NSW GOVERNMENT

White Rock Wind Farm

Modification Assessment
(10_0160 MOD 6)

August 2019

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Glossary

Abbreviation	Definition
Approval	Project Approval
CIV	Capital Investment Value
Commonwealth	Commonwealth Government
Department	Department of Planning, Industry and Environment
DoI – L&W	Department of Industry – Lands and Water
EA	Environmental Assessment
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
GWh	Gigawatt hours
ha	hectare
km	kilometre
LEP	Local Environmental Plan
m	metre
Minister	Minister for Planning and Public Spaces
OEH	Office of Environment and Heritage
RMS	Roads and Maritime Services
RTS	Response to Submissions
Secretary	Secretary of the Department of Planning, Industry and Environment
SEPP	State Environmental Planning Policy
SSD	State Significant Development
The Commission	Independent Planning Commission of NSW
TSC Act	*Threatened Species Conservation Act 1995* (repealed)

Executive Summary

White Rock Wind Farm Pty Ltd, a wholly owned subsidiary of Goldwind Capital (Australia) Pty Ltd and CECEP Wind-Power Corporation (Goldwind), is proposing to modify its approval for the White Rock Wind Farm (the project), an approved wind farm located approximately 20 kilometres (km) west of Glen Innes in the New England region of NSW.

The project was originally approved on 10 July 2012 under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) following a comprehensive assessment process. This approval allowed for the construction and operation of up to 119 wind turbines up to 150 metres (m) in height and associated ancillary infrastructure.

The project is also declared to be a "critical infrastructure project" under the EP&A Act, in accordance with a declaration made by the then Minister for Planning on 11 November 2009 concerning energy generating developments with capacity to generate at least 30 MW. The declaration of the project as critical infrastructure means that the project is, in the opinion of the Minister, essential for the State of NSW for economic, environmental or social reasons.

The project approval has subsequently been modified five times, although none of these modifications altered the height or number of turbines. One of these modifications allowed for the construction of a new 132 kV electricity transmission line and grid connection infrastructure. The transmission line would provide greater capacity on the existing network and would be constructed pending the future optimisation of Goldwind's operations, including its proposed Stage 2 operations described below.

Development of the project includes two separate stages. Stage 1, comprising 70 turbines and associated ancillary infrastructure, commenced construction in 2017 and is now operational and capable of generating 175 megawatts (MW) of electricity.

Stage 2 comprises 49 turbines and is not yet constructed. As approved, the Stage 2 turbines would be capable of generating 122.5 MW of electricity.

Following further design work and in recognition of the rapid changes in technology since the project was first approved, Goldwind has identified further opportunities to increase the efficiency of the second stage of the wind farm and to produce more electricity without increasing the number of turbines.

Proposed Modification

Goldwind is seeking further modifications to the project approval to facilitate the optimised development of Stage 2 of the wind farm.

These modifications involve changing the dimensions of the wind turbines (including raising the maximum tip height from 150 to 200 m and the rotor diameter from 121 to 170 m), changing the layout of the approved turbines and ancillary infrastructure, reducing the number of turbines from 49 to 48, increasing the overall project area and increasing the vegetation clearing limits.

The proposed modification would increase the electricity generated by Stage 2 by 40% (from 122.5 to 171 MW) and enable this electricity to be supplied to the National Electricity Market.

Engagement

The Department publicly exhibited the application and its Environmental Assessment from 13 February 2018 until 6 March 2018. The Department also visited the site and notified Glen Innes Severn Council, Inverell Shire Council, other relevant Government agencies, previous submitters and landowners adjoining the project boundary about the modification application.

The Department and its independent visual expert also visited 8 residences around the site to gain a better appreciation of the potential impacts associated with the modification and to further understand the concerns of individual landowners.

The Department received 60 submissions, including 12 from government agencies, 1 from a special interest group, and 47 from the public. While most public submissions objected to the proposal, only 6 objections were received from landowners located within 50 km of the project and only 4 of these submissions (3 from individual landowners and 1 from a special interest group) were located within 5 km of the project.

The key issues raised in community submissions objecting to the modification related to potential biodiversity and visual impacts. The three objections from local landowners primarily raised concerns about potential amenity impacts (noise and visual), erosion and sediment control and property devaluation.

None of the government agencies objected to the proposed modification however some sought additional information or clarification and recommended changes to the existing conditions.

Assessment

In assessing the merits of the modification application, and particularly the potential impacts on the local community, the Department carefully considered the potential visual and biodiversity impacts of the proposal. Specifically, the Department considered the potential visual impacts of the modified turbines and project layout and the biodiversity impacts associated with the revised clearing calculations.

While the Department acknowledges concerns that some members of the wider community have about wind farms, many of these issues raised in submissions were either considered during the assessment of the original project or are not directly relevant to the assessment of this modification application.

Notwithstanding, the Department has considered the issues raised in submissions and has sought to strengthen the existing conditions of approval to address some of the community's concerns about visual, noise and biodiversity impacts, as well as compliance and reporting measures. This has included updating the conditions to reflect comments from the relevant government agencies.

The Department's assessment focused on the incremental change between the approved and modified turbines and project layouts, and the potential impacts on non-associated residences with views of the turbines in accordance with the performance objectives identified in the *NSW Wind Energy Framework's Visual Assessment Bulletin* (the Bulletin), as well as an assessment of the proposed biodiversity impacts from the increased vegetation clearing and modified turbine dimensions.

Visual Impacts

Visual Magnitude

The Department's visual assessment considered the incremental change between the approved and modified turbines as well as the proposed changes to the overall turbine layout and Stage 2 project area. The Department then considered the potential impacts on residences with views of the modified turbines.

In accordance with the Bulletin, 200 m turbines have the potential to result in visual magnitude impacts on residences located within 4 km of a turbine. Goldwind has obtained neighbour agreements with the owners of 38 of the 49 non-associated residences/properties located within 4 km of the proposed Stage 2 turbines.

As a result, the Department's assessment of visual magnitude impacts focused on the remaining 11 non-associated residences. The Department also engaged O'Hanlon Design Landscape Architects to review Goldwind's visual impact assessment and to provide a report and independent advice in relation to the likely visual impacts.

The Department's assessment found that while the larger turbines would result in significant visual magnitude impacts on 2 residences, the remaining 9 residences would experience either a minor increase, reduction or no change in the visual impacts already approved. In this regard, the Department acknowledges this is largely due to Goldwind actively seeking to avoid impacts by increasing the setback distance from turbines for the majority residences. This included relocating 20 turbines up to 7.5 km away from approved locations to areas of newly acquired land with fewer neighbouring residences, as well as the removal of 1 turbine from the project.

The Department considers that the existing visual impact mitigation conditions that requires visual screening to be implemented on request to any non-associated residences within 5 km of a turbine remain appropriate for these residences.

Notwithstanding, the Department's visual assessment identified 2 residences (N180 and N190) that would experience an increase in visual magnitude impacts and high visual impact ratings, including potentially moderate to high impacts from aviation hazard lighting assuming a worst-case lighting scenario (noting the Department has since recommended mitigation to reduce these impacts, as discussed separately below). The Department notes that these residences are owned by a single (previously associated) host landowner, who has since chosen to withdraw from the project for commercial reasons.

The Department notes that this landowner has not chosen to enter into any form of negotiated agreement with Goldwind. The Department also notes that irrespective of the modification (including the removal of turbines from the land proposed to be excised from the project), these residences would still have experienced high visual impacts from the approved Stage 2 turbines.

The Department's independent visual expert has advised that to materially reduce the impacts to these residences, at least 4 turbines would need to be removed. Goldwind has advised this would significantly impact the financial viability of Stage 2. Given the scale and proximity of the wind turbines to these residences, the Department accepts that there are limited options for further reducing these impacts through visual screening.

Given the above, the Department considers that in this instance, it is not reasonable to require Goldwind to further avoid or mitigate the impacts on these residences, particularly given that overall, the visual impacts of the proposed modification are not so significant or widespread to warrant the refusal of the proposed modification. However, due to the increased visual impacts (namely dominance effects) that would arise from the proposed modification, and the existing high level of impact, the Department considers it reasonable for the landowner of N180 and N190 to be afforded voluntary acquisition rights for a period of up to 3 years should they wish to sell these properties as a result of the visual impacts once the project is constructed.

Night-Lighting

The Department acknowledges concerns raised by some members of the community and Inverell Council about the negative effects of aviation hazard lighting in the dark sky, citing recent concerns about the impacts of lighting at the Sapphire Wind Farm and given the Stage 1 turbines are currently not required to be lit. CASA has recommended that due to the increase in height, some of the Stage 2 turbines should be lit with steady red medium intensity lighting at night in accordance with contemporary requirements.

The Department's visual expert identified that without any mitigation, 8 properties would potentially experience significantly higher night-lighting impacts as a result. However due to the distance between the closest wind farms, surrounding topography and existing vegetation, significant cumulative night lighting effects were unlikely.

In recognition of the community's concerns, and to help mitigate these impacts, the Department has recommended a condition requiring Goldwind to ensure any aviation hazard lighting installed utilises an aircraft detection lighting system to minimise visual impacts, which is supported by CASA. In addition, CASA has advised that the intensity of aviation hazard lighting to be installed can be reduced by 90%, and that only around 60% of the turbines would need to be lit. The Department considers that with the recommended conditions and the implementation of reduced-intensity lighting as per CASA's recommendation, the night-lighting impacts associated with the Stage 2 turbines can be largely avoided whilst still maintaining safety standards for aviation operations.

Biodiversity Impacts

The estimated clearing of native vegetation required for the project would increase by 169 ha, including approximately 72.5 ha of moderate/good condition endangered ecological communities (EEC). Specifically, the modification proposes to increase the clearing limits for Ribbon Gum Woodland EEC by around 65 ha (from 28 ha to 93 ha) and to allow clearing of 8.5 ha of Box Gum Woodland EEC (currently not limited in the project approval).

The increase in the estimated clearing impacts is largely a consequence of calculating impacts using a conservative detailed engineering design of the project infrastructure and the updated ecological impact assessment methodology. This produces a more conservative and extensive approach for assessing disturbance areas than what was originally assessed when the project was first approved. In this regard, the current project approval only includes a clearing limit of 28 ha for the Ribbon Gum Woodland endangered ecological community (EEC) for the project. This limit was determined using older, high-level vegetation mapping and a basic infrastructure design, without detailed design and extensive mapping of all the vegetation types to be impacted, as per more contemporary assessments and approvals.

Only a relatively small proportion of the additional clearing is attributable to the larger turbine footings and layout changes proposed as part of the modification application. The larger hardstand areas still fall within relatively cleared open terrain and the detailed engineering design has been used to reduce impacts by relocating infrastructure where feasible.

This means that irrespective of the modification, if the more conservative and contemporary biodiversity assessment methodology was now applied to the approved Stage 2 project, together with the more detailed infrastructure design, it would identify that substantially more vegetation clearing would be required to construct the project as approved.

However, despite the revised clearing impacts, the Department's assessment found that the modified project would not result in any significant impacts on threatened species or EECs and would not pose a significant or unacceptable level of risk to bird and bat species due to the larger turbines. Further, the more conservative biodiversity assessment methodology has also been applied to the calculation of Goldwind's offset obligations, described further below.

The Department has also consulted with OEH to develop strengthened biodiversity conditions for the project to manage the residual biodiversity impacts associated with the modification. These conditions include requirements to:

- adhere to revised operating conditions including strict vegetation clearing limits for EECs;
- undertake surveys for the Small Snake Orchid to confirm it is not present within the proposed Stage 2 disturbance areas; and

- prepare and implement an updated Construction Flora and Fauna Management Plan and BBAMP in consultation with OEH.

The Department notes Goldwind has entered a Biobanking Agreement for a 475 ha offset site (the 'Tangari' property), which would generate 6,505 ecosystem credits, more than the currently calculated 5,816 credits required for the modified project. The Department has updated the conditions to require Goldwind to either demonstrate that the Tangari BioBanking site provides sufficient credits for the Stage 2 disturbance areas or to prepare an updated Biodiversity Offset Package prior to the commencement of construction of Stage 2 detailing how the proposed final offset credit obligation would be discharged.

Should any additional credits be required following the final clearing calculations or survey for the Small Snake Orchid, Goldwind would be required to discharge this obligation in accordance with the NSW Biodiversity Offsets Scheme.

Subject to the recommended conditions, OEH has no residual concerns with the impact of the modification on biodiversity.

Evaluation

With the implementation of the amended conditions, the Department is satisfied that the modified project achieves a reasonable balance between maximising the efficiency of the wind resource development and minimising the potential impacts on the local community and environment.

In this regard, the proposed modification would increase the project's overall energy generation and allow the benefits of the project to be realised. Stage 2 of the project would deliver a range of economic benefits, including up to 200 full time construction jobs and 2 full time operational jobs, with a capital investment of up to $300 million.

Furthermore, Goldwind would contribute up to $295,000 a year towards community enhancement and various projects within the local community.

The project is also consistent with the Commonwealth's *Renewable Energy Target* and the NSW *Climate Change Policy Framework* as it would generate approximately 995,000 megawatt hours of renewable energy per year, equivalent to 169,000 homes annually, with estimated emissions savings in the order of 955,000 tonnes CO2-e per year.

On balance, the Department considers that the proposed modification has merit, is in the public interest and is approvable, subject to the amended conditions of approval.

Contents

1. Introduction

Goldwind has approval to construct and operate the White Rock Wind Farm (the project), which is located approximately 20 kilometres (km) west of Glen Innes, within the Glen Innes Severn and Inverell local government areas (see **Figure 1** below).

Figure 1 | Regional Context Map

The project was originally approved by the then Deputy Director-General of the Department of Planning and Infrastructure on 10 July 2012. The project approval has been modified four times, noting that the application for Modification 1 was withdrawn prior to determination. None of these modifications included changes to the turbine dimensions or approved turbine locations. Modification 4 allowed for the construction of a new 132 kV electricity transmission line and grid connection infrastructure, which would enable the project to connect to the existing 330 kV Armidale - Dumaresq transmission line that forms part of the Queensland - NSW interconnection system (see **Figure 3**). The transmission line (yet to be constructed) would free up capacity on the existing network to allow the future optimisation of Goldwind's operations, including its proposed Stage 2 operations described below.

As currently approved, the project includes the construction and operation of up to 119 wind turbines up to 150 metres (m) in height, and associated infrastructure. Development of the project includes two stages. Stage 1, comprising 70 turbines and associated ancillary infrastructure, commenced construction in 2017 and is now operational and capable of generating 175 megawatts (MW) of electricity.

Stage 2 comprises 49 turbines and is not yet constructed. As approved, the Stage 2 turbines would be capable of generating 122.5 MW of electricity.

Both stages of the project are located on the same site (see **Figure 3**) and would share key infrastructure, including transmission cabling, grid connections and access tracks. The approved White Rock Solar Farm, also owned by Goldwind, is located within the project area.

Currently, the Stage 1 turbines are visible from the Gwydir Highway, extending approximately 14 km to the south along a partially vegetated ridgeline. **Figure 2** shows a view of the Stage 1 turbines, with a maximum tip height of 150 m.

