



Referral of proposed action

Project title: White Rock Wind Farm

1. Summary of proposed action

1.1 Short description

Epuron Pty Ltd proposes to develop a wind farm in the New England Tablelands region of New South Wales, approximately 20km west of Glen Innes. The wind farm would comprise of 119 turbines, each with a rated installed capacity of approximately 2.0 megawatts. The proposal would be for the purpose of renewable electricity generation. It would include turbines and associated infrastructure and connect to the TransGrid 132kV transmission line which crosses the northern part of the site.

1.2 Latitude and longitude

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
NW corner	151	30	55	-29	45	47
NE corner	151	34	46	-29	45	25
SW corner	151	33	28	-29	54	55
SE corner	151	37	49	-29	53	13

1.3 Locality and property description

The proposed White Rock Wind Farm would occupy ridgelines and hilltops between Grahams Valley Road and Gwydir Highway. The site is located in the New England Tablelands of northern NSW. The town of Glen Innes is the closest rural centre to the proposed wind farm development, located approximately 20km to the east.

Elevations of the ridgelines across the site range from 1000 to 1350 meters above sea level. The site has been selected for its windy ridges and extensive areas of cleared grazing land.

Figure 1-1 shows the project locality.

1.4 Size of the development footprint or work area (hectares)

It is difficult to provide an exact size of the development footprint in hectares. The development envelope studied as part of the ecological study was 1,293 ha. A precautionary 25 x 60 m development footprint of each wind turbine was assessed. Access tracks and footprints for associated infrastructure will also be developed. Approximately 23 ha of native vegetation are likely to be modified to some extent.

1.5 Street address of the site

The site is located between Grahams Valley Road and the Gwydir Highway, 20km west of Glen Innes, New South Wales. The main accesses are from these roads.

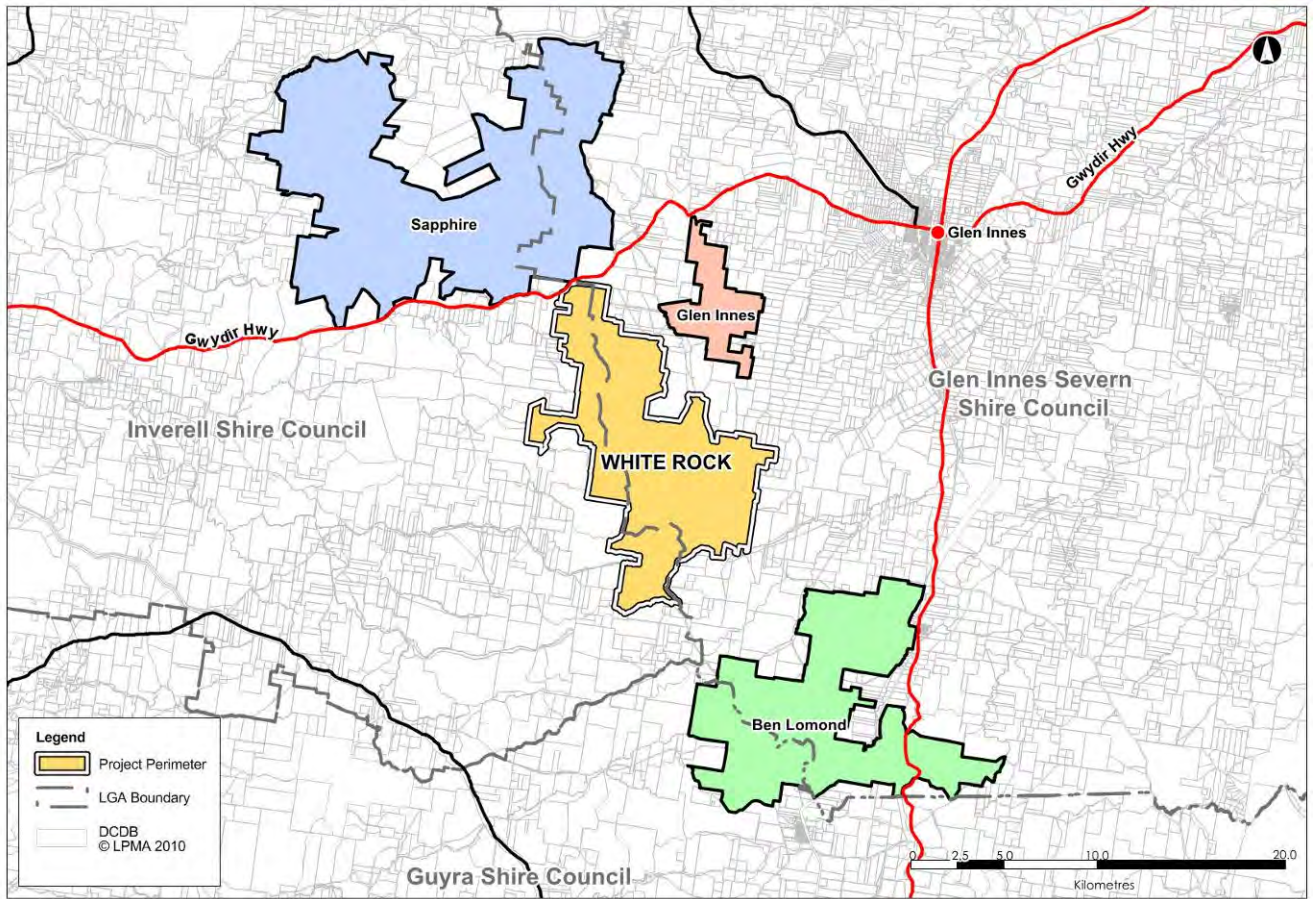


Figure 1-1 Site Locality

1.6 **Lot description**
 This proposal would directly involve 16 landowners. The properties are currently used for agriculture and grazing purposes. These existing uses would continue with minimal interruption from the wind farm construction and operation. Refer to the attached sheet for the lot numbers and title holders.

1.7 **Local Government Area and Council contact (if known)**
 The proposed wind farm site is located on freehold and leasehold land within and adjacent to agricultural areas in the Local Government Areas (LGA) of Glen Innes Severn and Inverell Shires.

The contact for the Glen Innes Severn Shire is: Graham Price – Director of Development and Environmental Services

The contact for the Inverell Shire is: Kendall Clydsdale – Manger Development Services

1.8 **Time frame**
 Before consent conditions have been received, it is not possible to define the timeline for the construction of the project. It would be expected that from the time consent conditions are received, it would take a further year to finalise the additional agreements required before construction could commence. This includes finalising the grid connection agreement and ordering long lead-time items such as transformers and turbines. The construction phase of the wind farm would then occur over an 18-24 month period.

1.9	Alternatives to proposed action	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete section 2.2
1.10	Alternative time frames etc	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.12	State assessment	<input type="checkbox"/>	No
		<input checked="" type="checkbox"/>	Yes, you must also complete Section 2.4
1.12	Component of larger action	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 2.6
1.13	Related actions/proposals	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, provide details:
1.14	Australian Government funding	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, provide details:
1.15	Great Barrier Reef Marine Park	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 3.1 (h), 3.2 (e)

2. Detailed description of proposed action

2.1 Description of proposed action

Introduction

Epuron Pty Ltd proposes to develop a wind farm in the New England Tablelands region of New South Wales, approximately 20km west of Glen Innes. The proposal would be for the purpose of renewable electricity generation.

The components of the proposed wind farm included in the development 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. The indicative capacity of 238 MW is based on a typical 2.0 MW turbine. The works establishment of the wind farm can be considered as occurring in four phases. These include construction, operation, refurbishment and decommissioning of the wind farm.

Phase 1 – Wind Farm Construction

Before consent conditions have been received, it is not possible to define the timeline for the construction of the project. It would be expected that from the time consent conditions are received it would take a further year to finalise the additional agreements required before construction could commence. This includes finalising the grid connection agreement and ordering long lead-time items such as transformers and turbines.

The construction phase of the wind farm would then occur over an 18-24 month period and would include such activities as:

- transportation of people, materials and equipment to site;
- civil works for access track construction, footings and trenching for cables;
- establishment, operation and removal of up to two concrete batching plants;
- potential use of rock crushing equipment, if required;
- potential use of blasting for foundation excavation, if required;
- installation of wind turbines using large mobile cranes;
- construction of substation and onsite power reticulation lines and cables;
- construction of temporary offices and facilities;
- temporary storage; and
- restoration and revegetation of disturbed onsite areas on completion of construction works.

In general, construction would commence with the upgrading of roads and all other site civil works, including preparation of hardstand areas and laying of cables. This would be followed by preparation of concrete footings, which must be cured for many weeks prior to construction of wind turbines.

The necessary substation construction and grid connection works would be carried out in parallel.

The commissioning phase would include pre-commissioning checks on all high-voltage equipment prior to connection to the TransGrid transmission system. Once the wind farm electrical connections have been commissioned and energised, each wind turbine is then separately commissioned, connected and put into service.

On completion of construction, disturbed areas would be revegetated and all waste materials removed and disposed of appropriately.

Construction Hours

Construction activities associated with the project that would generate audible noise at any residence would be undertaken during the hours of:

Monday – Friday	7am – 6pm
Saturday	8am – 1pm
Sunday and public holidays	Not proposed

Phase 2 – Wind Farm operation

While the wind farm operates largely unattended, the wind turbines and other equipment would require regular maintenance. It is possible that some equipment may require major repair or replacement. In addition, during the initial operating years, operator attendance may be more regular while wind farm operation is being fine-tuned and optimised.

Once installed, the turbines would operate for an economic life of 20 to 30 years. After this time the turbines may be refurbished to improve their performance or decommissioned and removed from the site.

Phase 3 – Wind Turbine Refurbishment

The life of a modern wind turbine is typically 20 - 30 years, at which point individual wind turbines would be refurbished, replaced or removed. Individual turbines may also fail at shorter lives for various reasons as discussed above.

