monitoring indicates unexpected adverse impacts. 		
			 Establishment of Biodiversity Stewardship sites on neighbouring properties. 		
			Operational measures to minimise the ongoing impact of the Project to threatened fauna will be implemented as part of an operational component of the Biodiversity Management Plan, and will include:		
			 Revegetation with Koala feed tree species where appropriate. 		

ID	Impact	Project component	Mitigation measures	Timing	Responsibility
			 Design of operational fencing layout to ensure fauna (incl Koala and Spotted-tailed Quoll) can continue to move through the landscape, and if they enter the wind farm are able to self-relocate back into surrounding landscape by providing egress opportunities. Ensure fauna are prevented from accessing higher traffic areas or other potentially hazardous area, and are funnelled towards areas of potential habitat rather than towards the operational wind farm, or into dead-ends and bottle-necks. Installation of glider poles for glider species in areas where the width of the transmission line easement exceeds minimum requirements for species movement. Establishment of Biodiversity Stewardship sites on neighbouring properties. 		
B9	Impacts to National Park estate	Wind farm corridor	An appropriate buffer will be maintained to National Park estate where practicable and as assessed in the revised BDAR in Appendix D. Implementing vegetated buffers between the access tracks and wind turbine pads and the National Park estate is to be considered during detailed design. The selection of areas of buffer plantings and species to be planted will be carried out in consultation with the Area Manager, Barrington Tops National Parks and Wildlife Service. The Erosion and Sediment Control Plan will include specific actions to identify sensitive receptors associated with the National Park estate, including waterways and the adjacent Sphagnum Moss TEC.	Pre-construction	Proponent
B13	Impacts of wind turbine strikes on protected animals	Wind farm corridor	Operational management measures specific to the wind turbines will be implemented. These are described in Section 8.9.1 of the updated BDAR in Appendix D. Bird and bat activity within the site is generally concentrated around areas of vegetation. A minimum safe distance of 30 m will be maintained from the turbine blade tip to the adjacent tree canopy to minimise any risk of bird or bat strike.	Pre-construction, post-construction	Proponent
B16	Impacts to water quality and hydrology	Entire development footprint	 The Biodiversity Management Plan will include: measures for the management and monitoring of surface water quality and hydrology during construction, as applicable to the protection of biodiversity values; 	Construction and operation	Contractor/ Proponent

ID	Impact	Project component	Mitigation measures	Timing	Responsibility
			 any requirements for the management of potential acid sulphate soils or contaminated lands during construction so as to minimise impacts to terrestrial and aquatic habitats; 		
			construction surface water quality monitoring to minimise impacts to surface water quality including to prevent indirect impacts to waterways potentially supporting Booroolong Frog surrounding the development footprint, waterways that traverse the National Park estate and the location of the Sphagnum Moss TEC in Ben Halls Gap Nature Reserve.		
B19	Fauna injury / mortality	Entire development footprint	The Biodiversity Management Plan will include the following to minimise and manage any risk of fauna injury mortality during construction:	Construction	Contractor
			 Strategies for fauna management during construction including any identification roles, responsibilities and contingency measures such as temporary stop works and engagement of fauna specialist. 		
			Requirements for temporary deterrent fencing, signage and/or requirements to modify driver behaviour and regular visual inspections to minimise the risk of fauna injury / mortality (particularly Koala and Spotted Tailed Quoll) due to vehicle strike or entrapment in deep excavations, with details to be developed during the preparation of the BMP.		
			 Opportunity for egress to any species that may become trapped in any open excavation in the form of graded exits or tools to support climbing out. 		
			 Pre-clearing protocols, including pre-clearing inspections, establishment of exclusion zones and on-ground identification of specific habitat features to be retained and/ or relocated. 		
			 For example, occupation surveys for wombat burrows, application of exclusion measures / deterrents prior to vegetation clearing / earthworks, works undertaken in presence of spotter / catcher. 		
			 Protocols for fauna handling and management of adverse incidents. 		
			 Fauna monitoring and management protocol including identification and reporting of fauna mortalities to the relevant Biodiversity Conservation Division office. 		

ID	Impact	Project component	Mitigation measures	Timing	Responsibility
B20	Impacts to habitat connectivity	Entire development footprint	The following opportunities will be fully explored as a part of the detailed design:	Pre-construction	Proponent
			 Opportunities to further minimise the disturbance footprint and clearing within important movement corridors for fauna. 		
			 Opportunities for post-works restoration of habitat connectivity within important movement corridors for fauna. 		
			 Areas subject to temporary disturbance will be rehabilitated using a native species planting schedule as much as practical considering any operational and safety constraints. 		
			The total area exposed and cleared at any one time will be minimised and planned to allow for fauna movement during construction and periods of temporary disturbance		
B21	Impacts to habitat connectivity	Transmission line	The following measures be implemented post-construction to minimise impacts to flora and fauna within the transmission line easement:	Post-construction	Proponent
			 Promotion of the growth of vegetation under the transmission line to the maximum allowable height to maintain habitat connectivity for fauna. 		
			 Management of understorey vegetation in easements to maintain composition and quality and to prevent weed invasion. 		
			 Installation of glider poles for glider species in areas where the width of the transmission line easement exceeds minimum requirements for species movement. 		

6.2 Noise and Vibration

6.2.1 Relevant Project Amendments

Project amendments relevant to potential noise impacts include:

- noise from inclusion of optionality for any laydown area with the exception of laydowns along Morrisons Gap Road to host concrete batching plants;
- relocation of WTG 47 approximately 209 m north east of the original location in the EIS;
- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and relocation of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27, WTG 31; and
- amendment of traffic access to Project Area.

Sonus has prepared a letter report (December, 2021) (Appendix F) in response to the submissions received during exhibition and relevant Project amendments.

6.2.2 Assessment of Impacts

Turbine relocation and removal

Sonus concluded that noise impacts at receivers arising from the proposed relocation of WTG 47, WTG 50, and WTG 12 will have negligible differences when compared to the Project originally assessed in the original Noise and Vibration Impact Assessment (NVIA) (Appendix E of EIS) due to adequate separation distances. The assessment noted that given that there are other turbines much closer to the non-associated residences and that the changes in location are relatively minor, the potential noise impact at these residences will not increase as a result of the changes.

It is noted that prior to construction of the wind farm, the final wind turbine selection and layout will be modelled to ensure the objective Project noise criteria are achieved. The final noise model will ensure these changes and any other micro-siting result in compliance with the criteria.

The removal of WTG 1, WTG 19, WTG 23, WTG 27, and WTG 31 will not result in any higher noise levels at nearby residences than were predicted in the Noise and Vibration Assessment in the EIS. It can be expected that noise levels will be marginally lower at NAD_1 and NAD_69 as a result of the turbine removal, therefore not changing compliance of the wind farm.

Laydown area and concrete batching plant optionality

Sonus has considered the equipment and noise sources associated with concrete batching activity.

As discussed in Section 1.4, the Project as exhibited initially included two batching plant locations. It is now proposed that a total of five locations be considered for the batching plant to operate during construction to provide flexibility in construction operations, as depicted in Table 6-6 below. In addition, a second option for the construction compound has been identified, although one will be constructed. It is noted that the construction compound locations (now two) being considered are in the vicinity of the batching plants, at significant distances to any non-associated dwellings. They do not include any significant noise sources with the potential for a greater impact than batching plant and any larger equipment would only operate during the daytime period. Sonus' assessment therefore considered the equipment and noise sources associated with batching activity, which occurs early in the morning, but would also ensure no adverse impact from the construction compound operations during the daytime at the proposed sites.

ID	Approximate Coo Z	Approximate Coordinates (GDA94 / MGA Zone 56)			
	Easting	Northing			
Exhibited Project					
1	320548	6502812			
2	327195	6508738			
Proposed Final Amended Locations					
А	326044	6505957			
В	327140	6501513			
С	325068	6499684			
D	324444	6498799			
E	323277	6499300			

Table 6-6: Proposed Batching Plant Locations

The noise level from each of the proposed additional batching plant locations has been predicted using the methodology in the NVIA as presented in the EIS. The predicted noise levels at residences have been compared against the management level of 35 dB(A) for a residence being "Noise Affected", as described in the original NVIA All locations are at a separation distance of approximately 1440 m or more from non-associated residences.

Based on the five proposed batching locations, the prediction table from the original NVIA has been updated and is provided below. The updates relate to the noise level resulting at the new minimum separation distance of 1440 m and the change in "Noise Affected" residence (those at a distance of 2400m or less to the activity) for the new locations.

Table 6-7: Updated Noise Predictions – Batching Plant	Table 6-7:	Updated Noise Predictions – Batching Plant
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Phase	Main Plant and Equipment	Predicted Noise Level at Closest Dwelling	Outcome/Action
Batching (assessment locations in EIS)	Front end loader Truck	38 dB(A) (2,000 m from Dwelling)	Predicted to exceed criterion at dwellings within 2,400 m of the construction activity (NAD_8 and NAD_11). Implement "feasible and reasonable" noise control strategies to minimise noise during construction in accordance with the recommendations below.
Batching (revised locations)	Front end loader Truck	40 dB(A) (1,440 m from Dwelling, NAD_67)	Predicted to exceed criterion at dwellings within 2,400 m of the construction activity (NAD_67). Implement "feasible and reasonable" noise control strategies to minimise noise during construction in accordance with the recommendations below.

As the predicted noise level at the closest residence exceeds the 35 dB(A) "Noise affected" management level, "feasible and reasonable" noise control measures which should be applied at the concrete batching locations to achieve the intent of the Interim Construction Noise Guideline. The original NVIA provides further information on "feasible and reasonable" noise control measures that should be applied.

Amendment of Traffic Impacts to Project Area

The Project initially included two separate access tracks to access the wind farm:

- Head of Peel Road; or
- Barry Road and Morrisons Gap Road.

The previous noise predictions in the NVIA were based on the conservative assumption that all vehicles would use a single route, being either of the above options.

As discussed in Section 3.2, the transport route has now been amended to remove Head of Peel Road, with the traffic now proposed to solely use the Barry Road and Morrisons Gap Road access track except in the case of an emergency.

Given all traffic was assumed to use a single access route, the proposal to remove one of the access tracks therefore will not result in increased noise levels at residences, above that which were provided in the original NVIA.

In addition, the number of trips to and from the Project Site during the peak of construction has been reduced with the relevant Project amendments. Table 6-8 compares the number of trips considered in the Original Assessment and the number of trips now predicted.

Table 6-8 also provides the predicted noise level at 25 m from highways and 10 m from a road within townships (corresponding to the predictions and distances provided in the Original Assessment).

Table 6-8:	Predicted Noise Level at 25 m from Highways and 10 m from a
	Road within Townships

	Assumed Number of Trips within 1 Hour		Predicted Noise Level at a Residence	
	Light vehicles	Heavy vehicles	25m from the road (country road)	10m from the road (within township)
Original Assessment	109	18	58 dB(A)	60 dB(A)
Amended Project	70	10	56 dB(A)	58 dB(A)

The predictions demonstrate that the revised project would result in noise levels being 2 dB(A) less than that in the Original Assessment.

The Original Assessment was based on the preliminary access routes and was conservatively compared against the "Local Roads" criterion of 55 dB(A) under the *Department of Environment, Climate Change and Water NSW Road Noise Policy* (the Road Noise Policy).

The assessment has now been updated based on the final access route (being Barry Road and Morrisons Gap Road), which includes the "Sub-Arterial Roads" of Oakenville Street and Barry Road. The criterion for these sub-arterial roads under the Road Noise Policy is an average noise level of 60 dB(A).

It was noted in the Original Assessment that the noise criterion of 55 dB(A) was predicted to be exceeded during the peak of construction activity. As provided above however, the highest noise level at a residence is 58 dB(A) during the peak of construction activity and would therefore achieve the most relevant 60 dB(A) criterion for sub-arterial roads.

Residences along the final access route have been identified and those with the highest predicted traffic noise levels during the peak of construction are included in Table 6-9 below.