Figure 2 | Photo of constructed Stage 1 turbines

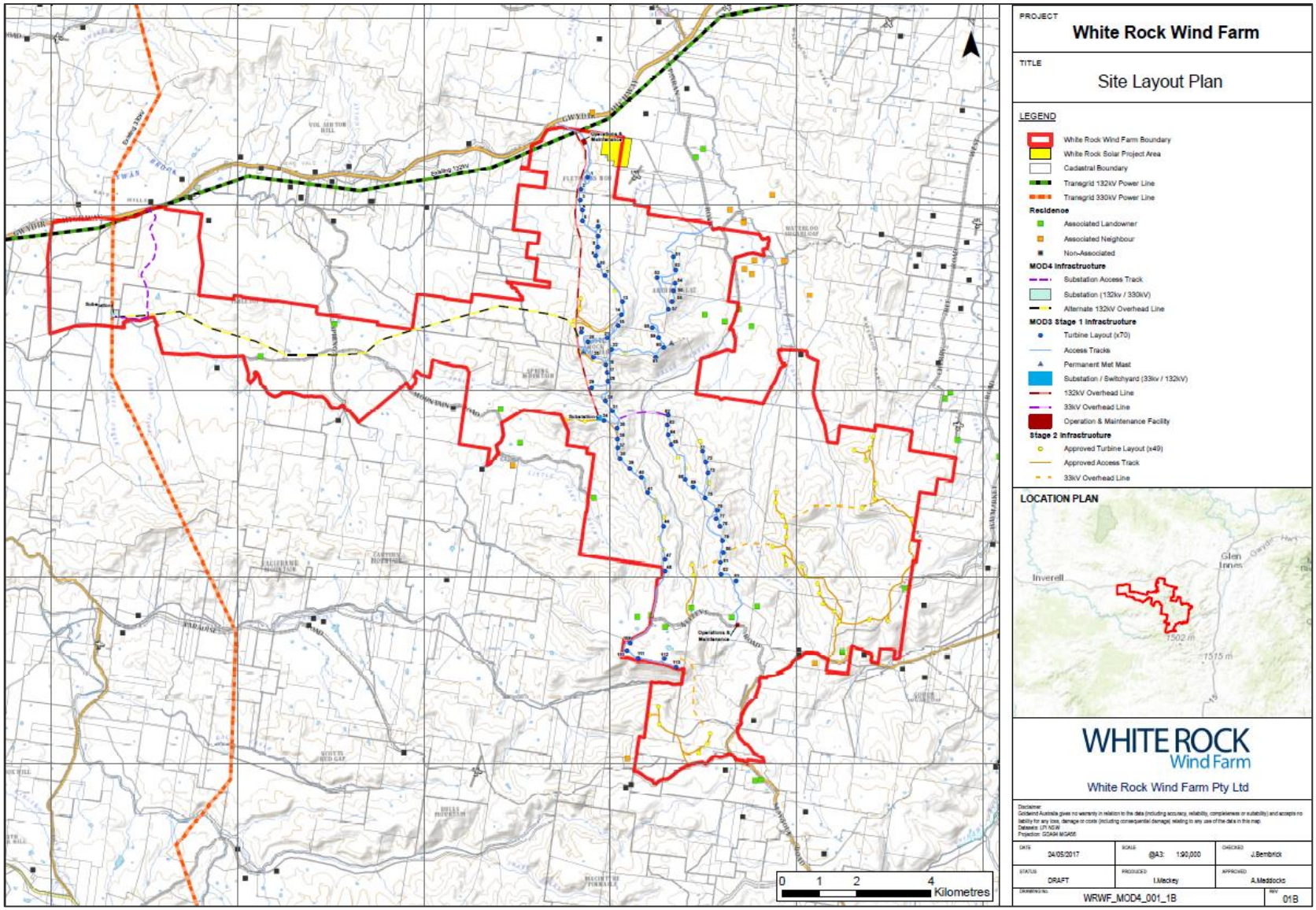

Figure 3 | Approved White Rock Wind Farm (including Stage 1 and Stage 2 infrastructure and 132 kV transmission line)

2. Proposed Modification

Goldwind is seeking further modifications to the project approval to facilitate the development of Stage 2 of the wind farm.

These modifications are described in detail in the Environmental Assessment (EA) (see **Appendix D**), the Response to Submissions (RTS) (see **Appendix F**) and additional information that was submitted by Goldwind in support of the application (see **Appendix G**).

The key aspects of the proposed modification involve changing the dimensions of the wind turbines, changing the project layout (including the locations of turbines and ancillary infrastructure), expanding the project area and increasing the vegetation clearing limits for the project.

These modifications are summarised in more detail below and shown on **Figures 4**, **5**, **6** and **8**.

Turbine Dimensions and Layout

Goldwind proposes to modify the dimensions of the Stage 2 turbines to increase the blade tip height (from 150 m to 200 m) and increase the rotor diameter (from 121 m to 170 m). While Goldwind has proposed two turbine model options (either 140 m or 170 m blade diameter), the Department has assessed the impacts of the 'worst-case' 170 m option. **Table 1** compares the approved and proposed turbine dimensions.

Table 1 | Approved and proposed Stage 2 (170 m blade diameter option only) turbine specifications

Component	Approved Stage 2 Turbines	Modified Stage 2 Turbines	Change
Number of turbines	49	48	1 less turbine
Maximum blade tip height	150 m	200 m	33 %
Minimum blade tip height	29 m	30 m	3 %
Hub height	89.5 m	115 m to 130 m	28.5 % to 45 %
Rotor diameter	121 m	Up to 170 m	40 %
Blade length	55 m	Up to 85 m	55 %
Swept area per turbine	11,499 m^2	Up to 22,698 m^2	97 %
Nominal power per turbine	2.5 MW	Up to 3.57 MW	43 %
Total generation capacity	122.5 MW	Up to 171 MW	40 %

Goldwind's primary justification for the larger turbine dimensions is the opportunity to adopt new turbine technology that would increase the generation capacity of Stage 2 by 40% with lower production costs.

Goldwind also proposes to reduce the number of Stage 2 turbines from 49 to 48 and to relocate 29 turbines from the currently approved locations (see below).

Project Layout and Area

The proposed turbine relocations are shown in **Figures 5** and **6** and include:

- relocating 9 turbines up to 125 m from the currently approved locations; and
- relocating 20 turbines between 700 m to 7.5 km from the currently approved locations, including:
    - 11 turbines between 3 - 7.5 km to a new project area southwest of the approved layout which has fewer neighbouring residences (shown on **Figure 6** as the Spring Mountain turbine cluster);
    - 6 turbines between 2 - 3 km (shown on **Figure 6** as the Furracabad turbine cluster); and
    - 3 turbines between 700 - 865 m (shown on **Figure 6** as the Maybole turbine cluster).

The proposed changes to the turbine layout are to accommodate the increase in turbine dimensions, reduce visual impacts on residents and to reflect the proposed changes in the project area.

In this regard, Goldwind are proposing to increase the overall project area from 13,176 to 15,053 hectares (ha). The increase includes additional areas of land southwest and east of the approved project area, and removal of several lots in the southeast of the approved project area (see **Figure 4** below). The additional areas of land are a consequence of detailed project design to mitigate the visual impacts of the larger turbines on surrounding residences, and the removal of land due to one host landowner withdrawing their involvement from the project.

Goldwind is also proposing to amend the layout of ancillary infrastructure including the addition of temporary construction compounds and relocation of some access tracks and overhead transmission cabling (see **Figure 5**). Goldwind is also seeking approval for the option to construct an alternative 330 kV substation footprint, as described in **Appendix G**.

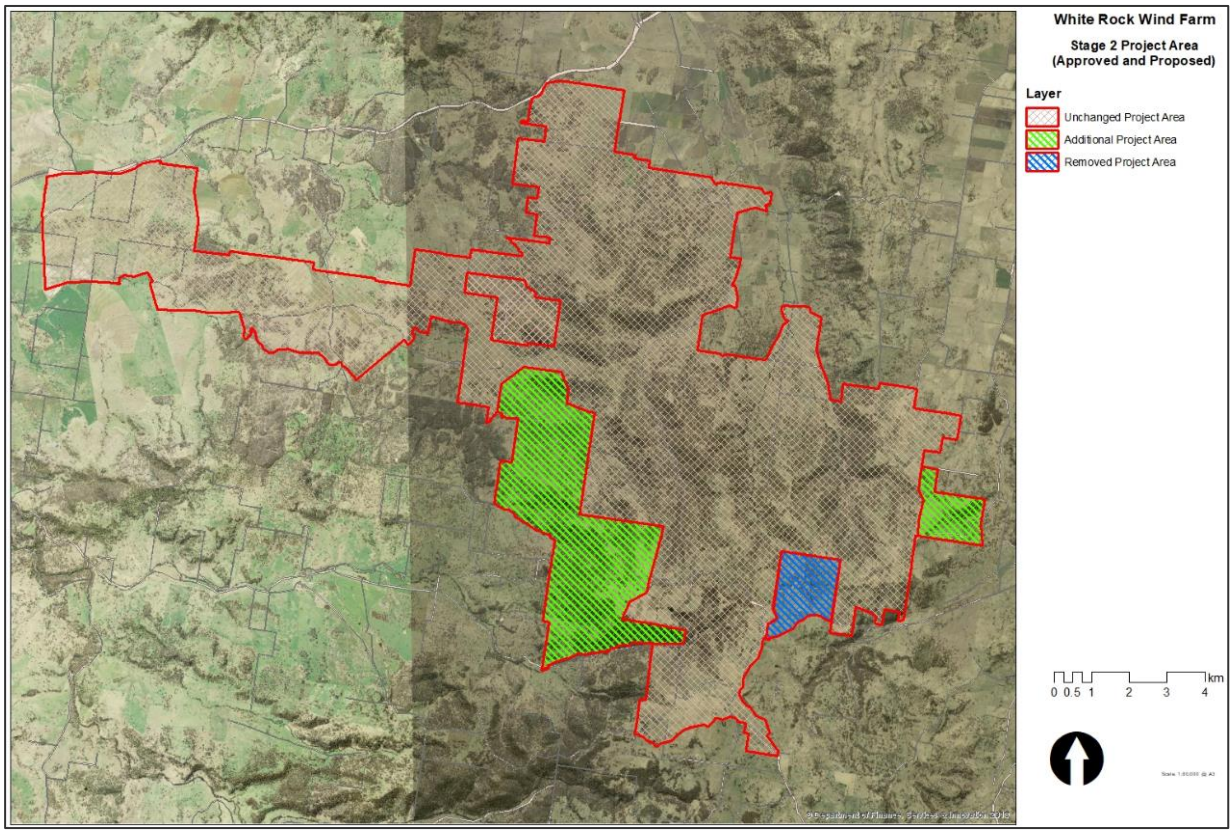

Figure 4 | Changes to land ownership

Vegetation Clearing

The estimated clearing of native vegetation required for the project is proposed to increase by 169 ha, including approximately 72.5 ha of moderate/good condition endangered ecological communities (EEC). The remaining vegetation (around 50%) to be impacted is highly modified, low condition and exotic dominated vegetation.

The modification proposes to increase the project's clearing limits for Ribbon Gum Woodland EEC by around 65 ha (from 28 ha to 93 ha) as well as allow for clearing of up to 8.5 ha of Box Gum Woodland EEC (currently not limited in the project approval).

Goldwind had identified in the Modification 4 application that the clearing estimations for the project had been under-calculated and that the clearing limit for Ribbon Gum EEC would only cover the clearing requirements for Stage 1 and the alternative grid connection infrastructure approved under Modification 4.

Goldwind has advised that the increase in the estimated clearing impacts is largely a consequence of calculating the impacts using a conservative detailed engineering design of the project infrastructure and the updated ecological impact assessment methodology, as discussed further in **section 6.2**. Goldwind has advised that irrespective of the modification, it would not be able to comply with the current approval limits to build Stage 2 of the project.

3. Strategic Context

3.1 Renewable Energy

In 2018, NSW derived approximately 17.4% of its energy from renewable sources. The rest was derived from fossil fuels, including 79% from coal and 3.1% from gas. However, there are currently no plans for the development of new coal fired power stations in NSW, and the development of renewable energy sources, like wind and solar farms, has been identified as a key development priority for the diversification of energy sources in the future.

This is highlighted in the 2017 *Independent Review into the Future Security of the National Electricity Market* (the Finkel Review), which outlines a strategic approach to ensuring an orderly transition from traditional coal and gas fired power generation to generation with lower emissions.

A number of State and Commonwealth Government initiatives, including the *Renewable Energy Target*, *NSW Climate Change Policy Framework* and *Renewable Energy Action Plan* set targets and objectives for reducing greenhouse gas emissions and promoting the development of renewable energy. Under the *Renewable Energy Target*, more than 20% of Australia's electricity would come from renewable energy by 2020. It is estimated that an additional 5,400 MW of new renewable energy capacity will need to be built by 2020 to achieve the Renewable Energy Target.

These initiatives, together with the dramatic reduction in development costs for new large-scale renewable energy generation projects and rapid improvements in technology, means the development of renewable energy sources like wind and solar farms, continues to experience rapid growth.

The NSW Government has identified 10 potential Renewable Energy Zones across three broad regional areas (New England, Central West and South West regions of NSW) as 'priority' areas for renewable energy development. The project is located within the New England Energy Zone, which has some of the highest wind resources in NSW. This zone currently comprises several large-scale renewable energy projects, including wind and solar farms (see **Figure 7**).

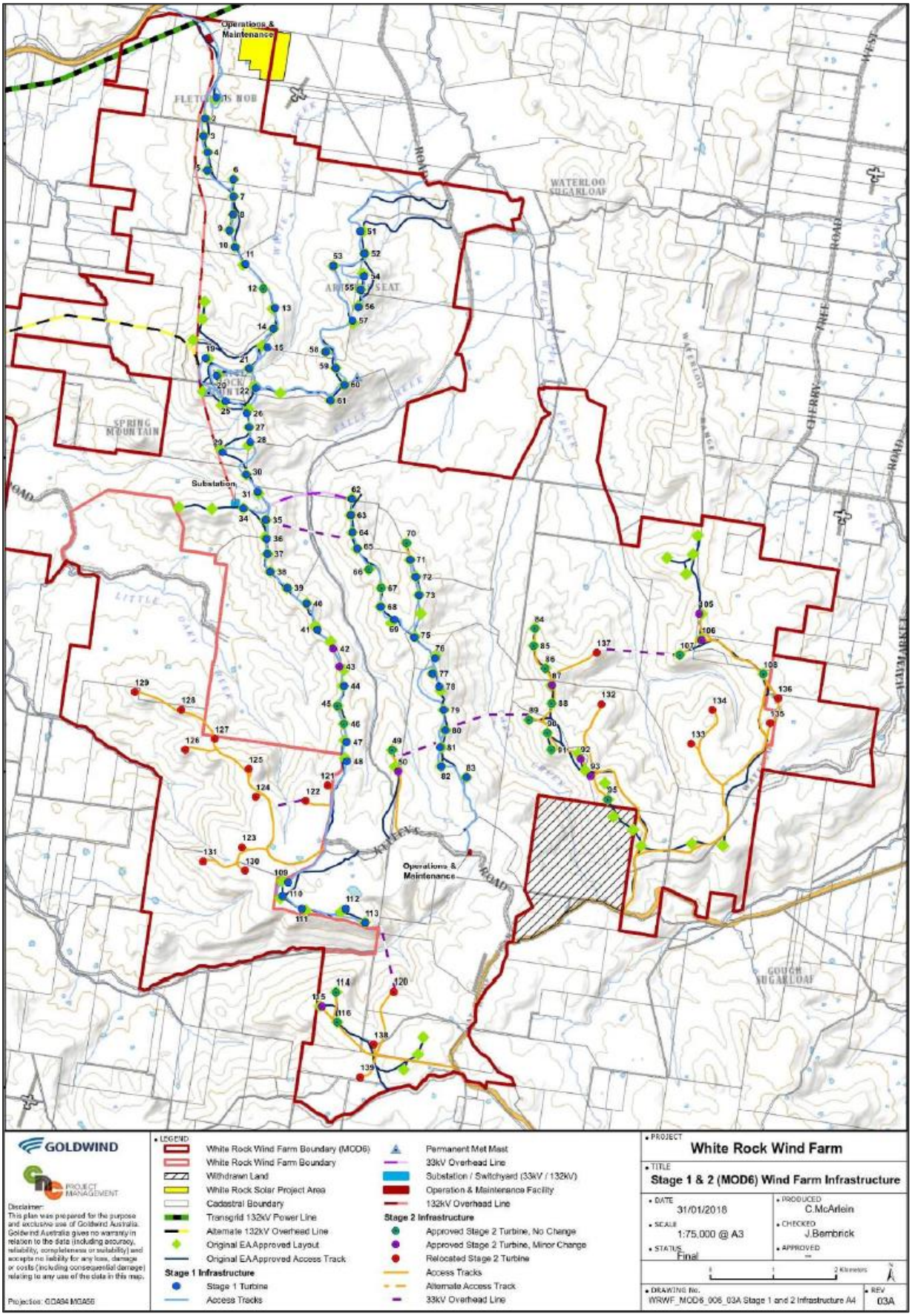

Figure 5 | The project as proposed including relocated Stage 2 turbines and changes to the project area

