White Rock *Wind Farm*

Environmental Assessment | April 2011

EPURON

POWER FOR PORTFOLIOS

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1.1 Introduction

This executive summary provides a brief introduction to the proposed White Rock Wind Farm, a 119 turbine wind farm project located on high ridges in the New England Tablelands, 20 km west of Glen Innes and about 500km north of Sydney.

The site has been selected for its windy ridges and cleared grazing land. The majority of land in the region is currently used for commercial agriculture (sheep and cattle grazing) and has been cleared and grazed over many decades.

The Environmental Assessment (EA) has been prepared to assess the potential environmental impacts associated with the development of the White Rock Wind Farm. The project will be assessed as a Major Project under Part 3A of the *NSW Environmental Planning and Assessments Act 1979*. Under this act the project also meets the criteria for Critical Infrastructure as a renewable power generator with the capacity to generate in excess of 30 MW.

The Proponent is Epuron Pty Ltd, a renewable energy company established in North Sydney in 2003. Epuron is the most experienced wind energy development company in NSW, with approved projects including Cullerin Range, Conroys Gap, Gullen Range, and Silverton wind farms.

This executive summary provides an overview of the EA. Further details of each aspect of the EA can be found in the full document and the specialist studies which are appendices to this EA.

Figure 1-1 Photograph of the site

1.2 Project Outline

The White Rock Wind Farm would involve the construction, operation and maintenance of up to 119 wind turbines, together with the ancillary structures, access tracks and electrical infrastructure required to connect the project into the existing electricity network. The map on the following page shows the proposed turbine layout and site boundary.

This project would directly involve approximately 16 properties that are currently used for agriculture and grazing purposes. These existing uses would continue with minimal interruption from the wind farm construction and operation.

The wind turbines would have a maximum tip height (tower plus blades) of 150 metres above ground level and would be located on a series of ridgelines running north to south between the Gwydir Highway and Maybole Road.

The wind turbines would be connected by a series of underground and overhead powerlines, joining each wind turbine to the on-site substation. A short powerline would connect the substation to the existing 132kV Inverell – Glen Innes transmission line, which crosses the northern end of the site.

Additional permanent structures such as an operations and maintenance facility would be required as well as temporary construction facilities. Minor upgrades to local roads would be required for the installation and maintenance of wind turbines and the related facilities.

Table 1-1 Summary of the project

ASPECT OF THE PROJECT	DESCRIPTION
Project Summary	Construction and operation of a wind farm approximately 20 kilometres west of Glen Innes, NSW. The project would have the ability to produce around 830,000 MWh of renewable energy every year, equivalent to the average consumption of around 130,000 homes.
Infrastructure & Facilities	The site will require a substation, a switch yard and an operations and maintenance facility. Access tracks approximately 5 metres wide would connect all of the turbines.
Electrical Connection	Underground and overhead cabling would connect the turbines to the on-site substation. The substation would include transformers to step up the voltage from 33kV to 132 kV and the wind farm would be connected to the existing transmission network via a switchyard adjacent to the existing transmission line.
Employment	The construction phase would create approximately 250 jobyears and there would be a requirement for around 20 ongoing operation and maintenance jobs.
Project Life	Once installed, the turbines would operate for an economic life of twenty to thirty years. After this time the turbines may be refurbished to improve their performance or decommissioned and removed from the site.
Capital Cost	The project would have a capital cost of approximately $450 million
Environmental Benefits	Carbon Dioxide (CO_2) emissions reductions of 754,000 tonnes per year
Installed Capacity	The project would have 119 turbines with an installed capacity in the order of 238 MW (based on a typical 2.0MW turbine). The likely turbine capacity is in the range of 1.5 – 3.4MW each.

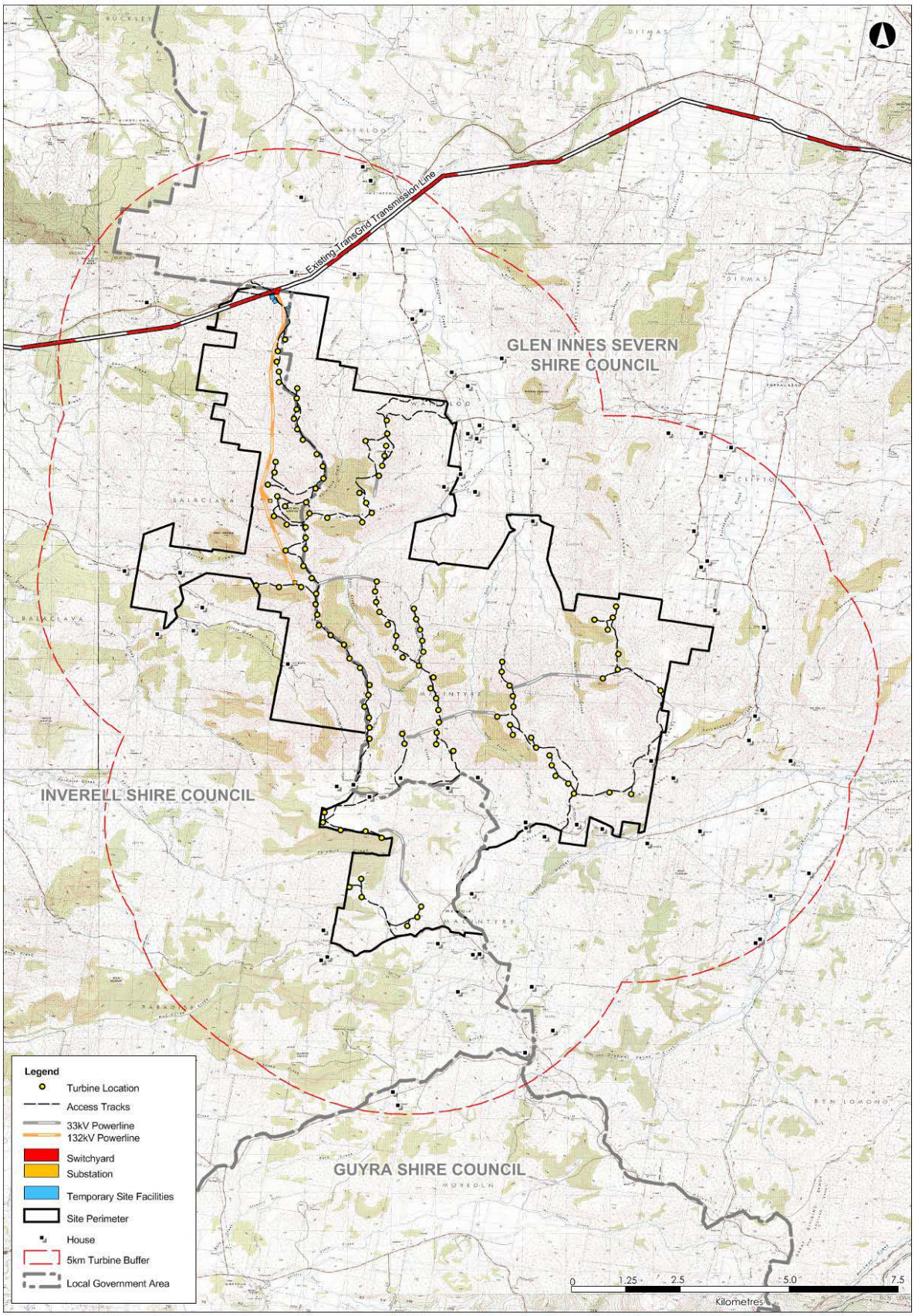


Figure 1-2 White Rock Wind Farm turbine layout & site boundary

1.3 Strategic Justification

The key drivers for developing renewable energy projects in New South Wales such as the White Rock Wind Farm are: meeting a growing electricity demand, reducing greenhouse gas (GHG) emissions through clean energy sources, and contributing to state and federal renewable energy targets.

Electricity consumption continues to grow in NSW and the additional demand must be met by either increased fossil fuel generation or an increase in generation from renewable sources such as wind power.

TransGrid's Annual Planning Report (2010) confirms that growth in electricity demand will soon exceed supply during peak times. Meeting this demand will require our existing electricity generators to increase their annual output, however at some point, additional power generators will also be required. TransGrid has estimated that additional power generating capacity will be required to manage peak periods by summer 2016/17. The figure below shows the predicted growth of electricity generation capacity up to 2020.