Table 6-9: Highest Predicted Traffic Noise Levels during the Peak of
Construction at Residences along the Final Access Route

Dwelling ID	Distance to Road	Residence Coordinates		Predicted Noise
		Easting	Northing	Level (dB(A))
TR1	11m	322218	6517795	58
TR2	11m	328439	6514703	58
TR3	12m	322240	6517788	57
TR4	12m	322230	6517792	57
TR5	16m	322292	6517743	56
TR6	17m	328126	6515339	56
TR7	18m	322107	6517801	56
TR8	19m	324386	6516929	55
TR9	19m	328019	6515604	55
TR10	20m	323395	6517912	55
TR11	20m	322111	6517839	55

These residences are on the transport route either in the township of Nundle, or between Nundle and the Wind Farm. It is understood that for these roads, vehicles accessing the site will travel at reduced speeds (heavy vehicles at less than 50 km/hr, passenger vehicles less than 80 km/hr), rather than at highway speeds.

The following images (refer) show the location of the residences identified above, relative to the access route.

As these residences are adjacent to sub-arterial roads, the noise criteria under the Road Noise Policy are therefore predicted to be achieved, even during the peak of construction activity.





Figure 6-2: Location of Highest Predicted Traffic Noise Levels during the Peak of Construction at Residences along the Final Access Route

Development Application Dwellings

Since the Original Assessment, a total of three dwellings sought development consent / have been granted approval to be constructed in the vicinity of the wind farm. It is not known if these dwellings will be constructed, however each location has been assessed against the Project noise criteria to determine the potential impact (noting the assessments were completed using a 68WTG layout). The assessments determine the noise level at each location and the changes needed to ensure compliance with the noise criteria, should they be constructed.

The assessments concluded:

DAD1: Based on the predictions, the noise from operation of WTGs would exceed the criteria by a significant margin and would require the removal of nine (9) WTGs from the current layout. The noise from the operation of the site substation is predicted to easily achieve the noise criteria without any Project changes.

Despite the history of engagement with the landowner of DAD 1, the Proponent is endeavouring to continue negotiations with the landowner regarding either a neighbour benefit agreement or the acquisition of the property by the Proponent. DAD1 has not been constructed and there is no

current indication that it will be constructed (which would require the demolition of the landowner's existing dwelling).

- DAD2 (NOTE: this is now an associated dwelling, referred to as AD_4): Based on the predictions, the noise from operation of WTGs would exceed the criteria by up to 4 dB(A), and would require the removal of three (3) WTGs from the current layout. The noise from the operation of the site substation is predicted to easily achieve the noise criteria without any Project changes.
- DAD03: Based on the predictions, the noise from operation of WTGs would achieve the criteria at all wind speeds for the current layout. The noise from the operation of the site substation is predicted to easily achieve the noise criteria without any Project changes.

6.2.3 Mitigation and Management Measures

The NVIA in Appendix E of the EIS provides detailed information on "feasible and reasonable" noise control measures which should be applied at the concrete batching locations.

No additional noise and vibration mitigation and management measures to that already contained in the NVIA are proposed as a result of the relevant Project amendments.

6.3 Landscape and Visual

6.3.1 Relevant Project Amendments

Project amendments relevant to potential visual impacts include:

- amendments to the turbine layout, including:
 - the removal of WTG 1, WTG 19, WTG 23, WTG 27, WTG 31 and associated access roads and ancillary infrastructure;
 - the hardstand area of WTG 2 has been reoriented and the footprint reduced in response to the removal of WTG 1;
 - WTG 12 has been relocated approximately 50 m of the exhibited location and the hardstand area modified;
 - WTG 47 has been relocated approximately 215 m north east of the exhibited location;
 - WTG 50 has been relocated approximately 137 m north east of the exhibited location;
- amendments to ancillary infrastructure siting and configurations, including:
 - the relocation of the laydown / batching area at the top of the Head of the Peel Road to the BESS / substation area / O&M area;
 - inclusion of optionality for all laydown areas with the exception of laydowns along Morrisons Gap Road to host concrete batching plants (total number of batching plants for the Project will not increase and will remain as two);
 - O&M siting optionality, with option 2 adjacent to WTG 55 / WTG 56, and additional temporary construction compound adjacent to WTG 5;
- realignment of a portion of the transmission line; and
- changes to transport routes, site access and Devil's Elbow bypass road realignment.

6.3.2 Assessment of Impacts

The impact of these Project amendments on landscape and visual aspects have been assessed in an Addendum LVIA (MLA, 2021), presented in Appendix G of this Amendment Report. The outcomes of this assessment and the updates to the proposed mitigation and management measures are summarised below.

Amendments to the Turbine Layout

Since the LVIA included in the EIS was completed (MLA, 2020), five (5) turbines have been removed from the Project (see Figure 3-1), with dwellings located to the south of the Project now with increased distances to the nearest turbines. These turbines have been removed both to reduce visual impacts at specific dwellings to the south of the Project, and to reduce biodiversity impacts. Assessment of the visual impacts associated with the removal of the turbines at key dwellings has been considered in the Addendum LVIA and is summarised below.

Removal of WTG 19 and WTG 23

WTG 19 and WTG 23 have been removed to reduce the number of visible turbines and proximity to the nearest turbine from dwellings NAD_01 and NAD_69, located to the south of the Project. The removal of these two turbines increases the minimum separation distance between dwellings NAD_01 and NAD_69 and any turbines associated with the Project as detailed in Table 6-10.

Table 6-10: Increase in distance to nearest turbine by removal of WTG 19 andWTG 23

Dwelling ID	Distance to nearest turbine (LVIA 2020 layout) (EIS)	Distance to nearest turbine (Addendum LVIA 2021 layout) (Amendment Report)	Increase in Separation Distance
NAD_01	2.58 km (to WTG 23)	3.05 km (to WTG 24)	+ 470 m
NAD_69	3.10 km (to WTG 23)	3.62 km (to WTG 24)	+ 520 m

Additional assessment of the visual impacts of the Project as revised at NAD_01 and NAD_69 have been undertaken following the removal of these turbines (Appendix G). The assessment noted:

NAD_01:

The LVIA presented in the EIS (MLA, 2020) assessed the visual impact rating from NAD_01 as **Low** based on a desktop assessment only.

Since the completion of the LVIA and exhibition of the EIS, access to NAD_01 has been granted. A site inspection was subsequently undertaken MLA in July 2021 which confirmed that no turbines will be visible from the dwelling due to existing vegetation although some views would remain from the driveway entry from the public road. Accordingly, the updated assessment concluded that the impacts of the Project on NAD_01 would be **Negligible**.

Two (2) photomontages have been prepared to illustrate the variation in the Project layout in proximity to NAD_01. The photomontage of the original 2020 EIS layout (refer Figure 6-3) illustrates WTG 23 had the potential to be prominent from the driveway of NAD_01. A subsequent photomontage (refer Figure 6-4) has been prepared to reflect the views from the driveway entry resulting from the removal of turbines WTG 19 and WTG 23. This updated photomontage confirms that the removal of WTG 23 reduces visual impacts from the driveway entry to NAD_01, with the remaining partial views of turbines in excess of three (3) kilometres from a high point adjoining the driveway considered to be negligible. These are described further in Appendix B.1 of the Addendum LVIA.

NAD_69:

The LVIA presented in the EIS (MLA, 2020) assessed the visual impact rating from NAD_69 as **High.** The removal of turbines WTG 19 and WTG 23 has increased the separation distance from the nearest turbine to NAD_69 by 520 m, with the closest turbine now 3.62 km away from the dwelling, reducing the overall prominence of the Project. The removal of turbines WTG 1 and WTG 27 has also reduced the horizontal extent of visible turbines along the ridge. Two (2) photomontages have been prepared to illustrate the variation in the Project layout in proximity to
NAD_69 (refer Figure 6-5 and Figure 6-6). These are described further in Appendix B.2 of the Addendum LVIA.

With the removal of WTG 19 and WTG 23 and the implementation of screen planting as suggested in Appendix B.2 of the Addendum LVIA (refer Appendix G), the visual impact rating of the Project on NAD_69 is considered to be reduced to a **Moderate** visual impact.



Figure 6-3: NAD_01 Photomontage –EIS Layout 2020 – 70 Turbines



Figure 6-4: NAD_01 Photomontage – Amended Layout 2021 – 65 Turbines



Figure 6-5: NAD_69 Photomontage –EIS Layout 2020 – 70 Turbines



Figure 6-6: NAD_69 Photomontage – Amended Layout 2021 – 65 Turbines

Removal of WTG 1, WTG 27 and WTG 31

WTG 1, WTG 27 and WTG 31 have been removed predominately to further reduce biodiversity impacts as well as to reduce visual impacts on residences to the south of the Project, including NAD72 and NAD73.

Relocation of Turbines WTG 12, WTG 47 and WTG 50

Project amendments include the relocation of three (3) turbines in response to design changes resulting from the removal of adjacent turbines. The visual impacts of the relocated turbines are assessed in the Addendum LVIA as follows:

- WTG 12: This turbine has been relocated approximately 50 m north east of the EIS location. The Addendum LVIA concludes that the change in location would be indiscernible and will not result in any changes to the findings of the LVIA presented in the EIS (MLA, 2020);
- WTG 47: This turbine has been relocated approximately 209 metres to the north east of the EIS location to reduce cut and fill and therefore reduce biodiversity impacts. MLA undertook a review of the amended location of WTG 47, noting that the new location adjoins a large expanse of uninhabited vegetated land, with the nearest non-involved dwelling, NAD_67, being approximately 3.37 km to the north. The Addendum LVIA concluded that WTG 47 will not be visible from NAD_67 due to topography; and
- WTG 50: This turbine has been relocated 137 m to the north east of the EIS assessed location. The Addendum LVIA concludes that this change will not result in any change to the findings of the LVIA presented in the EIS (MLA, 2020).

The Addendum LVIA concluded the relocation of the three (3) turbines would not result in any increased visual impacts. In particular, the assessment noted that the minor turbine relocations will not increase the number of visible turbines, reduce separation distances to the nearest turbine or increase the shadow flicker hours at any non-involved dwelling (refer Appendix G).

Amendments to Ancillary Infrastructure

The amendments to ancillary infrastructure proposed have also been assessed in the Addendum LVIA as follows:

- Laydown / Batching Plants:
 - The relocation of the previous laydown / batching area from the top of the Head of the Peel Road to the O&M /BESS / substation area was assessed. The Addendum LVIA concluded that it would have no impact on the visual impact of the Project as it;
 - The optionality in the location of batching plants on laydown areas (with the exception of Morrisons Gap Road) was also assessed in the Addendum LVIA;
 - The Addendum LVIA states that the locations of the temporary laydown and batching plants which will be used during construction are surrounded by vegetation and are likely to be screened from surrounding residences due to their relatively low height. The assessment concluded that there would be no variation to the previously assessed visual impact resulting from the alternate batching plant and laydown area locations now proposed;
- O & M and Construction Facility Optionality: The Project now includes an additional option (Option 2) for the location of the O&M to a site adjacent to WTG 55 and WTG 56;
- The nearest non-involved dwelling to this optional location is NAD_67, which is located approximately 1.6 km south east of the proposed O & M Facility. Further, a Complying Development Certificate has been granted for a new dwelling (DAD_01) 570 m to the north of the O & M Facility. It is not yet known whether DAD_01 will be constructed in this location;

- The Addendum LVIA concludes that the relocation of the O&M Facility will not alter the findings of the original LVIA from the EIS, finding that the proposed O&M Facility will be screened by vegetation from both NAD_67 and DAD_01 (assuming DAD_01 is ultimately constructed in that location). A Photomontage of the view from the location approved for DAD_01 has been prepared which demonstrates that existing vegetation will screen views to the O&M facility. This is shown in Figure 6-7 and Photomontage C01B, Appendix C.1 of the Addendum LVIA; and
- WTG 2: The hardstand area of WTG 2 has been orientated and the footprint reduced in response to the removal of WTG 1. This results in a slight reduction to the extent of vegetation removal required to construct this turbine. The Addendum LVIA concludes that this change will not result in any change to the findings of the LVIA presented in the EIS (MLA, 2020).

Realignment of Transmission Line

Sections of the 330kV and 33kV internal connector line has been realigned to further reduce biodiversity impacts and the visual impacts of these changes have also been assessed in the Addendum LVIA.

The Addendum LVIA confirms that the realignment will reduce the visibility of the transmission line from dwellings to the north as follows:

- NAD_21: Views to the transmission line realignment will not be visible from NAD_21 due to
 existing dense vegetation associated with the roadside to the east of the dwelling; and
- NAD_22: The nearest visible section of transmission line is in excess of four (4) km from the dwelling, and in the context of the orientation of the dwelling (to the east) and extent of views, the transmission line realignment would result in a negligible visual impact rating from this dwelling.

