Rye Park Wind Farm Modification 1

Turbine tip height increase
State Significant Development Modification Assessment
(SSD 6693 MOD 1)

April 2021

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Cover image: Wind turbines at Boco Rock Wind *Farm. Nimmitabel, NSW. Source. NSW Department of Planning, Industry and Environment at https://images.planning.nsw.gov.au/.*

Executive Summary

Rye Park Renewable Energy Pty Ltd (the Applicant), owned by Tilt Renewables Limited (Tilt), has approval to develop the Rye Park Wind Farm (the project) in the Southern Tablelands of NSW, located approximately four kilometres east of Rye Park and ten kilometres north-east of Yass within the Hilltops Council, Upper Lachlan Shire Council and Yass Valley Council local government areas.

Tilt is seeking to modify the development consent to build fewer (92 to 77) but larger wind turbines, increase the maximum tip height from 157 m to 200 m, hub height from 101 m to 117 m and the rotor diameter from 130 m to 170 m. The tip height is consistent with other wind farms in NSW, including the neighbouring Bango Wind Farm which is currently under construction.

The location of the 77 turbines has not changed and the 15 turbines being removed in this application are distributed across the site. Five turbines to be removed are near the Rye Park village and in particular, three of the four turbine locations closest to the village are removed (see **Figure E1**). The larger turbine dimensions would enable Tilt to utilise newer and more efficient turbine technology that would increase the total generation capacity of the project by at least 26 % compared to the approved project.

Tilt is also proposing to use alternative heavy vehicle haulage route options from Port Kembla and allow for haulage from Port of Newcastle and has identified road upgrades required for the route, and also consolidate site access points (from 8 to 3) and realign ancillary infrastructure, reduce the length of the internal access tracks and 330 kV transmission line.

Tilt's detailed design and a review of constructability has reduced the length of internal access roads and aimed to reduce impacts on significant vegetation but conservatively assumed wider construction corridors to construct the access tracks (from 12 m to 30 m) and 33 kV underground cabling to account for cut and fill requirements in areas with steeper terrain and to allow adequate space for stabilisation works and erosion and sediment controls.

The project was originally approved by the then Planning Assessment Commission as delegate for the Minister for Planning under Section 89E (now Section 4.38) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 22 May 2017. Accordingly, the modification application is to be assessed under Section 4.55(2) of the EP&A Act.

Under the Minister's delegation dated 9 March 2020, the Deputy Secretary, Assessment and System Performance may determine the application as there were more than 50 unique objections, none of the local councils have objected to the application and Tilt did not make any political donations.

Engagement

The Department publicly exhibited the modification application from 13 May 2020 until 3 June 2020 and received 94 unique submissions from the public (74 objections and 20 in support), and five from special interest groups (4 objections and 1 in support).

Around 25 % of the objections came from residents living between 2 and 5 km of the project site, and around another 36 % came from residents located between 5 and 25 km from the site. The most common issues raised in the submissions objecting to the project relate to the increase in biodiversity impacts, loss of amenity from visual and noise impacts, and inadequate consultation.

To better understand these concerns, the Department visited several properties surrounding the project site on 4 and 5 November 2020 as part of the assessment process.

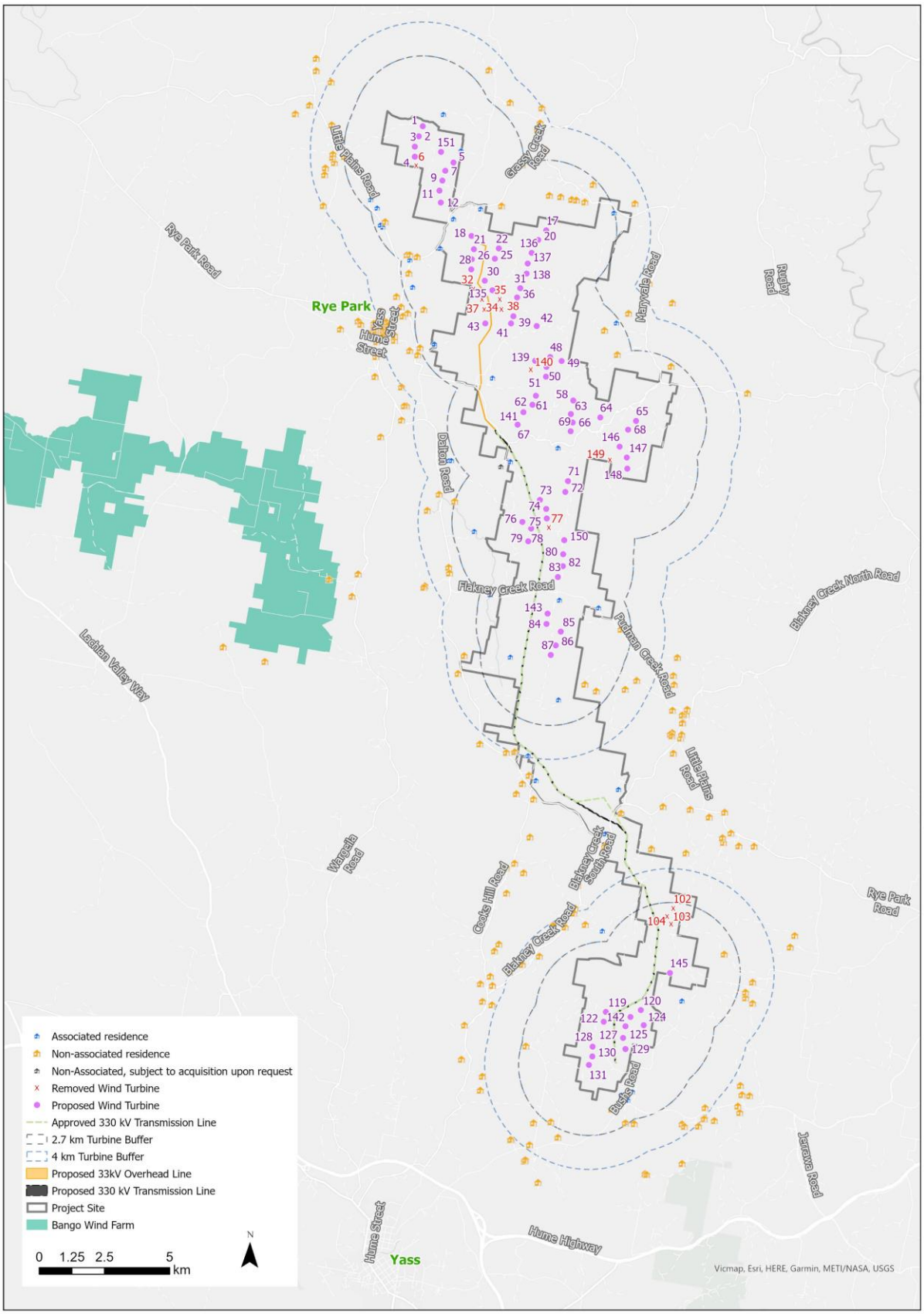


Figure E1 | Proposed Project Layout

The submissions supporting the modification cited the benefits the project would provide to the local economy, improvements to the local road network and the reduced number of turbines proposed.

During the assessment, the Department has consulted with key public authorities, local Councils, and utility providers including TransGrid. Several government agencies provided advice on matters relevant to their respective regulatory responsibilities and recommended a range of updated conditions that the Department has considered, and where applicable, adopted in the modified conditions of consent.

Assessment

The Department has considered the merits of the modification application in accordance with all the applicable NSW legislation, policies and guidelines. A summary of the findings of the Department's assessment is provided below.

Visual

The Department's visual assessment focused on the incremental change between the approved project with the modified turbines. The Department also engaged O'Hanlon Design to review Tilt's visual impact assessment and to provide independent advice on the likely visual impacts.

The topography of the project area and surrounds is characterised by rolling hills, with approved turbine locations spanning approximately 35 km from north to south on a series of undulating ridgelines. The area surrounding the project has scattered rural residences located primarily along Blakney Creek North Road to the east, Grassy Creek and Maryvale Roads to the north, Coolalie Road to the south and Rye Park – Dalton Road and Cooks Hill Road to the west.

In accordance with the *Wind Energy Visual Assessment Bulletin,* 200 m turbines have the potential to result in visual magnitude impacts on residences within 4 km of a turbine. There are 94 non-associated residences within 4 km of the proposed turbine layout, including 27 within 2.7 km of turbines.

Approximately one-third of the residences within 4 km are near or within Rye Park village, located on an easterly facing hill with the primary views towards the project.

Although the increase in turbine height could increase the visual magnitude impact, the overall visual impacts would not be significantly increased with the visual impact for the modified project ranging from low to moderate. This is due to the presence of existing mature vegetation, intervening topography and the removal of 15 approved turbines from visually prominent locations and in particular five turbines near the Rye Park Village. The Department also notes that the existing consent allows landowners within 4 km of a turbine to request visual mitigation and landscape screening.

However, there is one residence (R38) where the residual visual impacts are predicted to remain high.

While the impact at R38 would be high, the existing conditions of consent allow the landowner to request acquisition for a period of five years from the commencement of construction of turbines 62, 67, 71-76, 78 and 141. The Department considers that the increased magnitude of the turbines will increase the visual impacts at this residence, and hence has recommended that the acquisition rights in the current conditions be maintained in the modified consent.

The Department considered that the proposed increase in turbine size would also materially increase the visual impacts at R45 but notes that Tilt now has reached an agreement with the landowner.

The Bango Wind Farm, located 5 km south west of Rye Park village includes the development of up to 46 wind turbines with a maximum blade tip height of 200 m and is currently under construction.

The proposed maximum tip height increase would not expand the zone of visual influence for receivers to both wind farms to the extent that would considerably change the cumulative visual impacts at these locations.

The realignment of the 330 kV overhead transmission line between turbines 87 and 145 would bring the transmission line closer towards several residences in the Western Intermediate Cluster, resulting in moderate-high to high visual impacts to three non-associated residences (R47, R48 and R50). Tilt is proposing to offer landscaping treatments for these residences.

The Department notes that R48 and R50 are located more than 4 km from the nearest turbine and are therefore not covered by the existing consent condition which allows landowners to request visual mitigation from Tilt. As such, the Department has updated the consent conditions to allow these two residences to also request landscape screening. Beyond landscape screening, the selection of finishes on the transmission towers to match or blend with the background colours would be more effective than landscaping. This measure is already required under an existing consent condition, where Tilt must ensure the visual appearance of all ancillary infrastructure (including transmission towers) blends in as far as possible with the surrounding landscape. The Department considers the visual impacts to these three residences could be further mitigated by micro-siting the relevant portion of the transmission line further to the north of its current alignment in the final design and placement of towers.

With the implementation of these additional mitigation measures, the Department considers the residual visual impacts of the project would be acceptable.

Aviation Hazard Lighting

The Civil Aviation Safety Authority (CASA) did not require aviation obstacle warning lights to be installed on turbines for the approved project. However, with the increased height of the turbines, CASA has advised that some turbines would need to be lit with low intensity (200 candela) obstacle warning lights in lieu of the standard medium intensity (2,000 candela) lighting for structures of this height to ensure appropriate levels of aviation safety are maintained.

Tilt prepared an obstacle light impact assessment in response to CASA's requirements, stating the removal of 15 turbines reduces the extent of wind turbines subject to lighting, and of the 35 non-associated residences with increased turbine hub visibility, most would see no more than 1 or 2 additional hubs.

The Department acknowledges that the operation of obstacle warning lights can increase the visual impacts to surrounding residences, particularly for those in rural environments with low amounts of light sources. There are existing wind farms which have successfully implemented aircraft detection lighting systems to reduce the duration of time that warning lights are activated. The Department considers this mitigation measure, in combination with using low intensity lighting and shielding would reduce impacts to surrounding receivers to an acceptable level.

Consequently, the Department has strengthened the existing consent conditions to require any lighting installed to use an aircraft detection lighting system. Such a system would only activate the lights when an aircraft is detected nearby and deactivate lighting once it has passed and would reduce the visual impact of night lighting of receivers.

Biodiversity

Tilt has sought to minimise the project's biodiversity impacts by further refining the design of the project to avoid areas with significant biodiversity values. Despite the considerable increase to the area of native vegetation to be cleared from 241 ha to 392 ha, this is largely related to an increase in the area of derived native grassland to be disturbed (from 96 to 192 ha or 63% of the increased area) rather than remnant native woodland.

The modification would decrease clearing of White Box Yellow Box Blakely's Red Gum Woodland Grassland (Box Gum Woodland) critically endangered ecological community (CEEC) under the *Biodiversity Conservation Act 2016* by 12.9 ha compared to the project as approved (from 50.2 ha to 37.34 ha). The Department has updated the condition limiting the area of Box Gum Woodland CEEC that can be cleared accordingly.

The modification would increase clearing of Golden Sun Moth habitat within the project site from 66.94 ha to 85.22 ha, although this is primarily due to the application of a revised more detailed survey methodology because the Golden Sun Moth was found in a broader range of habitats in more recent surveys than previously documented.

Nonetheless, the Department has added a limit on the area of GSM habitat clearing permitted.

Impacts can be minimised further through micro-siting infrastructure during the detailed design stage of the project, and through a range of mitigation and adaptive management measures. All impacts would be offset in accordance with the NSW Biodiversity Offset Scheme. To encourage better design, the existing consent conditions allows Tilt to re-calculate the biodiversity offset liability based on a final detailed design once a turbine and preferred contractor is selected, prior to construction.

Noise

The noise assessment was modelled using the GE158 – 5.5 MW turbine, which has higher sound power level outputs compared to the Vestas V112 – 3.0 MW in the original application. The GE158 – 5.5MW model has one of the highest noise emissions compared to other similarly sized turbines currently available on the market and provides a conservative 'worst case' assessment.

Noise modelling predicts the modified project would comply with the relevant operational noise criteria at all but four non-associated residences. The potentially impacted residences are R6 and R7 on Maryvale Road, R11 on Grassy Creek Road located north of the site, and R38 (that already has acquisition upon request) located approximately 7 km south east of Rye Park village. Modelling suggests these residences would experience noise levels that marginally exceed the criterion by 1 - 2 dB(A) at certain wind speeds above 8 m/s (for example between 8 m/s and 10 m/s for certain turbines).

Tilt is proposing a turbine curtailment strategy to meet the noise criteria at all residences under all wind speeds. The strategy involves operating 19 turbines in a noise reduced mode (i.e. limiting the speed of the turbine's rotor for certain wind speeds for different turbines). The Department notes that this curtailment results in an overall 1.4 % reduction in output of the wind farm. In addition, such curtailment strategies are a recognised noise mitigation measure in the *Wind Energy Noise Assessment Bulletin* and the Department and EPA are satisfied that such an approach would ensure the project can meet the applicable noise criteria.

Overall, the Department considers that the proposed modification would not significantly increase the noise impacts of the project and notes that the wind farm will require an Environment Protection Licence from the EPA to operate.

Transport

The proposed modification is seeking to increase the number of one-way heavy vehicle movements over the construction period from 15,055 to 33,000 heavy vehicle movements which represents a 120% increase.

Tilt advised the project as currently approved could not be constructed with the originally estimated 15,055 movements and would require an increase based on its recent experience constructing a similar size wind farm in Victoria.

Despite this significant increase, the TIA indicates that the road network has sufficient capacity to accommodate the additional traffic.

The Department notes that the existing conditions require Tilt to prepare a dilapidation survey of the designated over-dimensional and heavy vehicle route, and rehabilitate damage caused by the project and must upgrade the transport route to the satisfaction of the relevant road authority. In addition, Tilt must prepare a Traffic Management Plan in consultation with Transport for NSW (TfNSW) and the Hilltops Council, Upper Lachlan Shire Council and Yass Valley Council detailing measures to minimise traffic safety impacts and disruptions to local road users.

The additional potential haulage routes from the Port of Newcastle would provide flexibility for selecting turbine suppliers. Depending on the preferred supplier chosen by Tilt, all traffic would use up to two of the three proposed haulage routes (either all traffic via one route for turbine components and the tower components via two different routes). However, this would only be confirmed once the final supplier is selected. The Department notes the assessment has considered the worst-case scenario of all traffic using each of the proposed haulage routes.

The proposed modification would consolidate the number of site access points for the project from eight to three, with two site access points off Grassy Creek Road to the north, and one site access point off Dalton Road south of Blakney Creek Road to access the central and southern portions of the site. The consolidation of site access points would significantly reduce the length of local roads being used by heavy vehicles during the construction and decommissioning phases.

With suitable road upgrades agreed with each of the Councils, regular road maintenance, and the implementation of standard traffic control measures and a driver's code of conduct, and implementation of a Traffic Management Plan, the Department is satisfied that the proposed modification would not result in any unacceptable impacts on the capacity, efficiency or safety of the road network.

Evaluation

The Department has considered all issues raised in submissions and assessed the merits of the modification application in accordance with the relevant requirements of the EP&A Act.

The Department's assessment considers the modification can be undertaken without significant visual impacts in accordance with measures in the existing approved conditions of consent due to the presence of existing mature vegetation, intervening topography and the removal of 15 approved turbines from visually prominent locations.

Although the proposed modification would increase native vegetation clearing by 151 ha, the Department acknowledges that Tilt has redesigned the project to reduce impacts on high value habitat such as reducing the clearing of Box-Gum Woodland CEEC by 12.9 ha. The Department considers the biodiversity impacts can be managed subject to the implementation of the existing strict conditions of consent by limiting the clearing of the CEEC, minimising the clearing during final detailed design, a

Biodiversity Management Plan and offsetting the residual impact under the *NSW Biodiversity Offset Scheme*.

The Department has also considered a range of other matters including potential impacts relating to noise, traffic, soil and water, heritage, aviation safety, bushfire risk, decommissioning and rehabilitation. The assessment concluded that these matters can be adequately addressed by existing consent conditions or amending the conditions of consent accordingly.

While there is some community opposition from local landowners to both the existing approved project and the proposed modification, the Department considers the proposed modification would enable the project to be developed to provide generation of 462 MW electricity, a 140 MW increase from the approved project (or 26 % more power) with 15 fewer turbines. It would also allow the following socio-economic benefits of the project to be realised:

- contributing up to $230,000 per annum (adjusted annually to increases in the CPI from July 2011) for the operational life of the project, with no net loss in contributions towards local community enhancement despite the reduction in turbines;
- reducing the duration of construction by up to 9 months;
- employment for up to 250 staff during construction and up to 10 staff during operation; and
- consolidates site access points, reduces the length of the local road network that would be used by project vehicles and includes road upgrades to the local road network.

The project has access to the electrical grid at a location with available network capacity and the proposed modification is required to improve constructability of the project. With a capacity of up to 462 MW the project would generate enough electricity to power about 225,000 homes, and is consistent with NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020 – 2030*.

On balance, the Department considers that the proposed modification has merit, is in the public interest and should be approved subject to the recommended conditions.