Phase 4 – Wind Turbine Decommissioning

Should a turbine fail and it is not commercially viable to replace the turbine, it would be decommissioned. Any turbine remaining non-operational for a continuous 12 month period would be decommissioned and removed from the site.

Decommissioning would involve similar road access arrangements to construction, and would require access for large cranes and transport vehicles to dismantle and remove the turbines. All underground footings and cable trenches would remain in situ; all above ground infrastructure would be removed. The decommissioning period is likely to be significantly shorter and with significantly less truck movements than the construction phase.

Wind Farm Layout

The proposed wind farm layout has been developed using an iterative process, taking into account technical and environmental constraints, community consultation and results of the various environmental assessments conducted.

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 the 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, where practical.

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

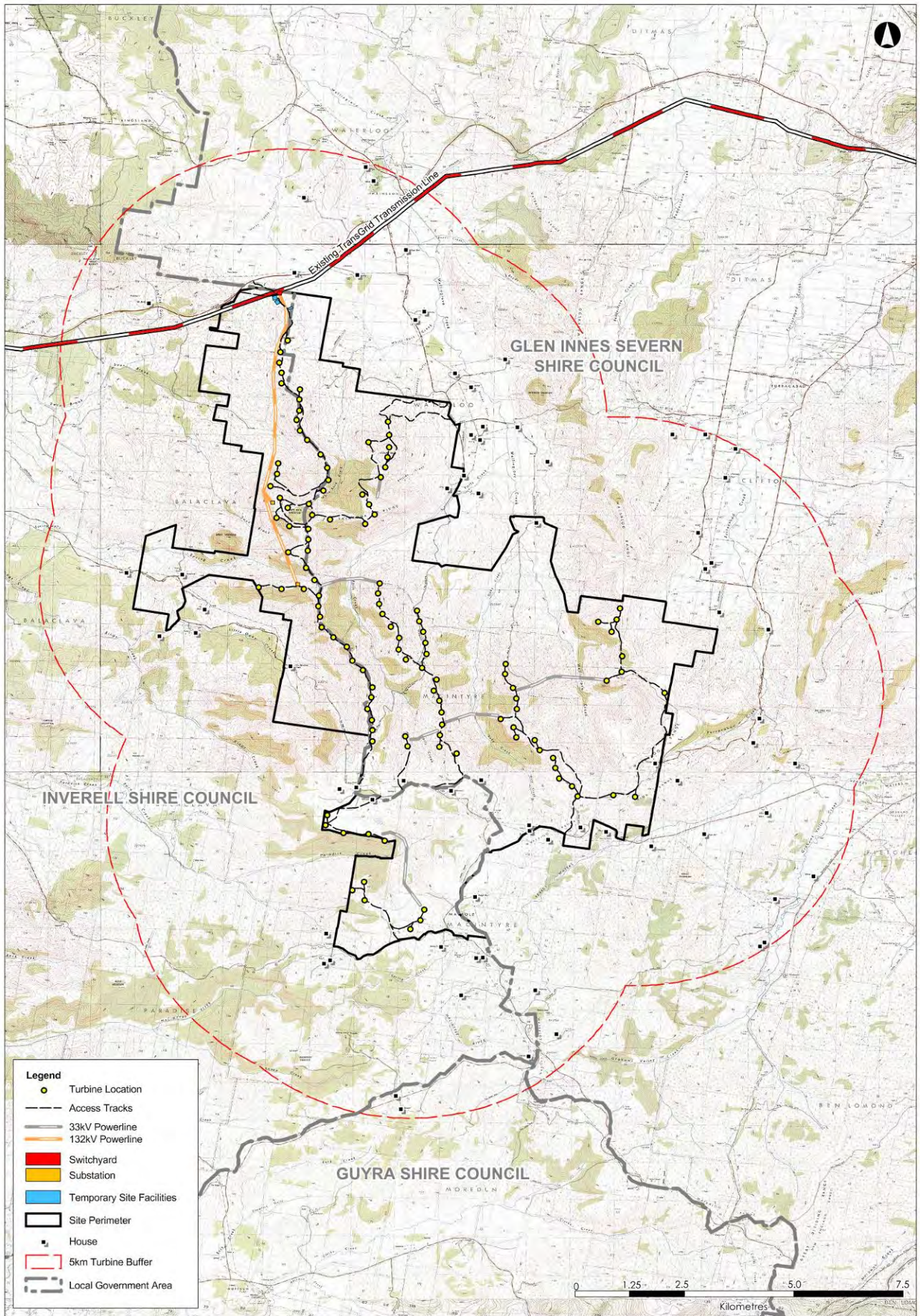


Figure 2-1 Project infrastructure

The turbine locations span a distance of 15km from north to south and 8km from east to west as shown in Figure 2-1. The turbine layout reflects the typical spacing required for the wind turbines under consideration, while maximising the total energy output of the wind farm. 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;
- information on general constraints within the site;
- information on communications links in the vicinity of the site; and
- accessibility for delivery of large scale wind turbine components.

This indicative 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;
- 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 (e.g. noise constraints).

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

Wind Turbine Selection

A number of turbines are under consideration for the proposal. The turbines under consideration have a maximum blade length of 56m. The tallest tip height combination under consideration is 150m, while the likely tip height is expected to be between 125m – 135m.

Wind Turbines

Each wind turbine will be a three bladed type of the “up-wind” design. That is, facing into the wind and in front of the tower. This design reduces noise levels generated during operation. Each wind turbine will also have a rated power capacity of between 1.5 and 3.4 MW, subject to final turbine selection.

Nacelle

The nacelle is the housing at the top of the tower enclosing the generator, gearbox, and control gear including motors, pumps, brakes and electrical components. This control gear ensures that the wind turbine always faces into the wind, and adjusts blade angles to maximise power output and minimise blade noise. The nacelle also houses a winch or winches to assist in lifting maintenance equipment or smaller replacement parts to the nacelle. The nacelle design takes into account acoustic considerations to minimise noise emissions from mechanical components.

Tower

The tower is a tubular steel or tubular steel and concrete tower up to 84 metres high, tapering from around 5 metres in diameter at the base to around 3 metres at the top. Exact dimensions would depend on the wind turbine design selected. The tower is constructed in up to five sections, each section bolted together via an internal flange. Within the tower are the power and control cables and an access ladder or lift to the nacelle (with safety climb system).

Access Tracks, Hardstands and Footings

The tower will be mounted on a reinforced concrete footing and would require removal of rock and subsoil at the base of each turbine. Two footing design options are under consideration: a gravity footing (where subsoil geology is less stable) and a rock-bolted footing (where subsoil geology provides good bedrock). A combination of these footing designs may be used on the site depending on the geology at each turbine location.

Each wind turbine will require vehicle access and an electrical connection to the site substation. Access tracks will be a minimum of 5 metres wide (wider at bends and passing lanes) and be all weather graded gravel tracks. Hardstand areas required beneath each turbine will be approximately 25m x 45m (1125m²). The shape and exact size of the hardstand area is subject to final turbine selection and crane requirements. The hardstand area is used for storage of turbine components, assembly of the turbine components and for the turbine installation cranes. Access tracks and hardstands areas will generally be left in situ after construction to allow for any required maintenance and repairs.

Transformer

Each wind turbine generator will produce power at typically 690V, and up to 1,000V. Power is then transformed at each wind turbine to either 22 kV or 33 kV for reticulation around the site. The transformer for each wind turbine will be located either within the base of the tower, in the nacelle, or adjacent to the tower as a small pad-mount transformer, depending on the specific wind turbine model selected. The transformer will be either a dry-type transformer, or would be suitably banded.

Lightning Protection

Each wind turbine will have a lightning protection system installed. This system includes lightning rods through each wind turbine blade, an earth mat built into the foundations of the wind turbine, and lightning protection around the various electronic components within the wind turbine.

Obstacle Lighting

Civil Aviation Safety Authority (CASA) guidelines for aviation warning lighting for a group of wind turbines are currently being reviewed and Advisory Circular 1390-18(0) has been withdrawn by CASA. The issue of safety risks to aviation operations will be considered. If it is considered by CASA or an independent consultant that the project is likely to be a hazard to aircraft, sufficient turbines would be fitted with red obstacle beacons to indicate the extent of a group of wind turbines.

Wind Turbine Controls and Operation

Each wind turbine will have its own individual control system, and will be fully automated. Start-up and shutdown (including safety shutdowns) are fully automated, with manual interruption available via onsite control systems and remote computer.

Generally, wind turbines will commence operation at wind speeds around 3 – 5 metres per second (11 – 18 kilometres per hour) and gradually increase in production to their maximum capacity, usually at wind speeds around 12 – 15 metres per second (44 – 54 kilometres per hour). Once at this maximum capacity, the wind turbine would control its output by altering the pitch of the wind turbine blades. Under high wind conditions in excess of 25 metres per second (90 kilometres per hour) the wind turbine would automatically shut down to prevent damage. It would continue measuring the wind speeds during this state via an anemometer mounted on the nacelle, and would restart once wind speeds drop to a suitable level.

Various operating constraints can be programmed into the control system to prevent operation under certain conditions. For example, if operational issues are identified such as excess noise or shadow flicker under certain conditions, these conditions can be pre-programmed into the control system and individual wind turbines automatically controlled or shut down whenever these conditions are present.

Selection of 'Representative' Versus 'Worst Case Impact' Wind Turbines

The majority of issues identified with respect to this proposed development are not impacted by specific turbine selection. For example, the assessment of biodiversity and archaeology constraints is based on a development envelope. That is, the entire geographic area where infrastructure may be located. This approach allows ecological and archaeological constraints to be defined within the development envelope and as a consequence allows for design responsiveness including minor relocation of infrastructure within the development envelope, without further assessment. However, the final turbine selection could have a material impact on some issues, and in these cases the decision as to whether to present a representative or worst case turbine must be considered.