NAD_34: The nearest visible section of transmission line is in excess of six (6) km to the south of the dwelling. The proposed realignment reduces the visibility of the transmission line from NAD_34, reducing the extent of the visible portion of the transmission line by up to 1,000 m.Updated photomontages of representative locations for NAD_01 and NAD_34, presenting the EIS transmission line alignment, and the amended transmission line alignment are detailed in Figure 6-8 and Figure 6-9, demonstrating the reduced extent of visible transmission line (also refer Figures 4 and 5 of the Addendum LVIA).



Figure 6-7: Proposed 180 view south of DAD_01 - Existing vegetating screening O&M Option 2



Figure 6-8: Transmission Line – Photomontage representative of NAD_22



Figure 6-9: Transmission Line – Photomontage representative of NAD_34

Devil's Elbow Bypass Road

Section 3 of the Addendum LVIA (Appendix G) assessed the potential visual impacts associated with optimised Devil's Elbow bypass road. The assessment noted:

- whilst the removal of some vegetation will be required to accommodate road construction, the existing dense vegetation surrounding the site will screen views to the bypass road;
- the existing landscape has been (and continues to be) highly modified by forestry activity and when considered in this context, the visual impact of the bypass road is very low (refer Figure 6-10);
- there are no dwellings within close proximity that will have views of the bypass road. Views from the east (Barrys Road, Hanging Rock) will be screened by a combination of topography and vegetation and views from Nundle are limited due to intervening built form and vegetation;
- the removal of vegetation may be discernible in the distance from a very limited number of public locations to the south west of the site, in a similar fashion to existing clearing associated with roads and easements through the range. In particular, clearing associated with the road bypass may be discernible from Oakenville Creek Road, however it would be viewed in the context of existing areas of vegetation removal (refer Figure 6-11); and
- the removal of vegetation may be discernible from the vegetated range associated with Hanging Rock from Crawney Road, however in the context of the large scale of the views, the proposed clearing associated with the road alignment would form a very small portion of the range, and would be difficult to discern from this distance.



Figure 6-10: Clearing from forestry activities, Hanging Rock State Forest



Figure 6-11: View towards Hanging Rock State Forest from Oakenville Creek Road.

Additional Night Lighting Assessment

Section 4 of the Addendum LVIA provides additional consideration of night lighting in response to submissions from the community and DPIE.

Night Lighting – Ancillary Infrastructure

Night lighting requirements for ancillary infrastructure for the Project are generally limited to the lighting of the:

- switching station;
- BESS;
- substation; and
- O&M facility.

The night lighting required for these facilities is limited to low-level lighting for security, night time maintenance and emergency purposes. There will be no permanently illuminated lighting installed.

The Addendum LVIA considers a range of principles that will be incorporated into the detailed design of the switching station, BESS, substation, O&M and any other structures requiring lighting, including:

- control of the level of lighting, eg location of lights at key points (paths, entry points) and reduction of duration (switching of lighting and / or the use of sensors); and
- lighting design, eg use of the lowest intensity, energy efficient bulbs and warm colours, downward direction of lighting and close the ground, light shield fittings etc.

Night Lighting – Aviation

The Aviation Impact Assessment prepared as part of the EIS (Aviation Projects, 2020) concluded that obstacle lighting was not required. The Civil Aviation Safety Authority (CASA) made a submission for the Project in which they recommended aviation lighting be implemented. However, in section 2.1 of CASA's Advisory Circular (CASA, 2021) they state: "CASA provides advice about lighting of wind farms and other tall structures in submissions to planning authorities who are considering a wind farm or tall structure proposal. Regardless of CASA advice, planning authorities make the final determination whether a wind farm or a tall structure not in the vicinity of a CASA regulated aerodrome will require lighting or marking". For this reason and for the avoidance of doubt, aviation lighting will not be implemented for the Project unless the Planning Authority requires this to be implemented.

The LVIA presented in the EIS (MLA 2020) considered night lighting visual impacts including obstacle lighting. In the case that the Project is consented with a requirement from the Planning Authority to install obstacle night lighting, and in response to community and DPIE concerns regarding visual impacts from obstacle lighting, additional consultation with CASA has been undertaken since exhibition of the EIS. An Aviation Lighting Plan was prepared by Aviation Projects and subsequently forwarded to CASA for review. The plan nominates the lighting of 28 out of the 65 turbines, installed at hub height. The Aviation Lighting Plan was accepted by CASA on 22 September 2021. A copy of the Aviation Lighting Plan and correspondence with CASA is provided in Appendix J.

Consultation with CASA (19 July 2021) (refer Appendix J) has also confirmed a reduction in the requirement for lighting intensity, from 2000 candela to 200 candela. Table 1 from the CASA Advisory Circular AC139.E-05 V1.0 Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome) (CASA, 2021) provides distances at which intensity of light is predicted to be visible. This is reproduced in Table 6-11 below.

Time Period	Meteorological Visibility (m)	Distance (m)	Intensity (Candelas)
Night	4800	4700	1,500 (+/- 25%)
	4900	2,000 (+/- 25%) (ICAO medium intensity light)	
		2200	32

Table 6-11: Light Visible Distances (CASA 2021)

Source: CASA Advisory Circular AC139.E-05 V1.0 Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome) (CASA, 2021)

A 2000 candela light is visible at 4,900 m and 32 candela light is visible at up to 2,200 m. The Addendum LVIA concludes that it is therefore practical to assume that 200 candela light would be difficult to discern in excess of 3,000 m. However, to ensure a conservative assessment, the Addendum LVIA focuses on the visibility of lights on land within the blue line of visual magnitude (4,550 m), as it is likely the lighting would be indiscernible beyond this distance.

Section 2.6.5 of the CASA Advisory Circular AC 139.E-05 v1.0 (CASA, 2021)) states "*Permanent light shielding is also an option to reduce impact on residences within six kilometres of the installation*". In accordance with the plan prepared by Aviation Projects, shielding of the downward component of obstacle lighting is permitted to ensure that:

- no more than 5% of the nominal light intensity is emitted at or below 5° below horizontal; and
- no light is emitted at or below 10° below horizontal.

The Addendum LVIA (MLA, 2021) confirms that shielding can effectively reduce the impact on dwellings within up to six (6) km of the Project and that the efficiency of shielding would be increased for the Project due to the elevation difference between turbines and dwellings.

The Addendum LVIA concludes that there are very limited opportunities to view the Project in its entirety and therefore very limited opportunities to view all proposed aviation lighting installed. Accordingly, the Addendum LVIA confirms that, in light of the mitigation measures proposed, including low intensity and shielding, aviation lighting could be implemented with a low visual impact on the surrounding landscape.

Screen Planting

The Addendum LVIA demonstrates the effectiveness of screen planting to mitigate the potential visual impacts of the Project at key receptor locations. This additional evidence was provided in response to comments made in community submissions on the EIS. Photomontages have been prepared with the addition of vegetation to the minimum required height to screen views to the turbines. These examples have been prepared for AD_74 and NAD_05. An example photomontage is provided in Figure 6-14.



Figure 6-12: Photomontages of Proposed View without mitigation (upper image) and with indicative screen planting (lower image)

(based on 70 turbine layout as assessed in LVIA (MLA 2020)

Additional Dwelling and DA Location Assessments

Additional Dwelling Assessments – Community Submission Response

A number of submissions relating to specific dwellings were received during the exhibition phase of the EIS. The Addendum LVIA provides considered responses to the submissions. These are summarised in Table 6-12.

Additional Dwelling - DPIE Request

Consultation with DPIE post exhibition of the EIS identified a need for further assessment of visual impact to dwellings associated with Timor Crawney Road and Crawney Road (south west of the Project) (NAD_72, NAD_73, NAD_69, NAD_01). Further, DPIE also requested additional consideration of visual impacts on the commercial function of NAD_34 (DAG Sheep Station) (a wedding venue) and further consideration of the visual impact rating applied to NAD_05.

In response, MLA undertook a further assessment of the receptors identified by DPIE, as well as those receptors identified in the LVIA presented in the EIS (MLA 2020) to have a moderate or high visual impact within 4,550 m of the Project.

Table 6-13 provides a summary of the findings of additional dwelling assessments as identified by the DPIE in relation to the updated 65 turbine Project Layout. The table provides an overview of the findings of the assessment, proposed mitigation strategy and the revised assessment of visual impact rating based on findings from the following:

- identification of practical and feasible measures identified during site inspections;
- assessment of the revised 65 turbine layout; and
- implementation of mitigation measures.

Table 6-12: Additional Dwelling & DA Location Assessments

Submission ID	Concern / Dwelling Location	Response
SE-12780627	DA Location (DAD_03) Photomontage from assessment never received	At the time of the original assessment, no development application had been lodged at this location. A site visit was undertaken and several potential locations for dwellings were photographed. Since the original assessment was undertaken a development application has been approved for a dwelling which is now identified as DAD_03.
		While it is not yet known if a dwelling will in fact ultimately be constructed at this location, an updated assessment of the potential impacts of any dwelling constructed in this location has been provided in Appendix C.3 of the Addendum LVIA. A wire frame diagram prepared from the DA location identified 15 turbines will be visible to the south, within 8,000 m occupying approximately 70 degrees of the view (see Wire Frame Diagram 03, Appendix C.3 of the Addendum LVIA). A total of ten (10) proposed turbines are located within the black line of visual magnitude (3,100 m from the DA Location). Four (4) visible turbines are located between the black and blue line of visual magnitude (3,100 - 4,550 m). Aerial imagery indicates the DA location is located in a cleared, elevated location. The assessment concluded a visual impact rating of moderate.
SE-13129482	Dwelling ID NAD_4a Received wireframe from nearby property as a representative viewpoint. They want a specific assessment for their dwelling.	A representative wire frame diagram was utilised to provide a representation of the potential visual impact from houses 4a, 4b and 4c. Wireframe PM12 was a representative dwelling assessment from NAD4a, NAD4b and NAD4c and was selected to present the worst case scenario of the three dwellings. The potential view is very similar and is therefore an acceptable assessment as per the Bulletin: Page 12: Where relatively close clustering of houses belonging to different landowners or occupants occur, representative viewpoints maybe selected and assessed in lieu of every single dwelling in the following types of areas:
		 rural villages; and urban residential and commercial areas
SE-13629742	Darjin Cottage	As per above, a representative dwelling assessment has been utilised. Darjin Cottage is on the same property as Wombramurra Homestead. A photomontage was prepared from Wombramurra Homestead which is considered to be the main dwelling on the property and can be considered representative of the views from Darjin Cottage (refer Photomontage 25 in the LVIA (2020)).
SE-13700334	17 - 19 Blake Street	Dwelling is located in excess of 8 km from the Project. Representative viewpoints and photomontages have been undertaken near to the dwelling (Photomontage 02 and Photomontage 09 included in the LVIA (2020)). A photomontage was prepared as part of the community consultation from a nearby residence and was sent to the landowner by the Proponent. Refer to Appendix A.5 of the Addendum LVIA.

Submission ID	Concern / Dwelling Location	Response
SE-13019226	NAD_72 Dwelling not assessed and believe that the comment in the EIS regarding their opinion on visual impact is incorrect.	A desktop assessment was undertaken from NAD_72 and rated as moderate in the LVIA 2020. A site inspection was undertaken for NAD_72 on 30 June 2021 and a photomontage has been prepared to illustrate the proposed Project. Refer to Appendix A.1 of the Addendum LVIA.
SE-13695496	NAD_73 Since the project has been exhibited the landowner has been consulted and is concerned about impacts to their views.	 NAD_73 was assessed as moderate in the LVIA (2020). A site inspection was offered to the landowner and declined. Moir LA have undertaken detailed dwelling assessment based on a desktop assessment and wire frame diagram from this dwelling. Refer to Appendix A.2 of the Addendum LVIA. The assessment identified up to 24 turbines will be visible to the north east (based on an assessment of topography alone), 24 of these are within 8000 m of the dwelling. Some intervening vegetation to the east may assist in fragmenting views to distant turbines. The assessment concluded a visual impact rating of moderate.
SE-13633790	347 Happy Valley Road, Nundle Concerned they will see turbines from property and want a visual assessment.	Dwelling is in excess of 8 km from the Project. Representative viewpoint analysis and photomontages was undertaken from Nundle.
N/A	Koobah NAD_81	Dwelling is in excess of 8 km from the Project. The Proponent attempted to arrange a suitable time to undertake a site inspection during fieldwork process in June 2020, however a suitable time could not be arranged. Assessments were undertaken for NAD_75, 76 and 77 and are representative of the view from this dwelling.