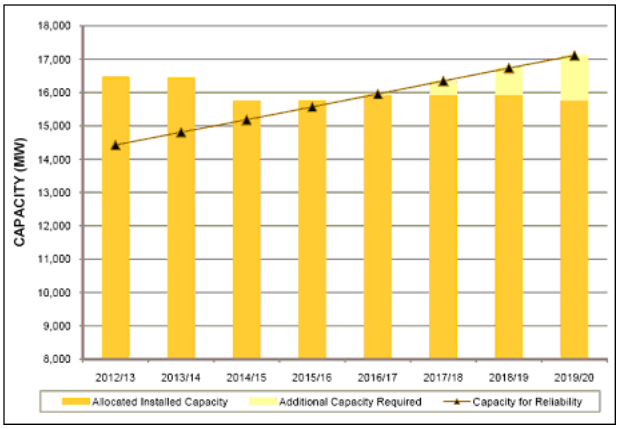


Figure 1-3 Predicted growth of electricity generation capacity (TransGrid, 2010)

The White Rock Wind Farm would contribute towards this required generation and decrease the country's dependence on fossil fuel power stations, which currently contribute over 90% of electricity generation. The proposed wind farm represents a medium sized wind farm with an installed capacity of around 238 MW (with a likely capacity of 2MW per turbine).

Based on the *NSW wind farm greenhouse gas savings tool* developed by Department of Environment, Climate Change and Water (DECCW), the White Rock Wind Farm will reduce greenhouse gas emissions by around 754,000 tonnes of carbon dioxide equivalent per annum. This is equivalent to taking 185,000 cars off our roads, and will contribute to global efforts to mitigate climate change.

There are also benefits to the local economy through job creation and investment. The Proponent is committed to developing this project in a way which minimises the adverse local impacts while maximising the potential energy in the wind resource and the benefits to the local community.

The project offers the following benefits:

- Production of more than 830,000 MWh of electricity per year - sufficient for the average consumption of around 130,000 homes;
- Improvement to the security of electricity supply through diversification of generation sources and locations;
- Reduction of greenhouse gas emissions by approximately 754,000 tonnes of carbon dioxide equivalent (CO_2e) per annum;
- Contribution to the State and Federal Governments' target of providing 20% of consumed energy from renewable sources by 2020; and
- Creation of local employment opportunities and local economic benefits; and,
- An injection of up to $250 million into the Australian economy.

1.4 Consideration of Alternatives

Site Selection

The proposed site for the White Rock Wind Farm was initially identified due to its excellent wind resource and its proximity to an existing strong transmission network. A feasibility assessment was undertaken and revealed the site had excellent potential due to its predominantly cleared ridgelines, access via a main highway and relatively low density of residential houses.

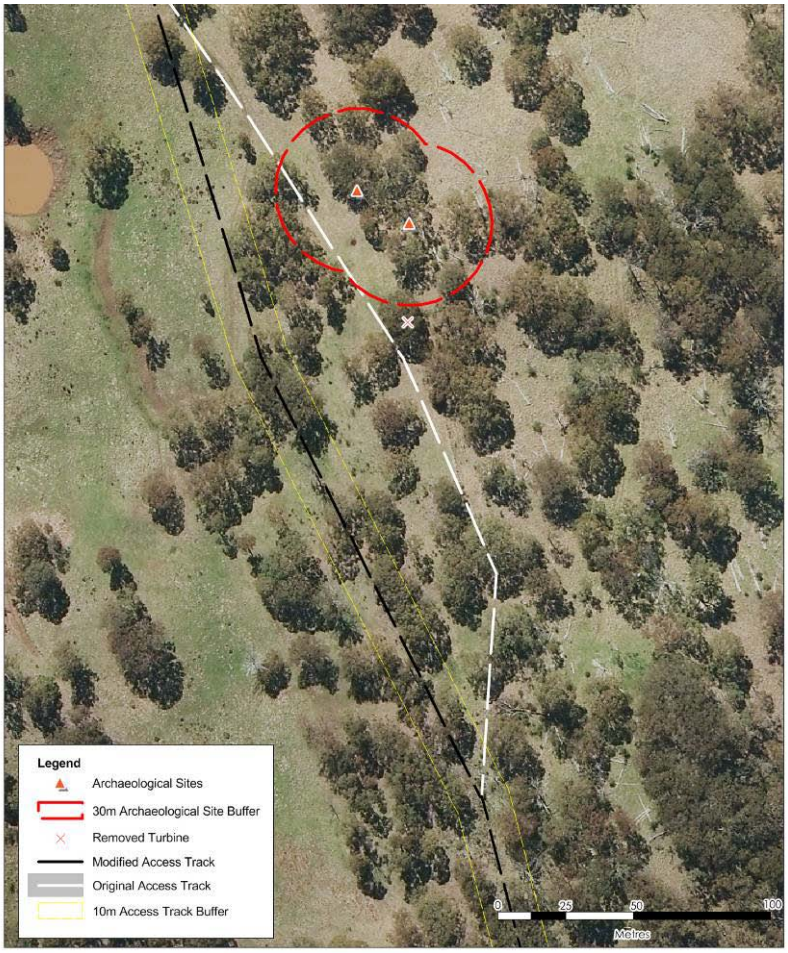
In addition to these characteristics, the engagement of interested landowners enabled the project development to progress. The selected development envelope for the turbine and infrastructure layout was chosen over earlier alternatives based on its commercial viability, landowner consent and reduced environmental impacts.

Design Principles

In NSW wind farm sites are typically located in areas with dominant ridgelines and strong prevailing winds. Due to the local geography the potential turbine locations are more limited than on flatter areas such as near the coast. Standard distances between turbines must be considered in conjunction with the prevailing wind conditions to avoid unnecessary turbulence that can lead to increased mechanical stress on the turbines. While the final turbine model has not yet been selected, a likely turbine size was considered when developing the layout for this EA.

Layout Adjustments

The design of the wind farm layout was an iterative process that sought to maximise the energy potential of the site while maintaining the existing amenity to the surrounding community. Inputs from the various assessments were considered when adjusting the turbine locations to design the most appropriate layout given the surrounding environment. Turbines were relocated and in some cases deleted to avoid noise, ecological and heritage impacts.



An example is shown here in the figure, where a turbine was deleted and the access track routed around two scarred tree that was identified during archaeological surveys.

Figure 1-4 Amendments made to the layout to avoid environmental constraints

1.5 Planning Context

State Legislation

The planning consent process in NSW is governed by the Environmental Planning and Assessment Act 1979 (EP&A Act). Under this Act, the White Rock Wind Farm is classed as a Part 3A Major Project. This is due to the fact that it has a capital investment value of more than $30 million. The Consent Authority for this project is the Minister for Planning based on advice received from the Department of Planning. The project has also been declared as Critical Infrastructure as it has the ability to generate in excess of 30 megawatts.

The local Councils are not the Consent Authority for this project, and there is no obligation to comply with all relevant Development Control Plans (DCPs) prepared by each Council. However, compliance or otherwise against these DCPs must be taken into consideration in carrying out the assessment.

The Director General of the Department of Planning has issued requirements for Epuron to consider and address in this EA (known as the Director General's Requirements or DGRs). These requirements incorporate inputs from the various government agencies that will provide advice to the Department in the assessment of this proposal.

The steps in the planning consent process are outlined in Table 1-2.

Table 1-2 Planning Assessment Process

STAGE OF THE ASSESSMENT	DESCRIPTION
Project Application and Preliminary Environmental Assessment	A Preliminary Environmental Assessment (PEA) is conducted by the Proponent to support the Project Application and give context around the site and potential issues that would need to be considered. This was submitted by Epuron on 10 September 2010.
Director General Requirements (DGRs)	Using the PEA and advice from other governmental departments the Department of Planning (DoP) issues DGRs. This is a list of issues that must be addressed by the proponent in an EA. The DGRs were issued to Epuron on 13 October 2010.
Environmental Assessment and Consultation	The Proponent prepares an EA following the DGRs. This involves extensive studies to be conducted on site as well as consultation with the local community and other stakeholders.
Submission and Departmental Review of the EA	The Proponent submits the EA and supporting studies to the Department of Planning (DoP) who undertakes a review of the EA to ensure the document is acceptable and addresses all issues raised in the DGRs. The DoP may require further work to be carried out by the Proponent before accepting the EA.
Public Exhibition	The EA is placed on display for the public to review and provide feedback via submissions to the DoP. The EA will be on display for a minimum of 30 days.
Response to Submissions	The DoP provides a summary of issues raised in submissions to the Proponent. The Proponent is required to respond to each issue that is raised in the submissions and submit a Submissions Report to support the EA.
Determination	The DoP will consider the EA and the Submissions Report in preparing its advice and recommendations to the Minister for Planning for the Minister's determination.