Contents

1 Introduction

Rye Park Renewable Energy Pty Ltd (the Applicant), owned by Tilt Renewables Limited (Tilt), has approval to construct and operate the Rye Park Wind Farm (the project) in the Southern Tablelands of NSW, located approximately four kilometres (km) east of Rye Park and 10 km north-east of Yass (see **Figure 2**) within the Hilltops Council, Upper Lachlan Shire Council and Yass Valley Council local government areas (LGAs).

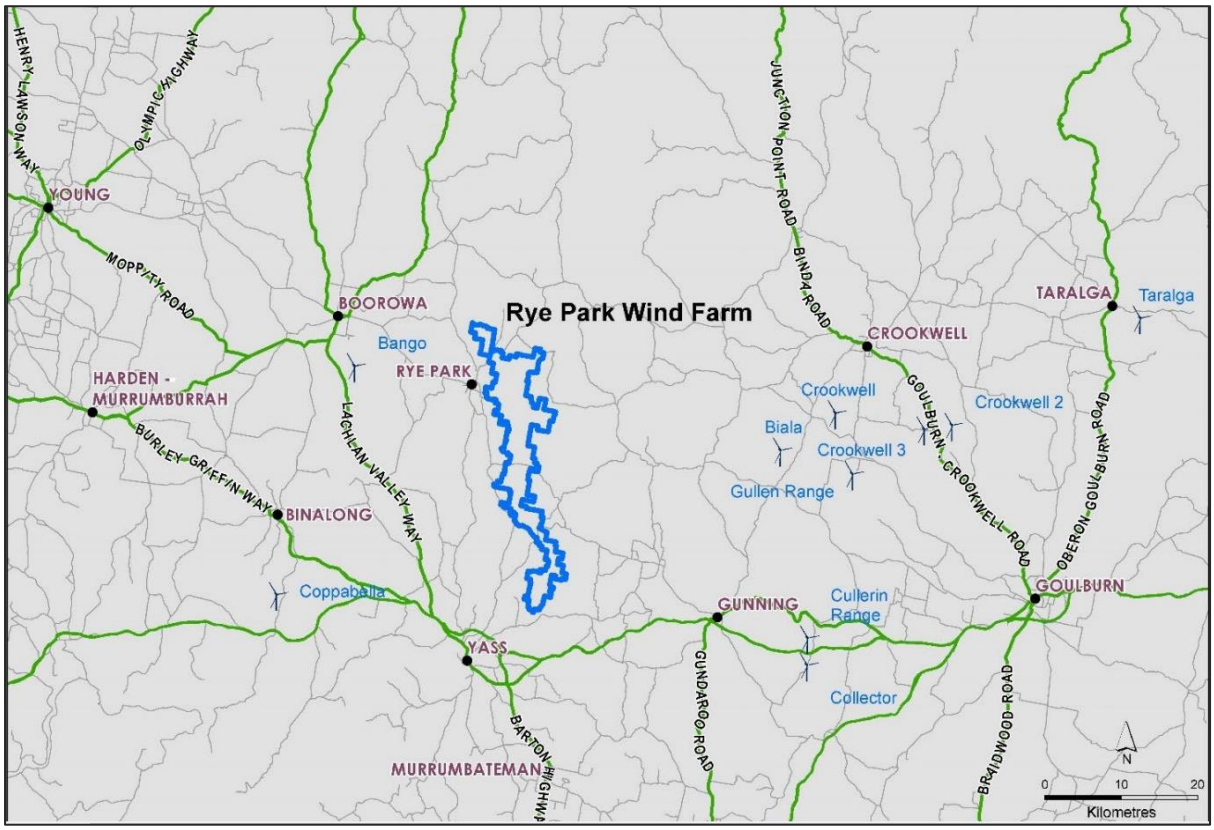


Figure 2 | Regional Context

The project was originally approved by the then NSW Planning Assessment Commission (Commission) on 22 May 2017. The development consent allows the Applicant to build and operate up to 92 wind turbines with a maximum height of 157 metres (m) and associated ancillary infrastructure.

This includes developing a 31.3 km 330 kilovolt (kV) transmission line that follows the ridgeline generally in a north to south direction in proximity to the turbine locations, until it terminates at the proposed connection substation, located adjacent to Days Road at the southern end of the project. While **Figure 3** and **Figure 4** shows the layout as shown in the consent, the determination by the Commission did not authorise the construction of 17 turbines (all of the intermediate precinct and eight turbines in the north western precinct being turbine numbers 16, 29, 44, 45, 47, 90, 93, 94, 95, 96, 97, 98, 99, 101, 133, 134 and 144).

Tilt has yet to commence construction of the project.

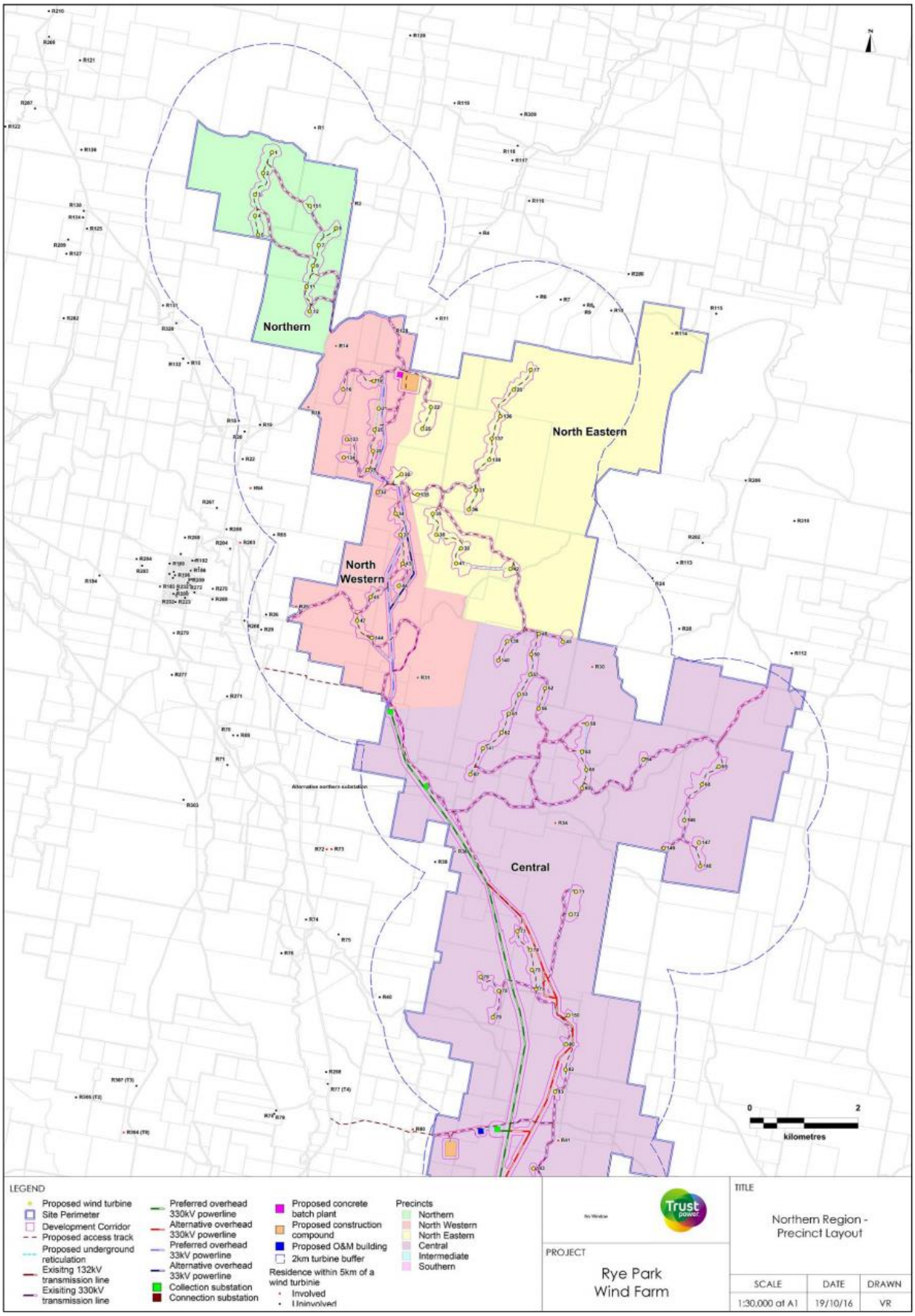


Figure 3 | Approved Project Layout (figure 1 of 2)

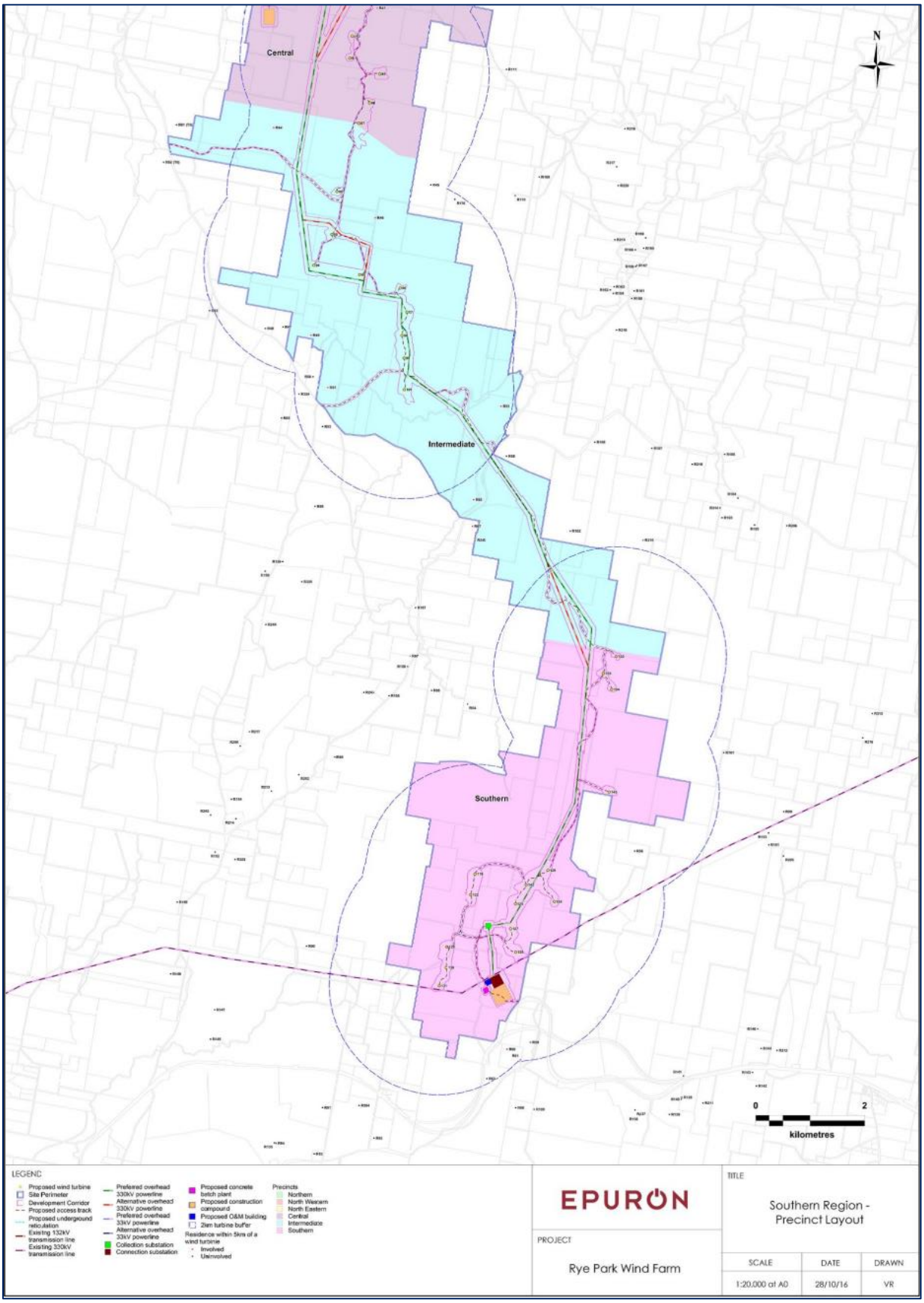


Figure 4 | Approved Project Layout (central, intermediate and southern clusters - figure 2 of 2)

2 Proposed modification

Tilt, on behalf of Rye Park Renewable Energy Pty Ltd, is seeking to modify the development consent to optimise the efficiency and constructability of the wind farm.

The proposed modification is described in detail in the Modification Report (see **Appendix B**), the Amendment Reports (19 August 2020 and 19 March 2021, see **Appendix E**), the Submissions Report (see **Appendix F**) and additional information that was submitted by Tilt on 30 October 2020 (see **Appendix C**).

The key aspects of the proposed modification involve four main components:

1. increasing the maximum dimensions of the wind turbines and reducing the maximum number of wind turbines;
2. design refinements to the location of ancillary infrastructure including the transmission line corridors, internal site access tracks and consolidating the site access points;
3. additional heavy and over-dimensional vehicle haulage route options; and
4. expanding the disturbance footprint of the project to accommodate the larger turbine foundations and in particular to facilitate constructability of the internal access roads.

These modifications are summarised in more detail below.

2.1 Turbine Dimensions and Layout

Tilt proposes to reduce the number of turbines from 92 to 77, while increasing the maximum blade tip height (from 157 m to 200 m) and maximum rotor diameter (from 130 m to 170 m). The turbines being removed are distributed across the project site (refer to **Figure 3Figure 4**), including one turbine in the Northern Cluster (i.e. 6), five turbines near Rye Park village in the North Eastern and North Western Clusters (i.e. 32, 34, 35, 37 and 38), six turbines in the Central Cluster (i.e. 52, 53, 56, 77, 140 and 149) and three turbines in the Southern Cluster (i.e. 102, 103 and 104).

The remaining turbine locations have all been previously assessed as part of the project's original assessment and none of the turbines excluded from being constructed in the Commission's approval of the original project are proposed as part of the modification. A comparison between the approved and proposed turbines are summarised in **Table 1**.

Table 1 | Wind Turbines as approved and proposed in Modification 1

Component	Approved	Proposed Modification	Change
Wind Turbine			
Number of turbines	92	77	-15
Maximum blade tip height	157 m	200 m	+43 m
Hub Height	101 m	117 m	+16 m
Blade length	65 m	83.5 m	+18.5 m
Nominal power per turbine	3.5 MW	6 MW	+71 %
Predicted total generating capacity	322 MW	462 MW	+140 MW

Tilt's primary justification for the larger turbine dimensions is to utilise newer and more efficient turbine technology that would increase the total generation capacity of the project by at least 26 % compared to the approved project with lower production costs, while minimising the impacts on the surrounding community and environment by reducing the number of turbines by 15 (or 16 %).

2.2 Design refinements

Transmission Lines

Tilt proposes to relocate the 330 kV transmission line off the ridgeline into the nearby valley, reducing the development corridor, amount of cut and fill and woodland vegetation clearing required for construction. A 2.8 km section of the transmission line at the southern extent of the site would also be realigned to provide enough spacing between the transmission line and the larger wind turbines proposed. These alterations result in a 2.9 km reduction of the total length of the 330 kV transmission line. Minor adjustments are also proposed to the 33 kV line which runs between turbine 18 and the switchyard near turbine 67 and in the vicinity of turbine 128.

Access Tracks and Site Access

Design optimisations and consolidation of site access points reduce the access track length by 15.8 km. While the permanent internal track width remains at 5.5 m, the width of the disturbance corridor for construction would increase from 12 m (as approved) to 30 m. This is based on more detailed information on the site constraints, cut and fill requirements to stabilise the tracks in areas with steep terrain, spacing for erosion and sediment control, and to ensure constructability of the project.

Tilt also proposes to rationalise the number of site access points for the project from eight approved locations down to three, with two site access points off Grassy Creek Road to the north (see 2 and 10 in **Figure 6**), and one site access point off Dalton Road south of Blakney Creek Road (see 12 in **Figure 6**) to access the central and southern portions of the site.

Other infrastructure

This modification provides specific locations for six wind monitoring masts located outside of the approved development corridor, adding 9.2 ha to the disturbance footprint. The modification also reduces the number of collector substations and operation and maintenance facilities required. The proposed design refinements to the ancillary infrastructure are summarised in **Table 2**.

Table 2 | Ancillary Infrastructure as approved and proposed in Modification 1

Component	Approved	Modification 1	Change
Access Tracks			
Length	103.4 km	87.6 km	- 15.8 km
Disturbance corridor width	12 m	30 m	+ 18 m
330 kV transmission line			
Length	31.3 km	28.4 km	- 2.9 km
Disturbance corridor width	60 m	40 m	- 20 m
33 kV transmission line			
Length	12.1 km	8.0 km	- 4.1 km
Disturbance corridor width	30 m	20 m	- 10 m
Other infrastructure			
Underground cabling length	82.4 km	66.7 km	- 15.6 km
Operation and Maintenance facility	2	1	- 1
Collector substations	3	1	- 2
Concrete batch plants	2	3	+1

2.3 Heavy Vehicle and Over-dimensional Access Route Options

Traffic movements

The proposed modification is seeking to increase the number of one-way heavy vehicle movements from 15,055 to 33,000 heavy vehicle movements during construction, a 120 % increase in traffic generation.

The proposed increase is informed by Tilt's recent experience building a wind farm in in Victoria, and driven by differences in assumptions made on traffic generation in the original application. These differences relate to a review of constructability and include changes in vehicle types (load capacity), volume of road base required for access track construction, trips required for water and materials to be imported for upgrades to the road network.

Tilt advised that the increase identified would still be required to build the project as approved.

State and Regional Network

The development consent for the project allows only one heavy vehicle and over-dimensional access route from Port Kembla via Goulburn, Gunning and Boorowa (refer to **Figure 4**). From Boorowa the traffic would continue the local road network.

This modification application is seeking to:

- refine the route between Port Kembla and the Hume Motorway (refer to **Figure 5**); and
- add route options from Port of Newcastle.

Tilt identified two additional heavy vehicle and over-dimensional access route options from the Port of Newcastle:

- Option one - via Goulburn / Gunning (approximately 509 km, refer to **Figure 6**); and
- Option two - via Dubbo (approximately 927 km, refer to **Figure 6**).

The additional routes would provide flexibility for wind turbine suppliers to use the Port of Newcastle for delivery of project components. Each transport route would require some upgrades to State and local roads / intersections. This is discussed further in **section 6.4** of this report.