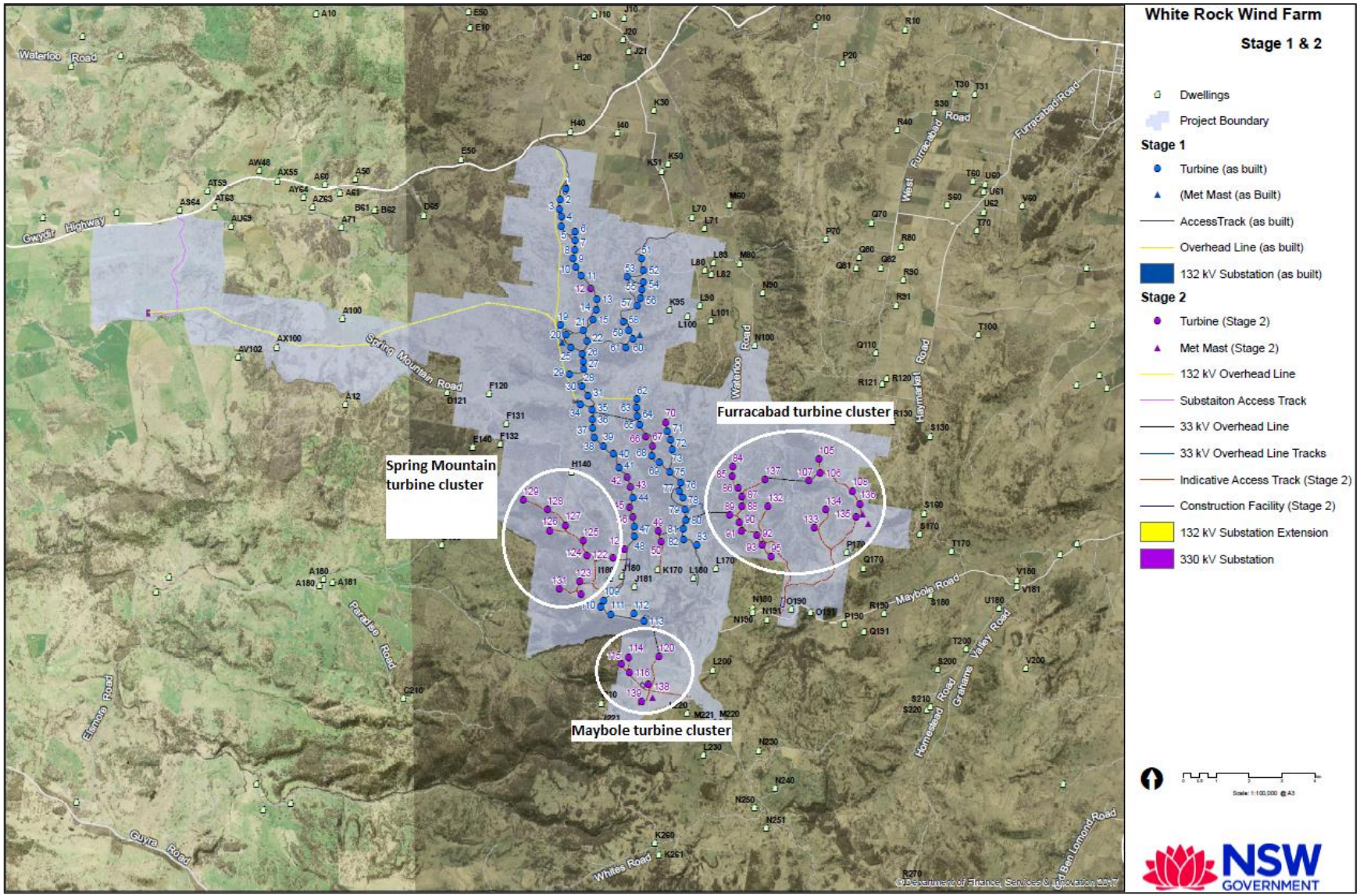

Figure 6 | Stage 2 turbine clusters

Renewable energy projects proposed or approved within this zone include the:

- Glen Innes Wind Farm (67.5 MW – approved but not constructed – a modification application is currently under assessment by the Department);
- White Rock Solar Farm (20 MW – operational);
- Sapphire Wind Farm (270 MW – operational);
- Sapphire Solar Farm (180 MW – approved); and
- Sundown Solar Farm (600 MW – proposed).

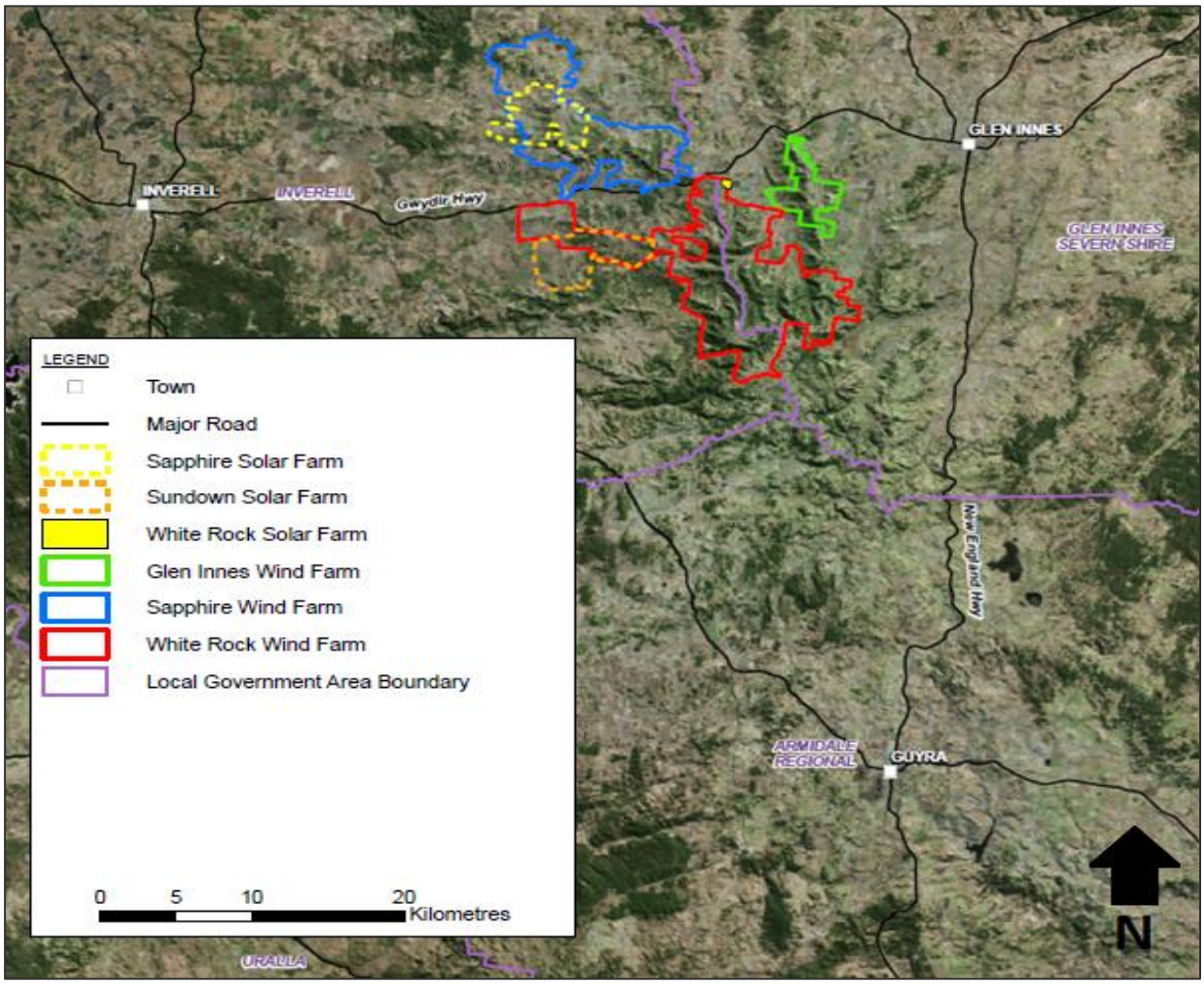

Figure 7 | Renewable energy projects in the locality

3.2 NSW Wind Energy Framework

In December 2016, the Department released the *NSW Wind Energy Framework* (the Framework). The Framework replaces the draft wind farm planning guidelines, which were exhibited in 2011, and seeks to provide greater clarity, consistency and transparency for industry and the community regarding both assessment and decision-making on wind energy projects.

The Framework provides a merit-based approach to the assessment of wind energy projects, which is focused on the issues unique to wind energy, particularly noise and visual impacts. Although the Framework applies to the proposed modification, it was developed after the assessment and approval of the original project.

The key documents comprising the Framework include the *Wind Energy Guideline*, *Visual Assessment Bulletin*, *Noise Assessment Bulletin* and *Standard Secretary's Environmental Assessment Requirements*.

The *Visual Assessment Bulletin* (the Bulletin) identifies a number of visual performance objectives that can be used to assess potential visual impacts associated with wind energy development. For the proposed modification, the performance objective for visual magnitude identifies that 200 m turbines have the potential to result in significant impacts on residences within 4 km of a turbine.

The performance objective requires proponents to either avoid[1] or provide detailed justification for 200 m turbines located within 4 km of any non-associated residence identified as having a higher sensitivity to visual impact (see **section 6.1**). The Bulletin also requires proponents to manage impacts and describe proposed mitigation measures for 200 m turbines located within 2.7 km of any non-associated residence identified as being in a moderate zone of visual influence.

Other key visual performance objectives identified in the Bulletin are landscape scenic integrity, cumulative impacts, aviation hazard lighting and shadow flicker. The Department's visual assessment and consideration of these performance objectives is discussed further in **section 6.1**.

3.3 Site and Surrounds

The project site is located within the Great Dividing Range of NSW comprising areas of elevation up to 1,500 m above sea level. The project's development footprint covers approximately 13,176 ha, which includes both cleared agricultural land and remnant woodland.

An undulating landscape of ridgelines, valleys and mountains surrounds the project area. While the landscape once resembled a natural-appearing and pastoral landscape character, construction of Stage 1 of the wind farm, the White Rock Solar Farm and the Sapphire Wind Farm has resulted in material changes to the local landscape over recent years.

There are 49 rural residences located within 4 km of the proposed Stage 2 turbines, with most of these residences located to the east and south of the project area. A number of residences are located within the rural community of Maybole, which is located approximately 2.5 km to the southeast (see **Figure 8**).

The Department notes the majority of these residences (78%) are host or 'associated' landowners, who own land and residences both on and adjoining the project site (see **Figure 8**). These landowners have entered into commercial agreements with Goldwind to facilitate the development of the project, including accepting the impacts of the project. As such, these residences are considered to be associated with the project for the purposes of the Department's assessment.

Eleven non-associated residences are located within 4 km of a proposed Stage 2 turbine. Potential amenity impacts on these residences are discussed in **section 6**.

[1] For new projects or modifications where the turbines are proposed in locations not previously approved

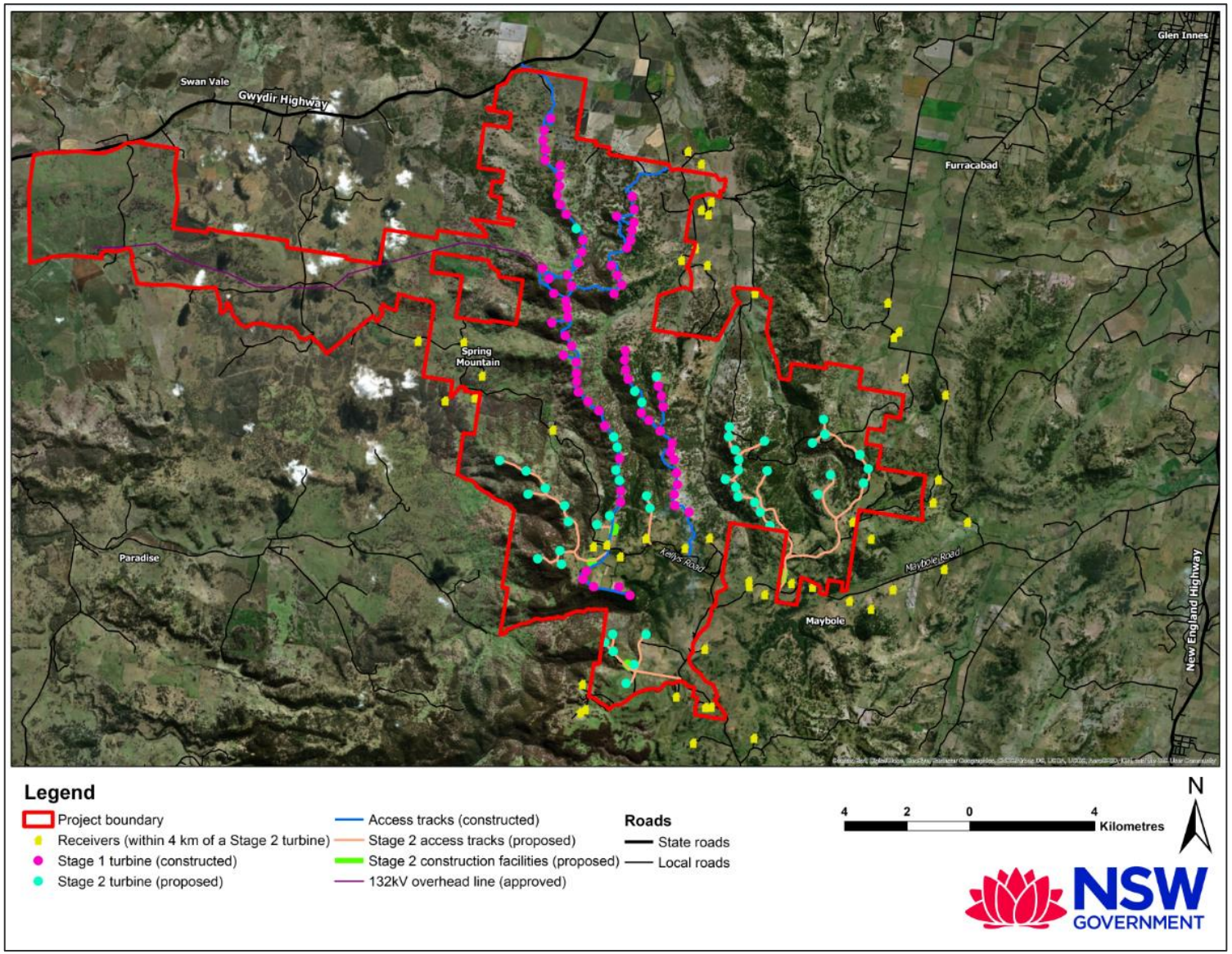

Figure 8 | The proposed layout of the White Rock Wind Farm

4. Statutory Context

4.1 Modifying a Project Approval

The project was approved under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and is a transitional Part 3A project under Schedule 2 to the *Environmental Planning and Assessment Act (Savings, Transitional and Other Provisions) Regulation 2017*.

While the power to modify transitional Part 3A projects under Section 75W of the EP&A Act is being discontinued, because the request for this modification was made before 1 March 2018, the provisions of Schedule 2 (clause 3) continue to apply. Consequently, this modification application has been assessed under Section 75W of the EP&A Act.

The Department is satisfied that the proposed modification is within the scope of Section 75W as no additional turbines are proposed as part of the modification, and the environmental impacts of the modification would not substantially increase the impacts of the approved project.

The project is also declared to be a "critical infrastructure project" under the EP&A Act, in accordance with a declaration made by the then Minister for Planning on 11 November 2009 concerning energy generating developments with capacity to generate at least 30 MW. The declaration of the project as critical infrastructure means that the project is, in the opinion of the Minister, essential for the State of NSW for economic, environmental or social reasons.

4.2 Approval Authority

The Minister for Planning is the approval authority for this modification application. However, under the Minister's delegation of 14 September 2011, the Independent Planning Commission must determine the request as more than 25 public submissions by way of objection were received during the exhibition of the application.

4.3 Commonwealth and other Approvals

There is no Commonwealth approval that applies to the project. However, Goldwind needs to obtain an approval from the Commonwealth Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), because the proposed modification was declared a 'controlled action' under that Act due to the potential for significant impact to listed threatened species and vegetation communities[2], specifically White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland critically endangered ecological community (CEEC).

The assessment process has not been accredited under the Assessment Bilateral Agreement between the NSW and the Australian Governments. Consequently, any impacts on matters of national significant will be subject to an entirely separate assessment process undertaken by the Commonwealth in accordance with the EPBC Act.

The Department notes that under the conditions of approval, Goldwind is required to obtain a number of further approvals, including (but not limited to) approvals under the *Protection of the Environment Operations Act 1997* and *Roads Act 1993*.

Accordingly, Goldwind would be required to consult further with the relevant Government agencies regarding the necessary approvals, prior to commencing construction of Stage 2.

[2] The proposal was declared a controlled action on 13 April 2018 EPBC Referral (2018/8156).

5. Engagement

5.1 Department's Engagement

The Department publicly exhibited the modification application and EA from Tuesday 13 February 2018 until Tuesday 6 March 2018 (21 days). The Department also notified Glen Innes Severn Council, Inverell Shire Council, other relevant Government agencies and landowners adjoining the project boundary. Previous submitters were also notified of the modification application and invited to make a submission.

During the assessment process, the Department visited the site and consulted with local residents, key Government agencies and Goldwind.

The Department and its independent visual expert visited 8 residences around the site to get a better appreciation of the potential impacts associated with the modification and to further understand the concerns of individual landowners.

5.2 Summary of Submissions

In response to the exhibition, the Department received 60 submissions, including:

- advice from 12 Government agencies;
- 47 public submissions; and
- 1 submission from a special interest group.

A full copy of the submissions is available via the Department's website (see **Appendix E**).

Goldwind's provided a Response to Submissions (RTS) in response to all matters raised in submissions (see **Appendix F**), as well as additional information to address matters raised by the Department and other agencies during the assessment process (see **Appendix G**). This included a revised Biodiversity Assessment Report (BAR) to address comments provided by the Office of Environment and Heritage (discussed below).

5.3 Key Issues – Government Agencies

While none of the agencies objected to the proposed modification, several agencies commented on aspects of the proposal and approved project, relevant to their regulatory responsibilities.

Following its review of the RTS, the **Environment Protection Authority** (EPA) noted it is satisfied that Goldwind would meet the required noise criteria and recommended that Goldwind review and if necessary vary its Environment Protection Licence (EPL No. 20665) to reflect any changes to the schedule of land associated with the proposed modification. The Department has considered noise related matters further in **section 6.3**.