About This Report

This EA was prepared in a manner that provides the reader with a clear concise overview of the project details, the rationale behind the project and the issues that have been considered from an environmental perspective. Additional detail is provided in the attachments and appendices. The EA references these sections wherever relevant in order to aid the reader in locating the more detailed sections.

This EA document comprises the following sections:

Main Report: Environmental Assessment for the proposed White Rock Wind Farm

Attachments:

1. Involved Land Parcels
2. Residence Coordinates
3. Grid Coordinates of Wind Turbines
4. Letter Confirming Part 3A Position
5. Director General Requirements
6. Community Consultation Plan
7. Community Consultation Material

Appendices:

1. Landscape and Visual Impact Assessment
2. Environmental Noise Assessment
3. Ecology Assessment
4. Aboriginal Heritage Impact Assessment
5. Traffic and Transport Assessment
6. Telecommunications Impact Assessment

1.6 Consultation

The NSW Government recently commissioned the report *'Community Attitudes to Wind Farms in NSW'* to assess residents attitudes towards targets set to achieve 20% renewable energy consumption by 2020. The survey was conducted by telephone of 2022 residents aged 18 years and older and 300 businesses across the 6 Renewable Energy Precincts, including the New England Tablelands and a control area in regional NSW.

One of the key findings from this study was the overall support for wind farms as a source of energy generation within the vicinity of a residence. Eighty five percent (85%) of the population across the precincts supported wind farms in NSW, with 80% supporting them within their local precinct, and 79% supporting a wind farm being built 10 km from their residence.

Based on this survey, it appears the communities within the New England Tablelands are generally supportive of wind farms. The survey showed that a majority of the population did not feel like they had adequate information about wind farms, even in areas where general wind farm awareness was much greater.

Epuron provided a Community Consultation Plan as part of its Preliminary Environmental Assessment. The Community Consultation Plan focused on providing as much information to the local community as possible about the project, the assessment process and outlining the mitigation of potential impacts. This has been achieved through individual consultation with residents within 5 kilometres of the project, newsletters and media articles as well as an information 'Open House' held in Glen Innes in November 2010.

The Open House event gave representatives from Epuron as well as specialist consultants the opportunity to answer questions from local residents about any aspect of the project. The main issues that were raised at the Open House along with individual meetings included:

- Visual impact from nearby residences;
- Operational turbine noise at dwellings;
- Weed control during construction; and
- Impacts from construction.

Epuron believes that the project can be constructed with minimal impact to the local community. Consultation would continue through the construction phase with an emphasis on providing as much information as possible.

Table 1-3 Consultation at the Open House in Glen Innes

Approach to Environmental Assessment

Epuron has followed the DGRs in designing the approach to this EA. Best practice guidelines were incorporated as well as information gained during consultation with the local community and other stakeholders.

Individual studies were commissioned for areas that were identified as 'key issues' in the Preliminary Environmental Assessment, while additional issues were assessed by Epuron based on information gained during site visits, desktop research, consultation and experienced gained from similar projects.

The benefit of this approach means that the assessment can be tailored around the likely impact, in other words, the significance of an issue determines the level of assessment required.

Figure 1-5 Summary of Assessment Studies

Consultant	Assessment	Summary / Sample comment
Green Bean Design Landscape Architects	**Visual Impact**	*"This LVIA concludes that the White Rock wind farm would have an overall low visual impact on the majority of non-associated residential view locations as well public view locations, including the New England and Gwydir Highways as well as sections of the local road network identified in this LVIA."*
Sonus	**Environmental Noise**	*"A representative turbine (REpower MM92) and a worst case turbine (Vestas V90) were modelled to show that compliance can be achieved with the proposed layout under the SA EPA Guidelines 2003. The REpower turbine demonstrated full compliance in its normal operating mode, while the Vestas V90 would require two turbines to operate in a 'low noise mode' at certain wind speeds."*
RPS	**Ecology**	*"From the data presented herein, there appears to be no significant ecological constraints to the development of proposals within this locality of the northern tablelands region."*
RPS	**Aboriginal Heritage**	*"Five Aboriginal sites in total were identified during the survey. All Aboriginal sites identified during the survey occur outside the development footprint and thus are not likely to be impacted."*
Epuron	**Shadow Flicker**	*"…no shadow flicker is predicted to occur at any of these residences. Therefore the results of this assessment show compliance with the Victorian Guidelines of 30hrs/year at all nearby residences."*

1.7 Landscape and Visual Impact

Epuron commissioned Green Bean Design to prepare a Landscape and Visual Impact Assessment (LVIA) to determine the potential visual impacts in the vicinity of the wind farm. The main concern is the change to the landscape for nearby residents, recreational users and passing motorists.

The visual assessment methodology included the following key activities and assessments:

- Describing the significant visual components of the wind farm infrastructure;
- Conducting a desktop study addressing visual character and identifying receptor locations surrounding the proposed wind farm site;
- Photographing the site from preselected vantage points;
- Preparation of Zone of Visual Influence (ZVI) diagram;
- Assessment and determination of landscape sensitivity;
- Assessment and determination of the visual impact of the proposed wind farm;
- Preparation of photomontages and illustrative figures to demonstrate the visual components of the project;
- Determining the potential for cumulative visual impact from the wind farm against other approved and proposed wind farms in the area.

The visual assessment considered multiple locations encircling the project site and made assessments from key vantage points, typically within the 10 kilometre viewshed of the project. Photomontages were also created from a selection of these locations to demonstrate what the proposed wind farm would look like.

The Zone of Visual Influence is a map indicating how many wind turbines may be visible from each location (as shown on the following page). The ZVI is conservative, as many of the locations indicated are amongst trees or near buildings that would obscure the wind turbines from view.

In terms of overall landscape sensitivity, the LVIA determined that on aggregate each of the five Landscape Character Areas within the 10km wind farm viewshed had a 'medium' sensitivity to accommodate change and represented a landscape that is reasonably typical of other landscape types found in surrounding areas of the New England Tablelands.

The visual landscape in the area has been heavily modified by agriculture and also contains many built elements such as transmission lines and farming structures. The assessment concluded that the wind farm would likely be an acceptable development within the viewshed, which in a broader context also contains approved wind farms and other built elements such as roads, transmission lines and communication towers. Visual impacts on surrounding townships are expected to be minimal due to their distance from the project site.

Figure 1-6 Photomontage of White Rock Wind Farm from Gwydir Highway

When a wind turbine is between the viewer and the sun, moving shadow created by the moving turbine blades can appear as shadow flicker. Due to the predictable nature of the sun's position, shadow flicker can be assessed for the life of the project using specialised industry software. The wind turbine locations were assessed and it was found that there were no residences that would be affected by shadow flicker due to the distance and orientation of the turbine locations to nearby dwellings.