Dwelling	Summary of assessment*	Proposed Mitigation Measures	Estimated timeframe for mitigation measures to take affect ^{**}	Revised Visual Impact Rating in Addendum LVIA with mitigation****	Visual Impact Rating in 2020 LVIA ^{**}
NAD72	Visual impact rating was assessed as moderate in the 2020 LVIA. This is due to there being no turbines within the black line, and turbines are only visible in two (2) 60 degree sectors. 10 turbines are visible within the blue line. Screen planting is an option but due to topography, however may take time to effectively screen turbines. With the proposed mitigation measures applied, the impact is rated as Low. Refer to Appendix A.1 of the Addendum LVIA.	Proposed screen planting	5 - 10 years	Low	Moderate
NAD73	Impact was assessed as moderate in the 2020 LVIA as there are no turbines within the black line and only visible in two (2) 60 degree sectors. 10 turbines are visible within the blue line. Screen planting is an option but due to topography may take time to be effective. A site inspection was offered to the landowner and declined. Moir LA have undertaken detailed dwelling assessment based on a desktop assessment and wire frame diagram from this dwelling. With the proposed mitigation measures applied, the impact is rated as Low. Refer to Appendix A.2 of the Addendum LVIA.	Proposed screen planting	5 - 10 years	Low	Moderate
NAD69	Impact was assessed as high in the 2020 LVIA. There are no turbines within the black line and the turbines are visible in two (2) 60 degree sectors. 8 turbines are visible within the blue line. Screen planting is an option to reduce the extent of impact. With the proposed mitigation measures applied, the impact is rated as Moderate. Refer to Appendix B.2 of the Addendum LVIA.	Proposed screen planting outlined in Appendix B.2 of the Addendum LVIA	2 - 5 years	Moderate	High
NAD01	Impact was assessed as low in the 2020 LVIA. Since this was prepared, Moir LA attended the property to undertake a site inspection and confirmed the Project will not be visible from this dwelling with only limited views to the Project available from the driveway. A comparative photomontage prepared by Moir LA (July 2021) from the driveway indicated the removal of turbines WTG 19 and WTG 23 reduced the potential visual impact from the driveway. Based on this the impact is rated as Negligible. Refer to Appendix B.1 of the Addendum LVIA.	Not required due to existing vegetation.	N/A	Negligible	Low

Table 6-13:	Summary	of Assessment	of Dwellings	Identified by	y DPIE
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Dwelling	Summary of assessment*	Proposed Mitigation Measures	Estimated timeframe for mitigation measures to take affect ^{**}	Revised Visual Impact Rating in Addendum LVIA with mitigation****	Visual Impact Rating in 2020 LVIA**
NAD34	Moir LA attended DAG station on two occasions (March 2020 and June 2020) and numerous viewpoints were taken. The turbines occupy a less than 20 degrees of the view. The nearest turbine is 5.95 km from the receptor. Based on this the impact is rated as Low. Refer to Appendix A.4 of the Addendum LVIA.	Not required in accordance with the Bulletin.	N/A	Low	Not previously assessed
NAD05	Impact was assessed as moderate in the 2020 LVIA due to the orientation of the dwelling (to the north), existing trees in the foreground which fragment views from the dwelling and the opportunity to implement screen planting to screen the turbines from the house. Mr O'Hanlon considers that the Visual Impact Rating should be High, however the methodology for this determination has not been provided. Although Moir LA do not consider this to be necessary due to orientation and existing screen planting, the removal of turbines: WTG 58, WTG 59, WTG 60 and WTG 63 would significantly reduce the potential for visual impact from dwelling NAD05. Based on proposed screen plantings, the revised Visual Impact Rating with mitigation is Low. Refer to Appendix A.3 of the Addendum LVIA.	Proposed screen planting.	2 - 5 years	Low	Moderate

* Based on revised 65 turbine layout.

** Based on 70 turbine layout without mitigation.

*** Estimated time frames are conservative estimate, based on moderately growing species as opposed to fast growing species (which could reduce the time frames).

**** Based on revised 65 turbine layout with the mitigation measures implemented.

DA Location Assessments

The Addendum LVIA also considers the potential visual impact on three locations where dwellings have been approved by either development consents or complying development certificates. It is important to note that it is not yet known whether any or all of these approved dwelling locations will in fact be constructed and occupied and that they do not currently form part of the landscape surrounding the Project. It is also noted that further approvals may be required to enable some of these dwellings to be constructed (for example, the complying development certificate granted for DAD01 requires the existing dwelling on the land to be demolished for DAD01 to be constructed and no complying development certificate has been obtained to authorise any such demolition works) to the best of the Proponent's knowledge at the time of writing.

As none of these approved dwelling locations have been constructed to date, the Addendum LVIA assessment was unable to consider:

- the orientation of the proposed dwelling;
- the extent of vegetation for removal or retention;
- the height and extent of surrounding vegetation; and
- the placement of windows or outdoor spaces.

Accordingly, the Addendum LVIA assessed these three approved dwelling locations by:

- application of the preliminary assessment tools: visual magnitude, multiple wind turbine tool and visual influence zone;
- wire frame diagram assessment to identify the extent of visible turbines (hubs and / or blades) based on topography alone;
- aerial imagery to consider the direction and extent of potentially visible turbines and any intervening elements (eg structures, wind break planting of vegetation) which may reduce potential visibility from the DA location;
- photomontage development;
- assessment against visual performance objectives in accordance with the Bulletin; and
- mitigation measures identified for each DA location (noting dwelling design was not taken into account).

The outcomes of the DA location assessment are detailed in Table 7 Summary of Assessment of DA Locations of the Addendum LVIA (Appendix G of the Amendment Report).

It is noted that, should the owner of each approved dwelling location wish to, they could also implement measures during the detailed design and construction of the approved dwellings to further screen potential views of the Project.

In light of this, and the fact that it is not yet known whether dwellings will be constructed at any of the DAD locations, it is considered that the potential visual impacts of the Project on these three locations should not be given determinative weight in assessing the Project. Rather, the impacts on these three DAD locations should be managed by the inclusion of appropriate conditions on any development consent granted for the Project, including by making it clear that the noise limits and visual mitigation entitlements will apply to each of the three DAD locations once they have been constructed and a final occupation certificate has been issued.

6.3.3 Mitigation and Management Measures

Mitigation and management measures are detailed in the LVIA presented in the EIS (MLA 2020). Further, based on the outcomes of the Addendum LVIA and further assessment and design including

the Aviation Lighting Plan, the following mitigation and management measures will also be implemented:

Night Lighting

The following principles will be incorporated into lighting design during the detailed design phase of the switching station, substation, O&M Facility and any other structures requiring lighting. If design principles are incorporated into the night lighting for Ancillary Infrastructure, it is likely there will be no visual impacts resulting from night lighting of Ancillary Structures.

- control the level of lighting:
 - only use lighting for areas that require lighting ie. paths, building entry points;
 - reduce the duration of lighting consider the use of sensors to activate lighting and timers to switch off lighting;
 - switch off lighting when not required;
- lighting design:
 - use the lowest intensity required for the job;
 - use energy efficient bulbs and warm colours;
 - direct light downwards;
 - ensure lights are not directed at reflective surfaces;
 - use non-reflective dark coloured surfaces to reduce reflection of lighting;
 - keep lights close to the ground and / or directed downward; and
 - use light shield fittings to avoid light spill;
- The O&M Building and any other structures are to be painted in a dark, non-reflective paint to reduce reflectivity from lighting and remain sympathetic to the surrounding landscape;
- Aviation night lighting:
 - If aviation night lighting is required by the Planning Authority:
 - lighting of the 28 turbines with low intensity 200 candela lights in accordance with the night lighting plan accepted by CASA;
 - operation of night lights only when notified to be required by CASA; and
 - installation of night lighting shields.

Screen Planting

As identified in the LVIA (2020), in circumstances where residences are subject to a high level of visual impact, screen planting is an option proposed to assist in mitigating view of turbines from residential properties. A number of additional dwellings have been identified as candidates for screen planting as an outcome the Addendum LVIA, which have been identified in Table 6-13.

In addition to the screen planting requirements contained in the LVIA (2020), the following items will be considered when undertaking screen planting:

- screen planting to be undertaken post construction of the Project;
- use of 50 / 75 litre tree stock to ensure plants establish;
- plant evergreen tree species that reach a minimum height required to sufficiently screen turbines (tree species selection is to undertaken in discussion with the landowner and local wholesale nursery and / or landscape contractor to suit local conditions); and

provide tree trunk protection to prevent damage to plant stock due to animals.

6.4 Traffic and Transport

6.4.1 Relevant Project Amendments

Project amendments relevant to potential traffic and transport impacts include:

- reduced number of WTGs from 70 to 65;
- The transport route for OSOM from the Port of Newcastle to the Project Area has been amended by the following:
 - removal of the tower route option via Tamworth;
 - removal of the Head of Peel Road route ('Southern Route') (as stated above) and associated alternate routes through Nundle including Happy Valley Road, Jenkins St, Gill St, Innes St;
 - some private land previously identified as being required for upgrades proposed along Morrisons Gap Road has also now been confirmed as no longer being required and so has been removed from the Project;
 - inclusion of route optionality in Muswellbrook;
 - additional laybys for OSOM traffic on Lindsay Gap Road and Morrisons Gap Road, to make a total of five proposed laybys on the transport route for the Project, to allow existing road users to pass slower moving Project traffic; and
 - addition of a pedestrian crossing in Nundle subject to further consultation with Tamworth Regional Council.
- amendment and optimisation of Devil's Elbow Bypass Road.

6.4.2 Assessment of Impacts

An Addendum Traffic and Transport Assessment has been prepared by The Transport Planning Partnership (TTPP) (2021) (refer to Appendix H). Although the overall turbine numbers have been reduced from 70 to 65 WTG's, the addendum has been assessed against the original 70 turbine layout to provide analysis that is deemed to be "worst case". The revised assessment included the modelling of key intersections and further traffic analysis, including of the revised traffic routes.

Overall, the assessment concluded that construction traffic will not have an adverse effect on the operation of the road network. Queueing and delay within Tamworth and surrounding intersections will not be significantly impacted by the additional traffic for the short period of peak traffic, and volumes of traffic forecast will be lower that the environmental capacity for local streets in Nundle.

The below sections summarise the Addendum Traffic and Transport Assessment relating to traffic generation, traffic analysis, and management and mitigation measures.

Traffic generation

Given the amendment that all traffic is to access the site via Morrisons Gap Road, the traffic distribution is as follows:

- 68% of traffic would use Nundle Road;
- 20% of traffic would use New England Highway (from the North via Lindsays Gap Road);
- 10% of traffic would use New England Highway (from the South via Lindsays Gap Road); and
- a small proportion of 2% of the light vehicles are assumed to use Crawney Road south of Nundle.

Use of light vehicles would be reduced through the implementation of carpooling, which is assumed to increase the average car occupancy to 2.5 workers per vehicle.

Table 6-14 to Table 6-18 below provides traffic generation projected during site establishment, peak construction period, typical operation period, and high activity operation periods.

Overall, the amendments to the Project will result in no material change to traffic generation during the site establishment period and high activity operational periods, as assessed in the EIS.