Figure 5 | Approved and Proposed Heavy Vehicle Access Routes

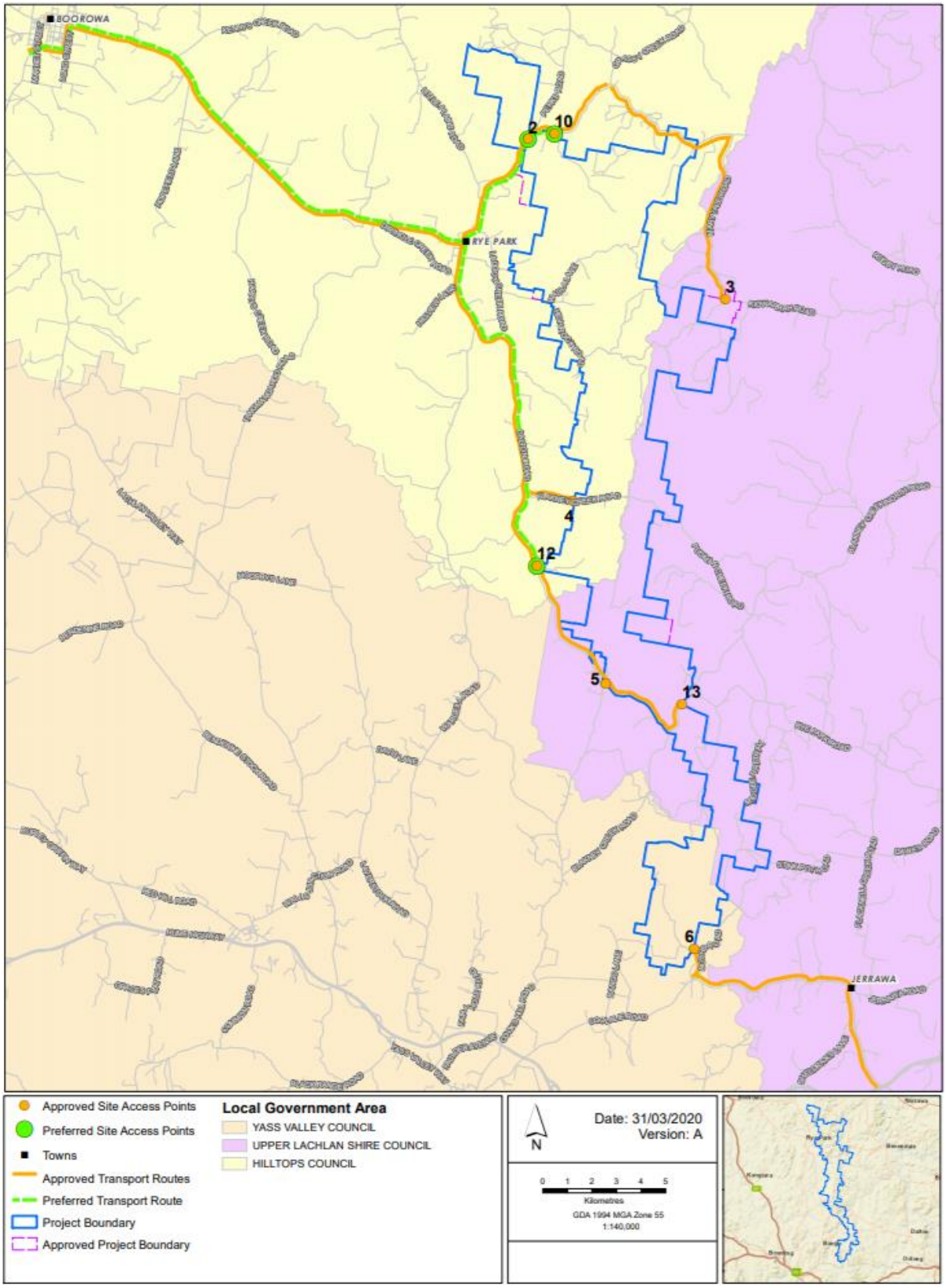


Figure 6 | Approved and Proposed Over-Dimensional and Heavy Vehicles Access Route

Local Network

The development consent allows over-dimensional and heavy vehicles to access the site off the Hume Highway via two alternative routes:

- Northern portion of the site: Lachlan Valley Way (a state road via Boorowa) followed by local roads including Boorowa Rye Park Road, Grassy Creek Road, Maryvale Road, Yass Street, Rye Park Dalton Road, Flakney Creek Road and Blakney Creek Road; and
- Southern portion of the project site: Jerrawa Road followed by Coolalie Road and Bushs Road.

This modification proposes all heavy and over-dimensional vehicles would access the project via Boorowa (as described above), with the Jerrawa Road route no longer required due to the extent of native vegetation clearing and extensive road upgrades required along this route.

The consent also required upgrades to the local network to facilitate both the over-dimensional and heavy vehicles and the increased volume of light vehicle traffic associated with the construction. This modification has quantified the ground disturbance associated with the road upgrades to the local network.

Road Upgrade Sequencing

Tilt is also seeking approval to commence construction works including the establishment of internal access roads in parallel with the upgrades to the local road network. This would require the one-off delivery of plant and equipment for civil works which would remain on site for the duration of construction. The delivery would not include over-dimensional vehicles.

2.4 Disturbance Area

Although the development corridor has been refined from 1,646 ha to 1,328 ha with a reduction in the number of wind turbines, reductions to the length of overhead and underground transmission lines and access tracks and consolidation of site access points, the development footprint would increase from 257 ha to 503 ha.

Around half the increase (138 ha) in the development footprint is a result of the conservative 30 m wide construction corridor assumed for the entire access track layout to account for areas with steeper terrain.

In addition, one third of the increase (91 ha) in the development footprint is a result of the 33 kV underground cabling between turbines no longer being co-located within the access tracks, which the applicant has stated is in line with contemporary best practice to prevent safety issues during construction. There are opportunities for the cable and access track disturbance areas to overlap, however a worst-case corridor width of 15 m for cabling has been assumed for the purposes of the modification.

Additional items including the 18.7 ha required for upgrades to the external road network and 9.2 ha for permanent met masts were omitted from the development footprint of the original project.

The Department notes that the 246 ha increase to the development footprint is conservative and can be further refined during the detailed design stage. Mechanisms to encourage a reduction to the final development footprint are discussed in **section 6**.

3 Strategic context

3.1 Renewable Energy Context

In 2019, NSW derived approximately 18.7% of its energy from renewable sources. The rest was derived from fossil fuels, including 76.7% from coal and 4.1% 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, is experiencing rapid growth.

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. It notes that Australia is heading towards zero emissions in the second half of the century.

The *United Nations Framework Convention on Climate Change* has adopted the Paris Agreement, which aims to limit global warming to well below 2°C, with an aspirational goal of 1.5°C. Australia's contribution towards this target is a commitment to reduce greenhouse gas emissions by 26 % to 28 % below 2005 levels by 2030.

The *NSW Climate Change Policy Framework*, released in November 2016, sets an aspirational objective for NSW to achieve net zero emissions by 2050. The *NSW Net Zero Plan Stage 1: 2020 – 2030*, released in March 2020, builds on the framework and sets out how the NSW Government will deliver on this objective and fast-track emissions reduction over the next decade.

In March 2018, the NSW Government identified 10 potential Energy Zones across three broad regional areas, including the New England, Central West and South West regions of NSW. While the project is not located within a Renewable Energy Zone, the NSW Government has a clear policy to encourage investment in new electricity infrastructure and unlock additional generation capacity in order to ensure secure and reliable energy in NSW, subject to appropriate site selection, detailed assessment and community consultation.

The approved project has access to the electrical grid at a location with available network capacity. With a capacity of up to 462 MW the modified project would generate enough electricity to power about 225,000 homes, and the modification improves the efficiency and constructability of the project and is therefore consistent with NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020 – 2030*.

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. The key documents comprising the Framework include:

- Wind Energy Guideline;
- Visual Assessment Bulletin; and
- Noise Assessment Bulletin.

The *Visual Assessment Bulletin* (the Visual 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

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

sensitivity to visual impact. The Visual 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 Visual 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**.

The Noise Assessment Bulletin (the Noise Bulletin) applies to this modification and provides guidance on measuring and assessing noise impacts from the project, including low frequency noise, tonality and auditing and compliance issues. The Department considered the Noise Bulletin in its assessment and in the revised conditions of consent as discussed further in **section 6.4**.

3.3 Site and Surrounds

The project is located across the Hilltops, Upper Lachlan Shire and Yass Valley LGAs. The portions of the project site that are in the Hilltops LGA and Yass Valley LGA are zoned RU1 – Primary Production under the *Boorowa Local Environmental Plan* (LEP) 2012 and *Yass Valley LEP 2013*, respectively. The part of the project site that is in Upper Lachlan LGA is zoned RU2 – Rural Landscape under the *Upper Lachlan LEP* 2010.

The project site is located on the edge of the Southern Tablelands and South West Slopes of NSW. The project site is approximately 1,328 ha with the development footprint covering approximately 503 ha and includes both cleared agricultural land and scattered remnant woodland. The closest conservation area is the Bango Nature Reserve, which covers an area of 409 ha, and is located adjacent to the Southern precinct of the project site.

The topography of the project area and surrounds is characterised by the rolling hills. The Bango Wind Farm is located approximately 8 km west of the project site between Yass and Boorowa. The Bango Wind Farm includes the development of up to 46 wind turbines with a maximum blade tip height of 200 m and is currently under construction. At the time of assessing the cumulative impact of the Rye Park original application, the proposal for Bango Wind Farm was for 122 turbines. This was reduced to 46 following proceedings in the NSW Land and Environment Court in 2018. Construction has commenced on Bango Wind Farm and although the construction periods of these two projects may overlap construction timeframes may overlap, at least to some extent and this is considered in **section 6**.

The area surrounding the project site has scattered rural residences located primarily along Blakney Creek North Road to the east, Grassy Creek and Maryvale Roads to the north, Coolalie Road to the south and Rye Park – Dalton Road and Cooks Hill Road to the west. There are 94 non-associated residences located within 4 km of the proposed turbine locations. Potential amenity impacts on these residences are discussed in **section 6.1**.

Of the 36 associated residences, 23 are host landowners. The 13 additional residences have entered into commercial agreements with Tilt in relation to the potential impacts from the wind farm.

4 Statutory context

4.1 Scope of modifications

The project was approved by the then Planning Assessment Commission (Commission) as delegate for Minister for Planning under Section 89E (now Section 4.38) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 22 May 2017.

This modification application has been lodged under Section 4.55(2) of the EP&A Act and the Department is satisfied that the modified project can be considered to be substantially the same development that was originally approved and that the proposed modification is within the scope of Section 4.55(2) of the EP&A Act as it:

- involves the use of the same land for the purposes of a wind energy project (i.e. electricity generation);
- reduces the number of approved turbines from 92 to 77; and
- based on the Department's assessment would not substantially increase the overall environmental impacts of the project as approved.

4.2 Consent authority

Although the Minister for Planning and Public Spaces is the approval authority for the application, the Deputy Secretary, Assessment and Systems Performance may determine the application under the Minister's delegation of 9 March 2020 there were more than 50 objections and none of the local councils objected to the proposed modification and Tilt did not make any political donations.

4.3 Mandatory matters for consideration

In accordance with Section 4.55(3) of the EP&A Act, the following must be considered in granting the modification application as relevant by the application:

- environmental planning instruments, proposed instrument or development control plan;
- any planning agreement;
- EP&A Regulation;
- likely impacts of the modification application, including environmental impacts on both the natural and built environments, and social and economic impacts;
- suitability of the site;
- any submissions;
- the public interest;
- the reasons for granting the consent for the original application.

The Department has considered the relevance of these matters for the modification application below.

Environmental Planning Instruments

The environmental planning instruments relevant to this modification are the *Boorowa Local Environmental Plan (LEP) 2012;* the *Yass Valley LEP 2013*; and the *Upper Lachlan LEP 2010*.

Several other environmental planning instruments are relevant to the project, including:

- SEPP (Infrastructure) 2007 (Infrastructure SEPP);
- SEPP (State and Regional Development) 2011; and
- SEPP No.55 – Remediation of Land.

Planning Agreements

Tilt currently has a voluntary planning agreement (VPA) with all three Councils based on the number of turbines. The VPAs with Councils are further considered in **section 6**.

EP&A Regulation

There are no additional considerations relevant to the modification application in the EP&A Regulation.

Likely impacts of the modification application

The likely impacts of the modification are considered in **section 6**.

Suitability of the Site

The suitability of the project site for a wind farm was assessed and considered by the Department and Commission in the original application and the Department is not aware of any changes in the receiving environment or applicable regulatory arrangements that would affect the suitability of the site for a wind farm.

Submissions

The Department sought advice from relevant government agencies and Councils and received 99 unique submissions from the general public and special interest groups. Public submissions and advice from government agencies is further discussed in **section 5**.

Public Interest

The consideration of public interest is provided in **section 5.5**.

The reasons for granting the consent for the original application

The Commission considered the impacts (including biodiversity, visual impacts and noise impacts) and the benefits of the wind farm in accordance with the EP&A Act in granting the approval.

The Commission's approval was for 92 turbines and excluded 17 turbines from being constructed comprising all 9 turbines from the Intermediate Cluster (90, 93, 94, 95, 96, 97, 98, 99 and 101) and 8 from the North Western Cluster (16, 29, 44, 45, 47, 133, 134 and 144). None of these excluded turbines have been proposed by Tilt in its modification.

4.4 Designation

The project was designated for the purposes of the modification to be a project on land with multiple owners under clause 49(2) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The Department requested Tilt notify landowners in writing and publish an advertisement to ensure the community is well informed about the lodgement of the development application for the project. Tilt advised the Department that it notified the landowners of the development site in accordance with the requirements of the EP&A Regulation and the Department's request. Tilt would still need to seek the agreement of the landowners to access land to undertake the construction and operation of the project.

4.5 Commonwealth and Other Approvals

The Commonwealth approved the project (EPBC 2014/7163) on 6 December 2017 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proposed modification was declared a 'controlled action' under that Act due to the potential for significant impact to listed threatened species and communities, and listed migratory species.

Tilt has separately pursued the proposed modification to its approval under the EPBC Act directly with the Commonwealth and Tilt did not request the assessment of this modification be accredited under the Bilateral Agreement between NSW and the Commonwealth. As such, the Commonwealth will be separately assessing the proposed modification in accordance with the EPBC Act.

Under the conditions of approval, Tilt is also required to obtain a number of further approvals prior to commencing construction of the project, including (but not limited to) approvals under the *Protection of the Environment Operations Act 1997* and *Roads Act 1993*.

5 Engagement

5.1 Department's engagement

The Department publicly exhibited the modification application from 13 May 2020 until 3 June 2020, advertising the exhibition in the Sydney Morning Herald, The Daily Telegraph, The Young Witness, and notified people who lodged an objection to the original project and the chair of Community Consultative Committee (CCC) for the project.

The Department notified and sought comment from TransGrid, Transport for New South Wales (formerly Roads and Maritime Services, TfNSW) and the APA Group (regarding the gas pipeline on the site) in accordance with the Infrastructure SEPP. Their feedback is discussed further in **section 5.4**.

The Department consulted government agencies and the Councils throughout the assessment process and visited a number of surrounding landowners on 4 and 5 November 2020.

5.2 Applicant's engagement

Tilt detailed its community engagement in the modification report, including placing information on the project community noticeboard, CCC meetings, newsletters, letters sent to host landowners, neighbours, prior submitters, local newspaper advertisements, and provided a dedicated online feedback form in the projects website. Tilt also consulted with relevant government agencies, Councils and the Department during the assessment process.

5.3 Submissions and Submissions Report

During the exhibition period of the modification application, the Department received 94 unique submissions from the public (74 objections and 20 in support), and five from special interest groups (four objections and one in support).

Advice was also provided by 19 government agencies and utility providers, including comments from the three Councils.

Full copies of the submissions are attached in **Appendix C**.

Tilt responded to matters raised in submissions on the project (see **Appendix D**) and also provided additional information during the Department's assessment (see **Appendix F**).

5.4 Key issues – Government agencies

Hilltops Council provided road upgrade specifications and sought assurances that these upgrades, including bridge and culvert strengthening works would be completed to a design approved by Council.

Council recommended vehicles use Dirthole Creek Road to by-pass Rye Park village and Meads Lane instead of Trucking Yard Lane at Boorowa township to reduce construction traffic impacts on the community. The Department notes Dirthole Creek Road was proposed but subsequently removed as a transport option in the original development application due to the high biodiversity values present along the route. Tilt also investigated the proposed route using Meads Lane for the modification application but advised the Department that it could not reach agreements with landowners along Meads Lane to facilitate the use of the route.

Council also raised concerns with Tilt's level of community consultation, particularly with landowners where private land access is required to accommodate over-dimensional vehicle movements. These matters on traffic and transport are discussed in **section 6.4**.

Yass Valley Council noted that while heavy vehicles associated with the project would no longer be using their local road network (Coolalie Road, Jerrawa Road and Bushs Road), the existing road upgrade requirements should remain as these roads would still be used by light vehicles. Tilt has since advised that no project vehicles (including light vehicles) would use Coolalie Road, Jerrawa Road and Bushs Road.

Both Hilltops and Yass Valley Councils sought to increase the Voluntary Planning Agreement (VPA) contribution rate originally agreed between the Councils and Tilt. Both Councils are concerned with reduction in contributions for community projects resulting from the removal of 15 turbines. Yass Valley Council also referenced its policy on Community Enhancement Funds adopted after the project was approved in October 2019, where rates are proportional to the generating capacity of each turbine.

In response, Tilt has committed to continue providing community funding equivalent to the originally approved 92 wind turbines. The VPA is discussed in **section 6.6** of this report.

Upper Lachlan Shire Council requested that VPA is adjusted for CPI commencing in June 2011 quarter, and did not raise any concerns about the modification application.

The Department's **Biodiversity, Conservation and Sciences Division** (BCS, formerly Biodiversity Conservation Division, BCD) sought clarification of technical matters in the Biodiversity Development Assessment Report (BDAR) including vegetation plot locations, the approach to determining the extent of species polygons and assumptions made in calculating impacts within the proposed transmission line corridors. Tilt updated the BDAR accordingly to BCS's satisfaction.

Despite the reduction in direct impacts on the Box Gum Woodland critically endangered ecological community (CEEC), BCS considers the proposed modification could have Serious and Irreversible Impacts (SAII) on the CEEC. BCS also raised concerns for SAII on the Golden Sun Moth in the absence of any actions that would conserve habitat for the species in the immediate vicinity of the project site. Biodiversity matters are discussed in **section 6.2** of this report.

The Heritage division of the former BCD (now Heritage NSW) sought clarification on Tilt's commitment to redesign development activities and the project footprint if significant Aboriginal objects and values are located during post approval test excavations and sought more details on the proposed under-boring for the site SU17/L1. It recommended that all Aboriginal sites to be avoided are identified in the development consent. Aboriginal heritage matters are discussed in **section 6.6**.

Transport for New South Wales (TfNSW) noted the significant increase in traffic movements compared to the project as approved and requested additional information on the maximum blade length proposed and a further breakdown of heavy vehicle movements along the multiple transport route options.

TfNSW also advised that mitigation measures must be detailed in the Traffic Management Plan (TMP) for the project and developed in consultation with TfNSW and relevant Councils. TfNSW raised no objections, subject to the preparation of a TMP and recommended consent conditions for the modification (if approved). These recommendations are discussed in **section 6.3**. Tilt has addressed these matters in the Submissions Report and TfNSW confirmed it has no residual concerns.