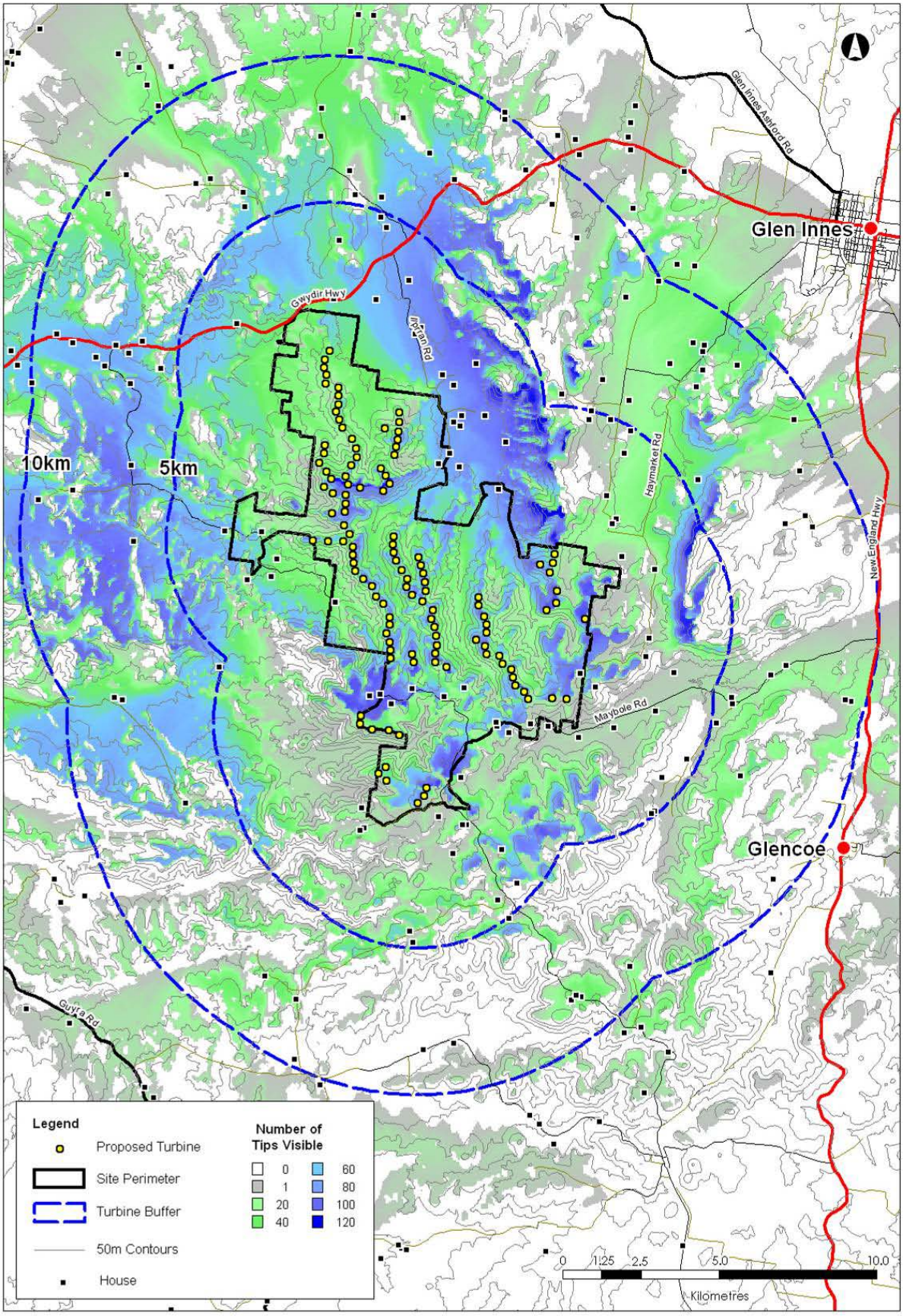


Figure 1-7 Zone of Visual Influence of the wind farm

1.8 Environmental Noise

Epuron commissioned Sonus to prepare an Environmental Noise Assessment to determine the potential for noise impacts from the project. The primary focus for the environmental noise assessment is to ensure that the existing amenity is not disturbed for neighbouring landowners.

To assess the impacts at these surrounding residences, the following tasks were undertaken:

- Preliminary predictions of wind farm noise levels were modelled for each relevant receiver (habitable residence) using computer noise modelling software[1]. The results were used together with topographical data to identify receiver locations that would be relevant for assessing the effects of wind farm noise from the development. Seven (7) relevant receiver locations around the site were selected for background noise monitoring.
- Background noise monitoring was conducted at each relevant receiver for a 21 day period equivalent to approximately 3000 data points. Monitoring of local weather conditions was undertaken at the same time in order to determine periods of rainfall. Where it was determined that rainfall had occurred, the background noise data was excluded from the dataset. Extraneous noise was also excluded from the dataset.
- A regression analysis was performed on measured background noise data, with a best-fit line representing the background noise level at each location across the wind speed range of interest.
- The noise criteria for new wind farm developments, as stipulated by the DGRs, was then applied to the derived background noise levels in the wind speed range of interest in order to determine noise limits at each receiver location.
- Finally, a comparison was made between the predicted wind farm noise levels and the noise limits determined in accordance with the South Australian Environmental Protection Agency, Environmental Noise Guidelines: Wind Farms 2003 (SA EPA, 2003) for each receiver in order to establish compliance.

The noise impact assessment has been undertaken in accordance with the SA EPA Guidelines 2003. The principal criterion for a wind farm development is that predicted noise levels should not exceed:

- 35 dB(A); or
- the existing background noise level by more than 5 dB(A);

whichever is greater, at all relevant receivers (residences not associated with the project) for each wind speed from cut-in to rated power of the turbine.

Table 1: Noise levels compared to a ten turbine wind farm

Activity	Sound pressure level (dBA*)
Jet aircraft at 250m	105
Noise in a busy office	60
Car travelling at 64kph at 100m	55
Wind farm (10 turbines) at 350m	35–45
Quiet bedroom	35
Background noise in rural area at night	20–40

In total there were 66 houses assessed for noise impacts from the project. There are 30 houses located within 2km of a proposed turbine location, 18 of which are involved with the project. Results from the assessment showed that under worst case scenarios the wind farm layout as proposed can achieve compliance with the stringent assessment criteria. The map on the following page shows graphically the results from the noise level analysis.

[1] Noise predictions were conducted using the propagation model, ISO 9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors" (ISO 9613).

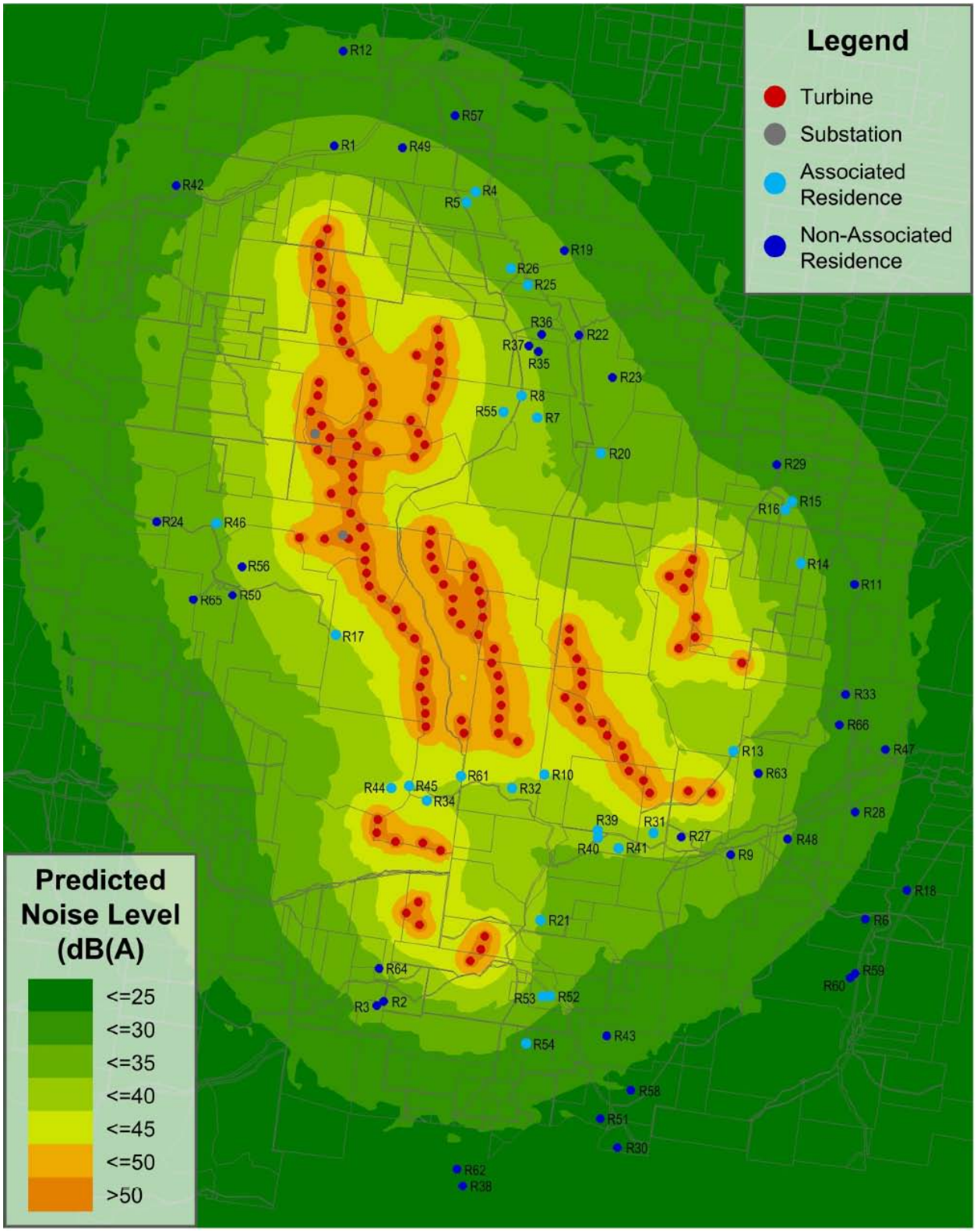


Figure 1-8 Predicted operational noise level for typical turbine (REpower MM92)

1.9 Ecology

Epuron commissioned an Ecology Assessment to be conducted by RPS to assess the ecological impacts of the project with a particular focus on native flora and fauna and threatened species.