Туре	Units	Morning to Site (trips)	Morning from Site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	125 workers	50	0	50	100
Buses	-	-	-	-	-
Water trucks	11 per day	2	2	4	22
Trucks	20 per day	3	2	5	40
Total	-	55	4	59	162

 Table 6-14:
 Site Establishment Trip Generation

Table 6-15: Peak Construction Period (through Nundle to the Project Site)

Туре	Units	Morning to Site (trips)	Morning from Site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	174 workers	70	15	85	155
Buses	-	-	-	-	-
Water trucks	15 per day	3	3	6	30
Trucks	63 per day	7	7	14	126
Total	-	80	25	105	311

Table 6-16: Peak Construction Period (with shuttle service to the Project Site
from Nundle)

Туре	Units	Morning to Site (trips)	Morning from Site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	104 workers	42	10	52	94
Buses	70 workers	3	3	0	6
Water trucks	15 per day	3	3	6	30
Trucks	63 per day	7	7	14	126
Total	-	55	23	72	256

Туре	Units	Morning to Site (trips)	Morning from Site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	14 workers	14	0	14	28
Heavy vehicles	2 per day	2	1	-	4

Туре	Units	Morning to Site (trips)	Morning from Site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	33 workers	33	0	33	66
Heavy vehicles	4 per day	2	1	-	8

Table 6-18: Higher Activity Operational Periods

Traffic analysis

Intersection Modelling

Intersection modelling was conducted at the following key intersections in Tamworth (refer Figure 6-13):

- Goonoo Goonoo Road (NEH) / Scott Road / Vera Street;
- Murray Street / Marius Street; and
- New England Highway / Nundle Road.

In addition to these intersection modelling was conducted at the following two local intersections in Nundle (refer Figure 6-14):

- Lindsays Gap Road and Nundle Road; and
- Oakenville Street and Jenkins Street.



Figure 6-13: Modelled Intersections (Tamworth)



Figure 6-14: Modelled Intersections (Nundle)

For this model, additional traffic was added to the key intersections in accordance with the traffic distribution assumptions. The model periods were:

- 7:00am 8:00am; and
- 5:00pm 6:00pm.

The modelling shows that each of the intersections modelled would perform acceptably with and without the construction traffic from the Project. At the New England Highway and Nundle Road intersection the movement with the highest average delay was from the north on Railway Street. This is a minor street with 12 vehicles an hour on approach the average delay for the through movement was 38 seconds in the existing case and 44 seconds in the case with the construction vehicles. The 95th percentile queue would be less than 1 vehicle on all approaches. This is considered to remain an acceptable outcome.

Queueing at all intersections modelled was very modest with 95th percentile queues of less than 20 m at all intersections. The largest queues were modelled at the intersection of Murray Street and Marius Street.

TfNSW in particular requested the review of the impacts at the intersection of New England Highway and Nundle Road and the right turn from the New England Highway to Nundle Road in the morning peak. Modelling indicates that the 95th percentile queue for this right turn would increase from 1 m to 4 m (i.e. less than 1 vehicle at all times). Similarly, the queue from the worst performing approach, Railway Street, would also be less than one vehicle.

The modelling shows that the construction traffic would have minimal impact on the road network operation in both the morning and evening peaks.

Project amendments include additional laybys for OSOM traffic on Lindsay Gap Road and Morrisons Gap Road, to make a total of five proposed laybys on the transport route for the Project, to allow existing road users to pass slower moving Project traffic.

A more detailed description of the intersection modelling can be found in Section 5.1 and Section 5.2 of the Traffic and Transport Addendum (Appendix H).

Midblock Capacity

An assessment of midblock traffic capacity has been prepared which included an assessment of the impact on the amenity of the environment (referred to as environmental capacity) based on the RTA (2002) *Guide to Traffic Generating Development*. Environmental capacities are estimated by considering a range of differing perceptions of traffic impacts in a particular area. The assessment has used the tables provided in the RTA *Guide to Traffic Generating Developments* as shown in Table 6-19.

Road Class	Road Type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)	
Local	Access way	25	100	
	Street	40	200 environmental goal	
			300 maximum	
Collector	Street	50	300 environmental goal	
			500 maximum	

Table 6-19: Environmental Capacity

Source: RTA Guide to Traffic Generating Developments

In summary, using the environmental capacity assessment method, the forecast volumes would be less than the maximum 300 vehicles for collector roads and less than 200 vehicles per hour for local roads. Accordingly, all Project related traffic would operate within environmental capacity guidelines.

A more detailed description of the midblock capacity assessment can be found in Section 5.3 of the Traffic and Transport Addendum (Appendix H).

Turn Treatment Analysis

The intersection of Barry Road and Morisons Gap Road has been checked against the turn treatment warrants provided in Austroads *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (2010). A photograph of the existing intersection is shown below in Figure 6-15.



Figure 6-15: Morrisons Gap Road and Barry Road

Traffic surveys of Morisons Gap Road and Barry Road show that the flows on the existing major road are less than 5 vehicles an hour. While the right turning traffic would be more than 115 vehicles per hour. In accordance with the Austroads guidelines (2010) a right turn bay would not be required. However, any intersection requires a (BAR) basic right turn treatment. A BAR is simply providing additional sealed shoulder at the intersection. The arrangement for a typical BAR treatment is shown below in Figure 6-16. A more detailed description of the turn treatment analysis can be found in Section 5.4 of the Traffic and Transport Addendum (Appendix H).



Basic Right Turn (BAR) on the Major Road (Two-Lane, Two-Way Road)

Figure 6-16: Austroads Turn Treatment Warrant

6.4.3 Mitigation and Management Measures

Overall, the amendments to the Project will result in no material change to traffic generation during the site establishment period and high activity operational periods, as assessed in the EIS.

Traffic Management Plan

A detailed Traffic Management Plan will be prepared prior to construction in consultation with Transport for NSW, Tamworth Regional Council, and other relevant roads authorities associated with the Project, to the satisfaction of the Secretary of DPIE. The Traffic Management Plan will incorporate management and mitigation measures for construction of the Project to minimise traffic safety impacts

of the Project and disruptions to local road users during construction. This will include, but is not limited to:

- temporary traffic controls, noise considerations and speed limits;
- community notification;
- Emergency Response Plan in consultation with the local emergency services;
- a driver's code of conduct that addresses:
 - travelling speed;
 - procedures to ensure drivers to and from the development implement safe driving practices and adhere to designated transport routes;
 - parking restrictions;
 - In vehicle monitoring system (IVMS) to vehicles travelling to and from site;
- operational traffic management; and
- a detailed program to monitor and report on the effectiveness of these measures and the code of conduct.

Additional mitigation and management measures for inclusion in the Traffic Management Plan are detailed in the below sections:

Implementation of carpooling for the construction workforce:

 Carpooling is expected to be an effective way of reducing traffic for this Project given that most workers are forecast to be travelling from Tamworth to the Project Area where there are common origins and destinations, and the distances make it financially beneficial.

Dedicated construction carpark:

- The Proponent will create a dedicated construction staff carpark immediately outside the Nundle town centre, in consultation with Tamworth Regional Council. This will enable the introduction of the proposed temporary parking restrictions without reducing the benefits of accessing local content for the Project. This carpark could also assist the introduction of a shuttle service for peak hour "last mile" site access to reduce traffic through Nundle, on Barry Road and Morrison's Gap Road, if practicable; and
- The location of this carpark is proposed to be within walking distance to the village of Nundle to ensure the township benefits from increased demand for local content services.

Temporary parking restrictions for Project staff:

- In the Traffic Management Plan a Code of Conduct will include temporary parking restrictions for construction workers on streets within Nundle providing key services to tourists and local residents in order to preserve the current amenity;
- The location of these restrictions will be determined in consultation with the Nundle Business and Tourism Marketing Group and Tamworth Regional Council, but should consider the services accessed by tourists and local community on Jenkins Street; and
- The nominal times for parking restrictions in these locations will be 8:00am to 5:00pm Monday to Friday, subject to further consultation.

Minimising conflict with school buses routes and times:

Special consideration will be given to travelling outside school peaks where practicable. This will
be for the route through Nundle and the Muswellbrook route that travels adjacent to

Muswellbrook High School as well as identified school bus routes to be confirmed in the Traffic Management Plan; and

 Nominally the hours to be avoided for heavy vehicles in these areas are 8:00am to 9:30am and 2:30pm to 4:00pm.

Use and introduction of additional laybys to minimise disruption to local traffic:

- Additional laybys, one along Lindsay Gap Road and another on Morrisons Gap Road, to make a total of five proposed laybys on the transport route for the Project, have been proposed to allow for passing of slower OSOM movements; and
- Consultation with Nundle Business and Tourism Marketing Group raised concerns impacting tourist traffic entering Nundle. These measures should support reduced impact.

Ensuring road and pedestrian safety:

- Within Nundle, the Proponent will provide a pedestrian crossing on the corner of Oakenville Street and Jenkins Street, subject to further consultation with and approval from Tamworth Regional Council. It is noted that there are existing pedestrian refuges at this location and a pedestrian crossing at this location will not meet the normal TfNSW warrants required for pedestrian crossings;
- Vehicle escorts will be provided for all permanent residents during significant construction activities such as concrete pours along Morrisons Gap and Barry roads;
- Local resident call up protocols for all heavy vehicles entering Morrisons Gap Road will be prepared; and
- A project vehicle speed limit will be implemented along Morrisons Gap Road for OSOM traffic and In Vehicle Monitoring system (IVMS) of project vehicles traveling to and from site to monitor speed.

Public road modifications and dilapidation:

- An extensive list of public road modifications are proposed as part of the Project in the RJA Transport Route Assessment (Appendix I). These have also been summarised in Table 6.1 of the Traffic and Transport Addendum (Appendix H);
- Road modifications will be undertaken to ensure sufficient space for oversized vehicles passage, including intersection widening, trimming and removal of vegetation, removable signs and infrastructure, and the relocation of overhead wires;
- All permanent public assets that the Proponent determines need upgrading as part of the Project, will be upgraded in accordance with the Austroads design requirements. Dilapidation surveys, road usage fees, and/or performance bonds for remedial works have been offered by the Proponent through Offer Letters sent to Tamworth Regional Council and Muswellbrook Shire Council;
- Further minor road upgrades are also proposed in Muswellbrook LGA based on selection of the final preferred route as outlined in the updated TTPP report (Appendix H). All works are expected to be carried out within the current width of the road reserve and will not require any additional clearing. A revised Letter of Offer relating to the use of council roads and assets for the Project is provided in Appendix F of the TIA Addendum (Appendix H), and is also detailed in Appendix G of the Submissions Report;
- The Proponent will conduct further assessment of Muswellbrook Shire Council owned road assets as based on final equipment dimensions and transport contractor selection. Structural assessments will be undertaken as required, and further consultation with Muswellbrook Shire Council will occur in this regard;

- Any removal of signage, repositioning of light poles and temporary changes along the OSOM route and damage caused as a direct result of the OSOM movements will be made good as agreed with the local authority. A dilapidation survey will be undertaken along the route prior to and at completion of OSOM movements;
- Dilapidation reports covering the pavement, drainage and bridge structures will be undertaken in consultation with TfNSW and local Councils for the proposed transport routes before and after construction. Regular inspections and consultation with local Councils and the Proponent will be carried out;
- The Proponent will seal Morrisons Gap Road following the completion of construction and deploy dust suppression measures such as polymers to prevent dust generation from traffic traveling to or from the Project Area during construction;
- A rumble grid will be used to shake dust off vehicles. A rumble grid may also be implemented with Forestry subject to further consultation. Onsite dust suppression using water trucks will be carried out, and vehicles may also be washed down on exit of site if required;
- The Proponent will repair or pay the costs of any damage to public infrastructure caused by the Project where required;
- The Proponent will:
 - undertake a utilities search as part of detailed design for the project after the transport and logistics contractor is engaged and the turbine technology is selected;
 - take steps to avoid impacts to City of Newcastle's stormwater infrastructure as much as practicable;
 - undertake a site inspection with the City of Newcastle's engineers prior to any works being undertaken on public roads in the Newcastle LGA;
 - obtain Section 138 permits from the relevant Road Authority for any road modifications required on public roads, as necessary; and
 - provide 48 hrs notice to the relevant Road Authority prior to any works being undertaken on public roads;
- The Proponent will provide an electronic copy of a dilapidation report prepared by a suitably qualified person for both pre and post works to be submitted to City of Newcastle prior to the commencement of any works on City of Newcastle's public roads, unless otherwise agreed with City of Newcastle;
- The Proponent will construct hardstand where boundary fencing is being relocated between TfNSW and City of Newcastle land;
- The proposed hardstands will not involve any changes to the line marking on the road so that the existing arrangement of travel lanes remains the same. Where roads are significantly widened and do not possess edge lines, edge/centre lines will be provided;
- No Stopping restrictions will be provided along the proposed hardstands to prevent vehicle parking on these areas for the duration of their required use; and
- For removable / sleeved signposts security head bolts will be used to affix posts.