Layout Design

The REpower MM92 is a mid range turbine, suitable for this site. If a larger physical turbine is selected, fewer turbines are likely to be installed, a consequence of the requirement for larger separation distances between turbines. In this scenario, some associated impacts may be reduced (such as visual impacts). Conversely, a layout using the smallest turbine option would represent the worst-case scenario in terms of the number of turbines able to be developed but may overstate other impacts. Use of the REpower MM92 is therefore considered a likely and representative turbine for the purposes of assessment.

Energy production and Green House Gas Calculations

A turbine with a name plate rating of 2.0MW sits in the middle of the range of turbines under consideration and is a likely turbine size to be ultimately selected. It is therefore considered representative of the energy production and greenhouse abatement benefits from the proposal.

Impact Area Calculations, Visual and Noise Propagation Modelling

The approach taken is to present the worst case impact assessment for specialist studies where physical dimensions and technical characteristics of turbines are related to the extent of the potential impact. Examples of this are visual impacts and noise propagation. However, the most likely turbine models to be ultimately selected for the project are not the largest and sit in the middle of the turbine size range (physical size and generation capacity).

Therefore in this context, the Environmental Assessment also considers and presents the indicative or likely impacts. Turbines providing the likely worst case impacts have been used for preparation of Photomontages, Zone of Visual Influence, and Shadow Flicker analysis for the Visual Impact analysis.

Connecting to the Electricity Grid

To export power from the wind farm, it is necessary to electrically connect the wind turbines to the electricity grid. This is achieved through a combination of underground and overhead power lines connecting to a site substation, which then connects into the electricity grid via a switchyard.

The onsite electrical works would include:

- electrical cabling at either 22kV or 33kV;
- a substation including a transformer(s) to step the voltage up from reticulation voltage to transmission voltage of 132kV, suitable for connection to the TransGrid 132kV transmission line; and
- an operations and maintenance facility.

Onsite Electrical Reticulation

From each wind turbine, the voltage is stepped up from generation voltage to either 22kV or 33kV for reticulation from each group of turbines to the substation.

In general, overhead cabling offers benefits as it minimises ground disturbance and is lower cost. However, there are practical limitations to installing overhead cabling on ridges where turbines are located. Typically underground cabling is used to connect turbines along the ridgelines and overhead cabling is used to transport power between adjacent ridges and from groups of turbines to the substation.

Cable trenches would, where practical, be dug within or adjacent to the onsite access tracks to minimise any related ground disturbance. Short spur connections would come off a main cable run which would approximately follow the main road access route at each group of turbines. Underground cables would require a trench of approximately 0.75 to 1 metre deep and be 0.3 – 1 metre wide.

Site Substation and Transmission Connection

The proposed location and an alternate location for the site substation have been identified. The final location and route for the transmission line to the TransGrid transmission line will only be finalised following detailed design and optimisation of the site electrical reticulation. The substation will also include all necessary ancillary equipment such as control room and amenities, communication equipment, control cubicles, voltage and current transformers, and circuit breakers for control and protection of the substation.

The substation area would be surrounded by a security fence as a safety precaution to prevent trespassers and stock ingress. The ground would be covered partly by crushed rock and partly by concrete pads for equipment, walkways and cable covers, and would have an earth grid extending outside of the boundary of the security fence. Typically a 132kV substation would take up an area of up to 100m x 100m surrounded by a security fence.

Interaction with TransGrid

Epuron has submitted a Grid Connection Enquiry and will seek a Grid Connection Agreement with TransGrid in accordance with the National Electricity Code. This Grid Connection Agreement would include all technical requirements for safe connection of the wind farm to the electricity grid. AEMO will review the technical aspects of the proposed connection including compliance with the generator performance standards.

Switchyard and Connection to TransGrid Transmission Line

The main switchyard used to connect the wind farm into the TransGrid network would be located at the northern extreme of the site, adjacent to the Glen Innes to Inverell transmission line. Additional substations may also be required around the site. Final locations will be selected to minimise environmental disturbance, reduce cabling lengths and therefore reduce costs and environmental impacts, visual impacts and ground disturbance of the project.

Each substation would include up to two large power transformers. The transformers are likely to be of the oil-cooled variety, and therefore may contain considerable quantities of oil. Provision will be made in the design of each substation for containment of any oil which may leak or spill. Other equipment in the substation includes circuit breakers and a 132kV busbar.

Access to and around the site

Main Access

The primary access to the project site will be via the Gwydir Highway. This is a major two lane highway between Glen Inness and Inverell and will comfortably handle the additional traffic generated during the construction of the wind farm. The turn off to and from the wind farm will be signposted and designed to allow vehicles to exit and enter the highway safely.

An alternate access to the site from the south would be via the Maybole Road and Kellys Road. Maybole Road is sealed to near the intersection with Kellys Road. Kellys Road is a gravel road.

Access Tracks

On site access tracks required for construction and operation will be unsealed formations with a minimum width of 5m. Tracks are required to the base of each wind turbine location and to the location of the site substation and operation and maintenance facility. New gates and possibly new or realigned fences may also be required to protect stock during the construction phase.

Once the construction phase has finished, the crane hardstands and access tracks will be maintained to allow maintenance and repairs to the wind turbines.

In locating access tracks on site, every effort would be made to:

- minimise the number and length of necessary access tracks;
- locate access tracks along the route of existing farm tracks;
- locate access tracks to minimise clearing of native vegetation;
- locate access tracks to minimise impact on sensitive biodiversity or heritage areas; and
- construct access tracks with due regard to erosion, sediment control and drainage.

Additional Permanent Facilities

Operations and maintenance facilities

An operation and maintenance facility will be built. The facility will include car parking, offices and amenities for the maintenance staff, a control room and storage facilities for spares and equipment needed for the maintenance of the wind turbines.

Control Cabling

In addition to the electrical cabling, control and communications cabling is required from the maintenance facility to each wind turbine, and to the substation. This communication cabling will be optical fibre cable and be installed using the same method and route as the power cabling described above. That is, strung from the same poles as overhead lines, or buried in the same cable trench as the electrical cables.

Wind Monitoring Equipment

Epuron is currently maintaining a wind monitoring mast on the site to assess wind speeds at proposed turbine locations. Following construction, permanent wind monitoring masts will be required to assist the control and

operation of the wind farm. These will be static guyed masts with remotely operated wind monitoring equipment installed at multiple heights on each mast.

Pending final wind turbine placements, it may be necessary to maintain, move or replace the existing wind monitoring masts, or install additional wind monitoring masts to assist with control and operation of the proposed development.

These masts will be located within the development envelope assessed in the various studies reported in this document. Approvals for the construction of these masts are not required. Epuron will inform CASA and the Department of Defence of the location of any monitoring masts constructed.

Temporary Facilities

During the construction phase a construction compound will be established on the site. The compound will include car parking, site offices, amenities for the construction work force and a laydown area for the temporary storage of construction materials, plant, equipment and wind turbine components. A temporary power supply will be required to be connected to the construction compound.

2.2 Alternatives to taking the proposed action

Initial feasibility assessments continue to be undertaken by Epuron for a number of potential wind turbine sites across Australia. The results of these assessments have indicated that the White Rock site is a preferred site for the development of a wind farm in NSW.

There is a recognised need for the provision of energy from renewable resources supported by both the Commonwealth and State governments.

2.3 Alternative locations, time frames or activities that form part of the referred action

There are no alternative locations, time frames or activities that form part of the referred action.

2.4 Context, planning framework and state/local government requirements

Local Planning Legislation

The proposed site straddles two local government areas as shown in Figure 1-1. The eastern part of the site is located in the Glen Innes Severn Shire and the western portion in the Inverell Shire.

Glen Innes Severn Local Environmental Plan

The eastern side of the site is in the Glen Innes Severn Council which is currently preparing a new Local Environmental Plan (LEP). The former Glen Innes Municipal Council and former Severn Shire Council LEPs are still current. These are the Glen Innes Local Environmental Plan 1991, and the Severn Local Environmental Plan 2002, respectively.

Inverell Shire Local Environmental Plan

The western portion of the site is within the Inverell Shire LGA and the operative LEP is the Inverell Local Environmental Plan 1988 (Amendment 12) which was Gazetted on 9 January 2009.

State Planning Legislation - Environmental Planning and Assessment Act (1979)

This proposal will be a major project assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (the EP&A Act). The EP&A Act integrates the planning and assessment regime that requires approval from the Minister for Planning and incorporates approvals and authorisations required under other NSW legislation.

Federal Planning Legislation – Environmental Protection and Biodiversity Conservation Act (1999)

The Environment Protection and Biodiversity Conservation Act (1999) (EPBC Act) provides for a Commonwealth assessment and approval of proposals that have a significant impact on 'matters of national environmental significance'. Part 13 of the EPBC Act identifies a list of threatened species, threatened communities and key threatening processes.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

Epuron has prepared an Environmental Assessment for the proposal in accordance with the requirements of the EP&A Act including the Director General's Requirements. This EA included detailed expert assessment of key environmental issues, and was prepared in parallel with detailed community consultation.

The Environmental Assessment contains the detailed and comprehensive assessment of the proposal. The Environmental Assessment will then be placed on public exhibition and assessed by the Department of Planning before consideration by the Minister for Planning. The Department of Planning will invite submissions from community and public stakeholders during the public exhibition period and will consider the issues raised in any submissions in determining the application.

Environmental issues most often associated with wind farms will be covered by the relevant specialist assessments including:

- Visual amenity
- Biodiversity including flora and fauna
- Electromagnetic interference (Telecommunications)
- Soil and landforms
- Climate and air quality
- Noise amenity
- Indigenous and European heritage
- Traffic and transport
- Water and groundwater
- Safety issues (including aviation and bushfire safety)
- Health issues (including infrasound and electromagnetic fields)

An Ecological Assessment Report has been prepared by RPS (2010) and is attached to this referral.