Department of Primary Industries – Fisheries (DPI Fisheries) advised that works located within Key Fish Habitat must be designed in consultation with Fisheries and comply with relevant policy and guidelines requirements. This is discussed in **section 6.5**.

The **Civil Aviation Safety Authority** (CASA) noted that while the turbines are not located near any certified or registered aerodromes and pose a low aviation hazard risk, it recommends wind turbines be installed with low intensity obstacle warning lights, and that wind monitoring towers include marker balls

on each guy wire to ensure visibility for pilots operating in the area. This is discussed in **section 6.1** and **6.5**.

Airservices Australia noted that the wind farm would not affect any sector or circling altitude, nor any instrument or departure procedures at any airport, but would require an increase to the lowest safe altitude to 4,000 feet. Airservices requested notification once construction commences so that the wind turbines are registered for aeronautical charting. This is discussed in **section 6.5**.

The **Department of Defence** (Defence) recommended that Tilt conduct and submit an aeronautical risk assessment to CASA in line with the *National Airports Safeguarding Framework Guideline D – Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers*, and if CASA determined obstacle warning lighting is required, it should be compatible with persons using night vision devices. Defence also requested that Tilt provide Airservices 'as constructed' details for aeronautical charting. This is discussed in **section 6.5**.

The **Rural Fire Service** (RFS) raised no objections and noted that any changes made to the Bush Fire Management Plan or Plan of Operation for the site should be provided to the local RFS District Office for comment. The Department has incorporated this into the recommended conditions of consent.

Fire & Rescue NSW (F&RNSW) noted that there is insufficient information about the fire safety and emergency response management of the project and requested to review such information after determination. The Department notes this information would be provided as part of the Emergency Plan which is a requirement of the recommended conditions.

The **Environment Protection Authority** (EPA) recommended that the correlation between the wind speed at the modified hub height and background noise level at the receiver is recalculated and that the *Wind Energy – Noise Assessment Bulletin* be applied in full to the modification. Tilt addressed these issues in its revised noise assessment.

Because any change in the hub height based on the final turbine selected may result in minor changes to the noise criteria, the EPA recommended modifying the existing operational noise limits in the development consent from specific noise levels at each hub height wind speed to a general criteria derivation process. It is noted that in order to obtain an Environmental Protection Licence (EPL) under the *POEO Act*, Tilt will be required to submit a revised noise impact assessment to the EPA once a final turbine model is selected, and this data would be used to establish tabulated noise criteria for inclusion in an EPL. This approach is discussed in **section 6.4** of this report.

The Department's **Crown Land Group** (DPIE Crown Lands) require a tenure to authorise transmission lines, underground cabling, access tracks and overhang of blades over crown land, road and waterways. DPIE Crown Lands requested that the project layout should minimise impacts to Crown lands, and that Tilt liaise with the district office prior to submitting a licence application.

The **Heritage Council of NSW** notes that the site is not in the vicinity of any State Heritage Register item and recommended that works avoid areas of historic archaeological potential and infrastructure to be placed away from these locations. Heritage Council of NSW recommended specific relevant measures to be further detailed in a Heritage Management Plan. This is discussed further in **section 6.6** of this report.

The **APA Group** noted the benefits of the proposed relocation of the substation, O&M building and construction compound, and the reduction in the number of proposed electrical crossings of APA's pipelines compared with the approved project. The APA Group does not object to the modification application provided a Safety Management Study and Electrical Hazards Study is undertaken to inform the detailed design of the project, prior to the commencement of development. Safety and Hazards is discussed in **section 6.6** of this report.

NSW Ports noted that the wind turbines are proposed to be delivered from Port Kembla and stated that the necessary provisions to cater for the proposed larger turbines at this port are in place.

The Department's **Water Group** (DPIE Water), the **Department of Primary Industries – Agriculture** (DPI Agriculture), **Regional NSW – Mining, Exploration & Geoscience** (MEG) and **TransGrid** raised no concerns and made no recommendations.

5.5 Key issues – Community

Of the 94 submissions received from the public, 74 objected and 20 supported the project. A summary of all submissions received from the public is provided in **Table 3** | .

Around one quarter (24 %) of all objections came from residents located between 2 and 5 km of the site, about one third (36 %) came from residents located between 5 km and 25 km from the site and 22 % were from residents located more than 25 km from the site. Regardless of proximity to the site, submissions objecting to the project typically focused on local impacts and matters relevant to the local community.

Table 3 | Summary of Community Submissions

Submitter	Object	Support	Total
< 2 km	0	4	4
2 – 5 km	17	1	18
5 – 25 km	25	4	29
> 25 km	17	5	22
Other*	15	6	21
Total	74	20	94

* Submitters that did not provide a valid address

The key issues raised in public submissions objecting to the project are summarised in **Figure 7**. The most common issues raised in submissions objecting to the project include the following:

- biodiversity impacts including bird and bat strike, clearing of native vegetation and the loss of habitat for threatened species;
- visual impacts on the surrounding landscape;
- amenity (noise and increased traffic volume); and
- inadequate consultation.

Other issues raised in objections included hazards (particularly fire and aviation risks, cumulative impacts with other existing wind farms in the region, particularly the nearby Bango Wind Farm), land, erosion and water (tower stability, water resources and flooding), property devaluation, misleading and incorrect information in the modification report, social issues, health impacts, Aboriginal Heritage values, and greenhouse gases emissions over the life of the project.

The key matters raised in the supporting submissions included views that:

- reducing the number of turbines proposed would reduce biodiversity, visual and noise impacts;
- the project would result in improvements to local roads;
- the local economy would benefit as a result of the project by creating local jobs and supporting local businesses; and
- the turbine height increase would improve the efficiency and increase energy generation, providing a beneficial contribution to the State's future energy demands.

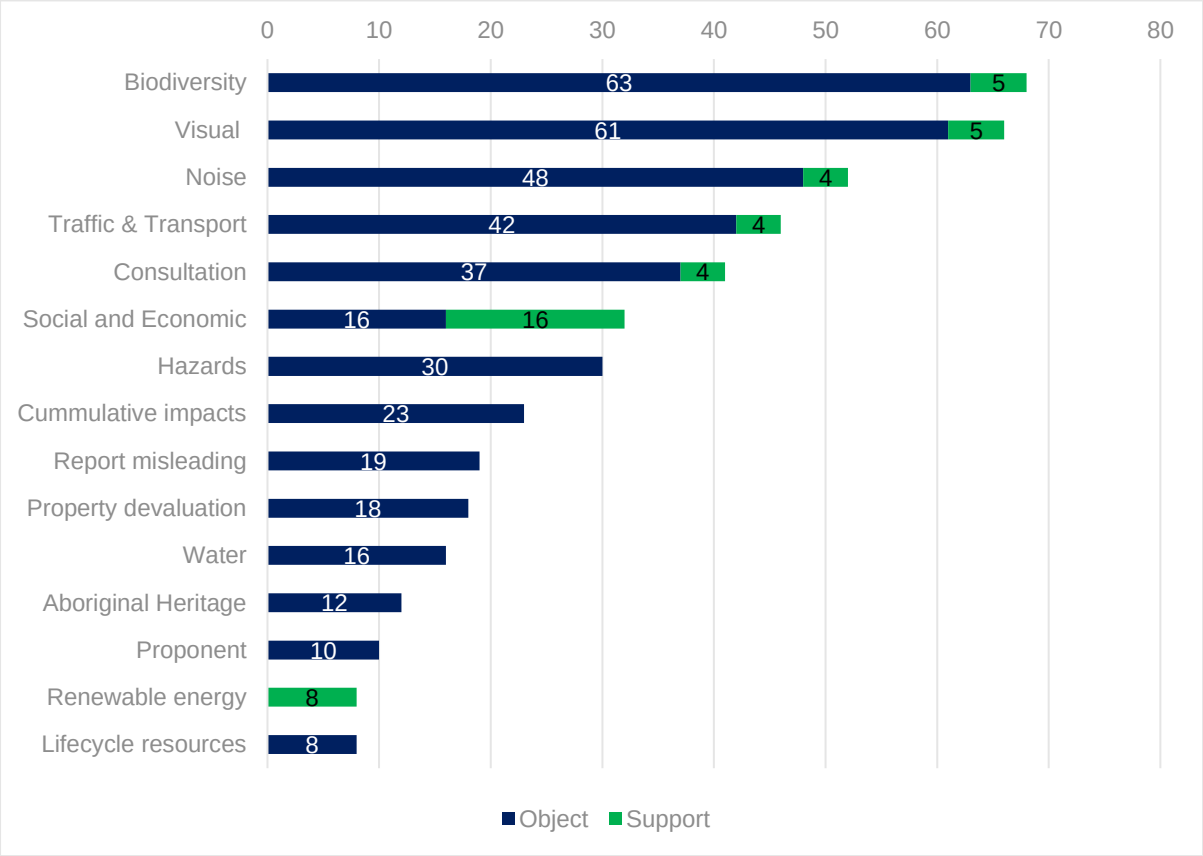


Figure 7 | Key Issues Raised in Public Submissions

A further breakdown and summary of key issues raised by the public is summarised in **Appendix F**. **Section 6** of the assessment report provides a summary of the Department's consideration of these matters and recommended conditions.

5.6 Key issues – Special Interest Groups

Rye Park Action Group consisting of local residents objected to the modification due to the visual impacts associated with taller turbines, increased development footprint and potential noise impacts and cumulative impacts to Rye Park, including the primary school that would be located between the Bango Wind Farm and the proposal.

Brown Mountain Residents Group, a group of residents in the Nimmitabel region, objected to the modification and refers to matters raised in an individual community submission, which raised concerns on visual, noise and biodiversity impacts.

Yass Landscape Guardians objected to the modification, raising concerns about the visual impact, environmental damage and social impacts on the community with multiple wind farms in the region.

Australian Industrial Wind Turbine Awareness Group objected to the modification and raised issues with visual, noise and biodiversity impacts due to the larger turbines proposed.

Australian Wind Alliance supported the modification noting that the increased tip height would increase the energy generation and highlighted that the project has considerable community support. It also mentioned that there would be benefits to the local community. It considered that visual and noise impacts remain largely unchanged, but noted proposed clearing has increased.

6 Assessment

The Department has considered the merits of the modification application in accordance with all the relevant NSW legislation, policies and guidelines. The key matters for assessment relate to the impacts on visual amenity (discussed in **section 6.1**), biodiversity values (discussed in **section 6.2**), transport (discussed in **section 6.3**) and noise (discussed in **section 6.4**).

A summary of the Department's consideration of other potential impacts is provided in **Table 16** (see **section 6.5**).

6.1 Visual

Introduction

Concerns about visual impacts were raised in most of the community submissions objecting to the project, particularly regarding the additional visual impacts from the increase in maximum turbine tip height from 157 m to 200 m, and the cumulative visual impacts of the project with Bango Wind Farm which is located 5 km west of Rye Park village and is currently under construction.

Tilt commissioned a visual impact assessment of the visual impacts of the development, prepared by Green Bean Design (GBD). Tilt also commissioned a peer review of the GBD's visual assessment prepared by Moir Landscapes Architecture.

The Department engaged O'Hanlon Design Landscape Architects (OHD) to review the Visual Impact Assessment Tilt commissioned and provide independent advice. The Department visited several non-associated residences surrounding the project with OHD to assess potential visual impacts and listen to residents' concerns.

Avoidance and Mitigation

Tilt initially presented an 80-turbine layout in the modification application, removing 12 approved turbine locations distributed across the site from the project primarily for operational reasons. Following feedback from community submissions and the Department, Tilt deleted an additional three (32, 34 and 37) of the four turbines closest to Rye Park village to reduce visual impacts.

Tilt also assessed night-time obstacle lighting impacts for the 77-turbine layout in response to CASA's request to install obstacle warning lights for aviation safety due to the proposed increase in turbine height.

Tilt's visual assessments concluded that there would not be any significant increase in the magnitude of visual effect or cumulative visual impacts than the approved project.

The existing development consent conditions require Tilt to:

- offer acquisition to:
  - the landowner of non-associated residence R38 linked to turbines 62-67, 71-76, 78 and 141; and
  - the landowner of Lot 75 DP 754136 linked to turbines 146-149;
- reach agreement with the landowner of non-associated residence R56 in order to construct turbine 145;
- offer visual impact mitigation measures (e.g. landscaping and/or vegetation screening) to all non-associated residences within 4 km of any approved wind turbine;
- implement all reasonable and feasible measures to minimise the impacts of the visual appearance of the development, including off-site lighting impacts; and

- ensure that shadow flicker from wind turbines does not exceed 30 hours per annum at any non-associated residence.

Since the project was approved in May 2017, R45, R56 and R68 have entered into commercial agreements with Tilt to facilitate the project's development, including accepting the impacts of the project. The landowners with acquisition rights remain as non-associated receivers.

Impact Assessment

The Department's assessment focuses on the incremental change between the approved and proposed turbines, including the increase in turbine dimensions and the removal of 15 turbines. Tilt is not proposing to relocate any turbines or add any of the turbines removed in the Commission's consent of the original project.

The Department has assessed the visual impacts of the proposed modification against the relevant performance objectives identified within the *Visual Assessment Bulletin* (the Bulletin).

Visual Magnitude

In accordance with the Bulletin, the Department has considered in detail the non-associated residences located within 4 km of a turbine. The Department's assessment also considered the Bulletin's visual performance objectives for a residence's visual influence zone. Visual influence zone is based on a combination of viewer sensitivity, visibility distance and scenic quality class.

Visual magnitude is a key consideration and important performance objective for this modification due to the increased height of the turbines and in particular for the sensitive visual influence zones around Rye Park village.

While the Department acknowledges the wind farm would be visible at distances beyond 4 km, it considers the incremental change in impact as a result of larger turbines at residences located greater than 4 km from a turbine would be negligible, noting there is an approved wind farm project on the site.

There are 94 non-associated residences located within 4 km of the proposed turbine locations including 27 within 2.7 km of turbines. Approximately one-third of the residences within 4 km are near or within Rye Park village itself.

The predicted visual impacts for residences located within 4 km of the nearest turbine is summarised by clusters (see **Figure 8**).

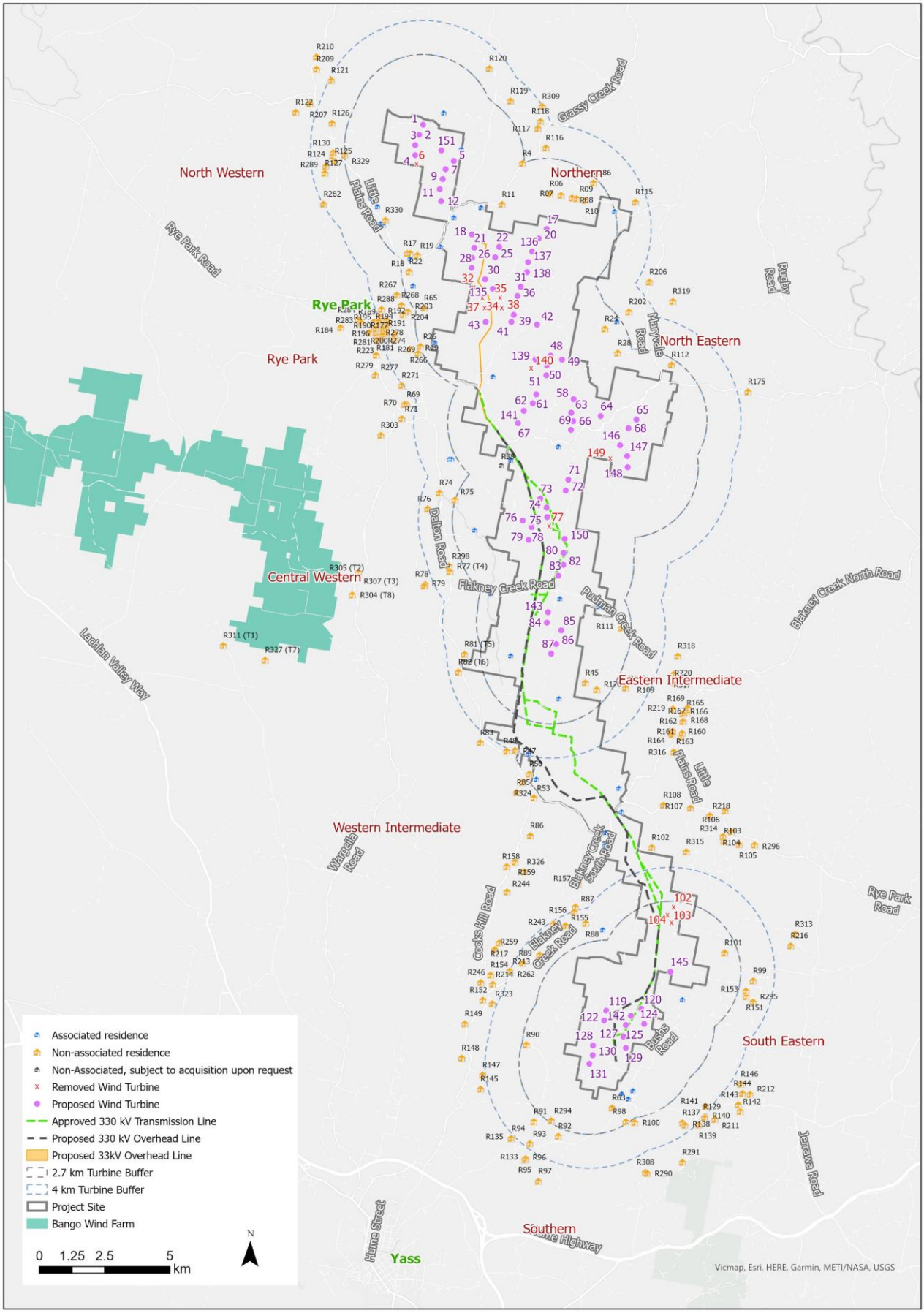


Figure 8 | Residential Clusters

North Eastern Cluster

The north eastern cluster of residences (R24, R28, R112, R202) is situated east of the main ridge with views of turbines to the west (see **Table 4**) and is located between 2 and 3.1 km from the closest turbine. Although the increase in turbine height has the potential to increase the visual magnitude impact, the overall visual impacts would be significantly reduced by removal of nine turbines (32, 34, 35, 37, 38, 52, 53, 56 and 140) in the vicinity of these residences by reducing the density of turbines and potential for views of overlapping of rotor elements.

Table 4 | Visual Impact Assessment ratings – North Eastern Clusters

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent expert's assessed impact
R24	VIZ2	2015	Low	Moderate-Low
R28	VIZ2	2148	Moderate	Moderate
R112	VIZ2	2484	Moderate	Moderate
R202	VIZ2	3143	Low	Low

Northern Cluster

The northern cluster of dwellings has views of the main turbine group to the south and west. Four residences (R6, R7, R8, R9, R10) would have the nearest wind turbine ranging from 1.3 km to 1.8 km and are located in VIZ 1 meaning an area identified as having a high level of visual sensitivity based on distance (see **Table 5**). However, the Department observed during its site visit at R10 that there is considerable existing vegetation at most of these properties screening views of the turbines, which would significantly reduce the potential visual magnitude impacts of the associated with the modification and the visual impact at these residences would be low to low-moderate.