The ridges most likely to contain turbines are generally clear on the top and carry dry forest vegetation communities on the steeper sheltered slopes. Remnant stands of the original vegetation remain as paddock trees or larger scattered patches of forest/woodland. The surrounding slopes and gullies are unlikely to contain turbines but could be affected if access tracks or powerlines were routed through them. In general, the slopes and gullies carry more native vegetation than the ridges.

Two Endangered Ecological Communities (EECs) were identified within the study area, namely, Ribbon Gum – Mountain Gum Woodland and Yellow Box Woodland. No threatened flora species as listed on the Threatened Species Conservation Act 1995 (TSC Act) and Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) were identified within the study area during field surveys. Potential habitat within the study area was identified for three threatened flora species identified during database searches, although none of these species were recorded on site.

Assessment of the potential level of impact on EECs and threatened flora species listed under the TSC Act identified one EEC and four threatened flora as potentially impacted by the project. The relatively small area of vegetation that would be removed for the wind farm in relation to much larger amount available in the immediate area resulted in a finding of no significant impact on EECs or threatened flora species listed under the TSC Act.

Three threatened fauna species were recorded during field surveys namely, the Eastern Bentwing-bat (Miniopterus schreibersii), Little Pied Bat (Chalinolobus picatus) and Varied Sittella (Daphoenositta chrysoptera). Potential habitat within the study area was identified for five threatened species during database searches.

Assessment of the potential level of impact on threatened fauna species under the TSC Act identified seven threatened fauna species as potentially impacted by the project. The seven fauna species are the Turquoise Parrot (Neophema pulchella), Grey-headed Flying-fox (Pteropus poliocephalus), Eastern Bentwing-bat, Yellow-bellied Sheathtail-bat (Saccolaimus flaviventris), Greater Broad-nosed Bat (Scoteanax rueppellii), Greater Long-eared Bat (Nyctophilus timoriensis) and Little Pied Bat. By applying the seven part test of potential for impact to each of these species it was found that the project was considered unlikely to have a significant impact on any of the seven threatened fauna species listed under the TSC Act.

The project was found to have no significant impact on any ecological communities, threatened species or migratory species as listed under the EPBC Act.

Figure 1-9 Ribbon Gum - Mountain Gum Woodland

1.10 Additional Issues

Cultural Heritage

A Cultural Heritage Impact Assessment was conducted for the project by a cultural heritage consultant with input from the local Aboriginal community. The assessment considered the environmental and archaeological context of the study area to develop a predictive model to help target an archaeological survey of the study area for Aboriginal and non-indigenous heritage items.

The following groups were consulted and contributed to the preparation of the cultural heritage assessment:

- Kwienabal Elders Group;
- Kwienbal Environmental Heritage and Cultural Aboriginal Corporation;
- Edgerton-Kwienbal Aboriginal Corporation; and
- Kwienbal Traditional Owners.

Five Aboriginal sites were identified during the survey. No non- Indigenous heritage items were identified during heritage register searches, or during the survey.

Three scarred tree sites were identified in close proximity to the development footprint. Implementation of appropriate mitigation measures, such as a 30m buffer zone during the construction phase, would prevent impacts to these sites from the proposed development.

Traffic and Transport

The construction phase of the project presents the most likely chance for traffic issues associated with the project as it generates the greatest volume of traffic. A Traffic and Transport Assessment considered the potential issues associated with the proposed wind farm and provides mitigation measures to help minimise and avoid such issues.

Access to the site would primarily be via the Gwydir Highway at the northern end of the site. A new unsealed track would be constructed to access the temporary construction compound, operation and maintenance facility, switchyard, substation and the turbine locations further south. Additional traffic generated from the project would not constitute a significant increase in existing volumes on the Gwydir Highway.

The operational phase would have a very minimal impact to traffic volumes as the turbines would be maintained by a relatively small crew of technicians likely to be based out of Glen Innes.

Aviation

Epuron has consulted with the relevant aviation associations in relation to air safety and potential hazards caused by the construction of turbines. The location of the proposed turbines would not encroach on an Obstacle Limitation Surface (OLS) of any registered or regulated aerodrome. The closest aerodrome is Glen Innes airport, approximately 24 kilometres away.

Figure 1-10 Construction of Cullerin Wind Farm in 2009

1.11 Land Management

Land Use

The project infrastructure is located on private property that is currently used for grazing. Once operational the wind farm will have a negligible impact on farming operations and the agricultural capacity of the land as it would occupy less than 1% of land from the involved properties.

Hydrology and Drainage

The site plan for the wind turbines and associated infrastructure has been designed with particular emphasise on protecting existing streams and ephemeral watercourses. The layout avoids crossing or interfering with watercourses by any infrastructure. This is to avoid and minimise any adverse impacts to the drainage and hydrological regime.

Water for the project would be sourced from a number of options including on site dams, reservoirs in the local area and water supply (including treated effluent) from the Glen Innes Severn Council.

Soils and Landforms

The project is not predicted to have any significant adverse environmental impacts on the site or its surrounds, geology or soils as the overall surface disturbance is relatively small in size and manner.

A detailed geotechnical assessment would be conducted once the turbine locations have been finalised to determine the ground stability at each site. No geotechnical issues are anticipated due to the geological characteristics of the area.

An Environmental Management Plan would be developed in accordance with the Best Practice Guidelines for Wind Energy Projects (Auswind, 2006) and the consent conditions to ensure that issues such as erosion, weed control, air quality and drainage are appropriately addressed.

Figure 1-11 Once operational the wind farm will have a negligible impact on farming operations

1.12 Environmental Management

A Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP) will be prepared to manage and mitigate environmental impacts on the wind farm site. The CEMP will incorporate all relevant processes and mitigation measures for development. It will include:

- Soil & Water Management;
- Fuel and Chemical Storage - to avoid the pollution of surface and ground waters;
- Erosion & Sediment Control Plan;
- Landscape Management Plan;
- Traffic and Transport;

- Fire Management;
- Waste Generation and Disposal; and
- Additional measures mentioned in the Statement of Commitments.

1.13 Statement of Commitments

A wide range of mitigation measures have been identified for the proposed White Rock Wind Farm. These measures will be used to address potential issues arising from visual, noise, traffic, ecology, communications and impacts to the local community. The mitigation measures set out for each issue have been documented as draft Statement of Commitments which would form the basis of the Construction and Operation Environmental Management Plans to ensure that the project achieves maximum benefits while minimising the impacts to the local environment.

1.14 Contact Information for Further Details

Address: Epuron
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North Sydney NSW 2060

Phone: (02) 8456 7400

Email: info@epuron.com.au

Web: www.epuron.com.au

2 Introduction

2.1 Overview of the Project

The proposed White Rock Wind Farm is to be located in the New England Tablelands region, 20 kilometres west of Glen Innes, New South Wales. The site is in close proximity to a number of proposed wind farms including the Glen Innes Wind Farm, the Sapphire Wind Farm and the Ben Lomond Wind Farm, as shown in Figure 2-1.