2.6 Public consultation (including with Indigenous stakeholders)

Indigenous Stakeholder Consultation

The purpose of Aboriginal community consultation is to provide an opportunity for the relevant Aboriginal stakeholders to have input into the heritage management process. DECCW encourages consultation with Aboriginal people for matters relating to Aboriginal heritage. If an Aboriginal Heritage Impact Permit (AHIP) is required, then specific DECCW guidelines are triggered in respect to Aboriginal consultation. In some circumstances DECCW consultation guidelines are also used as a framework for Aboriginal consultation, even if not specifically triggered by the preparation of an AHIP application.

This project is applying for approvals under Part 3A of the Environmental Planning and Assessment Act (EP&A) 1979. Whilst Aboriginal Heritage Impact Permits (AHIPS) under the NSW National Parks and Wildlife Act (1979) do not apply under Part 3A of the EP&A 1979 (Section 75U (1) d); Aboriginal consultation is still required. The Department of Planning Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005 and DECCW Fact Sheet 5: Landuse Planning Consultation Requirements for proponents indicate that the Aboriginal Cultural Heritage Consultation Requirements (ACHCRs) for Proponents

(DECCW 2010) should be followed for undertaking Aboriginal consultation in relation to the assessment and management of Aboriginal heritage.

The ACHCRs 2010, include a four stage Aboriginal consultation process and stipulates specific timeframes for each stage. Stage 1 requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. Stage 1 includes the identification of Aboriginal people who may have an interest in the project area and hold information relevant to determining the cultural significance of Aboriginal objects or places. This identification process should draw on reasonable sources of information including: the relevant DECCW EPRG regional office, the relevant Local Aboriginal Land Council(s), the registrar, Aboriginal Land Rights Act 1983, the Native Title Tribunal, Native Title Services Corporation Limited, the relevant local council(s), and the relevant catchment management authority. The identification process should also include an advertisement placed in a local newspaper circulating in the general location of the project area. Aboriginal organisations and/or individuals identified should be notified of the project and invited to register an expression of interest (EoI) for Aboriginal consultation. Once a list of Aboriginal stakeholders has been compiled from the EoIs, they need to be consulted in accordance with ACH Consultation Requirements Stages 2, 3 and 4.

Letters were sent to DECCW EPRG, Glen Innes Local Aboriginal Land Council, the Registrar of Aboriginal Owners, Native Title Services Corporation Limited, Glen Innes Severn Local Council and the Border Rivers - Gwydir Catchment Management Authority on the 31st of August, 2010. The registrar of Aboriginal owners indicated there were no registered owners for this area. As a result of the invitation for expression of interest letters and the advertisement published in the Glen Innes Examiner a number of Aboriginal Community Stakeholders registered their interest in the project.

Information regarding the proposed heritage assessment methodology and strategy for collecting information on cultural heritage significance was provided in writing to the Aboriginal stakeholders.

Consultation is ongoing with these stakeholders.

General Community Consultation

A community information session was held in November 2010 to inform the community of the proposal and discuss any questions they may have had. Public exhibition of the project will also occur via the NSW Part 3A planning processes.

2.7 A staged development or component of a larger project

The project is not a staged development or component of a larger project.

3. Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

The EPBC Act Protected Matters Report completed on 19th October 2010 identified no World Heritage Properties within a 10km search radius of the site.

Nature and extent of likely impact

As the proposed development is not located within or near any World Heritage Property there will be no direct impact on any World Heritage Properties.

3.1 (b) National Heritage Places

Description

The site is not located within 10km of any National Heritage Places.

Nature and extent of likely impact

As the proposed development is not located within or near National Heritage Places there will be no direct impact on any National Heritage Places.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The site does not contain any wetland areas of international significance. However, it is located within the same catchment as the Gwydir Wetlands Ramsar Site.

Nature and extent of likely impact

The site is located approximately 240km upstream of the Gwydir Wetlands Ramsar Site, and will not have a direct impact on this wetland of international significance.

3.1 (d) Listed threatened species and ecological communities

Description

The site does not contain any EPBC listed threatened ecological communities. While no threatened flora or fauna species listed under the EPBC Act 1999 have been recorded on the site, the EPBC Act Protected Matters report for the search area indicates that there are nine threatened flora and seventeen threatened fauna species that may occur in, or may relate to, the project area. The species identified, their status under the EPBC, and potential presence within the study area, have been outlined in the **Table 1** below.

With respect to the fauna species there are eleven (11) species classified as vulnerable and six (6) species classified as endangered. There are seven (7) flora species classed as vulnerable and two (2) endangered flora species.

Table 1 Status and Potential Occurrence of Listed Threatened Species and Ecological Communities

Species / Community	Common Name	Status ¹	Chance of Occurrence in Study Area ²	Likely Level of Impact
BIRDS				
<i>Anthochaera phrygia</i>	Regent Honeyeater	E	<p>Low</p> <p>Two records of this highly nomadic seasonal species occur within 30km of the study area. The species may occur on a rare basis during periods of heavy eucalypt flowering within remnant woodland areas.</p>	<p>Low</p> <p>It is unknown if this species commonly flies within the height range of the turbine blades for this proposal and as such turbine strike may occur however, if such strikes occur it is highly likely that only a very small number of birds would be affected. Due to the low chance of occurrence and the high likelihood that turbine strikes would be rare if they occur, this species is unlikely to be significantly impacted by the proposal. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on this species.</p>
<i>Lathamus discolor</i>	Swift Parrot	E	<p>Low</p> <p>This species has not been recorded on the Atlas of NSW Wildlife Database within a 30km radius of the study area. This species may occur on a rare basis during periods of significantly eucalypt flowering.</p>	<p>Low</p> <p>Due to the low chance of occurrence this species is unlikely to be significantly impacted by the proposal.</p>
<i>Poephila cincta cincta</i>	Black-throated Finch (southern)	E	<p>Low</p> <p>A single record of this species occurs within a 30km radius of the study area. No suitable habitat occurs within the individual proposed turbine locations however some areas of suitable habitat may occur within areas of proposed powerlines and access tracks.</p>	<p>Low</p> <p>As there is no suitable habitat within the proposed turbine locations, this species is unlikely to encounter turbines and furthermore is unlikely to fly within the turbine blade height. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on this species.</p>
<i>Rostratula australis</i>	Australian Painted Snipe	V	<p>Low</p> <p>Farm dams within the study area, and farm dams and other wetlands within the local area provide potential habitat for this species. This species has not been recorded on the Atlas of NSW Wildlife Database within a 30km radius of the study area. This species may occur in the study area on a rare basis during rare movements within the local area.</p>	<p>Low</p> <p>Due to the low chance of occurrence within the study area, this species is unlikely to be significantly impacted by the proposal.</p>
FROGS				
<i>Litoria booroolongensis</i>	Booroolong Frog	E	<p>Low</p> <p>No suitable habitat occurs within the study area for this species.</p>	<p>Low</p> <p>The proposal is unlikely to significantly impact this species.</p>

Species / Community	Common Name	Status ¹	Chance of Occurrence in Study Area ²	Likely Level of Impact
<i>Litoria castanea</i>	Yellow-spotted Tree Frog, Yellow-spotted Bell Frog	E	Low Potential habitat for this species may occur within farm dams within the study area, but these habitats are not within the immediate vicinity of turbine sites.	Low As this species is unlikely to occur, the proposal is unlikely to represent any threat to this species.
MAMMALS				
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	Low – Moderate Whilst suitable roosting and foraging habitat exists within the study area, no records exist from the Glen Innes 1:100,000 map sheets (Atlas of NSW Wildlife data) and the species was not recorded during investigations.	Low Due to the lack of records within the locality it is unlikely that this species occurs and as such is unlikely to be affected by the proposal.
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spotted-tail Quoll	E	Low This species requires extensive old-growth habitat, which does not occur within the study area. Therefore it is unlikely that this species occurs within the study area.	Low Due to the lack of records and suitable habitat within the locality it is unlikely that this species will be affected by the proposal.
<i>Nyctophilus timoriensis</i> (South-eastern form)	Greater Long-eared Bat	V	Moderate Records known for the wider locality. Hollow-bearing trees that may be used as roost study areas and potential foraging habitat occur throughout the study area.	Low - Moderate This species is considered to be a potential turbine strike victim. It is unknown if this species commonly flies within the height range of the turbine blades for this proposal and as such turbine strike may occur. However, if such strikes occur it is highly likely that only a very small number of bats would be affected. Due to the high likelihood that turbine strikes would be rare (if they occur), this species is unlikely to be significantly impacted by the proposal. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on this species.
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	Low Tableland populations of this species occur in the gorge country to the east, but the extensive rocky habitats required by this species do not occur within the study area.	Low Due to the lack of records and suitable habitat within the locality it is unlikely that this species will be affected by the proposal.
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (SE mainland)	V	Low Largely a coastal species in NSW, no records for this species occur within the wider locality of the study area and woodland habitat within the study area does not contain dense understorey vegetation frequented by this species.	Low Due to the lack of records and suitable habitat within the locality it is unlikely that this species will be affected by the proposal.