R11 has 14 turbines located within 2.7 km of the residence with the closest turbine at 1.6 km. The residence would have turbines located within 180 degrees of the horizontal viewfield (see **Figure 10**). The Department visited this residence to better understand the potential impacts of the modification.

The residence has mature trees immediately surrounding the residence and an additional windbreak planted to the south-east of the residence (see **Figure 9**). Although the dominant views from R11 are to the north and west including views from a veranda looking towards turbines 5 to 12 , a ridgeline with a north-east to south-west alignment located between the residence and these turbines, as well as existing vegetation would shield views of turbines, in particular the closest turbines including the hub of turbine 5 and base of turbines 7, 9 and 11.

Although not the dominant view from the residence, views to the south and south-east with the proposed increased turbine dimensions would include views of the hub of turbine 17 and the blade of 36 would become visible. However, there would no longer be views of four turbines (32, 34, 35, 37 and 38) previously visible, that have been removed from the project and the existing mature trees around the residence also provide screening.

The Department's assessment of the visual impact of the original project at this residence was moderate. Although the Department's assessment of the impact of the increased turbine dimensions would result in a rating of moderate-high, the existing mitigation measures in the consent for vegetation screening upon request could be implemented to supplement the existing planting on site, and are likely to effectively further reduce the visual impact.

Table 5 | Visual Impact Assessment ratings – Northern Cluster

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent expert's assessed impact
R4	VIZ2	2633	Low	Low
R6	VIZ1	1347	Low	Low
R7	VIZ1	1401	Low	Moderate-Low
R8	VIZ1	1533	Low	Low
R9	VIZ1	1633	Low (nil)	Low
R10	VIZ1	1833	Low	Low
R11	VIZ1	1623	Moderate-High	Moderate-High
R115	VIZ2	3551	Low	Low
R116	VIZ2	3103	Low	Low
R117	VIZ2	3459	Low	Low
R118	VIZ2	3653	Low	Low
R119	VIZ2	3165	Low	Low
R120	VIZ2	3327	Low	Low
R286	VIZ2	2512	Moderate	Moderate
R309	VIZ2	3983	Low	Low

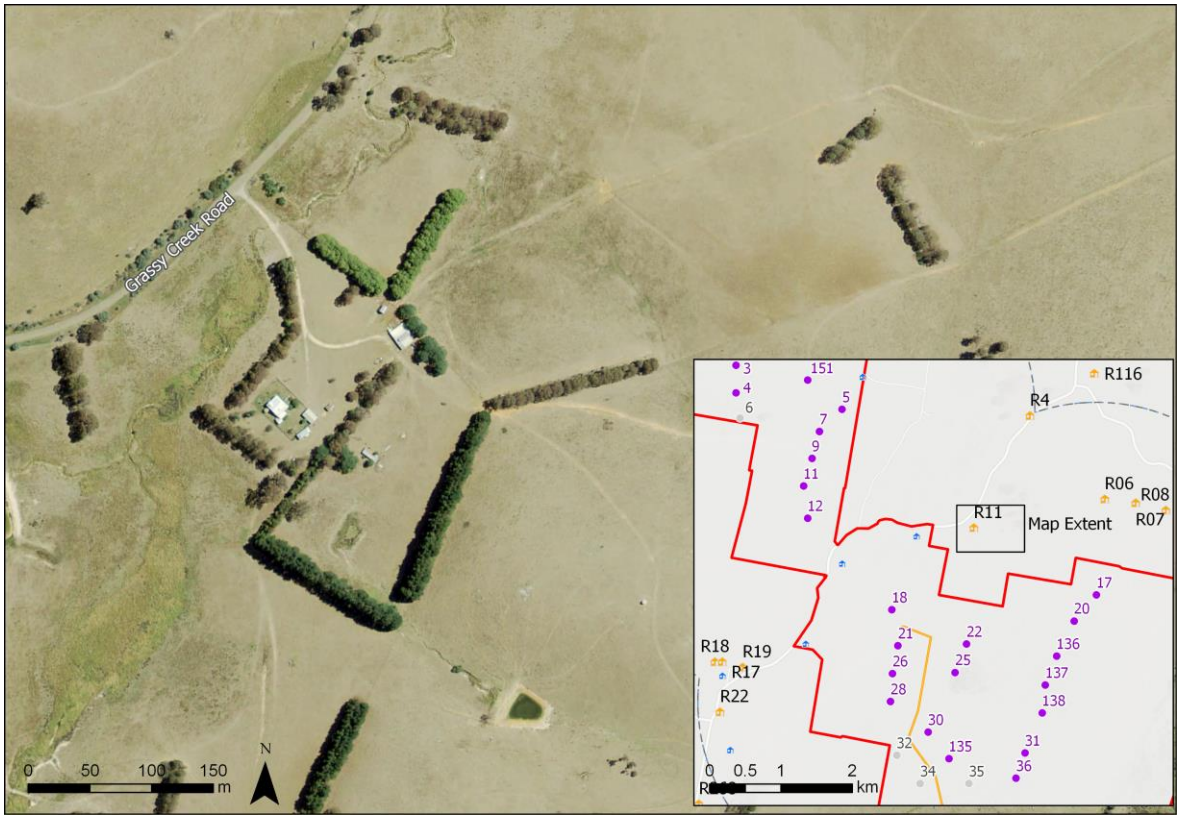


Figure 9 | Aerial of residence R11 showing existing plantings

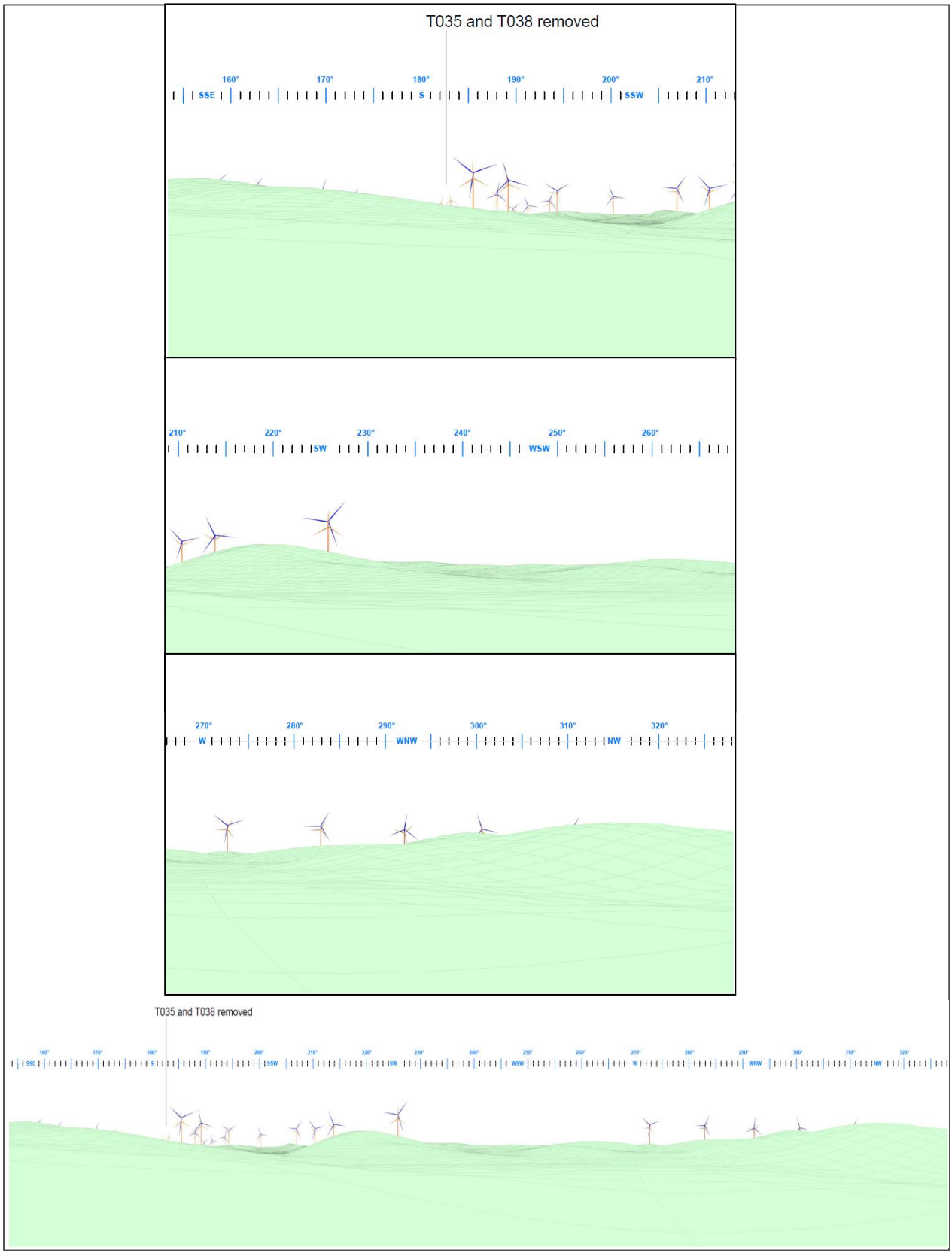


Figure 10 | Wireframe from R11 (Northern Cluster) cropped to 60 degrees comparing approved 157 m tip (orange) and proposed 200 m tip (blue) from south-east to north-west

North Western Cluster

This cluster of residences is located in open grasslands along Little Plains Road with east and south-east facing views toward the northern end of the project. Two new residences (R329 and R330) have been constructed after the wind farm was approved and are located within 2.7 km from the nearest turbine. The other seven residences are located between 3.1 km and 3.9 km from the nearest turbine (see **Table 6**).

The Department met with several landowners and objectors along Little Plains Road, with concerns relating to the visual impacts of larger turbines and aviation hazard lights. The Department considers that due to the distance between these receivers (except for R329 and R330) and the nearest turbine of more than 3.1 km, along with the removal of one of the closest turbines (6) and five turbines to the south, there would not be any significant increase in the magnitude of visual effect or cumulative visual impacts than the approved project. In addition, any increase could be mitigated by the existing condition of consent requiring Tilt to provide visual impact mitigation measures for these residences at the request of the landowner. Aviation hazards lights are discussed later in this section.

In regard to R329, there are two turbines (3 and 4) around 2.7 km from the residence and one of the closest turbines (6) has been removed from the project layout and five turbines removed from the layout further to the south. With the proposed reduction in turbines, R329 would have views to three fewer turbine hubs and 10 fewer turbine blade tips of turbines further south than the currently approved layout.

In addition, there is partial screening of views from R329 from mildly undulating topography, with a small mound and scattered paddock trees on adjoining property to the east. The Department considers the visual impacts at this property could be effectively mitigated through existing conditions requiring landscaping and visual screening at the landowner requests to bolster existing vegetation screening.

R330 has two turbines (11 and 12) located within 2.7 km of the residence, and one of the closer turbines (6) that was located 2.4 km from the residence has been removed from the project. Although one turbine has been removed from the layout, the Department considers the modification would result in slight increases to the visual impact at this location and that the visual impact for the residence would be moderate. However, the Department notes that the landowner has not objected to the modification application and has a neighbour agreement with Tilt covering adjacent multiple land parcels, but does not include R330, and the landowner would be able to request landscape screening to further reduce the visual impact.

Table 6 | Visual Impact Assessment ratings – North Western Cluster

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent expert's assessed impact
R121	VIZ2	3903	Moderate	Moderate
R124	VIZ2	3152	Moderate	Moderate
R125	VIZ2	3088	Moderate	Moderate
R126	VIZ2	3289	Moderate	Moderate
R127	VIZ2	3525	Moderate	Moderate
R130	VIZ2	3139	Moderate	Moderate
R289	VIZ2	3453	Moderate	Moderate
R329	VIZ2	2694	Moderate	Moderate
R330	VIZ2	2261	Moderate	Moderate

Rye Park village and surrounds

There are around 20 non-associated residences located near Rye Park village and 30 non-associated residences within the village itself (see **Table 7**).

The village is zoned RU5 – Rural Village and during the assessment of the original development application, the Department considered the impacts on this sensitive land use designation under the applicable LEP and the Commission removed eight turbines from the north western precinct to reduce the visual impacts on a string of non-associated residences (R266 – 271) located east of Yass Street in Rye Park village.

The further five turbines (32, 34, 35, 37 and 38) removed in this application also includes three of the four approved turbines closest to the village.

The Department considers that although there is a potential for an increase in visual impact from the increase in turbine height, the removal of five turbines would result in an overall visual impact of moderate to low due to the reduction in density of turbines in the landscape when viewed from Rye Park village. A photomontage taken from Kershaw Street in Rye Park village comparing the approved and proposed layouts is shown in **Figure 11**.

As such, the Department considers the proposed modification would not increase impacts to the residences (see **Table 7**) above and beyond what has been approved.

The cumulative visual impacts of the project with Bango Wind Farm are considered later in this section.

Table 7 | Visual Impact Assessment ratings – Rye Park village and surrounds

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent visual expert's assessed impact
R17	VIZ2	2338	Moderate	Moderate
R18	VIZ2	2393	Moderate	Moderate
R19	VIZ2	2101	Moderate	Moderate
R22	VIZ2	2394	Moderate-Low	Moderate-Low
R26	VIZ2	2673	Moderate-Low	Moderate-Low
R29	VIZ2	2862	Moderate-Low	Moderate-Low
R65	VIZ2	2057	Low	Low
R203	VIZ2	2830	Moderate	Moderate
R204	VIZ2	2899	Moderate-Low	Moderate-Low
R266	VIZ2	3084	Moderate-Low	Moderate-Low
R267	VIZ2	2956	Moderate-Low	Moderate-Low
R268	VIZ2	2854	Moderate-Low	Moderate-Low
R177	VIZ2	3831	Moderate-Low	Moderate
R179	VIZ2	3719	Moderate-Low	Moderate-Low
R180-R200	VIZ2	>3700	Moderate-Low	Moderate-Low
R230	VIZ2	3,563	Moderate-Low	Moderate-Low
R269	VIZ2	3546	Moderate-Low	Moderate-Low
R270	VIZ2	3509	Moderate-Low	Moderate-Low
R325	VIZ2	3849	Moderate-Low	Moderate-Low

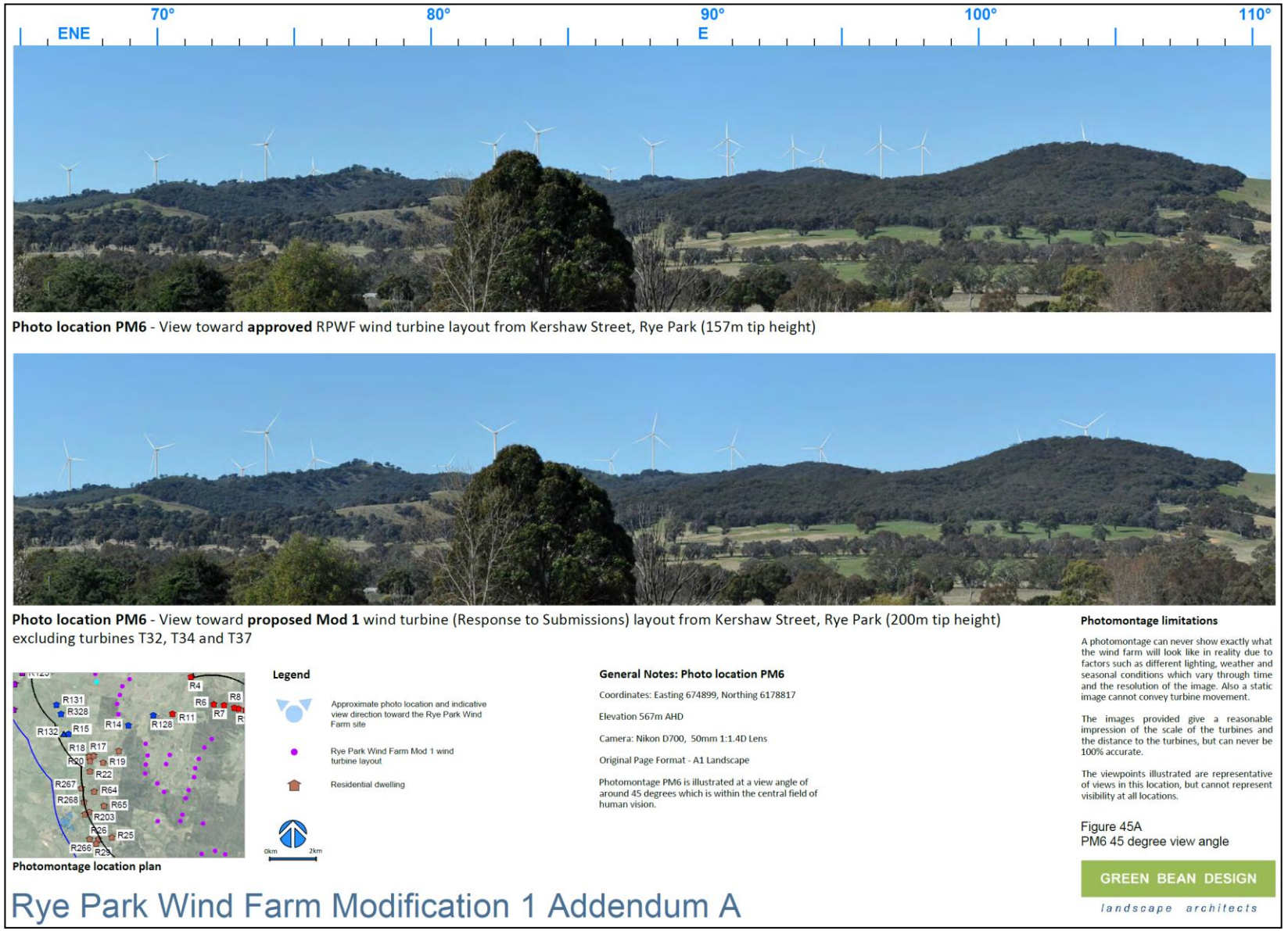


Figure 11 | Photomontage of view from Kershaw Street, Rye Park

Central Western and Western Intermediate Clusters

The residences (excepting R38) in the Central and Western Intermediate clusters are more than 2.7 km from the nearest turbine. The Department considers that given the distance from turbines the visual impacts with the larger turbine dimensions would remain low – moderate to low and can be mitigated with existing visual impact mitigation conditions (see **Table 8**).

In regard to R38, the Department considered in its original assessment that this non-associated receiver would experience moderate-high visual impacts considering the proximity of the nearest turbine (1.7 km), the relative height of the wind turbines and the degree of visual horizon that would be affected (240 degrees). The existing conditions of consent allow the landowner to request that Tilt acquires the land for a period of five years from the commencement of construction of turbines 62, 67, 71-76, 78 and 141.