While the **Office of Environment and Heritage** (OEH) initially raised concerns about the adequacy of Goldwind's assessment of bird and bat strike impacts and the flora and fauna survey effort, these concerns were resolved through the provision of subsequent information by Goldwind, including a revised BAR and additional ecological survey information. OEH did not raise any concerns over Goldwind's justification for needing to increase the vegetation clearing limits for the modified Stage 2 works, subject to the impacts being appropriately offset. Although OEH had residual concerns about the unconfirmed presence of the Small Snake Orchid on the site (due to its potential to occur on the site), the Department has recommended a condition requiring Goldwind to undertake surveys and calculate any offset liability for the orchid, prior to the commencement of construction of Stage 2, which OEH has accepted.

The **Department of Industry – Lands & Water** (DoI L&W) recommended Goldwind update its Construction Soil and Water Management Plan, and design and construct any watercourse crossings in accordance with the relevant guidelines. The Department notes the existing conditions of approval require Goldwind to develop a Construction Soil and Water Quality Management Plan and update this plan to reflect any project changes. The existing conditions also require Goldwind to comply with operating conditions relating to erosion and sediment control and ensure that any activities are undertaken in accordance with the relevant guidelines, including the *Guidelines for Controlled Activities on Waterfront Land*. The Department has considered these matters further in **section 6.4** of this report.

While the **Division of Resources and Geoscience** (DRG) raised concerns about resource sterilisation, these concerns are not currently relevant for the proposed modification as they relate to a neighbouring wind farm. DRG also recommended Goldwind consult with the owners of an adjacent quarry and consider sourcing construction materials for Stage 2 from local suppliers. Goldwind confirmed it was consulting with the quarry and has committed to sourcing construction materials locally.

Roads and Maritime Services (RMS) requested further assessment of the compatibility of the proposed blade length, specialised blade haulage vehicle and associated vehicle swept path within the proposed haulage route. While RMS confirmed it was satisfied with Goldwind's response to the matter, it noted the haulage route would require some upgrade works to accommodate the larger 85 m blades, and that Goldwind would need to complete all upgrades prior to commencing transport for Stage 2 as proposed. The Department has recommended a condition to this effect, as discussed further in **section 6.4**. RMS also noted that Goldwind would need to update the project's Construction Traffic Access Management Plan (CTAMP) and obtain the relevant permits and approvals, prior to commencing transport for Stage 2.

Glen Innes Severn Council (Glen Innes Council) raised concerns relating to traffic and transport impacts, noise and waste management. The Department notes the existing conditions of approval already require Goldwind to comply with obligations relating to waste management and traffic management. The Department has also recommended strengthening these conditions to reflect contemporary guidelines for waste management, and require Goldwind to submit a report detailing any road upgrades required. These matters are considered further in **sections 6.3** and **6.4**.

Inverell Shire Council (Inverell Council) raised concerns in relation to potential visual impacts associated with aviation hazard lighting, citing the community's recent concerns about the impacts of lighting at the Sapphire Wind Farm. The Department has recommended that the conditions of approval be strengthened to require that any lighting installed utilises an aircraft detection lighting system to minimise visual impacts. The Department has considered this matter further and addressed this in **section 6.1**.

Civil Aviation Safety Authority (CASA) did not raise any concerns about the proposed modification but recommended that some of the Stage 2 turbines should be lit with steady red medium intensity lighting at night in accordance with contemporary requirements. CASA also reviewed Goldwind's draft Obstacle Lighting Layout Plan and provided advice in relation to the number and intensity of lights that may be required, which the Department has considered further in **section 6.1.**

Airservices Australia, **NSW Rural Fire Service** (RFS), and **Heritage Council of NSW** did not raise any concerns about the proposed modification, subject to Goldwind complying with relevant existing and recommended conditions of approval.

Finally, **NSW Health - Hunter New England Local Health District** did not raise any concerns over the proposed modification and noted advice from the National Health and Medical Research Council that there is no consistent evidence that wind farms cause adverse health effects in humans.

5.4 Key Issues – Community

Of the 47 public submissions received, 45 objected to the proposal. However, the Department notes that only 6 of these were received from submitters residing within 50 km of the project. Most submitters objecting to the proposal reside in the Southern Tablelands region of NSW, located more than 700 km south of the project site.

Table 1 | Community Submissions

Submitters	Total	Object	Comments
< 5 km	3	3	0
5 – 50 km	3	3	0
> 50 km	41	39	2
TOTAL	**47**	**45**	**2**

The key issues raised in the wider community submissions related to visual, biodiversity and noise impacts. These issues are discussed in detail below in **sections 6.1**, **6.2** and **6.3**.

The three objections received from landowners residing within 5 km of the proposed layout raised concerns relating to noise, erosion and sediment control (specifically management of access tracks on steep slopes and future land use), visual impacts and loss of property value. The Department notes that one submission was received from a non-associated residence, S160, which is located 1.9 km from the proposed modified Stage 2 turbines. The submission raised concerns about the noise and visual impacts of both the constructed Stage 1 and proposed Stage 2 turbines. The Department has specifically considered the visual impacts to this property in **section 6.1** and addressed community concerns about noise in **section 6.2**.

5.5 Key Issues – Special Interest Groups

Waterloo Station Pastoral Company Pty. Ltd. as trustee for The Waterloo Pastoral Trust objected to the proposal citing broader concerns about the potential amenity impacts (namely visual and noise) of the larger turbines on residences surrounding the project. The Department has considered these matters in its assessment of visual and noise impacts in **sections 6.1** and **6.3**. This group did not raise any specific concerns about the property 'Waterloo Station' itself, which is located approximately 6 km north of the closest proposed Stage 2 turbine.

6. Assessment

In assessing the merits of the modification application, the Department has considered the:

- existing conditions of approval;
- previous documentation associated with the original application for the project;
- the EA, submissions, RTS and additional information for the proposed modification;
- advice from the independent visual expert commissioned by the Department;
- community views obtained during the Department's consultation activities;
- relevant environmental planning instruments, policies and guidelines; and
- relevant provisions of the EP&A Act, including the objects of the Act.

A list of the key documents that informed the Department's assessment is provided in **Appendix A**. The following is a summary of the findings of the Department's assessment.

6.1 Visual

Introduction

Concerns about visual impacts were raised in a number of public submissions, particularly regarding the potential impact of the proposed larger turbines on nearby residences.

In developing its modification application, Goldwind commissioned a visual impact assessment (VIA) to assess the visual impacts to residences surrounding the project, which was prepared by Green Bean Design in November 2017.

Following receipt of Goldwind's modification application, and in response to the concerns raised in submissions, the Department commissioned O'Hanlon Design Landscape Architects (OHD), to peer review Goldwind's VIA and provide independent advice to the Department (see **Appendix G**).

As noted in **section 5.1**, the Department also undertook several site visits during the assessment process, accompanied by OHD. This included visiting properties and viewpoints near the project to assess potential visual impacts and to discuss concerns with residents.

Goldwind's Visual Impact Assessment

Goldwind's VIA involved a desktop assessment of non-associated residences located within 4 km of a modified Stage 2 turbine.

The VIA noted that the proposed Stage 2 layout would result in greater distances from turbines for the majority of surrounding residences, especially those located to the east of the project, thus reducing overall visual magnitude impacts associated with the larger turbines.

The VIA concluded that the modification is not of a magnitude that would significantly increase the visual impacts associated with the approved project, and summarised that the overall visual impact of the modification would be low to medium. Goldwind's assessment of impacts on non-associated residences is summarised in **Table 2**.

Independent Review

The OHD review included the preparation of a report based on both desktop analysis and the site inspections.

The report assigns visual impact ratings for all residences that would be affected by the proposed turbine height increases, in accordance with the current *NSW Wind Energy Framework* and *Visual* Impact *Assessment Bulletin* (i.e. up to 4 km away).

The independent expert focused on the incremental change between the approved and proposed turbine dimensions. The report found that while the larger turbines would result in significant visual magnitude impacts for some residences, most residences would experience either a reduction or no change to the visual impacts already approved.

Avoidance and Mitigation Measures

The Bulletin lists different visual impact mitigation options for consideration, including physical turbine alterations (re-siting, re-sizing and re-colouring), landscaping alterations including vegetation screening, and landowner agreements or voluntary acquisition for significantly affected landowners.

To mitigate visual impacts on non-associated and associated residences, Goldwind has revised the Stage 2 layout to increase the setback distance between residences and turbines.

This includes relocating 29 turbines up to 7.5 km away from approved locations to areas of newly acquired land with fewer neighboring residences, or to positions that would introduce landscape features between residences and turbines. Eleven of the 29 relocated turbines have been moved to form a new turbine cluster in a new area of land located to the southwest of the approved layout (known as the Spring Mountain cluster, see **Figure 6**). No non-associated residences are located within 4 km of this new cluster. Goldwind has also opted to remove 1 turbine from the project entirely to mitigate visual impacts to residences in the south of the site (see **Figure 9**).

The Department acknowledges that Goldwind has made substantial efforts to obtain neighbour agreements with the majority (38 out of 49) of the owners of non-associated residences/properties located within 4 km of a turbine, which is the threshold distance identified in the Bulletin at which 200 m turbines may have high visual magnitude impacts.

Department's Assessment of Visual Impacts

The Department's assessment focused on the incremental change between the approved and proposed turbines, including dimensions, layout and number or turbines.

The Department has assessed the visual impacts of the proposed modification against the relevant visual performance objectives identified within the Bulletin.

The Department notes that while Goldwind has relocated a number of Stage 2 turbines further away from residences (see **section 2** and **Figure 9**), visual magnitude remains a key consideration and important performance objective for this modification due to the increased height of Stage 2 turbines that remain in close proximity to a small number of non-associated residences (see **Figure 10**). However, for most residences surrounding Stage 2 given the proposed setbacks, the Department considers that the larger turbine dimensions would not significantly alter views of the project or the broader landscape. The Department's assessment is summarised below.

Visual Magnitude

In accordance with the Bulletin's threshold distance for visual magnitude, the Department has assessed potential visual magnitude impacts for residences located within 4 km of proposed turbine.

While 49 residences are located within 4 km of a proposed Stage 2 turbine, Goldwind has secured landowner agreements with 38 of these residences (78%). Under these landowner agreements, landowners accept the visual impacts of the project, and these residences are considered 'associated' for the purposes of the Department's visual impact assessment of the modification application.

In this regard, the Department has focused on visual impacts for the eleven non-associated residences identified within 4 km of a Stage 2 turbine, including 6 non-associated residences located within 2.7 km. These residences are all located southeast or east of the project area (see **Figure 10**).

The predicted visual impacts for these residences are summarised in **Table 2** below.

Table 2 | Visual impact assessment for the modified project relative to the approved project

Residence	Visual Influence Zone	Distance to closest turbine (km)	Closest turbine	Turbine hubs visible	Turbine tips visible	Proponent's assessed impact		Independent visual expert's assessed impact
						Approved project	Modified project (MOD 6)	
L200	1	1.6	120	8 (-6)	24 (+7)	Moderate	Moderate	**Moderate**
L220	1	1.4	139	2 (-1)	9 (+5)	-	-	**Moderate - High**
L230	2	2.4	139	4 (+1)	6	Low	Low	**Moderate**
N180	1	1.6	95	40 (+1)	54 (+1)	High	High	**High**
N190	1	1.7	95	18 (-5)	34 (-1)	High	High	**High**
N230	2	3.8	138	29 (+4)	48 (+3)	Moderate	Moderate	**Moderate**
P190	2	3	95	0 (-6)	7 (-2)	Moderate	Low	**Low**
Q110	2	3.7	105	-	-	-	-	**Low**
Q191	2	3.4	135	-	-	-	-	**Low - Moderate**
S160	1	1.9	136	0	1 (-3)	Negligible	Negligible	**Negligible - Low**
S180	2	3.2	135	5	6 (-3)	Low	Low	**Low**

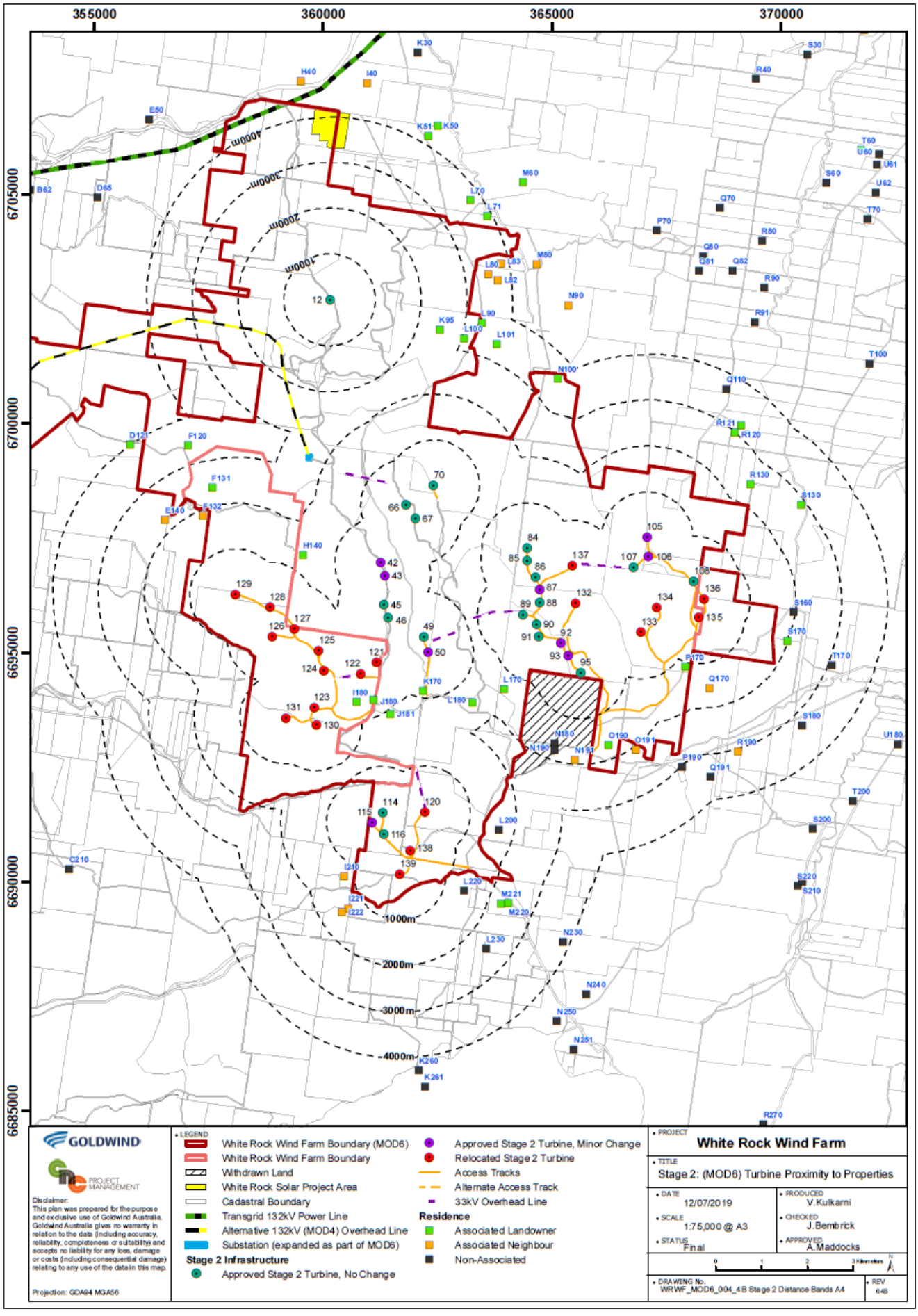

Figure 9 | Approved and proposed layout of Stage 2 turbines and surrounding residences