Species / Community	Common Name	Status ¹	Chance of Occurrence in Study Area ²	Likely Level of Impact
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	V	Low SEWPAC indicates that this species is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. These habitats are not present on the site.	Low Due to the lack of records and suitable habitat within the locality it is unlikely that this species will be affected by the proposal.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	Low – Moderate Unlikely to frequent the study area continuously throughout the year, but may occur during periods of heavy eucalypt flowering.	Low – Moderate This species is considered to be a potential turbine strike victim. This species commonly flies within the height range of the turbine blades for this proposal and as such turbine strike may occur however, if such strikes occur it is highly likely that only a very small number of bats would be affected. Due to the low chance of occurrence within the height of the turbine blades and the high likelihood that turbine strikes would be rare (if they occur), this species is unlikely to be significantly impacted by the proposal. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on this species
RAY-FINNED FISHES				
<i>Maccullochella peelii peelii</i>	Murray Cod, Cod, Goodoo	V	Low Tableland records of this species occur in more permanent creeks outside of the project area to the east and north. No suitable habitat occurs in areas to be affected by the proposal	Low Due to the lack of records and suitable habitat within the project area it is unlikely that this species will be affected by the proposal.
REPTILES				
<i>Delma torquata</i>	Collared Delma	V	Low Potential habitat for this species may occur within more continuous open woodland occurring down-slope of proposed turbine sites within the study area.	Low The proposal is unlikely to significantly impact this species.
<i>Eelseya belli</i>	Bell's Turtle	V	Low SEWPAC indicates this species is known only from the headwaters of the Namoi and Gwydir Rivers, west of Armidale NSW, between 700 and 800 m asl. Turtles prefer narrow stretches of river, 30 to 40 m wide, with pools up to 3 m deep. The riverbed is sandy and rocky, with small beds of weed. While some aquatic habitats are present they are less substantial than the requirements for this species, and the lowest part of the site is higher than the known altitudinal occurrence for this species.	Low Due to the lack of records and suitable habitat within the project area it is unlikely that this species will be affected by the proposal.

Species / Community	Common Name	Status ¹	Chance of Occurrence in Study Area ²	Likely Level of Impact
<i>Underwoodisaurus sphyrurus</i>	Border Thick-tailed Gecko	V	Potential habitat for this species may occur within more continuous open woodland occurring down-slope of proposed turbine sites within the study area.	
PLANTS				
<i>Callistemon pungens</i>	-	V	Low – Moderate This species was not detected during the current survey and potential habitat for this species does occur within the creek beds that criss cross the study area.	Low The proposal is unlikely to represent any threat to this species.
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	Low No potential habitat for this species was found to occur within the study area.	Low The proposal is unlikely to represent any threat to this species.
<i>Dichanthium setosum</i>	-	V	Moderate Not recorded within the current survey, although potential habitat does exist within the less improved pasture and woodland areas of the study area. Local records do exist nearby and one record is within 1km from turbine 9.	Low – Moderate Whilst some habitat is present within the study the removal of a small amount of native vegetation for the proposal is unlikely to represent any threat to this species.
<i>Diuris pedunculata</i>	Small Snake Orchid	E	Low The current survey was undertaken during this species flowering period and no plants were recorded within the study area. Due to the modified nature of the study area and grazing over the entire study area, this species is unlikely to occur.	Low It is unlikely that this species will occur within the areas of the study area where the majority of the turbines and infrastructure will be placed.
<i>Eucalyptus mckieana</i>	McKie's Stringybark	V	Low – Moderate This species was not detected during the current survey and potential habitat for this species may occur within the lower stretches study area.	Low Whilst some habitat is present within the study the removal of a small amount of native vegetation for the proposal is unlikely to represent any threat to this species.
<i>Eucalyptus nicholii</i>	Narrow-leaved Peppermint	V	Low – Moderate This species is more common further west of the study area near Tingha with populations reserved within Single NP. No individuals of this species were detected during the current survey.	Low Whilst some habitat is present within the study the removal of a small amount of native vegetation for the proposal is unlikely to represent any threat to this species.
<i>Eucalyptus rubida subsp. barbigerorum</i>	-	V	Low No potential habitat for this species was found to occur within the study area.	Low The proposal is unlikely to represent any threat to this species.
<i>Lepidium peregrinum</i>	Wandering Pepper-cress	E	Low No potential habitat for this species was found to occur within the study area.	Low The proposal is unlikely to represent any threat to this species.

Species / Community	Common Name	Status ¹	Chance of Occurrence in Study Area ²	Likely Level of Impact
<i>Thesium australe</i>	Austral Toadflax	V	Moderate This species has been recorded widely within the local area. Targeted surveys for this species within the study area failed to detect any further populations, however this species may be present.	Low – Moderate Whilst some habitat is present within the study the removal of a small amount of native vegetation for the proposal is unlikely to represent any threat to this species.
ECOLOGICAL COMMUNITIES				
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	-	CE	Low The species composition and geomorphological characteristics of this EEC do not occur within the study area.	Low This EEC does not occur within the study area therefore the proposal is unlikely to represent any threat to this EEC.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	V	Low This vegetation community was not recorded. While the NSW stated version of this community was recorded the whole of this vegetation is currently being grazed by livestock with the shrub layer being completely absent and the ground layer improved. While this still qualifies as an EEC under the TSC Act it does not under the EPBC Act, which requires a native understorey to be present in order to be considered as the listed community.	Low Efforts have been made to avoid impacts to this EEC and therefore the proposal is unlikely to represent any threat to the EEC.
¹ Conservation status as listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. CE: Critically Endangered; E: Endangered; V: Vulnerable. ² The assessment of likelihood of occurrence (Low, Moderate or High) is based on the known distribution and ecological requirements of each species, considered in the context of the site and the habitat values of the surrounding landscape. Low: No recent records or suitable habitat present on the site; Moderate: Recent records and/or suitable/preferred habitat present and/or species that they commonly associated with are present on the site, however, the species was not recorded during the field investigations; High: Known to occur on the site through direct observation within or immediately adjacent to the site.				

Nature and extent of likely impact

An Ecological Assessment has been undertaken by RPS (2010), considering a range of environmental matters relevant to the WRWF project (**Attachment 1**).

Figure 3-1 shows the ecological constraints on the site (Note there are no MNES matters on this figure). For more detailed mapping refer to the Ecological Assessment in Attachment 1.

In order to minimise the potential impacts upon sensitive environments and species, an initial layout put forward by Epuron was assessed in relation to outcomes of the ecological field survey. The initial layout resulted in a number of turbines and / or roads and cables being located within remnant native vegetation areas. From site surveys and aerial photo interpretation it was apparent that modifications could be made to the design to ensure that impacts to native species and habitat could be avoided and / or minimised. These important environments were considered in the reshaping process to provide the most sensitive environmental outcome possible, while still ensuring that the project was economically viable and socially responsible.

Whilst careful siting of the turbines and associated infrastructure in cleared areas and along existing access tracks has minimised the removal of native vegetation there will be some removal of native vegetation as a result of the proposal. Within the 1,293 ha study area there is approximately 310.3 ha of native vegetation. Of this, the Ribbon Gum vegetation type occupies approximately 306.9 ha and the Yellow Box vegetation type occupies 3.4 ha. The remaining 982.7 ha is occupied by cleared pasture with scattered trees.

The proposal will modify the vegetation in two different ways. Direct and complete clearing will need to occur for the access roads, turbine footprints, cabling and other related infrastructure. This is estimated to result in the removal of 4.9 ha of the Ribbon Gum vegetation type.

For transmission lines it is unlikely that complete clearing will be necessary, although significant modification will still be required. The easement for the 132 kV power line connecting the wind farm to the TransGrid line will be 40m wide and for the 33 kV overhead lines on the wind farm between the ridges will be up to 25m wide. Vegetation clearance is not required for the full easement width and will depend on the final line design. Vegetation clearance required from the conductors will vary from 2m at the poles to between 4m and 6m at mid-span. The design of the power lines can also be varied to reduce the impact on any specific areas of vegetation. Considering a worst-case scenario of complete clearing and / or vegetation modification, it is estimated that 0.5 ha of the Yellow Box vegetation type and 17.6 ha of the Ribbon Gum vegetation type may be affected.

In total, this equates to a potential maximum impact of 23 ha of native vegetation. This equates to approximately 7% of the native vegetation within the study area and 2% of the overall study area. The relative impact in relation to the amount of native vegetation within the site perimeter and surrounding locality is predicted to be minimal as these communities and native vegetation in general are likely to be significantly more extensive based on aerial photo interpretation.

This represents the least possible impact to native habitats in the study area and native vegetation in general as a consequence of the proposal, which has already been substantially refined and altered. All wind turbines have been located away from remnant stands of native vegetation as far as practicable and every effort will be made to divert tracks and cabling infrastructure away from existing native vegetation stands and paddock trees.

The following EPBC Act listed species and communities were identified as potentially occurring within the study area:

- *Bothriochloa biloba* Lobed Bluegrass
- *Digitaria porrecta* Finger Panic Grass
- *Thesium australe* Austral Toadflax
- *Pteropus poliocephalus* Grey-headed Flying-fox
- White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands EEC