Tilt is proposing to retain the ten turbines subject to this condition, and while the proposed modification would further increase the visual impacts to R38, the Department considers the acquisition rights available to the landowner remain appropriate.

Table 8 | Visual Impact Assessment ratings – Central Western and Western Intermediate Clusters

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent visual expert's assessed impact
R38	VIZ1	1735	High-Moderate	High
R72	VIZ2	2971	Low	Low
R73	VIZ2	2890	Low	Low
R74	VIZ2	3360	Moderate-Low	Moderate-Low
R75	VIZ2	2710	Low (nil)	Moderate-Low
R76	VIZ2	3669	Moderate-Low	Moderate-Low
R77	VIZ2	3258	Moderate-Low	Moderate-Low
R298	VIZ2	3210	Moderate-Low	Moderate-Low
R47	VIZ2	3963	Low	Low
R48	VIZ2	3950	Low	Low

Eastern Intermediate Cluster

The residences in the Eastern Intermediate Cluster (excepting R45) are between 2.2 and 3.3 km of the nearest turbine. The Department considers that while there may be minor increases in visual impacts to the residential receivers in this cluster, the visual impact rating would be low or low-moderate due to the distance from turbines, partial screening provided by existing vegetation at these residences (see **Table 9**). In addition, the visual mitigation measures in the existing consent provide sufficient mitigation for the potential impacts.

Residence R45 has two turbines to the north-west in close proximity to the residence, turbine 87 at 1.7 km and 86 at 1.9 km from the residence, and the dominant views from the residence are to the north-west towards these turbines. The Department notes that during its assessment of the modification application, Tilt reached an agreement with the owners of R45 and are considered associated with the project.

Table 9 | Visual Impact Assessment ratings – Eastern Intermediate Cluster

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent expert's assessed impact
R109	VIZ2	3382	Low	Low
R110	VIZ2	3146	Low	Low
R111	VIZ2	2318	Moderate-Low	Moderate-Low
R170	VIZ2	2231	Low	Low-Moderate

Southern and South Eastern Clusters

For residences in the South Eastern Cluster, the closest turbines are located between 2.2 km and 3.3 km and with the additional removal of turbines 102, 103 and 104 would result in an overall visual impact of low to low-moderate.

For residences in the Southern Cluster, the Department considers that the residences (excepting R63) are located more than 2.5 km from the nearest turbine the increase in turbine dimensions would not significantly increase the visual impact and the visual impact would be low-moderate or moderate (see **Table 10**).

Table 10 | Visual Impact Assessment ratings – Southern and South Eastern Clusters

Residence	Visual Influence Zone	Distance to closest turbine (m)	Applicant's assessed impact	Independent visual expert's assessed impact
Southern				
R63	VIZ1	1905	Low	Low-Moderate
R90	VIZ2	2523	Low (nil)	Low-Moderate
R91	VIZ2	3075	Moderate-Low	Moderate-Low
R92	VIZ2	3020	Moderate-Low	Moderate-Low
R98	VIZ2	2627	Moderate-Low	Moderate-Low
R100	VIZ2	2844	Low	Low-Moderate
R294	VIZ2	2626	Moderate-Low	Moderate
South Eastern				
R99	VIZ2	3196	Low	Low
R101	VIZ2	2204	Low	Low-Moderate
R151	VIZ2	3060	Low	Low
R153	VIZ2	2994	Low (nil)	Low
R295	VIZ2	3379	Low	Low

Residence R63 is located 1.9 km from the nearest turbine (131). As there is existing vegetation substantially screening views of the project, the Department considers that the increase in turbine dimensions would not significantly increase the visual impact and resulting visual impact would be low-moderate.

Landscape Scenic Integrity

The Department considers larger but fewer turbines would not significantly alter the area's visual catchment beyond what has already been assessed and approved. As a consequence of the region's abundant wind resources and proximity to the transmission network, there are six operating and five approved wind farms within 60 km of the site.

Key Feature Disruption

The key features disruption parameter describes proposed wind turbines that are likely to disrupt the central line of sight and/or the central focal viewing fields surrounding it, when seen from a viewpoint looking toward key features of a landscape. The Department notes that although individual turbines would be larger, the modification application is not proposing any additional turbine locations and would not disrupt any additional key features of the landscape.

Multiple Wind Turbine Effects

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 120° 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.

The Department and the Commission assessed the cumulative visual impacts on receivers in proximity to the Bango Wind Farm and Rye Park Wind Farm during the determination of both projects. The Department notes that since the Rye Park Wind Farm approval in 2017 the Bango Wind Farm has reduced its number of turbines from 122 proposed in its original application, down to 46 approved turbines.

Five non-associated receivers located south of Rye Park village would have medium/high cumulative visual impacts as residences would have turbines visible in up to 240 degrees of their horizontal view. However, the impacts could be sufficiently mitigated through the provision of mitigation measures such as landscaping and visual screening.

Although removing 15 turbines would reduce the extent of visible turbines from a limited number of residences when assessed using sector analysis, because most of the removals occur within the extended turbine strings along the ridgetops, this would not significantly change the cumulative visual impacts.

Similarly, the proposed maximum tip height increase would not expand the zone of visual influence for receivers to both projects to the extent that would considerably change the cumulative visual impacts at these locations.

Aviation Hazard Lighting

Although CASA did not require night lighting installation for the approved project, the conditions require any obstacle warning lights comply with CASA's requirements. This condition was to ensure that if obstacle warning lights are needed to be installed for any reason later, it is installed in accordance with CASA requirements and in a manner that minimises any adverse visual impacts.

Tilt's Qualitative Aviation Risk Assessment concluded that obstacle warning lights are not required because aviation strike risks with the larger turbines would remain low. However, CASA recommended that the wind farm be lit with red lighting to reduce the residual risk to aviation safety.

In response to CASA's advice, Tilt prepared an obstacle light impact assessment. The study states that removing 15 approved turbine locations reduces the extent of wind turbines subject to lighting, of the 35 residences with increased turbine hub visibility, most would see no more than 1 or 2 additional hubs.

However, the Department considers that the addition of obstacle lighting has the potential to increase visual impacts at residences. As such, the Department has strengthened the existing conditions to require any aviation hazard lighting installed to use an aircraft detection lighting system. Such a system would only activate the lights when an aircraft is detected nearby and deactivate lighting once it has passed.

Shadow Flicker and Blade Glint

Tilt's shadow flicker analysis found that while three associated residences could experience over 30 hours of shadow flicker per annum, no exceedances of this limit would occur at non-associated residences. No change to the existing consent condition limiting shadow flicker to 30 hours per year at non-associated residences is needed.

There is also an existing consent condition requiring wind turbines to be finished with a surface treatment that minimises the glare and reflection potential and for ancillary infrastructure to blend in as far as possible with the surrounding landscape.

Ancillary Infrastructure

The minor realignment of the 33 kV overhead line would increase its distance at its nearest point from Rye Park village from about 3.65 km to 3.80 km and would largely be screened by vegetation and undulating landform. The minor realignment to the southern section of the 330 kV transmission line between turbine 145 and the grid connection point at the southern extent of the project would not significantly increase visual impacts beyond what has been approved.

However, the realignment of the 330 kV overhead transmission line in between turbines 87 and 145 would mean the transmission line would be closer to several residences in the Western Intermediate Cluster (see **Figure 12**). The changes in proximity between the approved and proposed 330 kV alignment is provided in **Table 11**.

Table 11 | Visual Impacts of 330 kV line

Residence	Distance to approved 330 kV line (m)	Distance to proposed 330 kV line (m)	Applicant's assessed impact	Independent visual expert's assessed impact
R47	1165	339	High	High
R48	919	570	High	High
R50	1535	610	Moderate – High	Moderate – High
R53	1708	948	Low	Low
R83	1972	1351	Nil	Nil
R85	2322	1430	Low	Low
R324	2000	1024	Low	Low

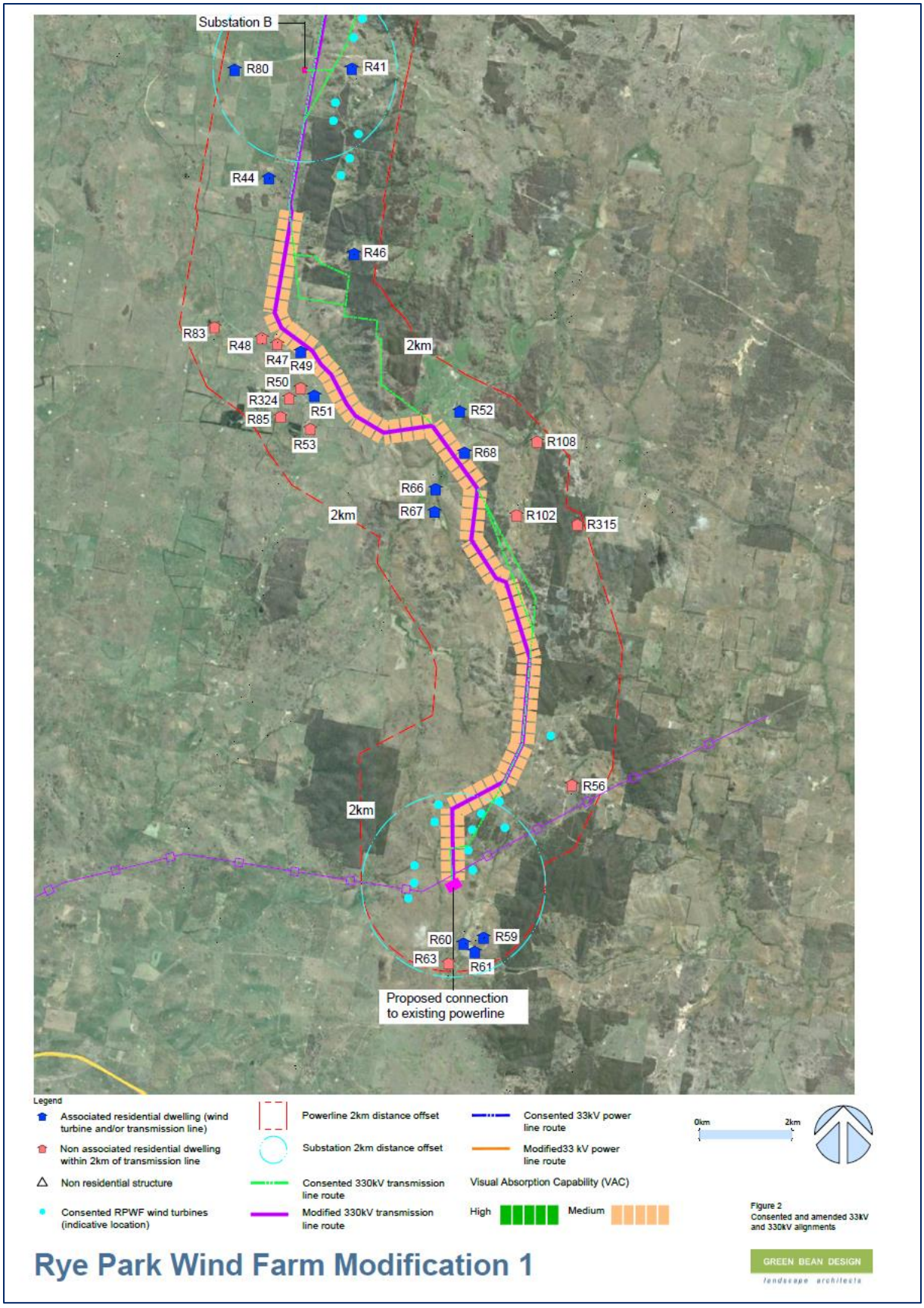


Figure 12 | Proposed Realignment of the 330 kV line

Tilt's visual impact assessment identified the 330 kV realignment would result in three non-associated residences (R47, R48, R50) with moderate-high to high visual impacts due to the reduction in distances and is proposing landscaping treatments for these residences to mitigate these impacts.

The Department notes R48 and R50 are located more than 4 km from the nearest turbine and are therefore not covered by the existing consent condition which allows landowners to request visual mitigation from Tilt. As such, the Department has updated the consent conditions to allow these two residences to request landscape screening.

Beyond landscape screening, OHD advised selection of finishes on the transmission towers to match or blend with the background colours could be more effective. This measure is already addressed under an existing consent condition, where Tilt must ensure the visual appearance of all ancillary infrastructure (including transmission towers) blends in as far as possible with the surrounding landscape. The Department considers the visual impacts to these three residences could be further mitigated by micro-siting the relevant portion of the transmission line further to the north of its current alignment in the final design and placement of towers.

With these measures in place, the Department considers the realignment of the project's ancillary infrastructure can be mitigated in such a manner that is unlikely to have a significant visual impact on these receivers.

Conclusion

In summary, the Department considers that the overall impact of the proposed increase to turbine dimensions along with removing 15 approved turbines does not significantly increase the visual impacts on the broader landscape or at non-associated residences except for residences R45 and R38. The existing conditions of consent require Tilt to implement visual mitigation upon the request of the landowner to further would also further reduce the visual impacts of the project.

The Department considered the proposed increase in turbine size would materially increase the visual impacts at R45, however, there is now an agreement between Tilt and the landowner of R45 to accept the increased level of visual impact.

While the impact at R38 would increase with the proposed increase in turbine dimensions, the existing conditions of consent allow the landowner to request that Tilt acquires the land for a period of five years from the commencement of construction of turbines 62, 67, 71-76, 78 and 141 and no further change is required to this condition of consent.

Accordingly, the Department has strengthened the existing conditions of consent requiring Tilt to:

- install low-intensity obstacle warning lights with an aircraft detection system that only activates when an aircraft is nearby at night or poor weather; and
- offer visual impact mitigation measures (e.g. landscaping and/or vegetation screening) to all non-associated residences within 1 km of the overhead transmission line.

6.2 Biodiversity

Introduction

The modification application included a Biodiversity Development Assessment Report (BDAR) prepared by Umwelt (Australia) Pty Ltd (Umwelt) in accordance with the *Biodiversity Assessment Method* (BAM) and the *Biodiversity Conservation Act 2016* (BC Act). Tilt revised the BDAR to address comments from BCS and to assess the changes in the project's infrastructure identified in the amendment report.

The majority of public submissions expressed concerns about the potential impacts on biodiversity from the proposed modification, including the increased disturbance footprint and associated clearing of native vegetation and the potential impacts on endemic birds such as the Superb Parrot, Wedge-Tailed Eagle and bats from the larger turbines.

The NSW Government's policies in relation to biodiversity impact assessment and offsetting have changed during the assessment of the original application with the introduction of the BC Act. This includes changes to the classification of native vegetation condition and the introduction of new procedures. The biodiversity impacts of the approved project were assessed under the *Framework for Biodiversity Assessment* (FBA) and the original consent required the offset credit liabilities to be calculated in accordance with the *NSW Biodiversity Offset Policy for Major projects*. However, for this modification Tilt's biodiversity assessment and offset credit liabilities were undertaken in line with the BC Act.

Avoidance and Mitigation

Tilt has sought to minimise the biodiversity impacts of the project by further refining the design to avoid areas with significant biodiversity value where possible. Despite the considerable increase to the development footprint, the modification would decrease clearing of White Box Yellow Box Blakely's Red Gum Woodland Grassland (Box Gum Woodland) critically endangered ecological community (CEEC) under the BC Act by 12.9 ha compared to the project as approved (from 50.2 ha to 37.34 ha).

In particular, the design refinements to consolidate site access points and transport routes have reduced Box Gum Woodland CEEC and other native vegetation clearing including:

- removal of the Flakney Creek Road / Dalton Road site access point (Access Point 4 in **Figure 6**) avoids over 1 ha of native vegetation.
- removal of the southernmost site access point 6 and its associated transport route via Coolalie Road, Jerrawa Road and Bushs Road (see **Figure 6**) avoids impacting approximately 10 ha of native vegetation, of which 5 ha is likely to be Box Gum Woodland (CEEC under the BC Act) and 2 ha is Golden Sun Moth habitat.

The existing consent conditions requires Tilt to re-calculate the biodiversity offset liability based on a final detailed design once a turbine and preferred contractor is selected, prior to construction. This has the benefit of encouraging Tilt to further minimise of clearing in the detailed design and therefore further reduce offset liability. Tilt has committed to avoid Box Gum Woodland, Superb Parrot habitat and hollow bearing trees in its design where possible. The Department's recommended conditions reduce the limits of the clearing to no more than 37.34 ha Box Gum Woodland CEEC and no more than 85.22 ha of Golden Sun Moth habitat.

Finally, the existing consent conditions already require Tilt to prepare and implement a Biodiversity Management Plan (BMP) and an adaptive Bird and Bat Management Plan. These plans would include measures to minimise vegetation clearance and impacts on threatened fauna and habitat, protect native vegetation and key fauna habitat outside the approved disturbance area, control noxious weeds and rehabilitate disturbed areas.

Native Vegetation

The proposed modification would directly impact 392 ha of native vegetation in various conditions. The Department recognises that this represents an increase of 151 ha in native vegetation clearing compared to the original project and includes clearing for wind farm and associated ancillary infrastructure, including road upgrades needed to facilitate project vehicle movements to site.

The Department also notes that the increase of 151 ha in clearing is predominantly due to greater allowance for construction of access tracks within the site and comprises mostly derived native grassland (95 ha or 63 % of the increased area) and the total clearing includes an overall 8.6 ha decrease in native woodland.

The impacts to native vegetation are summarised by plant community type (PCT) in **Table 12**.

Table 12 | Vegetation Clearing

Vegetation Community	PCT ID	Condition	Extent of impact (ha) as approved	Extent of impact (ha) with MOD 1	Change (ha)
Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest	289	Moderate to Good	N/A	0.77	+ 0.77
Tussock grass - sedgeland fen - rushland – reedland wetland	335	Moderate to Good	N/A	5.72	+ 5.72
Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland*	350	Moderate to Good	24.9	19.91	- 4.99
		Derived Native Grassland	25.3	17.43	- 7.87
Brittle Gum – Broad -leaved Peppermint - Red Stringybark	351	Moderate to Good	87.7	82.83	- 4.87
		Derived Native Grassland	71.6	174.92	+ 103.32
		Acacia Shrubland Moderate to Good	1.3	8.69	+ 7.39
		Sifton Bush Shrubland	29.6	80.57	+ 50.97
		Argyle Apple Forest	0.4	0.93	+ 0.53
Total Vegetation			**240.8**	**391.77**	**+ 150.97**

** Listed as Box Gum Woodland CEEC under the BC Act and EPBC Act.*

Despite the avoidance and mitigation measures proposed by Tilt, the project would impact a total of 37.34 ha of Box Gum Woodland and Derived Native Grassland (PCT 350) listed as a CEEC under the BC Act. There is approximately 69.04 ha of Box Gum Woodland within the project site, 31.7 ha (or 46 %) of which would be avoided. The proposed modification would reduce the impacts to this PCT by 12.9 ha compared to the approved project

Initially BCS expressed concerns about potential serious and irreversible impacts (SAII) from clearing of 37.34 ha of Box Gum Woodland.