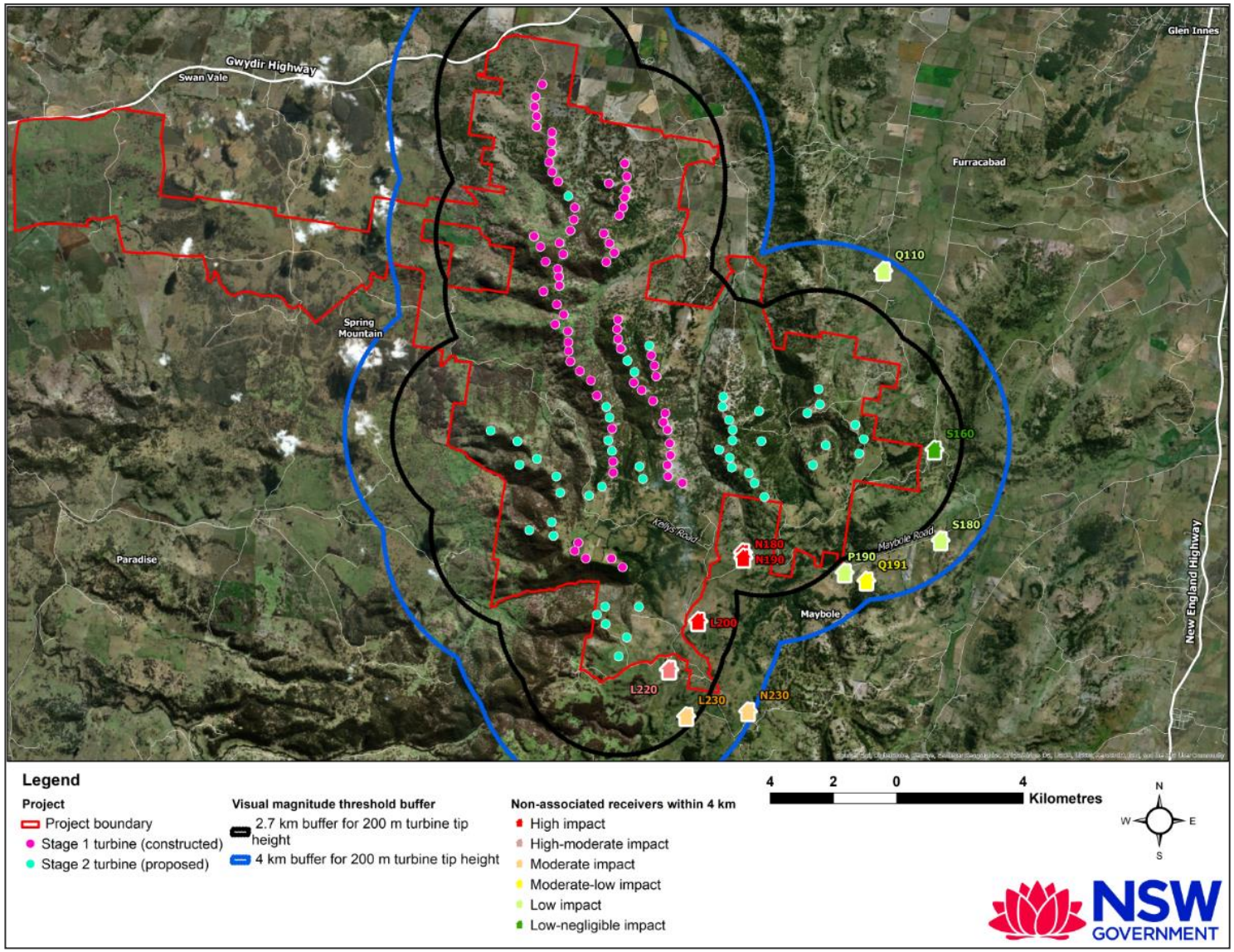

Figure 10 | Non-associated residences within 4 km of the proposed Stage 2 layout

In accordance with the Bulletin's visual performance objectives for visual magnitude, and as noted in **section 3.2**, proponents must consider and address impacts to non-associated residences within 4 km of a 200 m turbine. The requirements for proponents to address and mitigate impacts are dependent on the distance between the residence and turbine, and the residence's zone of visual influence, or Visual Influence Zone (VIZ). VIZ is based on a combination of viewer sensitivity, visibility distance and scenic quality class.

With regard to the 11 non-associated residences, while viewer sensitivity level and scenic quality class remain the same for all dwellings, visibility distance is different. Consequently, the visibility distance between each residence and the closest proposed Stage 2 turbine determine the VIZ for each dwelling. For rural dwellings, visibility distances of 2 – 4 km comprise VIZ 2, and visibility distances within 2 km comprise VIZ 1.

Visual Influence Zone 2

Six non-associated residences (L230, N230, P190, Q110, Q191 and S180) are located within VIZ 2, meaning an area identified as having a moderate level of visual sensitivity. Of these, only L230 is located within 2.7 km of a proposed Stage 2 turbine.

Although L230 would see one additional turbine hub and receive a slightly increased visual magnitude rating from the approved project (from low to moderate), the Department notes that views of the proposed Stage 2 turbines from this residence are limited and would be largely screened by topography and existing vegetation. The overall increase in visual impacts would be minor and could be adequately mitigated through visual impact mitigation measures, such as landscape screening, which are available to non-associated residences in the existing conditions of approval.

The Department considers that the visual impacts to N230, P190, Q110, Q191 and S180 have largely been reduced because of Goldwind increasing setback distances and relocating turbines in the nearby Furracabad cluster, and that residual magnitude impacts would be minor and could be adequately mitigated through the existing visual impact mitigation measures required in the approval.

Visual Influence Zone 1

Five non-associated residences (S160, L200, L220, N180 and N190), are located within VIZ 1, meaning an area identified as having a high level of visual sensitivity. All are located within 2.7 km of a proposed Stage 2 turbine.

While 3 turbines (including 2 new turbine locations) are located within 2.7 km of S160, only one turbine tip would be visible from this residence. The proposed turbine relocation would also remove views of 5 turbines from this residence. The Department considers the proposed modification would result in negligible to low visual magnitude impacts and an overall improved visual impact outcome for S160.

The Department considers that while the independent visual expert has provided moderate and moderate-high visual impact ratings for residences L200 and L220, the larger turbine dimensions proposed for Stage 2 would not significantly increase the visual magnitude impacts on these residences. The setback of 3 turbines in the Maybole cluster would remove these turbines from view and significantly reduce the visual magnitude impacts for both L200 and L220.

The Department notes that these visual impact ratings are predominately attributed to the intrusive night-time visual impacts predicted because of the aviation hazard lighting. However, as discussed below and in **section 5.3**, the Department has recommended mitigation measures that would significantly reduce these impacts and considers the overall visual impact rating for these residences is likely to reduce following the application of these measures.

However, the Department considers that the remaining non-associated residences located within VIZ 1, N180 and N190, would experience an increase in visual magnitude impacts.

The Department notes that both N180 and N190 are owned by a single (previously associated) host landowner, who has since chosen to withdraw from the project. As a result, the entire parcel of land that these residences are on would be excised from the project, as identified in **Figure 4** and **section 2**.

Consequently, these two residences would become non-associated with the project but would remain in close proximity to a number of Stage 2 turbines that are in full view and would become significantly more dominant as a result of the 50 m increase in tip height.

The Department also notes that irrespective of the modification (including the removal of turbines from the land proposed to be excised from the project), these residences would still have experienced high visual impacts from the approved Stage 2 turbines.

The Department's independent visual expert has advised that to materially reduce the impacts to these residences, Goldwind would need to remove at least 4 turbines, given these residences are situated 1.6 - 1.7 km from the closest turbines. Goldwind has advised this would significantly impact the financial viability of Stage 2. Given the scale and proximity of the wind turbines to these residences, the Department accepts that there are limited options for further reducing these impacts through visual screening.

In addition, the Department notes that this landowner has not entered into any form of negotiated agreement with Goldwind.

Given the above, the Department considers that in this instance, it is not reasonable to require Goldwind to further avoid or mitigate the impacts to these residences, particularly given that overall, the visual impacts of the proposed modification are not so significant or widespread to warrant refusal of the proposed modification.

However, due to the high and dominant visual impacts that would remain (see **Table 2** and **Figures 11** and **12**), the Department considers it reasonable for the landowner of N180 and N190 to be afforded short-term voluntary acquisition rights should they wish to exercise these rights once the turbines are constructed.

These rights would require Goldwind to make a binding written offer for the dwellings and land associated with N180 and N190, following receipt of a written request from the landowner of these residences. If the modification application is approved, this option would be available to the landowner for a period of 3 years from the commencement of construction of Stage 2. The Department has included the standard acquisition provisions (including the additional procedures consistent with other approvals such as the Crudine Wind Farm) in the recommended conditions of approval.

Landscape Scenic Integrity

The Department does not consider that the increase in height of the approved turbines would significantly alter the area's visual catchment, which already comprises existing wind energy infrastructure and does not include any national or state sensitive land use designations such as national parks or world heritage areas.

Cumulative Impacts

The Bulletin states that proponents should avoid or provide detailed justification for effective horizontal views of three or more 60˚ turbine sectors (i.e. over 180° views of turbines) for moderate sensitivity viewpoints. The Bulletin classifies rural dwellings as having a moderate sensitivity level. The Department is satisfied that all non-associated residences located within 4 km of the project can be considered rural dwellings.

While two non-associated residences (L200 and L220) would have views across three 60˚ turbine sectors, the Department considers that existing vegetation, infrastructure and landform around the curtilage or in the field of view of these dwellings would provide effective screening and significantly reduce potential cumulative impacts.

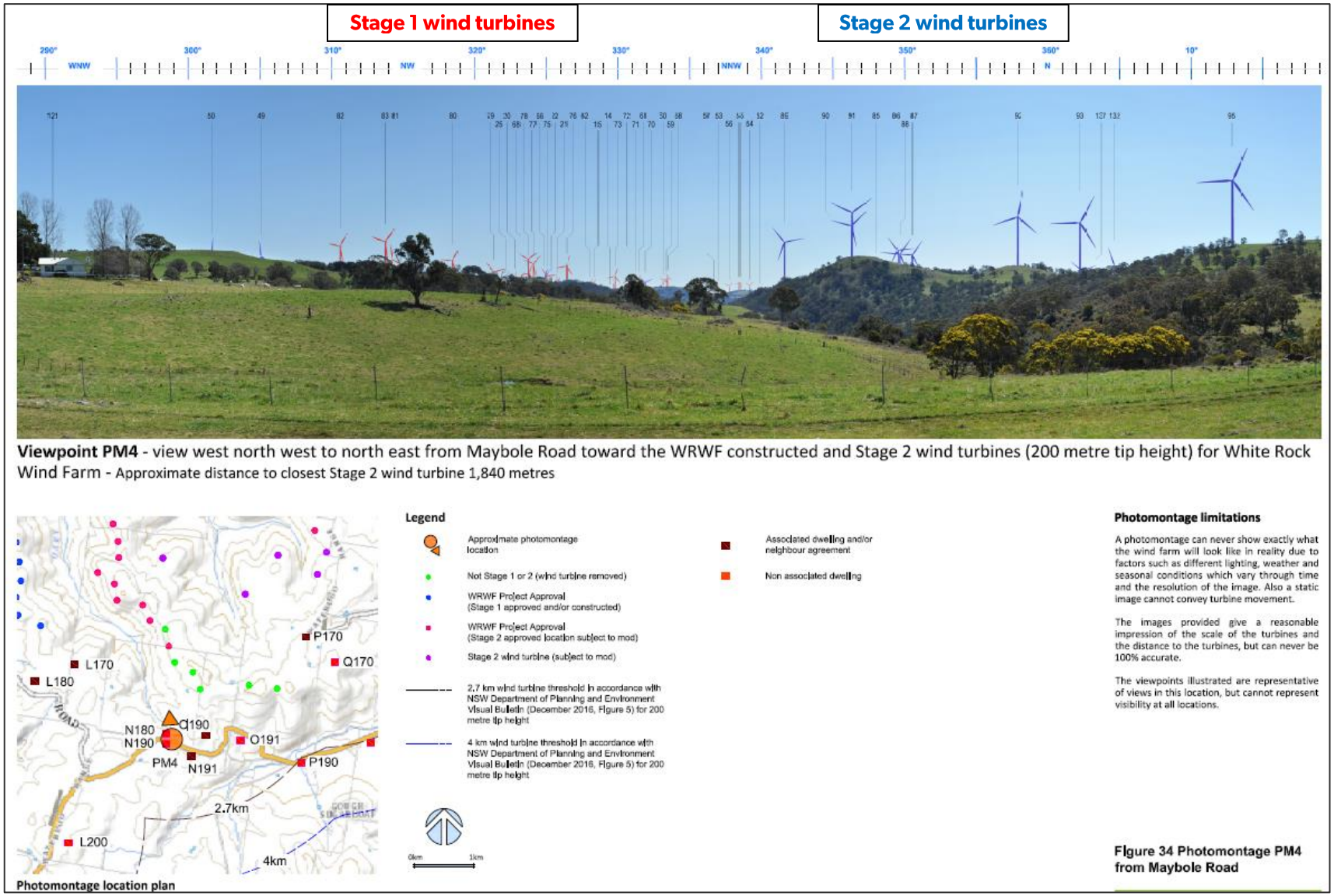

Figure 11 | Photomontage of the larger turbines from the south of the project close to non-associated residences N180 and N190

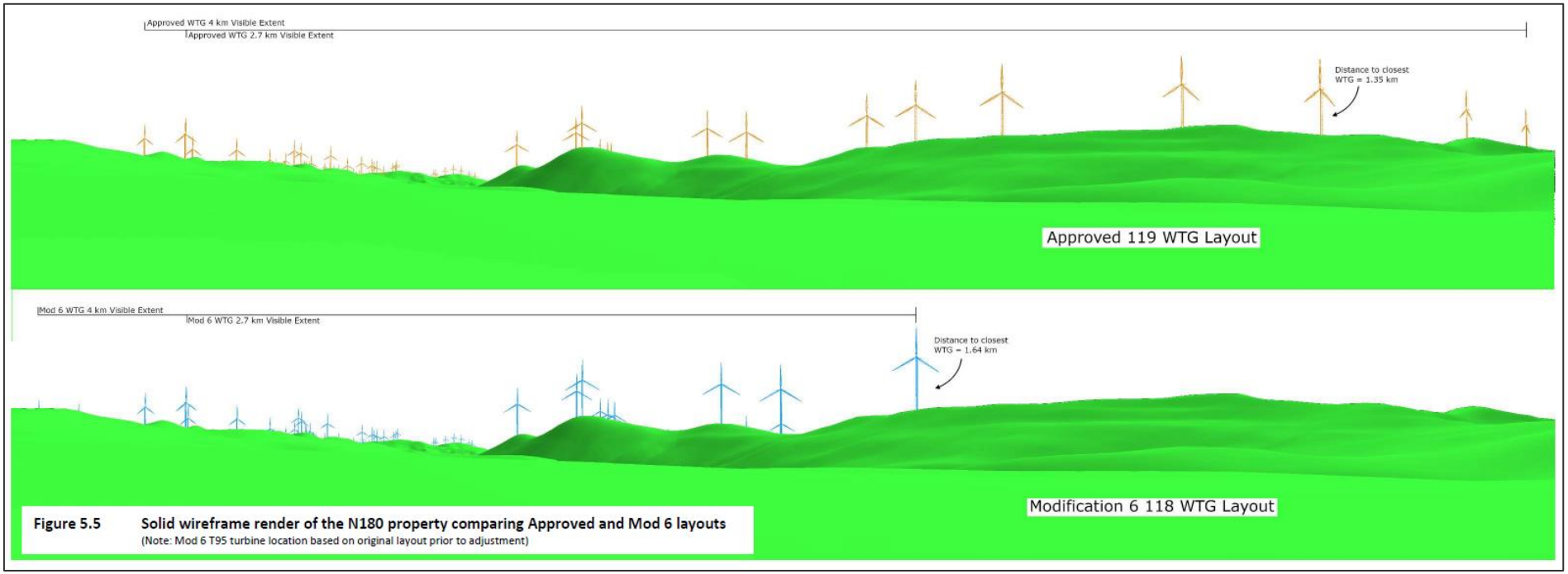

Figure 12 | Wireframe imagery comparing views of the approved and proposed layout from non-associated residence N180

Shadow Flicker

Goldwind's shadow flicker assessment predicted that the theoretical shadow flicker would not exceed 30 hours per year, as specified in the Framework and prescribed in the current conditions of approval, at any non-associated residence.

Aviation Hazard Lighting

The existing conditions of approval require Goldwind to consult with CASA about the need to install aviation hazard lighting for the project. As part of its modification application, Goldwind commissioned an Aviation Impact Assessment which concluded that hazard lighting was not required for the larger 200 m turbines.

However, CASA advised the larger turbines were a potential hazard to air navigation. To suitably mitigate any risk, CASA recommended that some of the Stage 2 turbines should be lit with steady red medium intensity lighting at night in accordance with the NASF Guideline D – Wind Turbines. In response, Goldwind prepared a draft Obstacle Lighting Layout Plan and undertook an assessment of the visual impacts of the recommended hazard lighting (see **Appendix F**).

While Goldwind's supplementary visual assessment concluded that the addition of hazard lighting would result in moderate visual impacts to surrounding residences, the Department's independent visual expert concluded that it would be a prominent and intrusive feature in the night sky, and would likely result in a significant increase in the visual impacts already or predicted to be experienced by some surrounding residences. However due to the distance between the Stage 2 turbines and the closest wind farms, significant cumulative night-lighting effects were considered unlikely.

Consistent with the independent expert advice, the Department acknowledges that the addition of aviation hazard lighting has the potential to significantly increase visual impacts at residences in close proximity to the Stage 2 turbines, particularly as there are limited existing light pollution sources in the vicinity and many landowners value the dark night sky as a feature of the area as noted in the concerns raised by Inverell Shire Council and residences about the impacts of lighting at the Sapphire Wind Farm.

To help mitigate these impacts, the Department has recommended a condition requiring Goldwind to ensure any aviation hazard lighting installed utilises an aircraft detection lighting system to minimise visual impacts, which is supported by CASA. Such a system would only activate the lights when an aircraft is detected in the near vicinity and deactivate the lighting once the aircraft has passed.