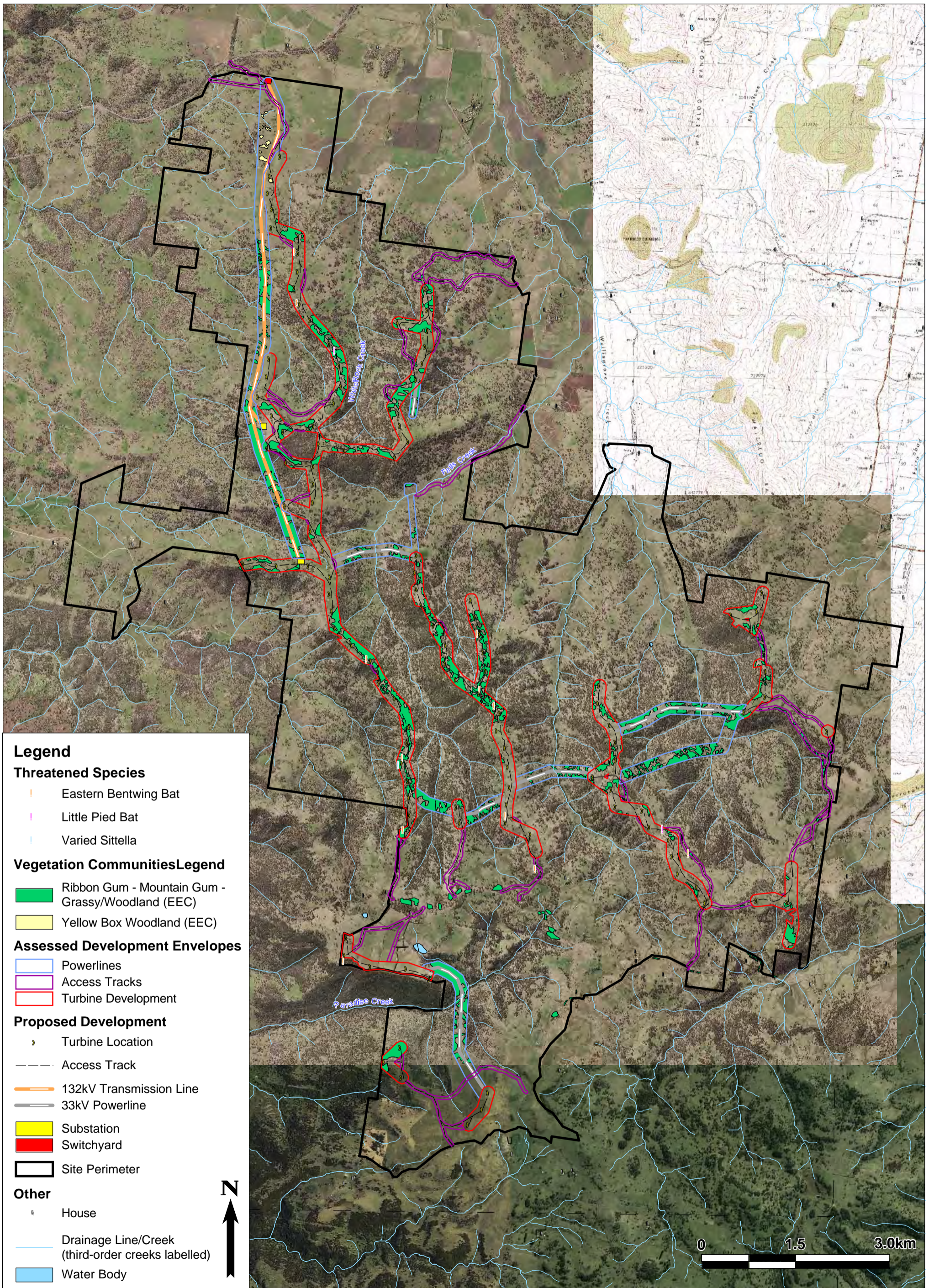


FIGURE 3-1 ECOLOGICAL CONSTRAINTS MAP

Bothriochloa biloba was not detected within the study during the current survey, however there is suboptimal habitat present within the wooded areas of the study area. The construction of the proposal is unlikely to have a significant impact upon the species as the study area has already been significantly impacted upon by a long history of agricultural practices which has reduced the likelihood of occurrence of this species. Additionally, the proposal will impact on a relatively small area of any potential habitat. Therefore, it is considered that the development proposal will not have a significant impact upon the population.

Targeted surveys for *Thesium australe* within the study area failed to detect this species, however several records exist within the local area and the Ribbon Gum – Mountain Gum – Snow Gum Tall Open Forest vegetation communities within the study area provide potential habitat for this species. The majority of this community is degraded by grazing with incursions of pasture weeds and a simplified structure. However there are some adjacent areas of intact moderately good condition vegetation on the steeper slopes which would provide ideal habitat for this species. These more suitable areas are located away from any turbine locations or associated infrastructure and will not be impacted upon by the proposal. Therefore, it is considered that the development proposal will not have a significant impact upon the population.

Digitaria porrecta was not detected within the study during the current survey, however there is some habitat present within the less improved areas of the study area. Notwithstanding, the construction of the proposal is unlikely to have a significant impact upon the species as the study area has already been significantly impacted upon by a long history of agricultural practices which has reduced the likelihood of occurrence of this species. Additionally, the proposal will impact on a relatively small area of any potential habitat. Therefore, it is considered that the development proposal will not have a significant impact upon the population.

The Grey-headed Flying-fox was not observed during surveys within the study area, but may occur on an intermittent basis during periods of heavy eucalypt flowering. This species is considered to be a potential turbine strike victim. This species commonly flies within the height range of the turbine blades for this proposal and as such turbine strike may occur. However, if such strikes occur it is highly likely that only a very small number of bats would be affected. Due to the high likelihood that turbine strikes would be rare (if they occur), this species is unlikely to be significantly impacted by the proposal. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on this species.

White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands does not occur within the study area. Although the NSW equivalent of this community is considered to occur in the form of the Yellow Box Woodland community, the EPBC definition requires a native understorey to be present in order to be considered as the listed community. No native understorey exists and therefore this community does not occur. In any case this community will not be impacted upon.

None of the EPBC-listed species or communities have been recorded or considered highly likely to occur in habitats to be affected by the proposal. A significant impact – and therefore a controlled action – is considered unlikely to occur as a result of the proposal.

3.1 (e) Listed migratory species

Description

The EPBC Act Protected Matters report indicates that there are eleven migratory species that may occur in, or may relate to, the project area. This includes six (6) terrestrial migratory species, two (2) wetland birds and three (3) migratory marine species. These species are listed below.

- *Haliaeetus leucogaster* White-bellied Sea-Eagle
- *Hirundapus caudacutus* White-throated Needletail
- *Merops ornatus* Rainbow Bee-eater
- *Monarcha melanopsis* Black-faced Monarch
- *Myiagra cyanoleuca* Satin Flycatcher
- *Xanthomyza phrygia* Regent Honeyeater
- *Ardea alba* Great Egret
- *Ardea ibis* Cattle Egret
- *Gallinago hardwickii* Latham's Snipe
- *Rostratula benghalensis* Painted Snipe
- *Apus pacificus* Fork-tailed Swift

Of the 13 migratory species, the following six species potentially fly within the turbine blade height;

- *Haliaeetus leucogaster* White-bellied Sea Eagle
- *Hirundapus caudacutus* White-throated Needletail
- *Merops ornatus* Rainbow Bee-eater
- *Ardea alba* Great Egret
- *Ardea ibis* Cattle Egret
- *Apus pacificus* Fork-tailed Swift

Nature and extent of likely impact

Of these, the Rainbow Bee-eater was recorded. All of these species are considered as relatively common throughout Australia and are not considered to be threatened. Each of these species is potential turbine strike victims. Each species may fly within the height range of the turbine blades for this proposal and as such turbine strike may occur. However, if such strikes occur it is highly likely that only a very small number of birds would be affected (due to nature avoidance behaviour). Due to the high likelihood that turbine strikes would be rare (if they occur), these species are unlikely to be significantly impacted by the proposal. The removal of relatively small areas of woodland for this proposal (in relation to the amount remaining) is unlikely to significantly impact on any of the migratory species.

The proposal is unlikely to substantially modify, destroy or isolate an area of important habitat, result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat or seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species.

3.1 (f) Commonwealth marine area

Description

The site is not located within and does not involve any Commonwealth Marine Areas.

3.1 (g) Commonwealth land

Description

The site is not located on Commonwealth land. All lots are freehold and leasehold land.

3.1 (h) The Great Barrier Reef Marine Park

Description

The proposal will not impact the Great Barrier Reef Marine Park.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

The proposal does not involve any nuclear actions.

3.2 (a)	Is the proposed action a nuclear action?	✓	No
			Yes (provide details below)
3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	✓	No
			Yes (provide details below)
3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	✓	No
			Yes (provide details below)
3.2 (d)	Is the proposed action to be taken on Commonwealth land?	✓	No
			Yes (provide details below)
3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	✓	No
			Yes (provide details below)

3.3 Other important features of the environment

3.3 (a) Flora and fauna

A total of 87 flora species were identified during the survey period over the White Rock study area within the quadrats and random meander surveys. This included 55 native species and 32 exotic species.

A total of 70 vertebrate fauna species were recorded during formal and opportunistic surveys, comprising 51 bird species, 7 mammals, 1 reptile and 6 amphibians.

For more information refer to the Ecological Assessment Report by RPS (2010).

3.3 (b) Hydrology, including water flows

The study area lies on the Great Dividing Range (New England Range) with height ranges of 880 - 1420 metres AHD. Most of the site drains into the third order creeks Paradise, Falls, Oakey and Wellingrove, with Falls Creek being the most centrally located creekline. The majority of drainage flows to the north, with most of the site draining west into MacIntyre and Severn Rivers (eventually draining into the Darling River). Numerous small farm dams occur throughout.

3.3 (c) Outstanding natural features

No outstanding natural features exist within the site. However, the small patches of remnant forest, scattered paddock trees, caves, water courses and dams within the site provide some habitat for a range of local native species.

3.3 (d) Remnant native vegetation

Three vegetation communities have been delineated within the site, including two endangered ecological communities (EEC) listed under the TSC Act. These communities include:

- Ribbon Gum – Mountain Gum Woodland (NSW EEC – Ribbon Gum – Mountain Gum – Snow Gum Grassy Forest/Woodland of the New England Tableland Region);
- Yellow Box Woodland (NSW EEC White Box Yellow Box Blakely's Red Gum Woodland); and
- Cleared Pasture with Scattered Trees.

For more information refer to the Ecological Assessment Report by RPS (2010).

3.3 (e) Current state of the environment

The majority of the project area has been historically cleared for the purposes of cattle and sheep grazing.

Tertiary basalt geology dominates the study area, rock is mafic and extrusive in character and has been formed through basalt flows, basaltic vents, minor basaltic volcanoclastics; breccias are also present (Geology 1:250,000 Glen Innes). Soils in the area have high components of clay and thus once, wet drain slowly leading to boggy and inundated soils on lower slopes and valley floors, although water is also retained in areas on ridgelines and upper slopes in many cases.