Traffic management system for managing OSOM vehicles:

The Traffic Management Plan will include a requirement to provide escorts for the majority of OSOM loads along Morrisons Gap Road, including police escorts for the higher risk OSOM loads, to ensure residents along Shearers Road and Morrisons Gap Road have safe passage. The Traffic Management Plan Driver's Code of Conduct will also include a requirement that all vehicles regularly accessing the Project Area during construction are required to have In-Vehicle Monitoring Systems installed;

- It is proposed that before the transportation of 'live' loads that a trial run of each of the routes will be completed using simulated loads that have the same height width and length of the Project OSOM loads. Once the route is demonstrated to be safe for transportation, then the transport of the loads could commence;
- The Proponent will provide UHF radios (given mobile phone reception can be intermittent) to residents along Morrisons Gap Road and Shearers Road to communicate any emergency or travel plans to site staff along with a protocol for reaching the site manager;
- Prior to OSOM component deliveries commencing on the Project, community information sessions will be held to provide information about the types of components that will be delivered to the Project Area. These will create opportunities to explain the Project and update the community on Project delivery schedules;
- Communication of the latest delivery schedules including expected component types, days and times and duration of deliveries will be provided to the local community (refer Section 6.10 of Appendix H for further detail);
- Consultation was undertaken with businesses within Muswellbrook Shire Council based on the OSOM route proposed and input from Muswellbrook Shire Council. The Project will include these businesses (as listed in Table 6.2 of Appendix H) in communication protocols;
- A communications protocols will be developed to allow communication between the NSW Forestry Corporation trucks and the Project trucks. The Project will maintain communication with NSW Forestry Corporation to coordinate the movement of oversized and over mass vehicles;
- The Project will consult with TfNSW Regional Infrastructure prior to OSOM transportation commencing;
- The Proponent will engage with local authorities and businesses in relation to traffic movements and the avoidance of peak commute times. This will be addressed in the Traffic Control Plan (TCP) to be prepared prior to OSOM transportation commencing; and
- The Belford to Golden Highway project is likely to be the most significant impact on the Project. As part of the Traffic Management Plan, the Project will maintain communications with TfNSW project managers to identify potential impacts. This will include notification of the times when trucks will be travelling through the construction sites.

Approvals:

- Relevant permits will be obtained for over-mass and over-sized vehicles from the National Heavy Vehicle Regulator;
- An application shall be lodged by the Proponent and consent obtained from the relevant Road Authority for all works within the road reserve pursuant to Section 138 of the Roads Act 1993 (NSW);
- The proposed widening of George Street will require the prior consent of TfNSW before any approval granted by the City of Newcastle;
- TfNSW approval of a Road Occupancy Licence (NSW Transport Management Centre) and Works Authorisation Deed agreement will be sought as works involve their assets (e.g. median, traffic signals) for all roads in the Newcastle LGA except for Selwyn Street and George Street; and
- The oversized and over mass routes in the Newcastle Local Government Area are only to be used during the night time, unless otherwise agreed with City of Newcastle. Travel restrictions will be formalised within transport permits, as required for the Project.

These requirements have been captured in the revised Mitigation and Management Measures in Appendix C.

6.5 Aviation Hazards

6.5.1 Relevant Project Amendments

Project amendments relevant to the aviation assessment include:

- relocation of WTG 47 209 m to the north east of the original location in the EIS;
- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and location of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27, WTG 31; and
- five additional temporary monitoring masts to be located within the assessed footprint of a WTG location with a maximum height of approximately 150 m AGL.

6.5.2 Assessment of Impacts

The aviation hazards of relocating WTG 47, WTG 50 and WTG 12, the addition of the up to five further temporary monitoring masts, and the removal of five WTGs has been assessed by Aviation Projects (2021).

The assessment found that the relocated turbines retain their site elevations (i.e. no height change) to that previously assessed in the Aviation Impact Assessment (Appendix H of EIS). Aviation Projects (2021) have confirmed that the relocated WTGs and the additional temporary monitoring masts do not affect the findings and recommendations of the Aviation Impact Assessment.

The removal of WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31 will reduce potential aviation hazards.

6.5.3 Mitigation and Management Measures

The relevant project amendments do not affect the findings and recommendations of the Aviation Impact Assessment contained in Appendix H of the EIS.

However, following ongoing consultation with the Project, CASA have approved the use of steady low intensity lighting (200 candela) night lighting rather than medium intensity. This requirement has been added to the revised Mitigation and Management Measures in Appendix C and assessed in the LVIA Addendum (Appendix G).

An Aviation Obstacle Lighting Plan has been prepared for the Project. CASA was consulted with relating to the plan and subsequently accepted the Obstacle Lighting Plan on 22 September 2021. The plan and relevant CASA consultation is provided in Appendix J. The Project will install the night lighting in accordance with the Obstacle Lighting Plan and will operate the night lighting when requested by CASA.

A copy of the Aviation Impacts Advice letter and documents showing ongoing consultation with CASA is attached at Appendix J.

6.6 Bushfire

6.6.1 Relevant Project Amendments

Project amendments relevant to the bushfire assessment include:

relocation of WTG 47 209 m to the north east of the original location in the EIS;

- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and location of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31;
- realignment of a portion of the transmission line within the Project Area;
- transmission line vegetation previously assessed for removal is now being retained;
- the Head of Peel Road will not be used for Project related construction and/or operational traffic and will be for emergency use only; and
- amendments to ancillary infrastructure, including:
 - removal of the construction laydown area and batching plant at the top of the Head of Peel Road access and relocation to the footprint of the BESS / substation and O&M facility;
 - increase in the footprint of the substation and change in BESS / substation / O&M facility configuration;
 - option to relocate the O&M to between WTG 55 and 56;
 - inclusion of optionality for any laydown area with the exception of laydowns along Morrisons Gap Road to house concrete batching plants (total number of batching plants for the Project will not increase and will remain as two); and
 - additional temporary construction compound proposed adjacent to WTG 56.

6.6.2 Assessment of Impacts

The impact of relocating WTG 47 and WTG 50 has been assessed by ERM (2021) (refer to Appendix K). The assessment found that the new locations have similar bushfire constraints to the previously assessed locations and do not present any greater risk to that already addressed in the EIS. WTG 47 is not located within the flame zone. WTG 50 is still at risk of direct flame contact from the north, south and west.

The amended assessment identifies that 39 of the 65 turbines have the potential for direct flame contact. This is a reduction from the original 45 turbines located within the flame zone based on the removal WTG 1, 9, 23, 27 and 31. It is also recognised that the realignment of the transmission line also results in a reduction of transmission line poles at risk of direct flame contact from 43 (69%) to 40 (65%). As per the original assessment in the EIS, all poles will be either concrete or galvanised steel poles. Some of the transmission line vegetation previously assessed for removal is now being retained. However, it is important to note that the maintenance 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.

The switching station, BESS, substation and the O&M building will continue have a minimum 20 m wide asset protection to ensure adequate defendable space around these assets. To ensure that these significant assets are not at risk of direct flame contact, and based on the results of the amended flame length modelling presented in Appendix K:

- the substation will have minimum 23 m wide APZ to the east and 20 m in all other directions;
- the switching station will have a minimum 33 m APZ to east and 20 m in all other directions;
- the BESS will have a 23 m APZ to the west and 20 m in all other directions;
- O&M Option 1 will require a minimum 20 m wide APZ in all directions; and
- Compound/O&M Option 2 will have minimum 21 m wide APZ to the south and 20 m in all other directions.

While it is recognised that key assets that have the potential to influence the spread of fire such as the switching station, substation, BESS and O&M buildings, these Project elements will be located outside of the flame zone. The batching plants will also be outside of the flame zone where possible.

6.6.3 Mitigation and Management Measures

Overall, the assessment confirms that the minor amendment to the Project does not affect the findings and recommendations of the Bushfire Risk Assessment (Appendix J of the EIS) as the Head of Peel Road will remain accessible for use during an emergency. Accordingly, no additional management measures (above those already identified within Appendix K of the Amendment Report) are required to accommodate the proposed Project amendments.

6.7 Hazards and Risk

6.7.1 Relevant Project Amendments

Project amendments relevant to hazards and risk (including blade and ice throw considerations) include:

- relocation of WTG 47 209 m to the north east of the original location in the EIS;
- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and location of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31;
- amendments to ancillary infrastructure, including:
 - removal of the laydown area and batching plant at the top of the Head of Peel Road access and relocation to the footprint of the BESS / substation and O&M facility;
 - inclusion of optionality for any laydown area with the exception of laydowns along Morrisons Gap Road to house concrete batching plants (the total number of batching plants for the Project will not increase and will remain as two);
 - increase in the footprint of the substation and change in BESS / substation / O&M facility configuration;
 - option to relocate the O&M to between WTG 55 and 56; and
 - additional temporary construction compound adjacent to WTG 56.

6.7.2 Assessment of Impacts

The Preliminary Hazard Assessment (PHA) prepared by Arriscar (2021) (refer Appendix L) was prepared to supplement the detailed assessment of hazards and risks presented in the EIS to address a number of requirements detailed in email correspondence by DPIE (refer to sub-Appendix B of Appendix L) and consider the relevant Project amendments outlined above. The updated PHA includes a risk assessment and analysis of a number of risk scenarios which have been summarised in the below sections.

Blade Throw, Tower Collapse or Nacelle Collapse

Blade Throw

Blade throw is a rare event where some or all of a WTG blade becomes detached. Blade throw is becoming increasingly rare however has been assessed as part of this amendment.

Tower Collapse

In the unlikely event of a collapse at the base of the tower, a person or object may be impacted if located within a distance equal to the tip height of the WTG (i.e. up to 230 m) A break in the lower or upper half is assumed to occur at the centre of the corresponding half, which reduces the maximum impact distance. The width of the potential impact area is assumed to be equivalent to the rotor diameter (i.e. up to 170 m). The direction of collapse is assumed to be in the same direction as the wind with the probability of each wind direction factored into the risk calculations.

Nacelle Collapse

In the unlikely event of a nacelle collapse, a person or object may be impacted if located within a distance equal to half the rotor diameter (i.e. up to 85 m). This assumes the nacelle collapses at the base of the tower. The width of the potential impact area is assumed to be equivalent to half the rotor diameter (i.e. up to 85 m for the proposed WTGs).

Likelihood of Blade Throw, Tower Collapse or Nacelle Collapse

There are numerous sources, which can be used to estimate the frequency of blade throw, tower collapse or nacelle collapse (refer to Table 7 of Appendix L (Arriscar, 2021)).

The frequency data from the *Handboek Windturbines* (2019), which is replicated below in Table 6-20, was applied for the risk analysis as it is the most recent complete data set.

Table 6-20: Frequency (per turbine per year) of Blade Throw, Tower Collapse or Nacelle Collapse (Handboek Windturbines 2019)

Failure Case	Frequency (Handboek Windturbines 2019)
Tower collapse	-
Break at base	1.5 x 10 ⁻⁵
Break in lower half	3.5 x 10 ⁻⁵
Break in upper half	8.0 x 10 ⁻⁶
Loss of an entire blade	6.2 x 10 ⁻⁴
Nominal operating rpm	6.2 x 10 ⁻⁴
Mechanical braking (1.25 x nominal rpm)	-
Emergency (2.0 x nom. rpm)	5.0 x 10 ⁻⁶
Loss of a blade tip	-
Nacelle collapse	1.8 x 10 ⁻⁵

Location-specific impact risk due to blade throw, tower collapse or nacelle collapse

The Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning (HIPAP 4) (Department of Planning, 2011) are guidelines which suggest risk assessment criteria to be considered when assessing the land use safety implications of industrial development of a potentially hazardous nature.

As depicted in Table 6-21 below, an individual fatality risk level of one in a million per year (pmpy) (1 x 10⁻⁶ per year) has been adopted in the HIPAP 4 for residential area exposure. Applicable to the Project, is the suggested criteria for individual fatality risk level at industrial sites, which is suggested at 50 pmpy (50 x 10⁻⁶ per year), and *"should, as a target, be contained within the boundaries of the site where applicable".*

Land Use	Suggested Criteria (risk in a million per year)
Residential	1
Industrial	50

Table 6-21: Individual Fatality Risk Criteria (HIPAP 4)

Arriscar (2021) has assessed the Project's compliance with the industrial individual fatality risk criteria contained in HIPAP 4. This involved considering local-specific impact risk due to blade throw, tower collapse or nacelle collapse on the BESS and the O&M building. The WTGs modelled included WTG No. 20, 21, 22, 25, 26 and 34, in which the maximum cumulative risk of impact from the above scenarios are presented below in Table 6-22.