However, the Department notes that the modification would reduce the clearing of Box Gum Woodland compared to the approved project and that Tilt would be required to fully offset the residual impacts of the modified project in accordance with the NSW Biodiversity Offsets Scheme.

Threatened Species

The project has the potential to impact fauna in several ways, mainly through direct habitat loss from land clearing, and bird and bat strike during operation of the wind turbines.

The BDAR identified habitat for five threatened species would be directly impacted by the project. These species, their conservation significance and the area of potential habitat are listed in **Table 13**.

Table 13 | Threatened Fauna Species Impacts

Species	Conservation Significance (BC Act)	Impact on habitat, ha (Approved)	Impact on habitat, ha with MOD 1
Striped legless lizard (*Delma impar*)	Vulnerable	39.04	43.07
Southern myotis (*Myotis macropus*)	Vulnerable	Not identified	< 0.01
Squirrel glider (*Petaurus norfolcensis*)	Vulnerable	Not identified	103.23
Superb parrot (breeding habitat) (*Polytelis swainsonii*)	Vulnerable	10.20	19.92
Golden sun moth (*Synemon plana*)	Endangered	66.94*	85.22

* *Assessed under the FBA Act using different methodology.*

During the assessment of the original project the impact to GSM habitat was assessed to be 66.94 ha. BCS initially had concerns with the methodology used for mapping and assessment of the GSM habitat polygons for the modification application and advised Tilt to re-evaluate the criteria for species polygons.

Following BCS advice, Tilt undertook an additional assessment of potential GSM habitat using the existing field survey results. The revised assessment has increased the GSM habitat within the project site from 43.20 ha (as identified in the BDAR, March 2020) to 85.22 ha (as per revised methodology, November 2020). This is because the GSM were detected in a broader range of habitats than previously documented. BCS has confirmed it was satisfied with the revised assessment and area of impact was estimated correctly.

BCS indicated the project could be considered SAII for the GSM, in particular as there may be more than 10 % habitat identified on site impacted and the remaining GSM habitat (138.93 ha) within the development corridor is not currently subject to any formal protections. Tilt has since advised they are exploring options with landowners in the locality to secure land based offsets for the species.

Furthermore, the Department notes that the difference in methodologies used to define GSM habitat between the original application and the more detailed method used for the modification has contributed to the increase in impact.

The Department considers there are opportunities for Tilt to significantly reduce impacts to GSM habitat, particularly in regard to the conservative assumption of a 30 m wide disturbance corridor for access tracks as the full extent of the wider disturbance corridor is less likely to be required for construction of access tracks in flatter areas where GSM is more likely to be located.

Due to the difference in GSM habitat mapping criteria, the conservative assessment undertaken, the financial incentives that are in place for Tilt to further reduce GSM habitat during detailed design to reduce offsets and that Tilt intends to obtain land based offsets for the species, the Department considers the proposed modification would not significantly increase impacts to the GSM beyond what was approved as part of the original application. Further, the exsiting consent includes requirements for Tilt to minimise clearing of key habitat and provide the final layout plans identifying details of micrositing to the Department.

Nonetheless, the Department has recommended that the conditions be strengthened by adding a restriction on GSM habitat clearing (i.e. 85.22 ha).

Bird and Bat Strike

Tilt commissioned Umwelt to assess the proposed modification to identify if any bird and bat species would be at a higher risk of blade strike from the changes to the turbine dimensions. The proposed modification would increase the dimensions of the turbines, including increasing the:

- maximum height of the rotor swept area (RSA) from 157 m to 200 m;
- minimum height of RSA from 27 m to 30 m;
- rotor diameter from 130 m to up to 170 m; and
- RSA from 12,267 m^2 to 22,698 m^2 (i.e. by 97%).

The collision risk assessment concluded that the impacts of the proposed modified turbines would increase the risk of blade strike for species that regularly occur above 30 m within the project area (i.e. Wedge-tailed Eagle, Little Eagle, Black Falcon and White-throated Needletail). In addition, species such as White-browed Woodswallow, Masked Woodswallow, Rainbow Bee-eater and all raptors would also be at higher risk of blade strike under the proposed modification.

Threatened species such as Superb Parrot, Dusky Woodswallow and White-fronted Chat can occasionally fly above 30 m and as such would also be at higher risk of blade strike under the proposed modification. For other threatened species within the project site that rarely fly above 20 m such as the Hooded Robin, Diamond Firetail, Brown Treecreeper and Speckled Warbler or species that occasionally fly above 20 m such as Varied Sittella, Flame Robin, Scarlet Robin, Painted Honeyeater the difference in blade strike risk between the approved project and the proposed modification is likely to be negligible and the risk of blade strike is very low.

Other non-threatened species that fly at these altitudes (30 m and above) would also have an increased risk of blade strike.

Regarding bat species, the assessment concluded that the proposed modification would increase the risk of blade strike to White-striped Free-tailed Bat, Gould's Wattled Bat, Inland Free-tailed Bat, Southern Free-tailed Bat and Inland Broad-nosed Bat are also likely to be at greater risk of blade strike under the proposed modification whilst the level of risk of blade strike to Large Bent-winged Bat, Yellow-bellied Sheathtail-bat, Chocolate Wattled Bat and Little Forest Bat may be similar or slightly higher than the level of risk posed by the project as approved.

Of the four threatened bat species recorded at the site (Large Bent-Winged Bat (vulnerable), Eastern False Pipistrelle Bat (vulnerable), Yellow-Bellied Sheathtail Bat (vulnerable) and Southern Myotis Bat (vulnerable)), the proposed modification may increase the risk of blade strike to two species such as Large Bent-Winged Bat and Yellow-Bellied Sheathtail Bat. However, Tilt's assessment concludes that it is unlikely that the adverse impact would be significant as the increased risk would be only slightly higher than the risk posed by current design.

Both the Department and BCS consider that Tilt 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 reduce any impacts if required.

The existing conditions already require Tilt to prepare and implement a Bird and Bat Adaptive Management Pan (BMP) in consultation with BCS. This plan would include measures to minimise bird and bat strike during operation, develop an adaptive management program if the development is adversely impacting a particular threatened or 'at risk' bird and/ or bat species or populations, monitor and report on the effectiveness of these measures.

Biodiversity Offsets

The BDAR calculated the ecosystem credit amount required to offset the proposed clearing, as summarised in **Table 14**. The project is spread across the South Western Slopes and the South Eastern Highlands bioregions. The results in **Table 14** present combined credit liability for both bioregions.

Table 14 | Ecosystem Credit Requirements

Vegetation Community	PCT ID	Area of Impact, ha	Credits Required
Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest	289	0.77	25
Tussock grass - sedgeland fen - rushland – reedland wetland	335	5.72	130
Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland	350	37.34	880
Brittle Gum - Broad-leaved Peppermint - Red Stringybark	351	347.94*	5,247
Total			**6,282**

**Note: not all of this vegetation community identified was of sufficient quality to generate biodiversity offsets.*

In total, 6,282 ecosystem credits would be required to offset the impacts arising from the modified project.

The Department notes that for the original project impact on some PCTs did not require offsetting as the assessment was undertaken in accordance with FBA which did not require offsets for vegetation that is not identified as an EEC unless it contains threatened species habitat. As such, offsets were not required for the impacts on PCTs 289, 335 and 351. However, under the BC Act impacts on the above PCTs generate credit liability.

In addition, the following species credits would require offsetting (refer to **Table 15**).

Table 15 | Species Credit Requirements

Species Credit Species	Credits Required
Striped legless lizard (*Delma impar*)	326
Southern myotis (*Myotis macropus*)	1
Squirrel glider (*Petaurus norfolcensis*)	3,507
Superb parrot (breeding habitat) (*Polytelis swainsonii*)	576
Golden sun moth (*Synemon plana*)	1,384
Total	**5,794**

The Department and BCS are satisfied that the offset credit requirements have been correctly calculated for the modified project using the Biodiversity Assessment Methodology under the BC Act.

The biodiversity offset scheme under the BC Act allows Tilt to offset the impacts using several options, including:

- land-based offset through establishment of a new stewardship site and subsequent retirement of credits or by retiring credits from existing stewardship sites;
- securing (purchasing) credits through the open credit market; and
- paying into the Biodiversity Conservation Fund (BCF).

Tilt advised the Department that it intends to satisfy as many credits as possible through the land-based stewardship sites and has started negotiations with landowners within the region. To facilitate this, the Department is not changing the condition requiring Tilt to retire the required biodiversity credits within two years of the commencement of construction.

Conclusion

Overall, the Department considers that the proposed modification would not significantly increase the biodiversity impacts of the project. Tilt could further minimise these impacts through micro-siting infrastructure and reducing the development footprint during the detailed design stage of the project, through a range of mitigation and adaptive management measures, and by offsetting the residual biodiversity impacts of the project.

To ensure this occurs, the Department has updated the biodiversity conditions by updating vegetation clearing limits and biodiversity offsetting requirements.

Both the Department and the BCS are satisfied that the modification would not result in any significant biodiversity impacts, subject to the implementation of the modified conditions.

6.3 Traffic and Transport

Introduction

Public submissions raised concerns about an increased number of heavy vehicles travelling on the local road network during construction, the potential damage to local roads from deliveries of larger turbines and encroachment of vehicles on private property.

The modification application was accompanied by a Traffic Impact Assessment (TIA) prepared by SMEC. Following the exhibition, Tilt has supplemented its TIA by Route Assessment Peer Review study prepared by GTA Consultants. Additionally, Tilt provided further details traffic and transport impacts in response to the Department's request for information.

Traffic Numbers

The proposed modification is seeking to increase the number of one-way heavy vehicle movements for construction of the project from a total of 15,055 to 33,000 heavy vehicle movements. The Department acknowledges the overall vehicle movements are double those considered in the original application. Tilt has indicated that the proposed movements are based on an assessment of constructability and further detailed design and recent experience with developing a wind farm in Victoria.

Despite the significant increase in traffic volume, the TIA indicates that the road network has sufficient capacity to accommodate the additional movements.

The Department notes that the existing conditions already require Tilt to prepare a dilapidation survey of the designated over-dimensional and heavy vehicle route, and rehabilitate damage caused by the project. In addition, Tilt must prepare a Traffic Management Plan in consultation with TfNSW and the Councils, detailing measures to minimise traffic safety impacts and disruptions to local road users.

Site Access

The proposed modification is seeking to rationalise the number of site access points for the project from eight to three as follows:

- two site access points (see 2 and 10 in **Figure 6**) off Grassy Creek Road to access the northern section of the site); and

- one site access point (see 12 in **Figure 6**) off Dalton Road south of Blakney Creek Road to access the central and southern sections of the site.

The removal of the five site access points would reduce the length of local roads being used and also reduces the roadside vegetation clearing along those routes.

Transport Routes and Road Upgrades

The approved project has a designated heavy and over-dimensional vehicle access route from Port Kembla to the site via Goulburn. The route comprises both TfNSW and Council controlled roads.

The proposed modification is also seeking to include transport from Port of Newcastle via two alternative routes options:

- Option 1 would be via Gunning (approximately 509 km);
- Option 2 would be via Dubbo (approximately 927 km).

Additionally, it proposes to slightly modify the approved route from Port Kembla to the project site (Option 3, see **Figure 13)**.

Tilt advises that the additional routes from Port of Newcastle provide flexibility based on feedback from potential turbine suppliers. Tilt has indicated that depending on the preferred supplier, all traffic would use up to two of the three proposed haulage routes (either all traffic via one route or turbine components and the tower components via two different routes). However, this would only be confirmed once the final supplier is selected. The Department notes the assessment has considered the worst-case scenario of all traffic using each of the proposed haulage routes.

All three options approach the site using the route approved in the original application from the Hume Highway along Lachlan Valley Way near Bowning, prior to traveling around the outskirts of Boorowa via Trucking Yard Way, Dillon Street and Long Street, and then travelling along Rye Park Road and Grassy Creek Road or Yass Street towards the site. Certain over-dimensional vehicles would use a dedicated access road on on the northern corner of Rye Park Road and Grassy Creek Road (Lot 1 DP580999) to enable overdimensional movements to turn north onto Grassy Creek Road and south onto Yass Street.

Tilt has undertaken an assessment of all three route options and identified upgrades necessary along each of the routes. The studies concluded that while some additional upgrades would be required at various points along Option 2 on Council managed roads within Narromine Shire Council and other minor relocations of street furniture (such street as signs), transport of the larger blades to site via all three proposed routes would be feasible.

Local Councils did not raise any concerns related to traffic impacts from the proposed modification, noting that the existing consent requires Tilt to upgrade several local roads to the satisfaction of relevant Council, including Cooks Hill Road which is anticipated to be used by most construction personnel in light vehicles coming from Yass.

TfNSW confirmed it did not have any concerns about the modification provided that a Traffic Management Plan (TMP) was in implemented. The existing consent includes a TMP that would be prepared in consultation with the relevant Councils and TfNSW.

The Department notes that in order to transport the larger blades, Tilt would need to complete the required upgrades as identified in the revised conditions of consent in consultation with relevant Councils and TfNSW, and that any works would be subject to relevant approvals and permits.

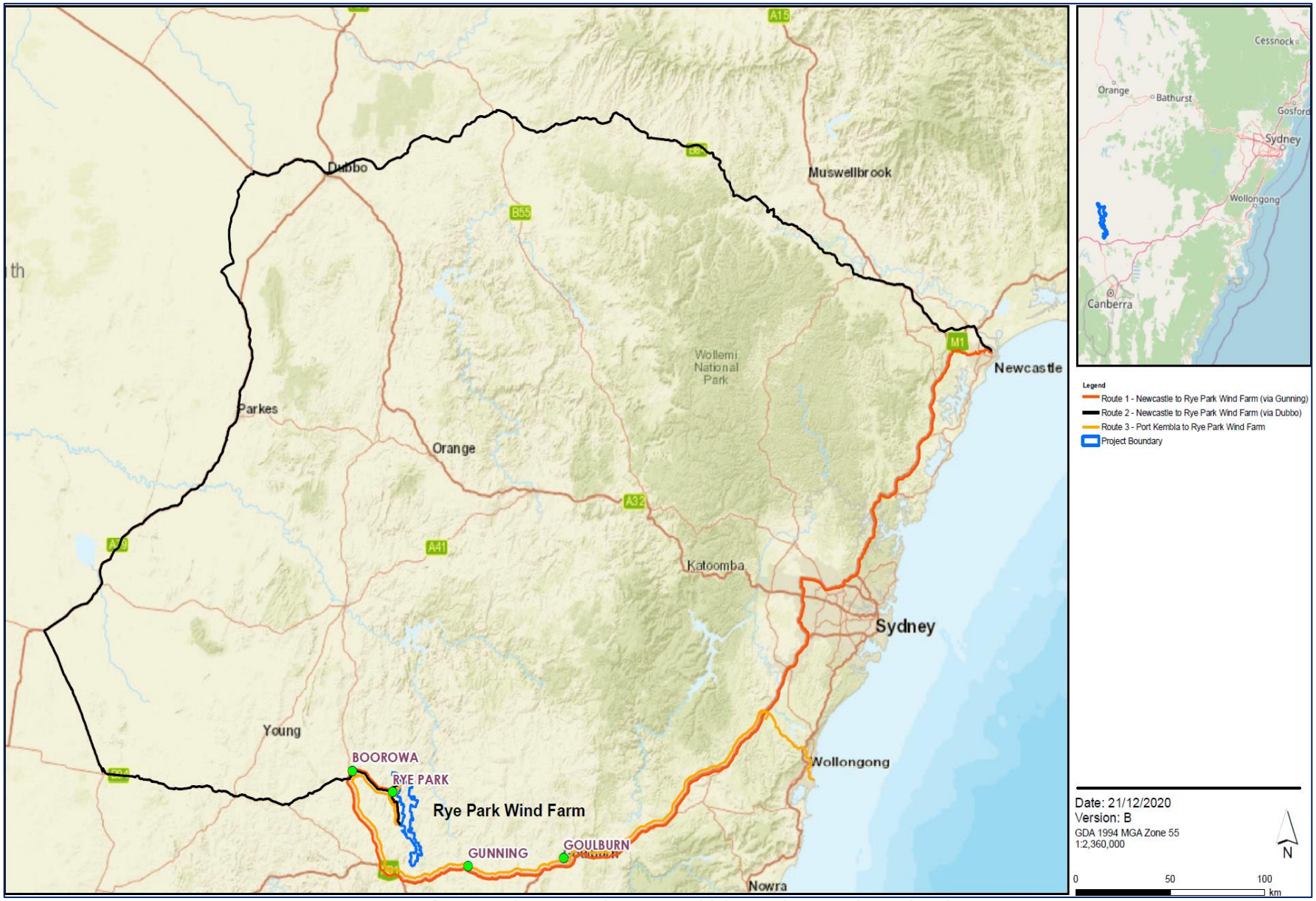


Figure 13 | Proposed Heavy Vehicles and Over-Dimensional Routes

Accordingly, the Department has updated the conditions of consent to:

- allow any of the haulage route options to be used for the project;
- remove the road upgrades that are no longer needed due to rationalising the site access points;
- add road upgrade requirements for sections of access tracks located on Council roads located within the development footprint; and
- include the road upgrades required by Narromine Shire Council associated with Option 2.

One Way Delivery for Preliminary Works

Tilt is also seeking to undertake preliminary works on the internal access roads in parallel with the local road upgrades to facilitate the construction of the project in a timely manner. These preliminary works would require one-way delivery of earth moving equipment to the site. The Department understands that this would reduce the construction timeframes of the project by up to 9 months.

The machinery proposed to be delivered includes excavators (6 x 20 t to 50 t), scrapers; bulldozer, grader; dump trucks (8) and rollers (4), but does not include any of the over-dimensional equipment for the turbines (i.e. blades, towers etc).

Tilt has consulted with Hilltops Council about the proposed delivery of the above equipment. Hilltops Council confirmed to the Department that it has no concerns about these works, and the Department has updated the conditions of consent to allow flexibility commencing road upgrades in parallel with works on internal access roads, subject to consultation with Hilltops Council.

Conclusion

With suitable road upgrades agreed with Hilltops, Yass Valley and Upper Lachlan Councils, regular road maintenance, and the implementation of standard traffic control measures and a driver's code of conduct, the Department is satisfied that the proposed modification would not result in any unacceptable impacts on the capacity, efficiency or safety of the road network.

6.4 Noise

Introduction

Community submissions raised concerns about the potential for increased noise from the larger turbines and cumulative noise impacts with the nearby Bango Wind Farm currently under construction. One community submission engaged a consultant, L Huson & Associates, to review the noise assessment, focusing on its adequacy and the increased noise impacts compared to the project as approved.

The Modification Report includes a noise impact assessment by Sonus. Additionally, the Submissions Report was accompanied by a supplementary environmental noise assessment (ENA) that assessed the relationship between the proposed increased hub height and the predicted noise levels at different wind speeds. Both the Department and the EPA are satisfied that supplementary ENA was prepared in accordance with the *NSW Wind Energy framework: Noise Assessment Bulletin*.