Erosion occurs in some gullies and along creeklines.

Feral animals including foxes, goats, rabbits and European hares impact on habitat attributes of the site in a number of ways, including reduction in native fauna populations, simplification of understorey and pollution of waterbodies. In addition, several weed species have been identified within the site.

3.3 (f) Commonwealth Heritage Places or other places recognised as having heritage values

No Commonwealth Heritage Places have been identified within or adjacent to the site.

3.3 (g) Indigenous heritage values

A pedestrian survey of the study area was undertaken in October 2010 by RPS archaeologists and Aboriginal community representatives. Five Aboriginal sites were identified during the survey. Scarred tree sites have been identified in close proximity to the development footprint. In order to conserve these sites and protect from accidental impact buffer zones will be provided.

No non-Indigenous heritage items were identified during heritage register searches, nor during the survey. Management recommendations have been formulated with consideration of the significance of Aboriginal heritage, as well as potential impacts and have been prepared in accordance with the relevant legislation.

3.3 (h) Other important or unique values of the environment

No other particularly important or unique values of the environment are known, although in general the project sits upon the Great Dividing Range, a significant topographical and environmental feature in the Australia landscape.

3.3 (i) Tenure of the action area (eg freehold, leasehold)

All lots within the proposed development are freehold.

3.3 (j) Existing land/marine uses of area

The current primary land use across the site and surrounding landscape is sheep and cattle grazing.

4. Measures to avoid or reduce impacts

In order to minimise the potential impacts upon sensitive environments and species, an initial layout put forward by Epuron was assessed in relation to outcomes of the ecological field survey. The initial layout resulted in a number of turbines and / or roads and cables being located within remnant native vegetation areas. From site surveys and aerial photo interpretation it was apparent that modifications could be made to the design to ensure that impacts to native species and habitat could be avoided and / or minimised. These important environments were considered in the reshaping process to provide the most sensitive environmental outcome possible, while still ensuring that the project was economically viable and socially responsible.

The current layout that is presented in this Environmental Assessment has gone through an iterative process, with turbines locations being repositioned, deleted and in some cases added to areas previously thought unviable. The purpose of this process is to design a layout that efficiently harnesses the energy in the wind with minimal impacts to the existing environment (including ecology, land use productivity as well as visual and noise amenity for surrounding residents).

Figure 4-1 shows the layout initially proposed for the White Rock Wind Farm. It contained 121 turbines locations, a switchyard location, and two potential substation locations. This layout was developed using a wind resource map created from existing monitoring masts, along with basic topographic features (contours) and satellite imagery. Experience gained from previous projects was applied to areas such as noise and ecology in determining the exact locations, however, detailed studies would be required to confirm these locations were appropriate.

Figure 4-2 shows the current layout proposed in this EA overlaid onto the initial layout to highlight the amendments that have been made. Figure 4-3 and Figure 4-4 show in more detail the areas that have undergone the most significant changes.

Along with the relocation or deletion of turbines, the associated access tracks were modified. While the impact of an access track is far less than a turbine, every attempt was made to reroute access tracks away from native vegetation. In some cases, however, it was concluded that the impact caused in clearing a small area of vegetation on the top of the ridge would have a lower impact than relocating the track on the side of the slope where the overall impact of the cut and fill required to construct the track would have an impact over a much larger area.

Power lines were rerouted or deleted, where possible, to minimise the impact to wooded areas and particularly sensitive species, for example the Yellow Box Woodland to the north of the site.