WTG No	Pick at Contro	Risk at Centre of O&M Building		Pick at Contro of BESS	
WIG NO.	Risk at Centre of Oaw Building		Risk at Cellule of BESS		
	Risk [pmpy]	%	Risk [pmpy]	%	
20	19.5	27.2	20.2	38.7	
21	8.3	11.6	10.4	19.9	
22	0.01	0.01	0.01	0.02	
25	0.01	0.01	0.01	0.02	
26	22.9	32.0	11.0	21.1	
34	20.9	29.2	10.6	20.3	
Total =	71.6	100.0	52.2	100.0	

Table 6-22: Risk Contribution to Centre of O&M Building and BESS

As depicted above, the risk is approximately 71.6 pmpy at the centre of the O&M building, and approximately 52.2 pmpy at the centre of the BESS. While these figures exceed the suggested criteria of 50 pmpy, the risk values shown are location-specific risk of impact and do not account for the occupancy of personnel. In the guidance notes on the implementation of HIPAP 4, it is said that:

In applying the industrial criteria of 50×10^{-6} for externally generated risk, regard should be had to the presence of workers on site and to the nature of activities and their relationship to each other. Where an industrial site or part of a site involves only the occasional presence of people ... a higher level of risk may be acceptable (provided that incident propagation risk criteria are satisfied).

Generally, there will be a low presence of staff who will occupy the premises, with most activity anticipated to occur during business hours. In addition, as illustrated in Figure 21 of the PHA (Arriscar, 2021), the suggest criteria of 50 pmpy is contained within the Project Area.

Nonetheless, for full compliance with the suggested criteria, Arriscar (2021) estimated risk at three potential alternative locations for the O&M building to provide optionality (refer to Table 6-23).

Alternative Option	Alternative O&M Building Location	Risk of Impact [pmpy] at Centre of Area
Option 1	Batching / laydown area between turbines 37 and 38	88
Option 2	Batching / laydown area between turbines 44 and 45	102
Option 3	Compound between turbines 55 and 56	34

Table 6-23: Risk of Impact at Alternative O&M Building Locations

The risk of impact Option 1 and Option 2 of the alternative potential locations for the O&M building is higher than at the O&M building location near the BESS. Whilst there are fewer turbines near these
locations, the centre of the relocated O&M building would be closer to a turbine (approx. 140 m from WTG 37 and approx. 110 m from WTG 45, which results in a higher cumulative risk.

For Option 3, the risk of impact at the centre of the compound located between WTG 55 and WTG 56 (34 pmpy) is lower than at the O&M building location near the BESS (71.6 pmpy). If the centre of the O&M building was to be located at equal distance between WTG 55 and WTG 56 (i.e. approx. 250 m from each), then the risk of impact would be further reduced to approximately 15 pmpy.

The maximum cumulative risk of impact due to blade throw, tower collapse or nacelle collapse for WTG No. 60, 61, 62, 64, 65 and 66 is approximately 0.06 pmpy at the closest residence (AD_5). This is lower than the DPIE risk criterion of 1 pmpy, which applies for residential uses.

Ice Throw

Two formulas were used by Arriscar (2021) to determine the maximum distance for ice throw for an operating wind turbine, and the maximum falling distance for a non-operating (i.e. stationary) wind turbine. The assessment found that the maximum ice throw hazard range (473 m) is significantly less than the distance to the closest existing residence (approx. 765 m to AD_5). It should be noted that DAD01 was not assessed for hazards and risk however falls within the 47 3m worst case ice throw hazard range.

Figure 6-17 illustrates that an ice throw may pose a hazard for personnel at the O&M building, BESS and substation. It may also pose a potential hazard when driving along roads or accessing the WTGs during icing conditions.



Figure 6-17: Example Ice Throw Hazard Ranges for WTG 25

According to the Canadian Wind Energy Association, this formula used to determine the maximum distance for ice throw for an operating wind turbine is 'widely accepted as being 'conservative (i.e. Ice throw will remain within this zone)'. The formula is typically used as the maximum ice throw distance for screening purposes. Measurements of collected ice particles confirm the conservatism of this formula, for example:

- an analysis of 1,000 collected ice particles for wind farms located in the Jura Mountains (Switzerland) indicated that all landed within 1.4 x tip height, with only 3% located further than the tip height (Cattin (2016); and
- an analysis of 530 collected ice particles from three wind farms in Sweden indicated that 75% landed at 20 to 90 m, with almost all particles located within 1 x tip height (Lundén, 2017).

This leads Arriscar (2021) to conclude that:

"The potential for ice formation on the wind turbines appears to be credible based on the available meteorological data for the Project Area; however, this is based on an approach that is very conservative and may lead to an over-estimation of the icing duration".

BESS hazards

Key findings of the Arriscar (2021) assessment relating to BESS hazards are summarised below:

- the thermal radiation, explosion and toxic gas effects of BESS fires would be confined within the Project Area and there would be no potentially injurious offsite effects;
- the explosion overpressure may reach up to 14 kPa in areas surrounding a container. At this overpressure, escalation is unlikely, some damage to utilities and cabling may occur. An explosion overpressure of 21 kPa or higher is not reached. Toxic gas concentrations that produce injury or irritation level are confined entirely within the Project Area, and do not reach ground level; and
- the thermal radiation impacts from transformer fires are confined within the Project Area with no
 potentially injurious offsite effects.

6.7.3 Mitigation and Management Measures

The following mitigation and management measures will be implemented to minimise hazards arising from the Project as amended:

- relocation of the O&M building will be considered to reduce the potential risk of impact from blade throw, tower collapse or nacelle collapse;
- measures to mitigate ice formation on the wind turbines (e.g. anti-icing or de-icing technologies) and/or control access (e.g. ice risk management plan) will be implemented to reduce the risk of ice impact to the extent reasonably practicable;
- BESS containers will be separated by a minimum of 3.05m (10 ft), based on the requirements of NFPA 855;
- forced ventilation will be installed in the BESS containers (minimum 32 air changes per hour is recommended to prevent flammable mixture formation in the container);
- an alarm will be installed to indicate loss of ventilation flow through the containers;
- a CO detector on the ventilation exhaust duct (CO is present whether the gas is ignited or not) will be installed, with shutdown of the BESS charging/ discharging if CO is detected. The HVAC will be kept on, and alarm if HVAC flow stops; and
- an Emergency Response Plan will be prepared and implemented and will address the specific hazards identified in the PHA (e.g. blade throw, nacelle collapse, tower collapse, ice throw, turbine fires, etc.) and ensure emergency response personnel take appropriate precautions to protect themselves and the general public from any immediate hazards from unlikely events such as blade throw caused by a turbine fire.

The above has been added to the revised Mitigation and Management Measures in Appendix C.

6.8 Indigenous Heritage

6.8.1 Relevant Project Amendments

Project amendments relevant to the Aboriginal cultural heritage assessment include:

- relocation of WTG 47 209 m to the north east of the original location in the EIS;
- relocation of WTG 50 approximately 137 m north east of the original location in the EIS;
- modification of hardstand and location of WTG 12 approximately 50 m of the original location in the EIS;
- removal of WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31;
- realignment of a portion of the transmission line within the Project Area (north of WTG 12 and to the west of WTG 2);
- realignment and modification of sections on internal access tracks;
- removal of Head of Peel Road transport route and associated road upgrades;
- modifications to OSOM transport route from the Port of Newcastle to the Project Area;
- modifications to Devil's Elbow Bypass Road alignment; and
- ancillary infrastructure amendments (including temporary concrete batching plant locations, optionality for new O&M location, construction compound and additional met masts).

6.8.2 Assessment of Impacts

Generally, the Project amendments do not change the outcomes of the Aboriginal Cultural Heritage Assessment because the assessment completed was broad enough to allow for the minor changes contemplated in this Amendment Report.

However, the change to the Project to use Head of the Peel Road only for an emergency reduces potential impacts to Aboriginal archaeological sites/PAD within these parts of the study area. Table 6-24 summarises the reduced impacts.

Site Name	Assessed Significance/Potential	Type/Degree of harm in EIS	Consequence of harm	Amended Project
Hills of Gold AFT 1	Moderate	None	N/A	
Hills of Gold AFT 2	Low	Direct/Partial	Partial loss of value	Avoided
Hills of Gold AFT 3	Moderate	Direct/Partial	Partial loss of value	Avoided
Hills of Gold AFT 4	Low	Direct/Total	Total loss of value	N/A
Hills of Gold IF 1	Low	Direct/Total	Total loss of value	N/A
Hills of Gold IF 2	Low	Direct/Total	Total loss of value	N/A
Hills of Gold IF 3	Low	Direct/Total	Total loss of value	N/A
Peel River/Woodleys Creek PAD	Moderate	Direct/Partial	Partial loss of value	Avoided

Table 6-24Updated Proposed impact to Aboriginal archaeological sites/PADwithin the study area

6.8.3 Mitigation and Management Measures

Overall, the minor amendment to the Project will not affect the findings and recommendations of the Aboriginal Cultural Heritage Assessment (ACHA) (Appendix M of the EIS). Some impacts to Aboriginal sites have been reduced or avoided by the amendments.

Accordingly, no additional management measures (above those already identified within ACHA) are required to accommodate the proposed Project amendments.

6.9 Historic Heritage

6.9.1 Relevant Project Amendments

Project amendments relevant to the historic heritage assessment are limited to the optimisation of the Devil's Elbow Bypass Road to minimise potential interactions with possible subsurface features related to the former Black Snake Mine.

6.9.2 Assessment of Impacts

The EIS incorporated a Historic Heritage Impact Assessment and Statement of Heritage Impact (SoHI) (ERM, 2020) (Appendix N of the EIS). The SoHI confirmed that the Devil's Elbow bypass as detailed in the EIS would have a negligible impact on the setting of the LEP listed Black Snake Gold Mine, but would have the potential to impact archaeological features, such as potential mine shaft entries and tunnels. The assessment recommended a geophysical and / or geotechnical assessment be undertaken to determine if there are any subsurface voids beneath the proposed upgrade or other anomalies that may be indicators of archaeological features.

In line with this recommendation, the *Devil's Elbow Bypass Road – Geophysical Interpretative Report* (Coffey, 2021) (provided in Appendix O) used electrical resistivity testing in March 2021 to assess potential for subsurface voids relating to abandoned mine workings, and other possible anomalies that may indicate the presence of archaeological features.

The investigation identified three resistivity anomalies (referred to as Areas 1, 2 & 3). While it is possible that these areas are the result of natural geological processes unrelated to the Black Snake Gold Mine, it is considered they are likely to be associated with abandoned (historic) mine workings such as tunnels. Based on Coffey's extensive tunnel design experience it is expected that these potential tunnel areas would be very unlikely to be structurally impacted by road excavation so as to cause any subsidence or collapse provided that they have at least 5 m of sound rock cover and span less than 4 m and measures such as heavy blasting are avoided.

Based on the outcomes of the geophysical assessment (Coffey, 2021) Catcon and WGA (Wallbridge Gilbert Aztec) redesigned and realigned the road such that the potential void locations identified are limited to within areas of fill so as to avoid the risk of removing earth support. The realigned and redesigned bypass road is identified in Figure 3-1c. A number of structural engineering solutions have been recommended by Coffey to ensure structural integrity of any subsurface voids in proximity to the works, and these will be confirmed during detailed design where necessary.

The additional geotechnical investigation for the refined road location, irrespective of the sound engineering solution design, will be the basis for further mitigation measures. Heritage controls, such as possible archaeological monitoring during earthworks in potential anomaly areas, will be contingent on the results of this analysis. Heritage controls and/or mitigation measures will be detailed in the Project's EMS and Heritage Management Plan.

Addendum SoHI

Tamworth Regional Council requested that additional information be provided in the form of an Addendum SoHI Report (ERM, 2021; Appendix Q) to further examine any indirect heritage issues associated with potential impacts to Black Snake Gold Mine's historic environmental setting, within the

location of LEP heritage item (I134) curtilage traverse (an approximate 600 m length of road). The Addendum Report findings supported the SoHI and concluded that construction of the bypass road will have no adverse indirect impacts through removal of secondary growth vegetation and minor cut and fill activities on the listed heritage values of Black Snake Gold Mine.