In addition, CASA has advised that the intensity of aviation hazard lighting to be installed could be reduced by 90% (from 2000 to 200 candelas), and that only around 60% of the turbines would need to be lit. The Department considers that this measure would significantly reduce the potential lighting impacts of the proposed modification, whilst maintaining safety standards for aviation operations.

Inverell Council advised it supports measures to reduce impacts of night lighting impacts on the local community. The Department considers that with the recommended conditions and implementation of reduced-intensity lighting as per CASA's recommendation, the lighting impacts associated with the Stage 2 turbines can be appropriately managed.

Conclusion

In summary, the Department considers that the increase in size of the Stage 2 turbines would not significantly change the broader landscape, particularly with the strategic relocation of several turbines. It notes Goldwind has obtained landowner agreements with the majority of residences located in proximity to the proposed Stage 2 turbines.

The Department considers that apart from one residence (L230) that would experience a minor increase in impacts, 8 of the 11 remaining non-associated residences would experience either no change or reduced visual

magnitude impacts from the proposed modification. The Department considers that the existing visual mitigation conditions remain appropriate and that any minor residual visual impacts could be adequately managed through visual screening.

However, the Department considers the proposed increase in the size of the turbines would materially increase the visual impacts at N180 and N190, whereby even if the modification is not approved, the residual visual impacts would remain high. There is also no agreement in place with Goldwind to accept the increased level of impact. Consequently, in this instance, the Department considers it appropriate for voluntary acquisition rights to be offered to the landowner of these residences for up to 3 years, should they wish to sell these properties as a result of the visual impacts of the project (as modified).

Although the Department has recently consulted with the landholder, the Department understands that they may wish to make further representations to the Independent Planning Commission about the proposal (including the recommended conditions) before the application is determined.

6.2 Biodiversity

The EA included a Biodiversity Assessment Report (BAR) undertaken by NGH Environmental, which assessed the biodiversity impacts of the modification in accordance with the *NSW Offsets Policy for Major Proposals* (NSW Offsets Policy) and the *Framework for Biodiversity Assessment* (FBA), which are accredited under the Assessment Bilateral Agreement between NSW and the Commonwealth.

The NSW Government's policies in relation to biodiversity impact assessment and offsetting have changed during the assessment of this modification application, including changes to the classification of native vegetation condition and the introduction of new procedures. However, as Goldwind's assessment was undertaken prior to the commencement of the *Biodiversity Conservation Act 2016*, under the transitional arrangements, the project can still be assessed and determined under the NSW Offsets Policy.

Initial surveys of the project were undertaken by RPS in 2010 and these formed the basis for the original project approval in 2012. Further surveys were undertaken by RPS in 2015 prior to the commencement of construction of Stage 1. Additional targeted surveys for the Stage 2 modification area were undertaken in November 2016 and January 2017. The EA also included an updated project Biodiversity Offset Package prepared by Eco Logical Australia and an assessment of impacts on birds and bats by Brett Lane & Associates.

Avoidance and Mitigation

Goldwind has sought to avoid and minimise the biodiversity impacts of the proposed modification by re-configuring the Stage 2 layout to site the relocated turbines in mostly cleared agricultural areas, and further refining the design to avoid woodland vegetation where possible.

Goldwind proposes to further minimise impacts by micro-siting the turbines and through ongoing implementation of the Construction Flora and Fauna Management Plan (CFFMP) that includes measures to minimise vegetation clearance and impacts on threatened fauna and habitat, undertake pre-clearance surveys, control noxious weeds and rehabilitate disturbed areas.

The Department acknowledges opportunities to further limit vegetation clearance are constrained given the increase in estimated clearing is is largely a consequence of Goldwind's re-calculation of impacts for Stage 2 using a conservative detailed engineering design of the project infrastructure and the updated ecological impact assessment methodology. This produces a more conservative and extensive approach for assessing disturbance areas than what was originally assessed when the project was first approved. **Figures 13** and **14** provide an example comparison of the differences in the assessment methodologies applied for the original biodiversity assessment undertaken in 2011 and the modification application.

Figure 13 | Original 2011 EA Ecological Impact Assessment Methodology Example

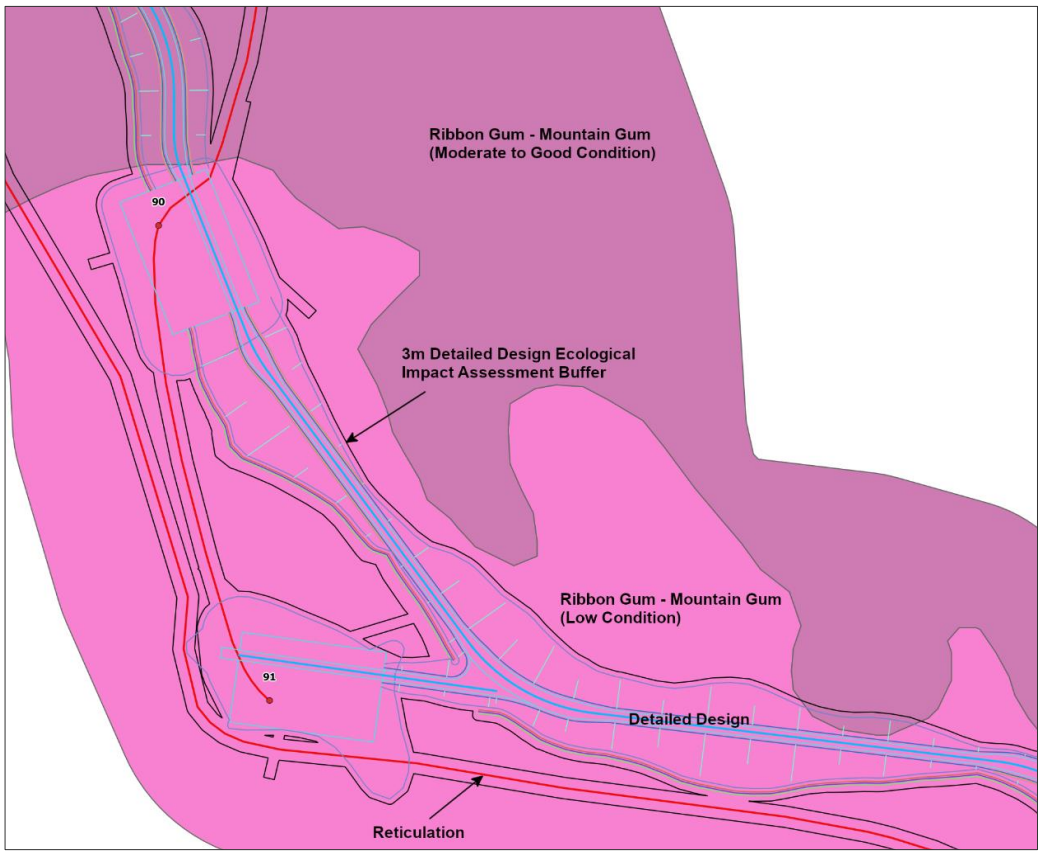

Figure 14 | Modification 6 Ecological Impact Assessment Methodology Example

In this regard, the current project approval limits the clearing of Ribbon Gum Woodland endangered ecological community (EEC) for the project (Stage 1 and 2) to 28 ha. This limit was determined using older, high-level vegetation mapping and a basic infrastructure design (as shown in **Figure 15**), without detailed design and extensive mapping of all the vegetation types to be impacted, as per more contemporary assessments and approvals.

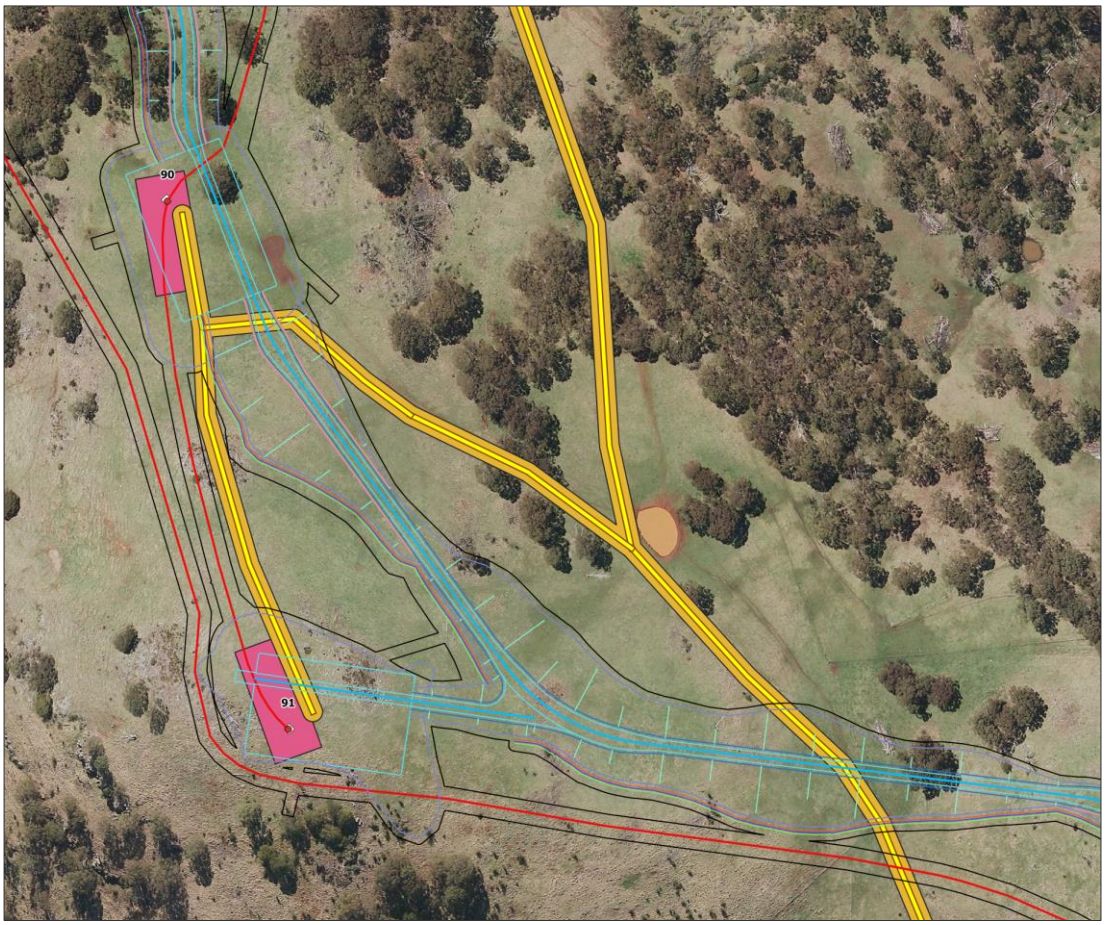

Figure 15 | Original and Modification 6 Design Layouts Compared over Aerial Imagery

Only a relatively small proportion of the additional clearing stated is actually attributable to the larger turbine footings and layout changes proposed as part of the modification application. As shown in the Figure above, the larger hardstand areas still fall within relatively cleared open terrain and the detailed engineering design has been used to reduce impacts by relocating infrastructure where feasible.

This means that irrespective of the modification, if the more conservative and contemporary biodiversity assessment methodology was now applied to the approved Stage 2 project, together with the more detailed infrastructure design, it would identify that substantially more vegetation clearing would be required to construct the project as approved.

Both the Department and OEH accept Goldwind's justification for needing to increase its vegetation clearing limits for the project, subject to the impacts being appropriately offset.

Native Vegetation Impacts

The BAR identified a total of 168.57 ha of native vegetation (inclusive of EEC) that would be impacted by the proposed modification, which represents a loss of approximately 4% of the native vegetation within the project site.

Table 3 provides a summary of the estimated revised vegetation impacts.

Table 3 | Vegetation Community Impacts (EEC listed in italics)

Vegetation Community	PCT ID	Condition Class	Extent of vegetation (ha) impacted
Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	*PCT #510*	*Moderate – good*	*7.95*
Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	*PCT #510*	*Low*	*0.51*
Ribbon Gum - Mountain Gum - Snow Gum grassy open forest or woodland of the New England Tableland Bioregion	*PCT #554*	*Moderate – good*	*61.92*
Ribbon Gum - Mountain Gum - Snow Gum grassy open forest or woodland of the New England Tableland Bioregion	PCT #554	Low	77.70
Silvertop Stringybark – Mountain Gum grassy open forest of the New England Tableland Bioregion	PCT #565	Moderate – good	12.33
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	PCT #84	Moderate – good	0.14
Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion	*PCT #507*	*Moderate – good*	*2.68*
Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion	PCT #507	Low	5.34
Total Vegetation	-	-	**168.57**

Of the native vegetation to be impacted, around 83.5 ha (or approximately 50%) is highly modified, low condition and exotic dominated vegetation. Notwithstanding, the remaining vegetation to be impacted includes 73.06 ha of moderate/good condition EEC, including around 8.5 ha of Box Gum Woodland EEC and around 65 ha of Ribbon Gum Woodland EEC (comprising both PCT 554 and PCT 507).

As noted in Section 2, given 28 ha of Ribbon Gum Woodland EEC has already been cleared for Stage 1/approved to be cleared for the infrastructure approved under Modification 4, Goldwind would not be able to construct Stage 2 with the existing vegetation clearing restriction.

Consequently, Goldwind is seeking to increase its vegetation clearance limit for the project to a maximum of 93 ha for this EEC.

The Department has recommended updating the biodiversity conditions in the project approval to reflect the revised clearing limits for Ribbon Gum Woodland (ie. 65 ha) and Box Gum Woodland (ie. 8.5 ha).

Threatened Species Impacts

The BAR identified 18 ecosystem credit species predicted to occur in the study area including the Scarlett Robin, Little Lorikeet and Brown Treecreeper that were subsequently recorded during targeted surveys of the site. These species were accounted for in the assessment of the ecosystem credit requirements for the modified project.

The BAR also identified 11 threatened species requiring additional targeted surveys, all of which were undertaken except for 2 flora species (*Prasophyllum sp. Wybong* and Small Snake Orchid) and the Koala. Both flora species were assumed not to occur on the site, given there were no known records near the site, and that only marginal and poor-quality habitat was available.

Notwithstanding, OEH confirmed it had residual concerns about the presence of the Small Snake Orchid within the modified Stage 2 areas. To address these residual concerns, Goldwind has committed to undertaking targeted surveys to validate the presence of the orchid for the purposes of determining any offset liability. OEH has

confirmed it is satisfied with this approach and the Department has recommended a condition to reflect this commitment.

Two Koala feed tree species listed under SEPP 44 were recorded within the study area, however, no Koala scats or any other evidence of Koala habitation were found during random field inspections of the site. Goldwind's assessment concluded that the proposal was unlikely to affect Koalas. Notwithstanding, the Department notes the proposed offset package (discussed further below) contains significant feed species for Koala.

No species credit species were recorded during the surveys and therefore no species credits were identified in the BAR. The surveys also identified 45 tree hollows present within the forested portions of the proposed Stage 2 area, of which 15 would be impacted by the modification.

These impacts would need to be offset as discussed below.

Bird and Bat Strike

Goldwind commissioned Brett Lane & Associates to undertake a collision risk assessment of the proposed modification to identify if any bird and bat species would be at a higher risk of strike from the changes to the turbine dimensions. The proposed modification would increase the dimensions of the turbines, including increasing the:

- maximum height of rotor swept area (RSA) from 150 m to 200 m;
- minimum height of RSA from 29 m to 30 m;
- rotor diameter from 121 m to up to 170 m; and
- RSA from 11,499 m^2 to 22,698 m^2 (i.e. by 97%).

The collision risk assessment concluded that the impacts of the proposed modified turbines on birds are not significant, noting most bird species recorded at the site were common, widespread species. The risk assessment found there would be no increased risk of collision to the threatened Dusky Woodswallow and Varied Sittella given these species either occurred at low frequency or were unlikely to fly at RSA height. The assessment also concluded that while there may be an increased risk of collision for the White-Throated Needletail (listed as a marine and migratory species under the EPBC Act), the incremental change in risk would be low given this species is common and widespread and occurs in low numbers at the site.

The risk assessment acknowledged there would be an increased risk of collision by Wedge-tailed Eagles and other high-flying raptors, as they forage in open areas at high altitudes looking for prey. Although the upper RSA height would increase from 150 m to 200 m and therefore potentially impact on more raptors flying at this height, the assessment found that due to the low number of recorded wedge-tailed eagles flying in the area, and no known nests on the site, it was unlikely that the modification would significantly affect the greater population compared with that of the currently approved project envelope.

In regard to bats, the assessment concluded that the impacts of the proposed modified turbines are not significant, noting that the survey data indicated almost 100% of species recorded at the site were common, widespread species. Of the four threatened bat species recorded at the site (Eastern Bent-wing Bat, Eastern Cave Bat, Little Pied Bat and Eastern False Pipistrelle), the assessment found they were unlikely to be adversely affected at regional level if at all, because they were recorded at very low numbers and were likely to fly mostly at or below the increased RSA height minimum.