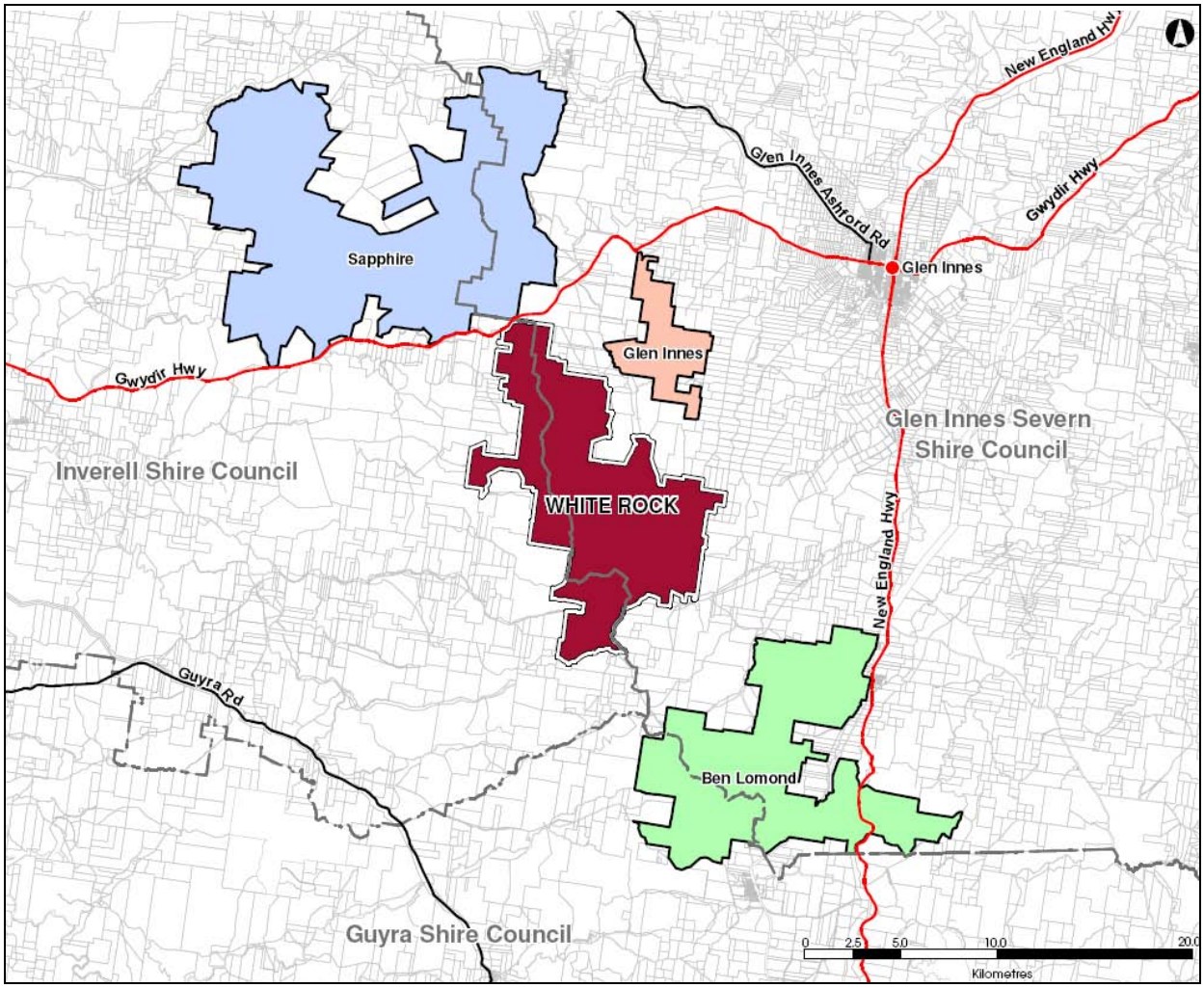

Figure 2-1 Proposed site location in relation to other proposed wind farms

The proposed site is located on freehold land within and adjacent to agricultural areas. The closest rural centre is the town of Glen Innes 20km from the site. A small number of residences surround the site; these have been identified through reviews of cadastral and topographic mapping, site inspection and aerial imagery.

The project would involve the construction, operation and maintenance of up to 119 wind turbines, together with the ancillary structures, access tracks and electrical infrastructure required to connect the project into the existing electricity network.

The turbines would be placed along a series of ridgelines and surrounding hilltops in order to maximise the renewable energy produced by the wind (see Figure 3-2 in Section 3.1 for details of the turbine layout). The site would contain both the wind turbines and the electrical infrastructure (substations and powerlines) required to connect into the existing transmission network.

2.2 Proponent and Stakeholders

Proponent: Epuron Pty Limited

The Proponent of the proposed White Rock Wind Farm is Epuron Pty Ltd. Epuron is the most experienced wind energy development company in NSW. Epuron commenced its operations in 2003 as Taurus Energy Pty Ltd and since that time has developed the largest wind farm, the largest number of wind farms, and the largest number of wind turbines in NSW as indicated in Table 2-1.

Epuron is therefore one of the largest wind farm developers in Australia.

Epuron operates out of its offices in North Sydney where it has a professional team with considerable development expertise. Epuron undertakes its own wind monitoring, site layout and design. For environmental assessments such as ecology, archaeology, noise and visual, appropriate specialists are engaged.

Table 2-1 New South Wales wind farm projects developed by Epuron

Project	Turbines / Size	Development Status	Region
Cullerin Range	15 turbines 30 MW	Operating – now owned by Origin Energy	Southern Tablelands
Conroy's Gap	15 turbines 30 MW	Development Approved – now owned by Origin Energy	Southern Tablelands
Snowy Plains	15 turbines 30 MW	Development Approved – now owned by Origin Energy	Monaro
Gullen Range	73 turbines	Development Approved	Southern Tablelands
Silverton	598 turbines Stage 1 - 282 Stage 2 - 316	Joint Venture (JV) with Macquarie Capital Wind Fund Project Approval -stage 1 Concept Approval - stage 2	Far Western NSW
Yass Valley	152 turbines	In planning – now owned by Origin Energy	Southern Tablelands
Birrema	60 – 80 turbines	Preliminary Environmental Assessment lodged	Southern Tablelands

Consent Authority: Department of Planning

The project will be a Major Project assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (the EP&A Act), accordingly the Consent Authority is the NSW Minister for Planning assisted by the Department of Planning.

An additional consent is required from the Federal Government, through the Department of Sustainability, Environment, Water, Population and Communities, under the EPBC Act.

An outline of the assessment processes including consultation with the community and other government agencies is found in Sections 6 and 7.

Key Stakeholders

During the development of this project, Epuron has actively engaged with a number of key stakeholders including:

- Local councils – both the Glen Innes Severn and Inverell Shire Councils;
- State Government Agencies – to receive specialised advice on the assessment of key issues;
- Local community – submissions on this proposal will be sought from the local community; and
- TransGrid – the high voltage transmission infrastructure that the project would connect into is owned and operated by TransGrid.

During the assessment process the Department of Planning (DoP) will seek comments on the project from key stakeholders and relevant government agencies, which will include a review of this Environmental Assessment (EA).

2.3 Development Application Process

Purpose of this document

This EA has been prepared to support the Development Application of the White Rock Wind Farm and to address the Director General's Requirements (DGRs) issued by the NSW Department of Planning.

This EA presents:

- a detailed description of the project;
- a summary of the development and assessment process;
- findings and recommendations from the detailed EA studies; and
- a description of the consultation plan Epuron is implementing in relation to this project.

Overview of the planning process

The proposal is required to be assessed under both state and federal government environmental legislation, specifically the *Environmental Planning and Assessment Act 1979 (NSW)* and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In relation to this EA, we note:

- The proposed White Rock Wind Farm would have a capital cost in excess of $30 million and in the Minister's opinion is considered to be a Major Project, under Part 3A of the EP&A Act (Minister's opinion dated 2nd June 2010, included in Attachment 4). Part 3A of the EP&A Act consolidates the assessment and approval regime for all Major Projects that require the approval of the NSW Minister for Planning.
- The proposed White Rock Wind Farm has the capacity to generate in excess of 30 Megawatts and therefore is a Critical Infrastructure Project under section 75C of the EP&A Act by virtue of the Critical Infrastructure declaration made by the NSW Minister for Planning on 11 November 2009.

The assessment process for the project is as follows:

1. The Proponent of a Major Project first submits a Project Application for the approval of the Minister for Planning.
2. The Department of Planning seeks input from key government agencies in detailing the requirements of the EA.
3. The Director-General of Department of Planning then issues the Proponent with requirements for the EA, indicating the issues to be addressed, the level of assessment required and consultation requirements. These are the DGRs.

4. The DGRs may also require the Proponent to include in the EA a Statement of Commitments (SOC) the Proponent is prepared to make for environmental management and mitigation measures on the site.
5. After an EA has been prepared and accepted by the DoP, the report is placed on public exhibition for a minimum of 30 days during which time submissions from the community, local government and state agencies are accepted.
6. Following the consultation period, the Director-General may require the Proponent to respond to the comments, revise the proposal or revise the Statement of Commitments.

Consistent with the Part 3A reforms, this assessment was preceded by an issues scoping exercise to identify and prioritise issues related to the project. A Preliminary Environmental Assessment identifying and prioritising issues relating to the project was submitted to the Department of Planning (DoP) on the 10th September 2010. The DoP responded on 13th October 2010 with the DGRs for this EA.

Next steps

This EA has been reviewed to ensure it addresses the DGRs and is on public exhibition for a minimum period of thirty days. The DoP will invite submissions from community and public stakeholders during the public exhibition period and will consider the issues raised in any submissions when determining the application.

2.4 Content in this Environmental Assessment

This EA draws together a number of specialist studies investigating the potential impacts of the wind farm. The findings of these studies have been summarised into the EA and are also included as stand alone documents appended to this EA. This EA concludes with a Statement of Commitments to which the Proponent would commit, pending approval of the proposal, in order to manage identified impacts.