It is noted that the ENA was based on an indicative wind turbine model being the GE158 – 5.5 MW with a tip height of 200 m. This wind turbine model has one of the highest noise emissions compared to other similarly sized turbines currently available on the market and provides a conservative 'worst case' assessment. The GE158 has higher sound power levels compared with the Vestas V112 – 3.0 MW turbine modelled in the original application. Further, the assessment added 1.5 dB(A) to the sound power levels of turbines for uncertainty which is also a conservative approach and most likely the sound power levels of the installed turbines would be lower than the ones assumed in the assessment.

Avoidance and Mitigation

The existing conditions of consent require Tilt to:

- comply with relevant operational noise criteria and operating conditions;
- comply with specified construction hours;
- undertake noise monitoring during operations to determine compliance with the noise criteria; and
- prepare and implement a Noise Management Plan to detail the turbine curtailment strategy and mange noise emissions of the project during the operation.

Tilt is also seeking to undertake preliminary civil works on site in parallel with upgrades to the local road network in order to reduce the construction timeframes by up to 9 months.

Construction Noise

The nature of construction works for the proposed modification remain the same as the approved project, but with an additional batching plant located 1.1 km from the nearest receiver. The Department does not anticipate any significant increases in construction noise impacts even with the additional batching plant which Tilt's assessment has shown to be below the relevant criteria in the *Interim Noise Construction Guideline*. The existing conditions of consent require Tilt to minimise construction noise of the development, including associated traffic noise. The consent also limits construction activities to standard construction hours.

Operational Noise

The Department and the EPA are satisfied that the operational noise assessment has been conducted in accordance with the *Wind Energy: Noise Assessment Bulletin*.

The noise assessment demonstrated that the modified project would comply with the relevant operational noise criteria at all non-associated residences, except at four residences (R6, R7, R11 and R38). Modelling suggests these residences would experience noise levels that marginally exceed the criterion by 1 - 2 dB(A) when wind speeds are at and above 8 m/s. The Department notes that these residences would not have exceedances under any wind conditions for the project as approved. The Department also notes R38 is already subject to voluntary acquisition rights in regard to 7 of the 19 turbines identified for curtailment.

Tilt is proposing a curtailment strategy to meet the noise criteria at all residences under all wind speeds. The strategy involves operating 19 turbines (11, 12, 17, 18, 20, 21, 22, 25, 26, 61, 62, 67, 71, 73, 74, 76, 136, 137 and 141) in a noise reduced mode (i.e. limiting the speed of the turbine's rotor at wind at certain speeds of 8 m/s and above). Without curtailment, the predicted modelling shows that at wind speeds of 8 m/s the noise criteria would be exceeded at two residences being R11 and R38, at wind speeds of 9 m/s the noise level would be exceeded at all four residences and at wind speeds of 10+ m/s the exceedance would only occur at R38. Tilt advised the Department that such a curtailment strategy would reduce the project's energy output by 1.4 %.

The Department notes that such curtailment strategies are a recognised noise mitigation measure in the Noise Bulletin and is satisfied that such an approach would ensure the project can meet the applicable noise criteria.

The L Huson & Associates review recommended a new noise condition requiring confirmation of sound power levels of the selected wind turbine that should be tested on site prior to construction of the whole project in order to ensure there would be no adverse noise impacts above what was predicted.

However, the EPA advised that a revised noise impact assessment would be required to establish final noise limits for the project. Tilt would need to submit the assessment as part of the Environmental

Protection Licence (EPL) application with the EPA. Tilt would then need to verify the noise assessment predictions and noise limits after choosing a final turbine model and layout design.

The Department has also added a requirement to prepare a Noise Management Plan to address noise compliance monitoring and detail the turbine curtailment strategy. Both the EPA and the Department are satisfied that with the implementation of Tilt'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.

Noise compliance monitoring would be required to be undertaken within three months of its operation. Should any wind turbines be responsible for exceedances of the noise criteria, a range of measures would be triggered by the conditions of approval and the EPL to ensure that the wind farm complies with the applicable criteria.

Finally, the Department has recommended updating the existing operational noise condition for ancillary infrastructure (such as collector substations, switching stations, permanent offices and site compounds and underground and overhead electricity transmission lines) 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.

As noted above, both the Department and the EPA have considered the noise related matters raised in the public submissions and consider that the modified project would be able to comply with the applicable noise criteria specified in the recommended noise conditions.

Low Frequency Noise

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

The Department's *Wind Energy Guideline* 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 has recommended contemporary conditions requiring Tilt to monitor low frequency noise in accordance with the *Wind Energy: Noise Assessment Bulletin*, that incorporates the penalties that must be applied in the unlikely event that excessive low frequency noise is detected.

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.

Cumulative Impacts

Regarding the cumulative construction noise impacts with the nearby Bango Wind Farm (currently under construction and forecast to finish in 2021) construction timeframes may overlap, at least to some extent. Works on the project would occur approximately 8 km east from the Bango Wind Farm. At this distance the predicted construction noise levels for the Bango Wind Farm would not influence the predicted noise levels for the Rye Park Wind Farm, and as such the cumulative construction noise impacts would not be significant.

Tilt 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. The project would continue to be subject to noise compliance monitoring to ensure this is the case. Similarly, the Bango Wind Farm would be subject to the same operating conditions.

The Department is satisfied that the noise generated by the project would be able to comfortably comply with the applicable operational noise criteria at all non-associated residences, both on its own and considering any cumulative impacts from the Bango Wind Farm.

Traffic Noise

Traffic noise impacts are assessed against the noise criteria in the *NSW Road Noise Policy* (2011). Many local submissions are concerned about noise impacts associated with the proposed increase in heavy vehicle movements, particularly through Boorowa township and Rye Park village during construction.

Sonus confirmed that despite the increase in vehicle movements, the predicted noise level within classrooms at the Rye Park public school would be below the internal noise criterion of 40 dB(A). However, noise levels are expected to exceed the 55 dB(A) noise criterion for residences outside towns which are located 30 m from the roadside, and for residences in Rye Park village within 10 m of the roadside by 2 dB(A) and 1 dB(A) respectively.

While the Department acknowledges there would be a noticeable increase in traffic noise, the Road Noise Policy considers this a minor change that would not require building treatments such as providing double glazing, insulation and/or air-conditioning.

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 criterion requiring the operation of the wind turbines to be measured in accordance with the requirements of the *NSW Wind Energy Framework: Noise Assessment Bulletin*;
- require the operation of ancillary infrastructure to comply with the requirements of the *NSW Noise Policy for Industry*; and
- prepare a Noise Management Plan to manage noise emissions from the operation of the development and to detail the turbine curtailment strategy.

6.5 Other issues

The Department acknowledges that in addition to concerns over visual, biodiversity, traffic and noise, community and agency submissions raised concerns about a range of other issues. The Department has summarised its assessment of these issues in **Table 16** below.

Table 16 | Other Issues

Issue	Consideration	Recommendations
Aboriginal and historic heritage	Aboriginal Heritage • Tilt completed additional heritage surveys in accordance with the relevant guidelines and consulted with local Aboriginal community groups. • Site surveys identified total of 78 Aboriginal heritage sites, 42 of which could potentially be impacted directly or indirectly by the modified development (an increase by 7 from the project as approved). The majority of these sites were assessed as having low to moderate scientific value. Based on the scientific values of the items and in consultation with the Aboriginal representatives, Tilt assessed that it would not be possible to avoid all items identified within the proposed area. • Tilt has committed to avoiding 33 heritage sites of higher significance with at least a 5 m buffer where relevant and salvaging and relocating 6 sites prior to the commencement of construction. The impact on 39 heritage items would be minimised with the mitigation strategies in place. • Existing conditions of approval require Tilt to prepare and implement a Heritage Management Plan that includes measures to avoid impacts on Aboriginal heritage items, in consultation with Heritage NSW 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. • The Aboriginal Cultural Heritage Assessment report recommends that the modified project should avoid impacting the above items with a 5 to 20 m buffer zone. Tilt has committed that during the detailed design it would avoid or further minimise the impacts to these sites as much as practicable. The conditions require Tilt to carry out detailed test excavations and salvage of potential archaeological deposits if impacts would be unavoidable. Historic Heritage • Eight areas of non-indigenous historic archaeological subsurface potential were identified during the field surveys undertaken as part of this modification. One site has high subsurface potential, six items have moderate and one has low subsurface potential. None of these items would have been impacted by the approved project. Tilt advised that impacts on these areas may be caused by the transmission lines or cabling and that it would try to avoid direct impacts on these areas by realigning the infrastructure once the final turbine locations are confirmed. If however, impacts on historic heritage cannot be avoided the mitigation measures will be managed through the Heritage Management Plan in accordance with the existing consent. • With the existing conditions, the Department and Heritage NSW consider that the proposed modification would not significantly impact the heritage values of the locality.	• The Department has updated the heritage conditions to: • Avoid impacts on 33 Aboriginal heritage items which are now located outside of the modified project's development corridor; and • Minimise impacts on 39 identified Aboriginal heritage items, and where impacts cannot be avoided, undertake salvage in consultation with Aboriginal representatives.

Soil and Water	• Around 25 % of public submissions raised concerns about the larger development footprint on land with highly erodible soils and steep terrain. • The increased development footprint is a result of more detailed information on the geology and site constraints, cut and fill requirements to stabilise the tracks in areas with steep terrain, spacing for erosion and sediment control, ancillary drainage, batters and construction disturbance buffers and to ensure constructability of the project.. • Representatives from the Department and the EPA met with local landowners in regard to erosion and sedimentation risks during the assessment of the original development application. While recognising the high erosion potential of the site, similar constraints have been effectively managed during the construction of other major infrastructure projects, including other wind farms using standard best practice erosion and sediment control techniques prescribed in a range of NSW Government guidelines. • The existing development consent requires the project to comply with Section 120 of the *Protection and Environmental Operation Act* 1997 to the prevent pollution of waterways. Tilt is also required to design, construct and operate the project in such a way that minimises soil erosion. • The existing conditions require Tilt to ensure all waterways crossings are constructed in accordance with requirements of National Guidelines *Why do fish need to cross the road? Fish passage requirements for waterway crossings.* In addition the waterway crossings proposed to be constructed or upgraded within Key Fish Habitat must comply with the requirements of the *Fisheries Management Act 1994*, the associated *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013).* • The Department will 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.	• Notwithstanding, the Department has recommended strengthening the existing conditions to: • Undertake an independent audit of the development within 3 months of commencing construction rather than 1 year; • Update the incident notification and non-compliance notification requirements; and • Update the requirements for the independent environmental audit.
Aviation	• The project is located 70 km north west of Canberra airport and 80 km west of Goulburn airport. 17 private airstrips historically used for aerial agricultural activities are located within 10 km of a wind turbine. • Tilt's modification application included an Aeronautical Impact Assessment (AIA) completed by Landrum & Brown Worldwide (Aust) Pty Ltd. The AIA concluded the proposed modification would result in an acceptable level of aviation safety risk without needing to install obstacle warning lights. • CASA advised that while the larger turbines are not likely to be an aviation hazard, it recommended installing low intensity (200 candela) obstacle warning lights to mitigate the risk of low flying aircraft colliding with a turbine in poor weather. The Department has updated the lighting condition so that aviation hazard lighting must be implemented to the satisfaction of CASA. • Airservices Australia confirmed that no adverse impact on aviation communications, navigation and surveillance equipment from the project airspace procedures and communication, navigation and surveillance facilities at any airports. The need to increase the Lowest Safe Altitude to 4,000 ft to in order to not affect local air route as identified in the assessment of the original development application remains unchanged.	• Strengthen the existing aviation conditions to comply with the *National Airports Safeguarding Framework Guideline D* and aviation hazard lighting is implemented to the satisfaction of CASA.

	• The Department of Defence did not raise any particular concerns about the modification, and requested that the details of wind turbines and monitoring masts be included in the RAAF's national database for tall structures and obstacle warning lights meet specific night vision criteria. • In addition, Tilt must inform CASA, Airservices and Department of Defence of final turbine coordinates and heights. • Based on advice from the relevant aviation authorities, the Department considers that the modified project is unlikely to result in any significant aviation hazards or risk to aviation safety, noting that aviation hazard lighting would be installed on site.	

Bushfire risk	• Approximately 21 % of public objections raised concerns about increased bushfire risk due to perceived impediments to aerial firefighting in the event of emergency. However, the NSW Rural Fire Service (RFS) did not raise any concerns about the project's impacts on aerial bushfire fighting.
	• The existing conditions of consent require Tilt to:
	  ○ provide for asset protection in accordance with the RFS's *Planning for Bushfire Protection 2006*;
	  ○ ensure the development is suitable equipped to facilitate appropriate emergency management;
	  ○ consult with the RFS when developing procedures to manage potential fires on site; and
	  ○ assist RFS in and emergency services in the event of fires on site.
	• The Department has strengthened the conditions by including a requirement for a comprehensive Emergency Plan to be prepared in consultation with FRNSW and RFS. The plan must identify (among the others) the fire risks and hazards and detail measures to prevent or mitigate fires igniting and include bushfire emergency management planning.
	• The Department and RFS consider that bushfire risk can be appropriately managed by the revised conditions.
		• Strengthen the existing condition to include a requirement for Tilt to develop and implement a comprehensive Emergency Plan in consultation with FRNSW and RFS.

Communication	• The modification application was accompanied by an Electromagnetic Interference Assessment (EMIA) prepared by DNV GL that assessed the change in potential electromagnetic interference (EMI) impacts from the Approved Project to the Modified Project. • The EMIA assessed that the modification will not increase the impact to nearby radiocommunication towers, point-to-point links, emergency services communications, meteorological radar, trigonometrical stations, citizen's band radio communications, or satellite television and internet signals. • However, the EMIA study found that there is a potential for interference with mobile phone signals, radio broadcasting and terrestrial television broadcasting. Tilt advised that mitigation measures can be implemented to rectify potential impacts. Tilt will continue its consultation with applicable operators once a final wind turbine is selected which will inform the final layout and mitigation measures required. • The existing conditions already require Tilt to make good any disruption to the services (including point-to-point microwave links) if it caused by the development as soon as possible following the disruption. • 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.

Property devaluation	• Approximately 24 % of public objections raised concerns about the potential adverse impacts of the project more broadly on property values from the loss in amenity. • 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 (now BCS) 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. • More broadly, the Department notes that the project is already approved, and the assessment demonstrates that with the changes made to project 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	• No additional conditions required.

Decommissioning and rehabilitation	• Some submissions raised concerns about decommissioning of wind turbines and associated infrastructure after the operational life of the project.
	• The existing conditions include a number of rehabilitation objectives requiring Tilt to:
	  ○ rehabilitate the site
	  ○ decommission wind turbines (and associated infrastructure) within 18 months of the cessation of operations;
	  ○ restore native vegetation; and
	  ○ restore or maintain land capability.
	• The Department has recommended including conditions requiring Tilt 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.
		The Department has recommended strengthening the existing conditions to:
		• 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.

7 Evaluation

The Department has considered all issues raised in submissions and assessed the merits of the modification application in accordance with the relevant requirements of the EP&A Act.

Submissions from the community and interest groups objected to the increased disturbance footprint in a landscape with highly erodible soils and biodiversity values, visual and noise impacts with the larger turbines and the increase in vehicle movements.

The Department's assessment considers the proposed modification can be undertaken without significant additional visual impacts, and has recommended conditions requiring Tilt to install low-intensity obstacle warning lights with an aircraft detection system that only activates when an aircraft is nearby at night or poor weather to address community concerns about night lighting.

Although the proposed modification would increase native vegetation clearing by 151 ha, the Department acknowledges that Tilt has redesigned the project to reduce impacts to the Box-Gum Woodland CEEC by 12.9 ha and that the increased disturbance footprint is necessary for constructability of the project. The Department considers the biodiversity impacts can be managed subject to the implementation of strict conditions, and the implementation of biodiversity offsets under the *NSW Biodiversity Offsets Scheme*.

The Department has also considered a range of other matters including potential impacts relating to noise, traffic, soil and water, heritage, aviation safety, bushfire risk, decommissioning and rehabilitation. The assessment concluded that these matters can be adequately addressed through the existing conditions or the recommended changes to the conditions of consent.

While there is some community opposition from local landowners to both the existing approved project and the proposed modification, the Department considers the proposed modification would enable the project to be developed to provide generation of 462 MW electricity, a 140 MW increase from the approved project (or 26 % more power) with 15 fewer turbines. It would also allow the following socio-economic benefits of the project to be realised:

- contributing up to $230,000 per annum (adjusted annually to increases in the CPI from July 2011) for the operational life of the project, with no net loss in contributions towards local community enhancement despite the reduction in turbines;
- reducing the duration of construction by up to 9 months; and
- employment for up to 250 staff during construction and up to 10 staff during operation;
- consolidating site access points, reducing the length of the local road network that would be used by project vehicles and improving road safety with upgrades to the local road network.

The project would have access to the electrical grid at a location with available network capacity. With a capacity of up to 462 MW the project would generate enough electricity to power about 225,000 homes, and is consistent with NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020 – 2030*.

On balance, the Department considers that the proposed modification has merit, is in the public interest and should be approved subject to the recommended conditions.

8 Recommendation

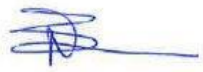
It is recommended that the Deputy Secretary, Assessment and System Performance, as delegate of the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report
- **determines** that the application SSD 6693 MOD 1 falls within the scope of Section 4.55(2) of the EP&A Act
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the modification
- **agrees** with the key reasons for approval listed in the draft notice of decision;
- **modify** the consent SSD-6693
- **signs** the attached approval of the modification (**Appendix H**).

Prepared by:

Anthony Ko, Team Leader
Tatsiana Bandaruk, Senior Environmental Assessment Officer

Recommended by:



12/4/21

Nicole Brewer
Director
Energy Assessments

12/4/21

Mike Young
Executive Director
Energy, Industry and Compliance

9 Determination

The recommendation is **Adopted** by:

15/4/21

David Gainsford
Deputy Secretary
Assessment and System Performance

as delegate of the Minister for Planning and Public Spaces

Appendices

Appendix A – List of referenced documents

Rye Park Wind Farm Modification Application Report dated April 2020

Rye Park Wind Farm Response to Submissions Report dated August 2020

Rye Park Wind Farm Amendment Report dated August 2020

Rye Park Wind Farm Request for Additional Information dated October 2020

Rye Park Wind Farm Modification Aboriginal Cultural Heritage Assessment letter dated 15 January 2021

Rye Park Wind Farm Amendment Report No. 2 dated March 2021

Appendix B – Modification report

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241

Appendix C – Additional information

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241

Appendix D – Submissions

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241

Appendix E – Amendment Reports

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241

Appendix F – Submissions report

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241

Appendix G – Notice of modification

See the Department's website at

https://www.planningportal.nsw.gov.au/major-projects/project/26241