Following provision of the additional assessment information, the Department and OEH consider that Goldwind has provided a suitably robust assessment of the potential risk of the modified project on bird and bat species from blade strike and recognises that adaptive management techniques would help reduce any impact.

In that regard, the Department has recommended strengthening the existing conditions to include a requirement for Goldwind to prepare a revised Bird and Bat Adaptive Management Program in consultation with OEH in accordance with contemporary requirements that includes:

- relevant baseline data on threatened and 'at risk' bird and bat species and populations in the locality that could be affected by the project;
- a detailed description of the measures that would be implemented on site for minimising bird and bat strike during operation of the project;
- trigger levels for further investigation of the potential impacts of the project on particular bird or bat species or populations;
- an adaptive management program that would be implemented if the development is having an adverse impact on a particular threatened or 'at risk' bird and/or bat species or populations;
- a detailed program to monitor and report on the effectiveness of these measures; and
- provisions for a copy of all raw data collected as part of the monitoring program to be submitted to OEH and the Department.

Biodiversity Offset

The BAR included an assessment of the ecosystem credits that would be required to compensate for the proposed clearing, as summarised below in Table 4.

Table 4 | *Ecosystem Credit Requirements*

Plant community type name / PCT	Impact Area (ha)	Credits required	Area estimate (ha)
Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion [PCT #510]	7.95	473	51.9
Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion [PCT #510]	0.51	9	
Ribbon Gum - Mountain Gum - Snow Gum grassy open forest or woodland of the New England Tableland Bioregion [PCT #554]	61.92	3,445	370.4
Silvertop Stringybark – Mountain Gum grassy open forest of the New England Tableland Bioregion [PCT #565]	12.33	458	49.2
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion [PCT #84]	0.14	5	1
Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion [PCT #507]	2.68	157	16.9
	85.53	**4,547**	**498.4**

In total, 4,547 ecosystem credits would be required to offset the impacts arising from the proposed modification.

The Department and OEH are satisfied that the offset credit requirements have been correctly calculated for the modified project using the FBA.

The offset requirements for the modification have been considered in the context of the overall project offset requirement and the offset package required by the existing conditions of approval. The total revised offset requirements for the project, including the modified Stage 2 impacts, have been calculated as 5,816 credits.

Goldwind's approved offset package includes a 180 ha offset area located within the 'Tangari' property, shown as the Tangari Stage 1 Offset Site on **Figure 13**. The approved package proposed the registration of a BioBanking Agreement over a part of this site to generate the required credits to offset the Stage 1 project impacts. Although the provisions for BioBanking Agreements have been removed following the repealed TSC Act, OEH accepted that it would still process Goldwind's application for a BioBanking Agreement as the relevant information was collected prior to 25 August 2017.

Eco Logical prepared an updated offset package to address the increased offset requirements for the project (including the approved Stage 1 and Modification 4 clearing impacts and the proposed modified Stage 2 impacts). A summary of the project offset requirements is provided in Table 5 below.

Table 5 | *Allocation of White Rock Wind Farm Ecosystem Credits*

Project Component	Approval Modification	Impact Area (ha)	Ecosystem Credits
Stage 1 – Construction	Mod 3	27.24	767
Stage 1 – Increased Clearing from 22 ha to 28 ha Ribbon Gum Woodland EEC	Mod 4	9.56	251
Alternate 330 kV Grid Connection	Mod 4	17.12	251
Stage 2 (Mod 6) (FBA)	Mod 6	85.53	4,547
	Totals		**5,816**

Since the EA was exhibited, Goldwind has entered a Biobanking Agreement for a 475 ha offset site (comprising the Tangari Stage 1 Offset Site and Tangari Stage 2 Offsite Site as shown on **Figure 16**) which would generate 6,505 ecosystem credits.

It is acknowledged that subject to the final clearing calculations and surveys to determine the presence of the Small Snake Orchid, Goldwind may need to adjust its credit liability calculations. Should any additional credits be required, Goldwind proposes to either enter into an agreement or agreements to discharge any additional credit obligations required to fully comply with the Stage 2 offset requirements from either an alternative land-based offset (see **Figure 16**) or via payment into the offset fund.

As such, the Department has recommended updating the biodiversity offset conditions to require Goldwind to either demonstrate that the Tangari BioBanking site provides sufficient credits for the Stage 2 disturbance areas or to prepare an updated Biodiversity Offset Package prior to the commencement of construction of Stage 2 detailing how the proposed final offset credit obligation would be discharged.

Goldwind would be required to discharge any additional offset obligation in accordance with the NSW Biodiversity Offsets Scheme.

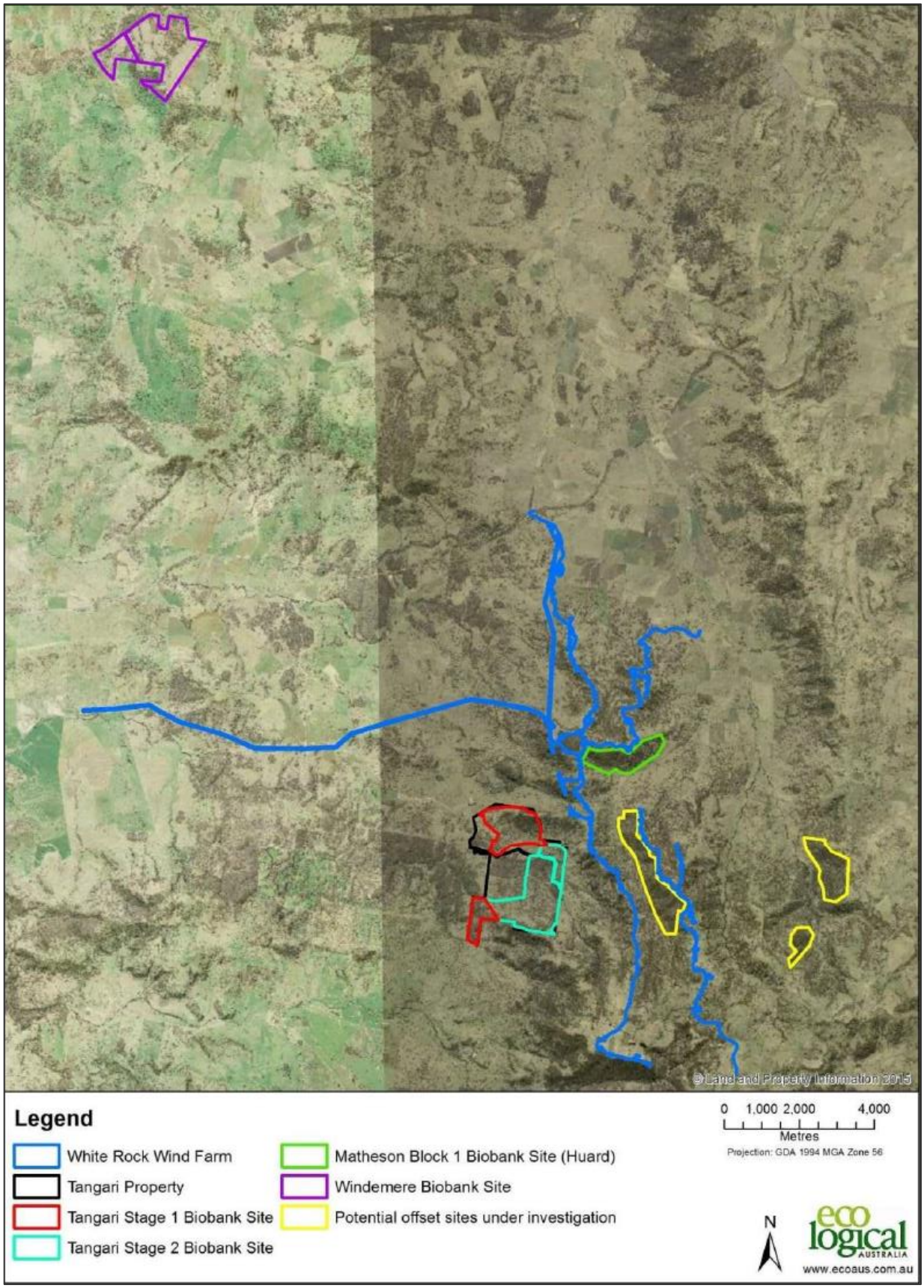

Figure 16 | Existing and Potential Offset areas for the White Rock Wind Farm

Conclusion

Overall, the Department considers that the modified project could be undertaken in a manner that maintains the biodiversity values of the locality over the medium to long term, with the implementation of appropriate mitigation and offsetting measures as supported by OEH.

To ensure this occurs, the Department has recommended that Goldwind be required to:
adhere to revised operating conditions including strict vegetation clearing limits for EECs;

- undertake surveys for the Small Snake Orchid to confirm it is not present within the proposed Stage 2 disturbance areas;
- prepare and implement an updated Construction Flora and Fauna Management Plan and BBAMP in consultation with OEH; and
- satisfy its offset obligations to the satisfaction of the Secretary and in consultation with OEH.

Subject to these recommended conditions, OEH has no residual concerns with the impact of the modification on biodiversity.

6.3 Noise

A number of submissions raised concerns about the potential for increased noise from the larger turbines and cumulative noise impacts.

The EA includes a noise impact assessment by Sonus in accordance with the *NSW Wind Energy Framework: Noise Assessment Bulletin*. Both the Department and the Environment Protection Authority (EPA) are satisfied that the noise impact assessment has been carried out in accordance with the Bulletin.

The Department notes the modification would involve the deletion of one turbine and move several turbines further away from nearby residences.

Avoidance and Mitigation

The existing conditions of approval require Goldwind to:

- comply with relevant operational noise criteria and operating conditions;
- comply with specified operating hours;
- undertake noise monitoring during operations to determine compliance with the relevant noise criteria; and
- implement a Construction Noise and Vibration Management Plan and Operational Environmental Management Plan.

Construction Noise

Due to the nature of construction works for the proposed modification remaining the same as the approved project, the Department does not anticipate any significant increases in construction noise impacts. The existing conditions of approval require Goldwind to implement an updated Construction Noise and Vibration Management Plan to address the noise reduction measures to be implemented for the Stage 2 works.

Operational Noise

Using conservative input conditions, the noise assessment demonstrated that the modified project would be able to comply with the relevant noise criteria at all non-associated residences, except for residences I221, N180 and N190. The noise levels at these residences were predicted to marginally exceed the criterion by 1 - 2 dB(A).

While Goldwind has proposed several noise mitigation options to meet the noise criterion (such as sector management, replacement of some turbines with lower sound power levels or the addition of blade serrations to

some turbines), the Department notes I221 is an associated residence, and N180 and N190 have been recommended for voluntary acquisition rights due to visual impacts.

Notwithstanding, Goldwind has committed to updating the Operational Environmental Management Plan for the project to address noise compliance monitoring and identify the need for any operational noise reduction measures. Both the EPA and the Department are satisfied that with the implementation of Goldwind's proposed mitigation options, the maximum noise generated by the modified project would be able to comply with the applicable noise criteria at all non-associated residences.

The Department acknowledges concerns raised by some members of the local community about the recent noise levels experienced following the commissioning of the Stage 1 turbines, particularly for residents in the Ilparren valley. The Department also notes there have been concerns raised about whether the characteristics of the valley (including the adjacent Glen Innes Wind Farm) would affect Goldwind's ability to comply with the relevant criteria.

In accordance with the existing approval conditions, a noise compliance assessment was undertaken on the operational Stage 1 of the White Rock Wind Farm. The assessment was undertaken by Sonus and followed the methodology outlined in the *NSW Wind Energy Framework: Noise Assessment Bulletin*. No exceedances of the project noise objectives were identified, and the data obtained was broadly consistent with both expectations and the predictions made in the EA. Following this review, the Department has confidence in the predictive capability of the noise model developed for Stage 2 of the project.

A similar compliance assessment would be required to be undertaken for Stage 2 when completed. As was the case for Stage 1, should any wind turbines found to be responsible for exceedances of noise objectives, then there are a range of measures that would be triggered by the conditions of approval to ensure that the wind farm is operated in a compliant manner.

Although predicted to comply with the criteria, the Department acknowledges some residents may continue to be concerned about noise levels experienced as development of the project progresses, particularly during the night-time periods.

These concerns were recognised in the *NSW Wind Energy Framework: Noise Assessment Bulletin*, which notes that wind energy projects are often located in quiet, rural areas and noise generated is often raised as a concern for people living in these areas. However, the purpose of the noise criteria established for the project is to retain noise levels that are compatible with surrounding land uses and to ensure that noise levels do not significantly affect the living experience of people residing in the area. As noted above, both the Department and the EPA consider that the project can continue to comply with the acceptable noise criteria.

Finally, the Department has recommended updating the existing operational noise condition for ancillary infrastructure to reflect the contemporary requirements, including the *NSW Noise Policy for Industry*. This update has not changed the operational noise criteria for ancillary infrastructure of 35 dB(A) at any non-associated residence.

Low Frequency Noise

The Department acknowledges the concerns of some members of the community about the health impacts of low frequency noise associated with wind turbines.

The Department's *Wind Energy Guideline* (2016) refers to the advice of the National Health and Medical Research Council (NHMRC) regarding this matter.

In a statement released in 2015, the NHMRC states that '*there is currently no consistent evidence that wind farms cause adverse health outcomes in humans*' but acknowledged that further high-quality research into possible health effects of wind farms, particularly within 1.5 km, is warranted.

The Department will continue to monitor contemporary scientific research outcomes to ensure its position reflects robust evidence on any health effects, including any advice released from the National Wind Farm Commissioner and the Independent Scientific Committee on Wind Turbines.

The Department notes that the analysis of wind turbine spectra shows that low frequency noise is typically not a significant feature of modern wind turbine noise when it complies with the A-weighted criteria calculated in accordance with the 2009 South Australian *Wind Farms – Environmental Noise Guidelines*. The project as modified is therefore not predicted to generate excessive levels of low frequency noise or infrasound.

The Department also notes that the proposed relocation of a number of turbines from the approved layout would result in an increase in the setback distances from the majority of the nearest residences to turbines.

Based on the above, the Department does not consider that the proposed modification (or the project as a whole) would result in any adverse health outcomes for the local community.

The Department has also recommended contemporary conditions requiring Goldwind to monitor the low frequency noise of the project in accordance with the *Wind Energy: Noise Assessment Bulletin* (2016), that discusses the penalties that must be applied in the unlikely event that excessive low frequency noise is detected.

Cumulative Impacts

In regard to construction noise, the Stage 1 and Stage 2 construction phases would not overlap, so there would be no cumulative construction noise impacts for the modified project. It is also unlikely that the Glen Innes Wind Farm and Stage 2 construction works would occur concurrently, notwithstanding the majority of the proposed Stage 2 works would occur in the south, more than 5 km from the southerly extent of the Glen Innes Wind Farm.

When considering the potential cumulative noise impacts associated with other developments in the region, the Department notes the noise assessment considers the impacts of the project as a whole and as such addresses the cumulative impacts of both Stage 1 and Stage 2. Goldwind would continue to be required to comply with the noise criteria applicable to the approved project, regardless of the other wind farms operating in the region. As noted above, the project would continue to be subject to noise compliance monitoring to ensure this is the case. Similarly, both the Glen Innes and Sapphire Wind Farms would be subject to the same operating conditions.

Conclusion

Overall, the Department considers that the proposed modification would not significantly increase the noise impacts of the project.

In line with contemporary approvals for other wind farms in NSW, the Department has recommended updating the noise conditions to:

- include an updated noise criteria table consistent with the EPA's advice; and
- be consistent with the Department's standard noise conditions, including:
    - requiring the operation of the wind turbines to be measured in accordance with the requirements of the *NSW Wind Energy Framework: Noise Assessment Bulletin*; and
    - requiring the operation of ancillary infrastructure to comply with the requirements of the *NSW Noise Policy for Industry*.

6.4 Other Issues

The Department acknowledges that in addition to concerns over visual, biodiversity and noise impacts, community and agency submissions raised concerns about a range of other issues. The Department has summarised its assessment of these issues in **Table 6** below.