A brief summary of the sections in this EA is as follows:

- **Section 1** – The Executive Summary aims to give a brief overview of the wind farm and how impacts will be managed.
- **Section 2** – Introduces the project and the process.
- **Section 3** – Provides a detailed description of the project and the activities involved with each stage of development.
- **Section 4** – Provides a context for the project in the form of an overview of the current energy situation and how wind energy fits in as well as the justification for the project.
- **Section 5** – Describes the alternatives considered for this project.
- **Section 6** – Provides a description of the planning process.
- **Section 7** – Details Epuron's community consultation process.
- **Section 8-11** – Provides a summary of the environmental assessment studies that were conducted to assess the impacts of the project.
- **Section 12** – Details Epuron's draft statement of commitments.
- **Section 13** – Provides a conclusion to this report.

3 The Project

3.1 Description of the Project

This section of the EA provides a detailed description of the project and in particular outlines the work associated with the construction and operation of the wind farm and all associated infrastructure.

The components of the proposed wind farm included in this application are:

- up to 119 wind turbines, each with:
  - three blades mounted on a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of 150 metres;
  - an adjacent pad mounted turbine transformer, crane hardstand area, and related turbine lay down area;
- a short (6-8km) on-site powerline connecting the wind farm to the TransGrid 132kV Inverell – Glen Innes transmission line, which intersects the north of the site;
- a 132kV switchyard at the connection point to the TransGrid transmission line, and a 132kV substation on-site;
- electrical connections between wind turbines and the on-site substation, which would be a combination of underground cables and overhead powerlines linking sections of the site;
- an operation and maintenance facility incorporating a control room and equipment storage facilities;
- temporary concrete batching plant facilities;
- access tracks required for each turbine and the related facilities above;
- minor upgrades to local roads, as required for the installation and maintenance of wind turbines and the related facilities above; and
- a number of permanent monitoring masts for wind speed verification and monitoring.

A range of turbines are being considered with a capacity between 1.5 and 3.4 megawatts. For ease of presentation the calculations used throughout this EA assume an indicative capacity of 238 MW based on a typical and mid-range 2.0 MW turbine.

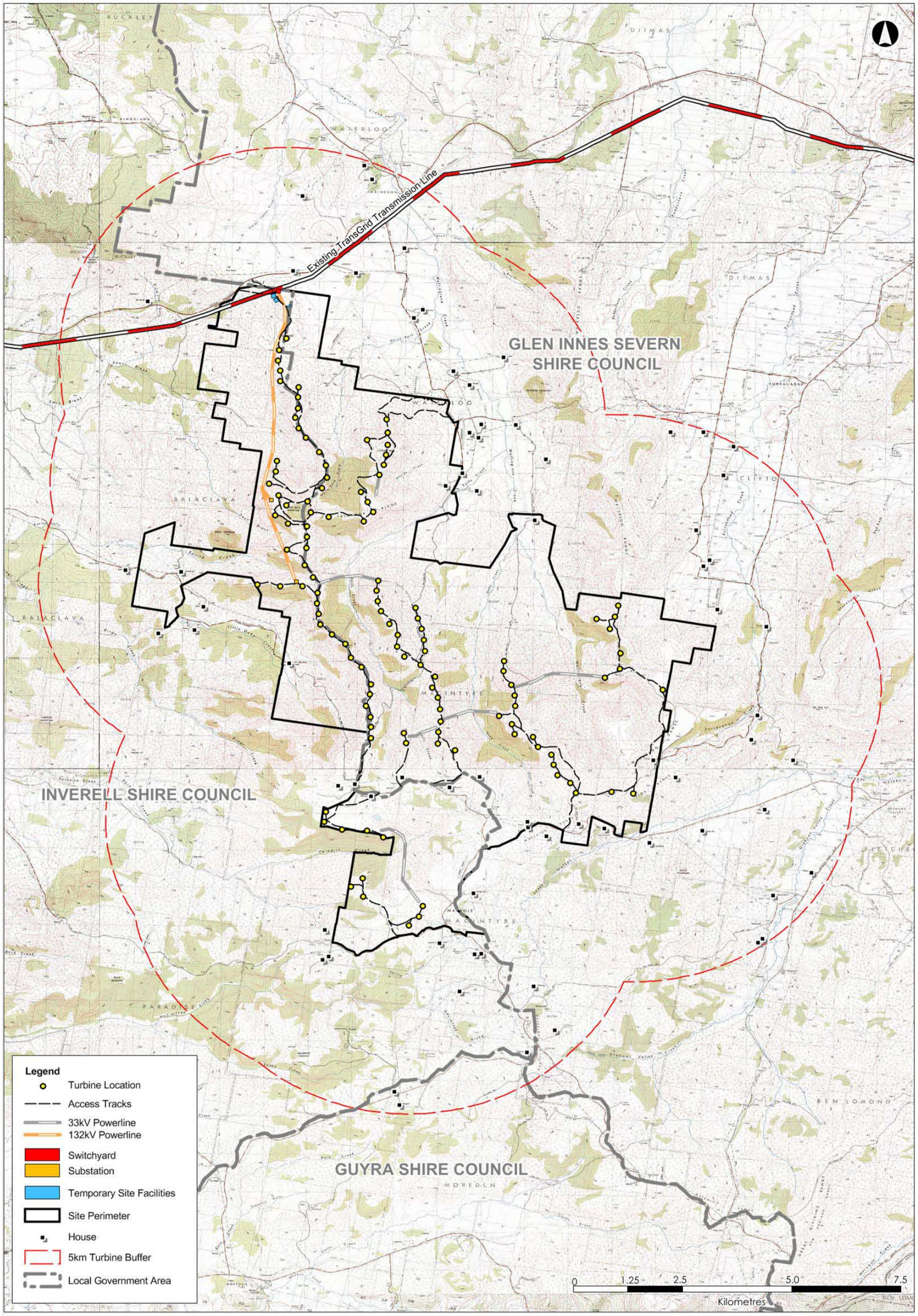

Figure 3-1 Proposed Infrastructure of the White Rock Wind Farm

3.2 Wind Farm Layout

The proposed wind farm layout presented in this EA has been through a number of design iterations. The design process is focused around three core principles:

- Minimising and/or avoiding negative environmental impacts;
- Maximising positive impacts (clean energy production and greenhouse gas reduction); and
- Practical limitations in relation to the construction and operation of the site, including costs.

Where tradeoffs are required between these core principles, Epuron has used its experience and judgement taking into consideration a balanced view of the public good in finalising the layout.

Initial Layout

An initial layout indicating 121 turbine locations was presented at the Open House on Wednesday 3 November 2010. This layout was based primarily on initial wind speed analysis as the results of community input and detailed studies were not available when it was prepared. The initial layout has been subsequently revised and improved, taking into account technical and environmental constraints, community consultation and results of the various environmental assessments conducted.

Current Layout

This EA seeks planning consent for the current layout which includes 119 turbine locations spanning a distance of 15km from north to south and 8km from east to west as shown in Figure 3-2, Figure 3-3 and Figure 3-4. The turbine layout reflects the typical spacing required for the wind turbines under consideration, while maximising the total energy output of the wind farm.

A description of improvements made to the layout with reasons for each improvement is included in Section 5.

Issues identified through the community consultation process guided the design and implementation of the various impact assessments, which guided this layout.

Avoiding and minimising impact to the vegetation has been considered during all stages of design through the use of mapped constraint areas identified during the detailed assessments. Noise and visual impact assessments have also been conducted on this final proposed layout. The assessments were carried out on the basis of the most representative project impacts, however a worst case impact assessment was also considered. These studies are included in section 9 and also as appendices to the EA.

To prepare this layout, key parameters and constraints were considered for the site, including:

- aerial photography and topographic contours (to produce vegetation and roughness maps);
- wind speed data collected on site;
- location of residences in the vicinity;
- results of background noise assessment including proposed noise limits at residences;
- results of ecological and archaeology assessments including constraint mapping;
- information on other constraints within the site;
- information on communications links in the vicinity of the site; and
- accessibility for delivery of large scale wind turbine components.

Final Layout

Detailed geotechnical investigations and final engineering design can only be carried out once consent conditions are known and a turbine supplier has been selected. Accordingly, minor changes to the layout are still possible prior to construction.