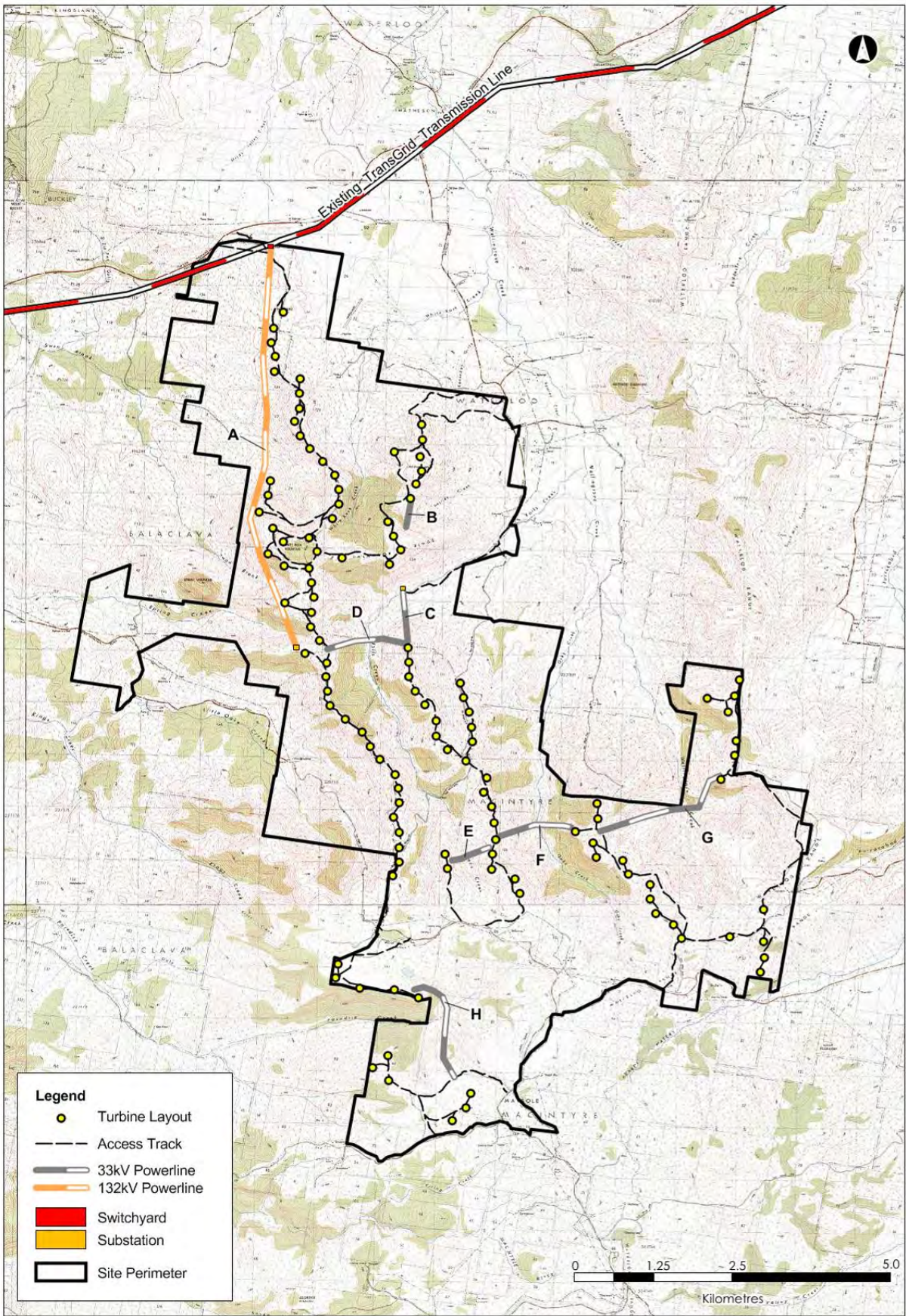


Figure 4-1 Initial layout

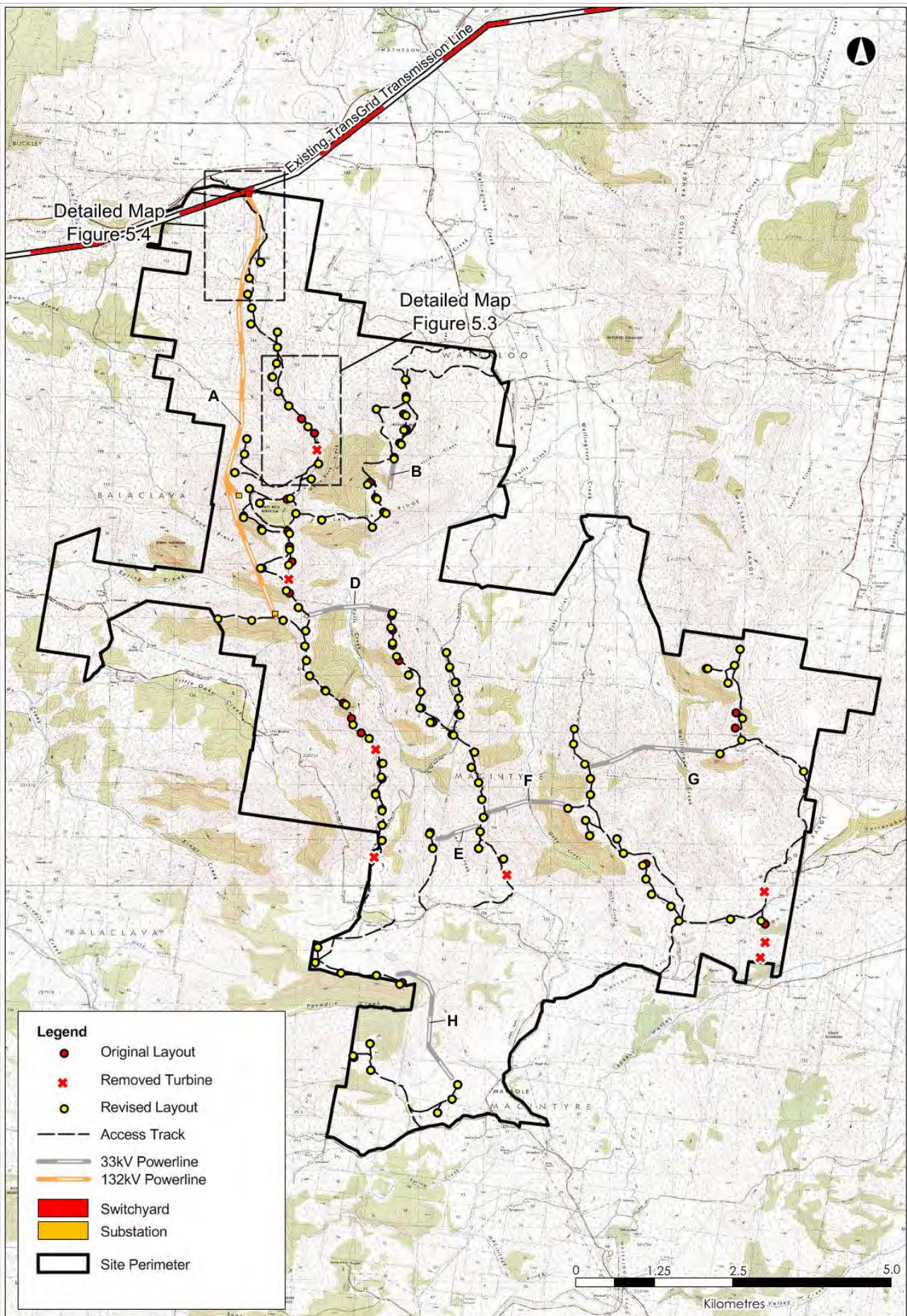


Figure 4-2 Current layout

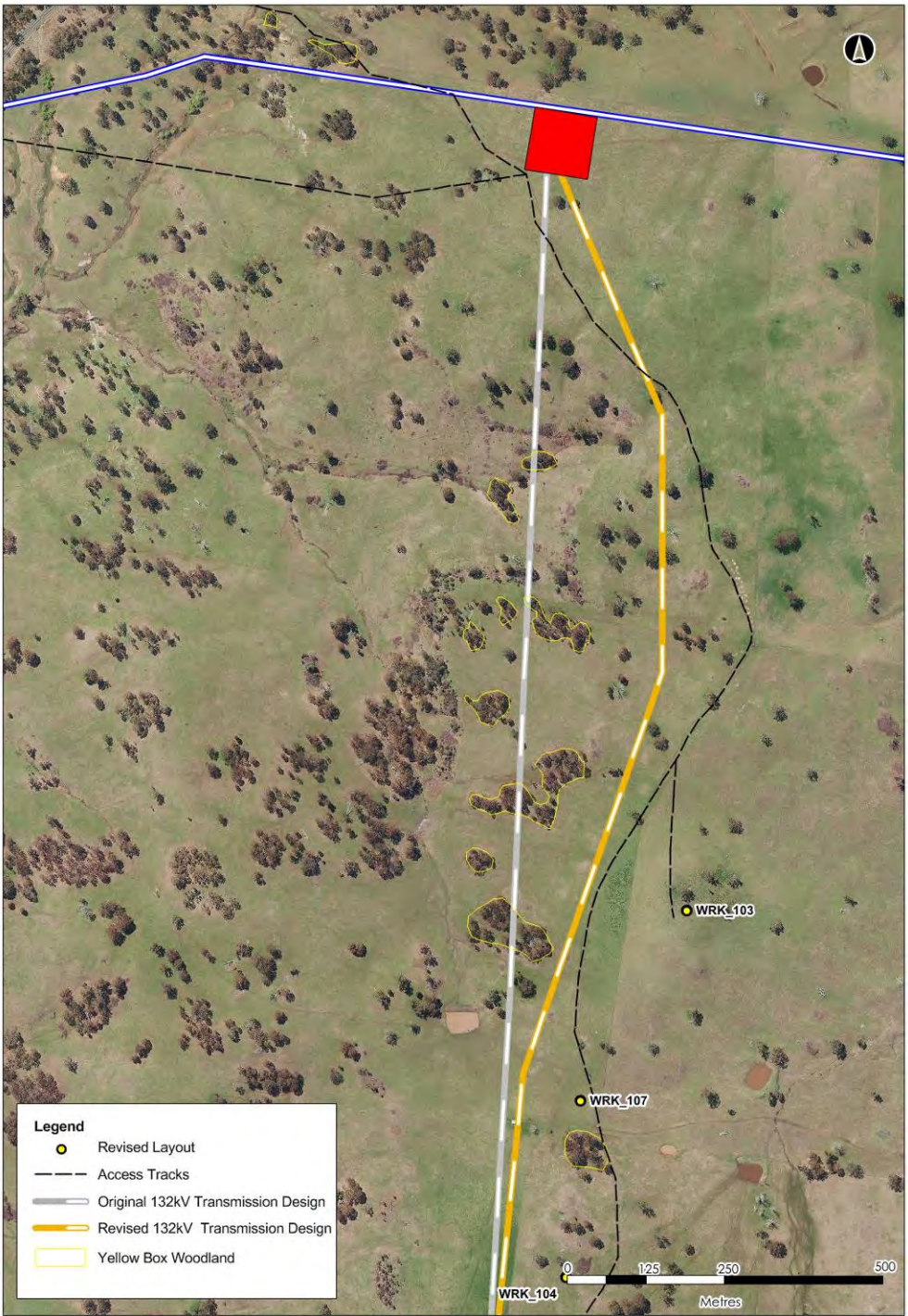


Figure 4-3 Example of revisions made to the power line route



Figure 4-4 Example of revisions made to the layout

5. Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

No, complete section 5.2

Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

It is unlikely that the proposed wind farm will result in a controlled action. Reasons for this are as follows:

- No World Heritage values are to be affected by the project;
- No National Heritage places are to be affected by the project;
- No Wetlands of international importance will be affected by the project. The closest RAMSAR site is the Gwydir Wetlands located over approximately 140km downstream of the project area;
- No Commonwealth-listed threatened species were recorded within the project area;
- No Commonwealth-listed Threatened Ecological Communities were recorded within the project area;
- One migratory species, the Rainbow Bee-eater was recorded. This is a common species throughout Australia and, if affected to any extent, it is expected that such effects would be negligible;
- No nuclear actions are relevant;
- No Commonwealth marine environments will be affected; and
- The Great Barrier Reef Marine Park will not be affected.

Impacts to the environment have been minimised through the design refinement process, reflecting the outcomes of the ecological and surveys undertaken by RPS in 2010.

5.3 Proposed action IS a controlled action

Matters likely to be impacted

World Heritage values (sections 12 and 15A)

National Heritage places (sections 15B and 15C)

Wetlands of international importance (sections 16 and 17B)

Listed threatened species and communities (sections 18 and 18A)

Listed migratory species (sections 20 and 20A)

Protection of the environment from nuclear actions (sections 21 and 22A)

Commonwealth marine environment (sections 23 and 24A)

Great Barrier Reef Marine Park (sections 24B and 24C)

Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)

Protection of the environment from Commonwealth actions (section 28)

Commonwealth Heritage places overseas (sections 27B and 27C)

6. Environmental record of the responsible party

		Yes	No
6.1	<p>Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>Provide details</p> <p>Epuron has a satisfactory record of responsible environmental management.</p>	✓	
6.2	<p>Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>If yes, provide details</p>		✓
6.3	<p>If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p> <p>If yes, provide details of environmental policy and planning framework</p> <p>Epuron operates under a corporate Environmental Policy and project specific Environmental Management Plans. The action will be undertaken in accordance with stringent environmental management plans and regular monitoring will occur to ensure that impacts are minimised or managed.</p>	✓	
6.4	<p>Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</p> <p>Provide name of proposal and EPBC reference number (if known)</p> <ul style="list-style-type: none"> • Silverton Wind Farm (EPBC 2009/4847) • Gullen Range Wind Farm (EPBC 2008/3947) • Conroys Gap Wind Farm (EPBC 2006/2733) • Cullerin Range Wind Farm (EPBC 2006/2687) <p>None of these projects have been considered controlled actions by DEWHA.</p>	✓	

7. Information sources and attachments

(For the information provided above)

7.1 References

Epuron (2010) *White Rock Wind Farm Preliminary Environmental Assessment*

RPS (2010) *Ecological Assessment Report, White Rock Wind Farm Near Glen Innes, NSW*. For Epuron Pty Ltd

RPS (2010) *Aboriginal Heritage Impact Assessment, White Rock Wind Farm Near Glen Innes, NSW*. For Epuron Pty Ltd

7.2 Reliability and date of information

The source of the information is from the material referenced above and from publicly available information from the SEWPAC website. The information was all prepared in late 2010 and has been reviewed internally following RPS's and Epuron Quality Assurance systems. No known uncertainties in the information exist.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1-1
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Attachment 1 - RPS (2010) <i>Ecological Assessment Report, White Rock Wind Farm Near Glen Innes, NSW</i> .
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Attachment 1 - RPS (2010) <i>Ecological Assessment Report, White Rock Wind Farm Near Glen Innes, NSW</i> .
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Attachment 1 - RPS (2010) <i>Ecological Assessment Report, White Rock Wind Farm Near Glen Innes, NSW</i> .
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

Project title: White Rock Wind Farm

8.1 Person proposing to take action

Name Andrew Wilson
Title Construction Manager
Organisation Epuron Pty Ltd
ACN / ABN (if applicable) ABN 70 104 503 380
Postal address Level 11, 75 Miller Street , North Sydney NSW 2060
Telephone 02 8456 7406
Email A.Wilson@epuron.com.au
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature  Date 4/2/11

8.2 Person preparing the referral information (if different from 8.1)

Name Toby Lambert
Title Senior Ecologist - Senior Project Manager
ACN / ABN (if applicable) ABN 44 140 292 762
Postal address PO Box 428, Hamilton NSW 2303
Telephone 02 4940 4200
Email toby.lambert@rpsgroup.com.au
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature  Date 4/2/11