Table 6 | *Other Issues*

Issue	*Consideration*	
Heritage	• Goldwind completed heritage surveys in accordance with the relevant guidelines and consulted with local Aboriginal community groups. • Site surveys identified four Aboriginal heritage items, including two stone artefact scatters and two possible scarred trees. All of the sites were assessed as having low to moderate scientific value. • While the proposed development footprint would avoid impacts to the scarred trees and one artefact scatter, the remaining artefact scatter (WRWF 2) would be directly impacted by construction of internal access tracks. Goldwind has committed to salvaging and relocating WRWF 2 prior to the commencement of construction. • Given the disturbed nature of the site and absence of any heritage items located during previous heritage surveys for the project, the likelihood of identifying unexpected items during construction is low. • Existing conditions of approval require Goldwind to prepare and implement a Construction Heritage Management Plan that includes measures to avoid impacts on Aboriginal heritage items, in consultation with OEH and registered Aboriginal stakeholders. • In addition, if Aboriginal artefacts or skeletal material are identified, all work would cease, and the Chance Finds Protocol would be implemented. • There are no known items of historic heritage value in the vicinity of the project site and the Heritage Council of NSW confirmed it had no concerns. • With the existing conditions, the Department and OEH consider that the proposed modification would not significantly impact the Aboriginal heritage values of the locality.	• No additional conditions required.
Bushfire Risk	• The existing conditions of approval require Goldwind to: o design all project components to minimise bushfire hazard risk; o facilitate appropriate emergency management; o consult regularly with the RFS; and o implement a Construction Environmental Management Plan that includes measures to address bushfire risk. • Goldwind has prepared a Bushfire Risk Management Plan for the project and has committed to updating this plan to reflect the proposed modification, in consultation with RFS. • The Department and RFS consider that bushfire risk can be appropriately managed by the existing approval conditions.	• No additional conditions required.
Decommissioning and rehabilitation	• A number of submissions raised concerns about decommissioning of wind turbines and associated infrastructure after the operational life of the project. • The Department notes that the existing conditions require Goldwind to:	The Department has recommended strengthening the existing conditions to:

	○ decommission wind turbines (and associated infrastructure) within 18 months of the cessation of operations; ○ prepare a Decommission and Rehabilitation Plan prior to the commencement of construction, which includes funding arrangements for decommissioning and rehabilitation. The plan must be updated every 5 years until decommissioning and rehabilitation is complete; and ○ prepare a Decommission Environmental Management Plan, prior to the commencement of decommissioning, including a number of environmental performance objectives associated with decommissioning, such as hazardous material and waste management, traffic and access, and soil and water and management. • The Department has recommended including conditions requiring Goldwind to rehabilitate landform of turbines pads and progressively rehabilitate unused project areas. • The Department considers that any risks associated to decommissioning of the project and rehabilitation of the site can be appropriately managed by the existing and recommended approval conditions.	• require the wind turbine pads be covered with soil and/or rock and revegetated on decommissioning; • rehabilitate all areas of the site not proposed for future disturbance progressively; • minimise the total area exposed at any time; and • employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated.
Waste	• Glen Innes Council raised concerns regarding the management and recycling of waste, and local landfill capacity and lifespan. • The Department notes the existing conditions require Goldwind to: ○ not cause, permit or allow any waste generated outside the site to be received at the site; ○ maximise the reuse and/or recycling of waste materials while minimising offsite disposal; ○ ensure waste generated on site is assessed and classified in accordance with the relevant guidelines and appropriately removed from the site; and ○ ensure no green waste is burnt on site. • In relation to local landfill capacity and lifespan, the Department considers these to be commercial matters outside the scope of the modification. • The conditions also require Goldwind to address waste management in the Construction Environmental Management Plan (CEMP) and the Decommissioning Environmental Management Plan (DEMP). • The Department has recommended including requirements for Goldwind to adhere to EPA's *Waste Hierarchy* when addressing waste management in the CEMP and DEMP. • The Department is satisfied that the existing and recommended conditions would ensure waste associated with the modification is appropriately managed.	The Department has recommended updating the existing conditions to: • reflect contemporary waste classification guidelines; and • require Goldwind to address and detail how waste will be minimised and managed to reflect EPA's *Waste Hierarchy*, in accordance *Waste Avoidance and Resource Recovery Act 2001*, in the CEMP and DEMP.
Erosion	• Concerns were raised in submissions about potential erosion associated with construction activities, particularly on steep slopes or where vegetation clearing is involved. • The Department notes the existing approval includes requirements for a Construction Soil and Water Quality Management Plan (CSWQMP) and CEMP.	The Department has recommended strengthening the existing conditions to: • ensure the turbines and ancillary infrastructure, particularly any access roads on steep slopes, are designed,

	• In addition to updating the project's CSWQMP and CEMP to reflect changes associated with the modification, Goldwind has committed to developing Progressive Erosion and Sediment Control Plans and undertaking regular inspections to check the adequacy of erosion control and rehabilitation measures. • The Department has recommended strengthening the existing conditions to ensure Goldwind minimises soil erosion during project construction and decommissioning. • The Department is satisfied that the existing post approval requirements, Goldwind's commitment to develop Progressive Erosion and Sediment Control Plans and recommended conditions would ensure effective erosion management. • The Department will also have an ongoing compliance role in monitoring the ongoing environmental performance of the project (such as site inspections during construction) and enforcing the conditions of approval.	constructed and maintained to minimise any soil erosion; • minimise any soil erosion associated with the construction and decommissioning of the project by implementing the relevant mitigation measures in *Managing Urban Stormwater: Soils and Construction (Landcom, 2004)*, or its latest version; and • update the incident notification and non-compliance notification requirements.
Traffic and transport	• Goldwind is proposing to use one of the project's approved haulage routes to transport the larger turbine blades to site. • The route includes travel along both RMS and Council controlled roads, including the Golden Highway, the New England Highway, Ben Lomond Road, Maybole Road and Kelleys Road. • The site would be accessed via the southern site access point located on Maybole Road and Kelleys Road. • In response to concerns raised by RMS and Glen Innes Council about the level of assessment undertaken for the proposed haulage route, Goldwind commissioned Rex J Andrews to undertake a route study. • The route study identified that while some works and upgrades would be required at various points along the route, transport of the larger blades to site via the proposed route would be feasible. • While RMS did not object to the proposed route or potential works required, it recommended Goldwind update the project's CTAMP, enter into a Works Authorisation Deed (WAD) for any additional works associated with the modification and continue to consult with RMS throughout its design of the route. • Glen Innes Council did not have any further concerns about this matter. • The Department acknowledges that in order to transport the larger blades, Goldwind would need to complete the required upgrades works in consultation with RMS and relevant Councils, and that any works would be subject to the relevant approvals and permits. • The Department also notes that the existing conditions require Goldwind to undertake a review of the transport routes (including over-dimensional transport routes) in consultation with the relevant road authorities. • For clarity, the Department has recommended a new condition consistent with other recent wind farm modifications requiring Goldwind to review the transport route in consultation with the relevant road authorities and to provide a report to the Department outlining the final proposed road upgrades to be implemented prior to the commencement of the Stage 2 haulage.	The Department has recommended updating the traffic and transport conditions (specifically adding a new condition E17B) to clarify the requirements around the review and implementation of any road upgrades required prior to the delivery of the selected wind turbine components for Stage 2.

	• The Department is satisfied that this condition, together with the existing conditions that include a requirement to update and implement the project's CTAMP and CEMP, would suitably manage road safety and traffic impacts associated with the modification.	
Aviation	• The Glen Innes and Inverell airports are located less than 50 km from the project site (17 km northeast and 40 km west), and a small number of private airfields used for agricultural purposes operate in the area. • Goldwind's application included an Aviation Impact Assessment (AIA), which was completed by Aviation Projects Pty Ltd. • The AIA identified that the project as modified would result in an acceptable level of aviation safety risk without fitting the larger turbines with aviation hazard lighting. • Airservices confirmed that airspace procedures and communication, navigation and surveillance facilities for the Glen Innes and Inverell airports would not be impacted as a result of the proposed modification. • However, CASA advised the larger turbines may be a potential hazard to air navigation and that installation of aviation hazard lighting would mitigate this risk. • In response to CASA's advice, Goldwind commissioned Aviation Projects Pty Ltd to complete an Obstacle Lighting Layout Plan, which proposes lighting 29 out of the 48 proposed 200 m turbines. • Following review of the Obstacle Lighting Layout Plan proposed by Goldwind, CASA advised that the plan was satisfactory and complies with relevant aviation guidelines. • The existing conditions require Goldwind to consult with potentially affected stakeholders, including local aerodrome operators and Aerial Agriculture Association Australia, prior to commencement of construction. • In addition, Goldwind must inform CASA, Airservices, Department of Defence and local operators of final turbine coordinates and heights. • As such, the Department considers that the modified project is unlikely to result in any significant aviation hazards or risk to aviation safety, and that further consultation with CASA would determine the need for aviation night lighting.	The Department has recommended updating the existing conditions to ensure any lighting installed utilises an aircraft detection lighting system.
Subdivision	• Goldwind is proposing to subdivide Lot 1 DP584081, Lot 153 DP753260 and Lot 1 DP624913 to create new and larger lots to facilitate the expansion of the 132 kV substation, alternate 330 kV substation footprint (if this option is selected) and construction of internal access tracks. • The proposed subdivision would result in two lots that are approximately 5 ha and one lot that is approximately 25 ha. • The subdivisions are prohibited under a strict reading of the Glen Innes Severn Council LEP 2012 and Inverell Council LEP 2012 as they would not meet the minimum lot size for land zoned RU1 – Primary Production in the respective LEPs (150 ha and 200 ha). • Notwithstanding, for Part 3A projects, approval for the modification as a whole can be granted despite the subdivision of the application being prohibited by the LEP.	• Subdivide the proposed lot providing information is provided in accordance with requirements of section 157 of the *Environmental Planning and Assessment Regulation 2000*.

	• The Department also notes neither of the relevant Councils have objected to the proposal. • In this case, the Department is satisfied that the subdivision should be approved as part of the project as: o it would not result in the addition of any dwelling entitlements on the subdivided land; and o it is consistent with the key objectives of the RU1 zone as it would encourage diversity in primary industry enterprises and minimise conflict between land uses.	
Communications	• The Department considers the proposed modification, including larger turbine dimensions and modified layout, would result in negligible impacts on television, radio and telephone/internet transmission.	• No additional conditions required.
Depreciation of land value	• One local submission (S160) raised concerns about the potential adverse impacts of the project more broadly on property values. However, the Department notes that the proposed modification would be able to comply with relevant noise criteria at nearby residences. Further, the Department's visual assessment concluded that the project as modified would not increase the visual impacts of the approved project at this residence, noting also that the residence was purchased after the project was approved. • More broadly, the Department notes that the project (including Stage 2) is already approved, and the assessment demonstrates that with the changes made to the Stage 2 through the assessment process, the proposed modification would not result in any significant impacts and would be able to comply with applicable amenity criteria established by the NSW Government for wind farm developments. • Furthermore, in 2009, the NSW Valuer-General released a report on the impacts of wind farms on land values in Australia. The report was based on primary investigations and analysis of previous studies and concluded that the majority of wind farms in Australia appear to have no quantifiable effect on land values. • In 2016, OEH commissioned Urbis to undertake an investigation into the potential impact of wind farm developments in NSW. The study was based on sales data and traditional valuation sales analysis techniques, and similar to the NSW Valuer-General's report, concluded that wind farms are unlikely to have a measurable negative impact on surrounding land values in rural areas. • The Department considers that there is no clear evidence that wind farms reduce property values, and that the proposed modification would not result in any significant or widespread reduction in land values in the areas surrounding the wind farm.	• No additional conditions required.

7. Recommended Conditions

The Department has drafted a Notice of Modification (see **Appendix B**) for the proposed modification, as well as a consolidated version of the project approval as modified (see **Appendix C**).

In modifying the project approval, the Department has taken the opportunity to update and strengthen the existing conditions, including requirements for decommissioning, rehabilitation and soil erosion, to focus more on outcomes and to better reflect contemporary conditions applying to other wind farms in NSW (see **Appendix C**). A summary of the proposed amendments is provided below.

Condition Number	Condition	Reason for changes
Definitions	Definitions	Updated to include contemporary definitions for wind farm project approvals. Update definition of 'EA' to reflect documents provided in support of the application.
Schedule B – condition B8A (new)	Final Layout Plans	New condition to reflect contemporary wind farm approvals, which requires the proponent submit final layout plans.
Schedule C – condition C1	Vegetation clearing	Updated to reflect proposed clearing limits for Ribbon Gum Woodland EEC and Box Gum Woodland EEC.
Schedule C – condition C6	Bird and Bat Monitoring and Management	Condition updated to reflect contemporary wind farm approvals.
Schedule C – conditions C7A – C7C	Biodiversity Offset	Included to reflect additional survey commitments for threatened species and Stage 2 Biodiversity Offset Package requirements.
Schedule C – condition C9	Operating Conditions	Operating conditions related to water, soil erosion and hazards included to reflect contemporary wind farm approvals.
Schedule C – condition C19	Waste Generation and Management	Updated to reflect contemporary guidelines.
Schedule C – condition C29	Night Lighting	Updated to reflect contemporary wind farm project approvals, specifically the requirement to ensure any lighting installed utilises an aircraft detection lighting system.
Schedule D – conditions D6 – D7	Incident Notification and Non-Compliance Notification	Conditions updated to reflect contemporary wind farm approvals.
Schedule E – condition E21	Construction Environmental Management Plan	Condition updated to strengthen consideration of erosion, sediment control and water quality, and to reflect contemporary guidelines.
Schedule E – condition E22(e)	Construction Soil and Water Quality Management Plan	Condition updated to strengthen consideration of erosion and sediment control during construction of access tracks.

Schedule E – condition E17(b) (new)	Road Upgrades	New condition to reflect review and reporting requirements relevant to the proposed Stage 2 haulage once the final turbine components are selected.
Schedule F – conditions F7 – F8	Operational Noise Criteria – Wind Turbines	Conditions updated to reflect revised noise criteria.
Schedule G – condition 1	Land Acquisition and Criteria	Condition updated to reflect voluntary acquisition requirement.
Schedule G – condition 8	Decommissioning	Condition updated to reflect contemporary wind farm approvals.
Schedule G – condition G8A and G10	Progressive Rehabilitation	Condition included to reflect contemporary wind farm approvals.
Schedule G – condition G12	Decommissioning Environmental Management Plan	Condition updated to reflect contemporary wind farm approvals and contemporary guidelines.
Appendix 1	Project Layout and Schedule of Land	Updated to reflect new land schedule and project layout.

The Department has also worked with relevant agencies to update the conditions for the project, the EPA to develop contemporary noise conditions (including those relating to compliance monitoring), and OEH to update the biodiversity conditions for the project.

8. Evaluation

The Department has assessed the merits of the modification in accordance with the relevant requirements of the EP&A Act.

With the implementation of the amended conditions, the Department is satisfied that the modified project achieves a reasonable balance between maximising the efficiency of the wind resource development and minimising the potential impacts on the local community and environment.

Notwithstanding, the Department acknowledges the concerns of community members about the impacts of the project as a whole, and the potential increase in impacts associated with the larger turbines.

The Department's assessment has found that the proposed modification can be carried out without any significant impacts, with the exception of visual impacts to two residences N180 and N190. In the absence of any agreements or other suitable mitigation options, the Department has recommended that the landowner of these residences be offered voluntary acquisition rights should they wish to sell these properties because of the visual impacts of the project (as modified).

However, while recent consultation has been undertaken with the landholder, the Department understands that they may wish to make further representations to the Independent Planning Commission about the proposal, and specifically any recommended conditions, prior to determination of the application.

Finally, although the modification would result in clearing of an additional 169 ha of native vegetation, the Department considers that the modified project could be undertaken in a manner that maintains the biodiversity values of the locality over the medium to long term, with the implementation of appropriate mitigation and offsetting measures as supported by OEH.

As is the case for all major projects in NSW, the Department and EPA would continue to have a compliance role in monitoring the ongoing environmental performance of the project and enforcing the conditions of approval.

The proposed Stage 2 modification would deliver a range of economic benefits, including up to 200 full time construction jobs and 2 full time operational jobs, with a capital investment of up to $300 million.

Furthermore, Goldwind would contribute up to $295,000 per year for the operational life of the project, towards community enhancement and various projects within the local community.

The project is also consistent with the Commonwealth's *Renewable Energy Target and the NSW Climate Change Policy Framework* as it would generate approximately 995,000 megawatt hours of renewable energy per year, equivalent to 169,000 homes annually, with estimated emissions savings in the order of 955,000 tonnes CO2-e per year.

On balance, the Department considers that the proposed modification has merit, and is in the public interest.

As such, following on from its assessment of the modified project, the Department considers that the proposed modification is approvable, subject to the amended conditions of approval (outlined in **Appendix C**). This assessment report is hereby presented to the Independent Planning Commission for determination.

Recommended by:

Tim Stuckey
Senior Environmental Assessment Officer
Energy Assessments

Recommended by:

Phillipa Duncan
Team Leader
Resource Assessments

Recommended by:

Mike Young 23.8.19.
A/Executive Director
Energy and Resources

Appendices

Appendix A – List of Documents

White Rock Wind Farm Modification 6 - Environmental Assessment (including associated appendices), Goldwind, 2018.

White Rock Wind Farm Modification 6 - Response to Submissions report (including associated appendices), Goldwind, 2018.

White Rock Wind Farm Modification 6 - Biodiversity and Transport Information, Goldwind, 2019.

White Rock Wind Farm Modification 6 - Additional information, Goldwind, 2019.

Independent Peer Review of Landscape and Visual Impacts (OHD Report), Terry O'Hanlon of O'Hanlon Design, 2019.

Appendix B – Notice of Modification

Appendix C – Consolidated Approval

Appendix D – Environmental Assessment

Appendix E – Submissions

Appendix F – Response to submissions report

Appendix G – Additional Information

Appendices B – G see the Department's Major Projects website at:
http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9067