The current turbine layout has undergone a preliminary review to determine if the layout is reasonably suitable for construction and would comply with expected consent conditions. However, minor relocation of specific turbines may be required prior to construction to take into account a number of factors including:

- final turbine selection;
- final wind speed and energy yield analysis;
- additional site constraints identified through ongoing investigations;
- constraints identified in relation to constructability or construction cost minimisation; and
- constraints identified after the results of final geotechnical investigations at each turbine location are completed.

Depending on final turbine selection, it is possible that not all turbines proposed would be installed to ensure that the project continues to meet all consent conditions.

To that end, a final layout would be prepared after final turbine selection has taken place and prior to construction. This final layout would include adjustments to ensure all criteria are achieved.

Epuron would ensure that any minor changes do not create a detrimental overall impact and if any revisions are material, will resubmit noise and visual impact assessments based on the revised layout prior to construction.

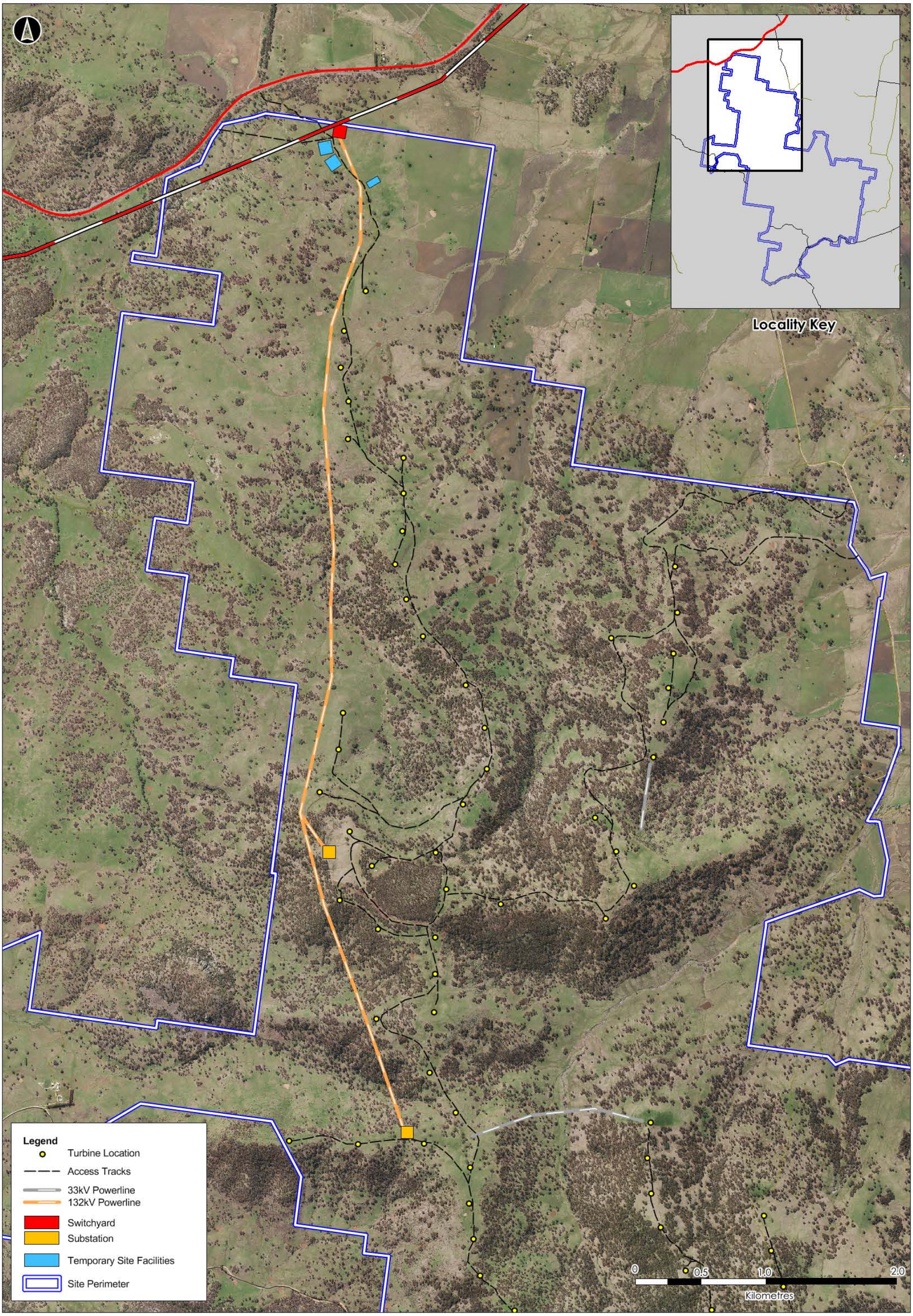

Figure 3-2 Proposed infrastructure for the White Rock Wind Farm (northern section)

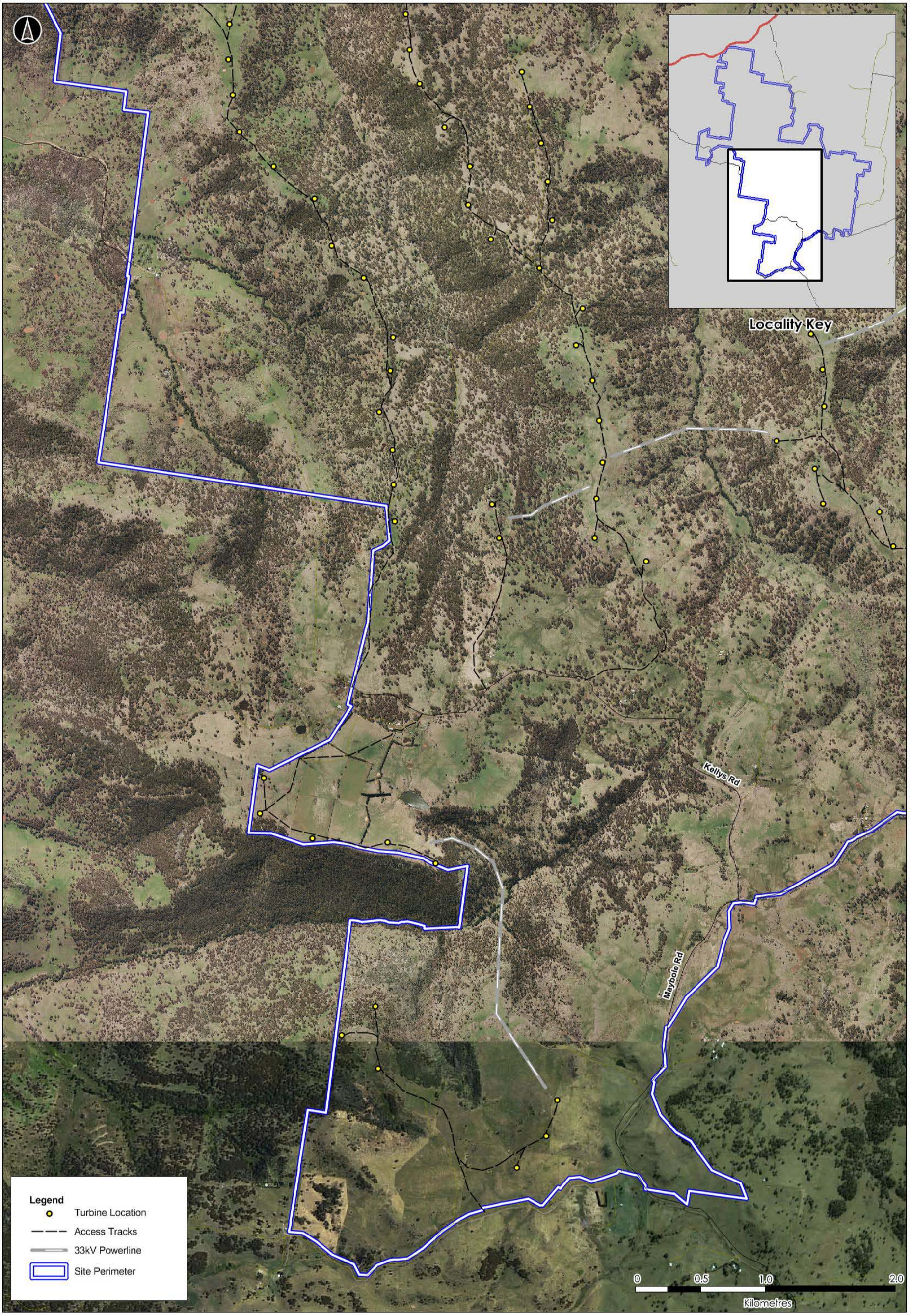

Figure 3-3 Proposed infrastructure for the White Rock Wind Farm (southern section)