Opportunities for potential enhancements to the LEP listed heritage item were also identified in relation to the bypass component, in terms of development of heritage interpretation site involving signage or other devices, subject to further discussions with Council and the community. These opportunities do not form part of the Project and remain subject to further separate approvals and assessments by the Council and local community.

6.9.3 Mitigation and Management Measures

The following mitigation and management measures will be implemented to minimise impacts to historic heritage arising from the Project as amended:

- further geophysics, engineering assessment and heritage protocols / approvals will be undertaken and obtained during detailed design of the final Devil's Elbow bypass road alignment;
- heritage controls, such as possible archaeological monitoring during earthworks in potential anomaly areas, will be contingent on the results of the further geotechnical analysis. Heritage controls and/or mitigation measures will be detailed in the Project's EMS and Heritage Management Plan; and
- heritage interpretation relating to the transport alignment upgrade will be investigated as a
 possible community value-add, in terms of development into a unique future heritage
 interpretation site.

6.10 Soils and Water

6.10.1 Relevant Project Amendments

Project amendments relevant to the Soil and Water assessment relate to changes to the area of disturbance associated with:

- relocation of WTG 47 209 m to the north east of the exhibited location;
- relocation of WTG 50 approximately 137 m north east of the exhibited location;
- modification of hardstand and location of WTG 12 approximately 50 m of the exhibited location;
- removal of WTG 1, WTG 19, WTG 23, WTG 27 and WTG 31;
- realignment of a portion of the transmission line within the Project Area (north of WTG 12 and to the west of WTG 2);
- removal of Head of Peel Road transport route and associated road upgrades;
- modifications to Devil's Elbow bypass road alignment; and
- ancillary infrastructure amendments (including temporary concrete batching plant locations, optionality for new O&M location, construction compound and additional met masts).

6.10.2 Assessment of Impacts

The hydrology of the Project Area consists of the headwaters of three main river catchments being the Namoi, Hunter and Manning Rivers. With the alternate access via an upgraded Head of Peel Road no longer being proposed, the Development Footprint on the ridgeline only directly impacts first order ephemeral watercourses, primarily tributaries of the Peel River within the Namoi River catchment. The transmission line alignment has also been amended and no longer spans Woodleys Creek. No other second order or higher watercourses are affected by the route realignment.

Optimised wind farm design layout has minimised bulk earthworks and associated disturbance to soils and biodiversity. This includes the reduction of five turbines from the original layout, reduced access road length and optimised batters, relocation of WTG 47 to reduce slope, removal of WTG 1 which was located on a narrow section of ridgeline, and the re-orientation of the WTG 2 hardstand. These Project changes have contributed to the overall reduced Development Footprint from 513 ha to 300 ha.

The Development Footprint, including the relocated WTGs, avoids the steeper upper slopes to the ridgeline of 33 to >50 %. The Transverse Track generally follows existing topographic contours at the base of these steep upper slopes on slopes of generally 10-33 % with some sections crossing steeper sections of >33 %. No turbines are located in slopes above 33 %.

6.10.3 Mitigation and Management Measures

Design mitigation measures

During detailed design, turbine and infrastructure locations will be further refined to avoid the adjacent steeper slopes and areas of significant rocky outcrops. In addition, appropriate permanent cut batter slopes will be assessed on an individual basis with reference to cutting ground conditions. Benches will be implemented into areas of higher cut slopes or wherever deemed necessary for stability purposes.

As an additional mitigation measure, where feasible earthwork batter design will be implemented, as follows:

- for slopes 2H:1V or shallower, individual vertical batter heights may be up to 10 m;
- minimum bench width of 4.5 m;
- the unreinforced slopes will be designed with the following long-term factor of safety \ge 1.5;
- no temporary or permanent surcharges loads may be placed on batter crests; and
- surface rainwater flows will also be diverted away from batter crests and faces.

If steeper, or relatively high batter slopes are required, then engineering design and support / stabilisation will be implemented. Permanent soil nailing and shotcrete support will be considered for such cases during detailed design.

Given the relatively steep and exposed nature of much of the Development Footprint, and assessed high dispersity/erodibility of site soils, detailed design will assess the need for the use of appropriate cut/fill batter protection and effective site surface water management and drainage techniques to prevent the mobilisation of sediments to natural water courses. This may include vegetation or shotcreting batter faces. Drainage design will aim to direct runoff from all hardstands, access tracks and Project infrastructure to appropriate sediment control facilities such as sediment basins, grassed filter strips or swales to trap sediments and filtered off before being discharged (to appropriate vegetated areas or drainage lines).

To minimise the ongoing maintenance any cut and fill slopes, batters will be vegetated with grass as soon as possible following construction, and be protected from overland surface water flows by the construction of appropriate permanent surface drainage measures.

Appropriate erosion and sediment controls will be implemented for any exposed soil in stockpiles, temporary works or permanent works such as covering, vegetation or a permanent capping.

Runoff from fill batters facing towards the National Park will be retained as sheet flows utilising vegetated filter strips or concentrated in collection drains diverted either via culverts beneath the access tracks to join the northern drainage network or to enhanced sediment controls prior to release. To ensure that flows from the up-gradient catchment reach the Peel River culverts will be installed at key watercourse crossing points confirmed at the detailed design phase.

Construction Mitigation Measures

The following additional / amended measures to those identified in the EIS will be implemented to address potential soil and water impacts:

- undertake a further geotechnical study prior to construction commencement including soil characteristics to inform the development of appropriate erosion and sediment controls;
- prepare and implement a detailed Soil and Water Management Plan (SWMP) prior to construction commencing, outlining measures for the management and monitoring of surface water quality and hydrology during construction. The plan would also address any requirements for the management of pollutants or contaminated lands during construction so as to minimise impacts to terrestrial and aquatic habitats. The SWMP should be prepared by a suitably qualified person, such as a soil conservationist;
- Progressive Erosion and Sediment Control Plans (PESCPs) within the SWMP as the Project progresses to address management requirements at individual work sites to be developed by an experienced CPESC;
- SWMP & PESCP will be prepared based on 'The Blue Book' (Landcom, 2004) utilising a range of BMPs for the various construction activities and landforms including the adoption of enhanced controls/higher level of protection for activities in sensitive catchments and challenging landforms such as increased capacity of controls, shortening lengths between controls and use of soil binders and other proprietary products;
- divert upslope (clean) stormwater around the disturbed sites and capture sediment-laden run-off from within the disturbed site for diversion to sediment control devices;
- installation of geotextile silt fences (with sedimentation basins where appropriate) on all drainage lines from the site which are likely to receive runoff from disturbed areas;
- installation of appropriate sediment traps or sediment ponds near waterways to contain surface water contaminated with sediment runoff entering the waterway;
- procedures to ensure that steep batters are treated appropriately for sediment control;
- a process for overland flow management to prevent the concentration and diversion of water onto steep or erosion prone areas; and
- inspect and maintain erosion and sediment control devices for the duration of the Project construction stage including thorough visual inspections following significant rain events with a requirement for immediate remediation of localised erosion caused by runoff (within specified response times).

Sensitive areas mitigation measures

The Ben Halls Gap Nature Reserve is located adjacent to the Project Area, immediately to the east of the ridgeline. In portions of the National Park, a rare moss has been identified as requiring additional consideration to ensure activities associated with the Project do not impact on the integrity of the rare moss. The primary risk to impact upon the "sensitive location" is associated with runoff and sediment deposits.

Additional measures are able to be effectively implemented to appropriately mitigate impacts associated with the identified sensitive location in the adjacent National Park. Measures are to be included in the PESCP to either:

- direct disturbed runoff away from the catchment area identified to contain the sensitive location, or
- process runoff through additional sediment controls (e.g. sumps and/or sediment basins) and discharge at a low, non-erosive velocity.

A monthly ambient water quality monitoring program will be developed in consultation with NPWS for the two sensitive receiving waters during the period where construction is being undertaken within proximity to the National Park. The monitoring program will include trigger parameters that can be measured insitu such as pH and turbidity along with visual observations for any hydrocarbons. Monitoring would be undertaken during dry periods and post rainfall.

These measures will be included in the SWMP.

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 despite the reduction in impacts resulting from the amendments to the Project presented in this Amendment Report. However, the Submissions Report and this Amendment Report have 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 FOR THE AMENDED PROJECT

Since lodgement of the EIS, the Proponent has continued to consult with community members, community organisations, councils, and relevant government agencies including DPIE and its independent visual technical advisors regarding the Project. Engagement with these stakeholders has informed the Project changes and resulted in Project amendments including the reduction in the Development Footprint by approximately 213 ha and reduced environmental impacts, including in relation to biodiversity, visual, traffic, aviation and heritage impacts.

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 and 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.

The impacts of the Project on biodiversity values will be fully offset and in any event are significantly lower than comparable, recently approved wind farm projects, as demonstrated by Table 8-1.

Table 8-1:Comparison of Project Impacts to recently approved Wind Farm
Developments

	This Project	Uungula Wind Farm	Rye Park Wind Farm
Approval Date	-	7/05/2021	15/04/2021
Loss of Native Vegetation (ha)	132.4	626.0	392.0
Loss of Native Vegetation (ha) per MW	0.3	1.6	1.0
Total ecosystem Credits required	4,252.0	26,020.0	6,282.0
Ecosystem Credits required per MW	10.9	65.1	15.9
Species Credits required	4,570.0	18,123.0	5,794.0
Species Credits required per MW	11.7	45.3	14.6

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 more decentralised system of renewable energy production;
- help contribute to meet increasing energy demand, provision of dispatchable energy by the provision of the large scale battery energy storage system (BESS) which will assist in managing ongoing electricity demand peaks;
- provide necessary alternative electricity production to replace the forecasted retirement of coalfired power stations with renewable energy;

- contribute to GHG emission reductions in the order of 608,000 tonnes per annum, supporting Australia's commitment 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 the 35% reduction by 2030 which is regarded by many as the minimum necessary to contain global warming;
- take advantage of the best wind resource in the Hunter/New England region as shown in Figure 2-1;
- provide a significant amount of new generation capacity which will be required when the 2,000 MW Liddell Power Station located in the NSW Hunter Valley closes in 2023;
- contribute to NSW and Commonwealth renewable energy targets without depending on network expansion proposed in the New England area;
- will bring material benefits to the Tamworth and Hunter Valley LGA and aligns with the Tamworth Regional Blueprint 100; and
- deliver economic benefits to regional and local communities, including:
 - 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;
 - 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) including 16 ongoing site based jobs for the life time of the Project;
 - economic stimulus through \$73 million of direct injection of income to the regional economy during construction, and \$15.3 million injection per year during Project operations;
 - diversified income stream for rural landholders and neighbours through a Neighbour Benefit Sharing Program;
 - diversifying regional employment opportunities;
 - renewable low cost energy to the national grid;
 - community enhancement funding of \$3,000 per turbine per annum during operations, and a one-off construction sponsorship fund off \$150,000 to support community initiatives during construction; and
 - to help support the community, ENGIE's energy retailer will offer an exclusive electricity plan to the residents within the Nundle, Hanging Rock & Crawney area. If the Project is approved, and once operational, ENGIE will cover the wholesale component costs of participants' electricity which will help them save on their energy bill.

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.

This Amendment Report, and the Submissions Report confirm the benefits of the Project and related impacts and it is considered that the Project is in the public interest.

9. CONCLUSION

The impacts of the Project as amended have been fully assessed in the EIS, this Amendment Report and the Submissions Report.

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.

As Chief Justice Preston recognised in *Taralga Landscape Guardians Inc v Minister for Planning and RES Southern Cross Pty Ltd* [2007] NSWLEC 59 when approving the Taralga Wind Farm:

The insertion of wind turbines into a non-industrial landscape is perceived by many as a radical change which confronts their present reality. However, those perceptions come in differing hues. To residents, the change is stark and negative. It would represent a blight and the confrontation is with their enjoyment of their rural setting.

To others, however, the change is positive. It would represent an opportunity to shift from societal dependence on high emission fossil fuels to renewable energy sources. For them, the confrontation is beneficial – being one much needed step in policy settings confronting carbon emissions and global warming.

Resolving this conundrum - the conflict between the geographically narrower concerns of the [residents] and the broader public good of increasing the supply of renewable energy - has not been easy. However, I have concluded that, on balance, the broader public good must prevail.

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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