EPURON
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Proposed Development of the Gullen Range Wind Farm, Southern Tablelands New South Wales

Project Application

prepared by

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planning • assessment • ems • auditing

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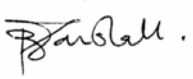
		Sign.		Sign.		Sign.	
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EXECUTIVE SUMMARY

This Project Application outlines the scope of the construction, operation and decommissioning/recommissioning phases of the Gullen Range wind farm proposal. It identifies and prioritises the associated potential environmental impacts. The Project Application has been prepared by **ngh**environmental on behalf of Epuron Pty Ltd.

The proposal would be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* which provides a consolidated assessment and approval regime for Major Projects. Following the submission of the Project Application and issuing of the Department of Planning Director-General's requirements, a detailed Environmental Assessment Report would be prepared. The Environmental Assessment Report would draw upon the input of local and state government agencies, as directed by the Department of Planning. A Planning Focus Meeting involving government representatives has been scheduled for 15th of August 2007 to identify the key issues of involved government agencies.

The Gullen Range proposal would be located on private grazing land, approximately 25 kilometres north-west of Goulburn, on the NSW Southern Tablelands. Four discrete development envelopes would be established, following the Gullen Range from north to south.

The development sites carry mixed native-exotic pasture with paddock trees and fragmented woodland remnants. More extensive areas of woodland are located adjacent to the two southern most sites.

The proposal would involve the construction and operation of a number of wind turbines on ridge crests and plateaus, each with three blades up to 47 metres long mounted on a tubular steel tower up to 85 metres high. The turbines are likely to have a rated output of between 1.75MW and 3MW each. Underground and overhead cabling would be used to connect the turbines. Based on the current grid connection concept, one substation would be installed, linking all turbines to the grid.

Moderate to high priority issues associated with the proposal and identified by this preliminary assessment include visual, noise, archaeological, biodiversity, traffic and roads and community impacts. These issues would be investigated by way of specialist reports, liaison and for the latter, a community consultation program.

Issues where impacts are expected to be readily manageable using a range of mitigation measures include land use and land value, aircraft and telecommunication (including defence), services and infrastructure, bushfire, construction noise, safety and impacts on local hydrology, soils, air and climate. These issues would be investigated primarily through desktop assessment and liaison with stakeholders and relevant agencies.

1 INTRODUCTION

1.1 Purpose of this document

This Project Application has been prepared on behalf of Epuron Pty Ltd. Epuron (formerly Taurus Energy), is the Australian subsidiary of a significant international group of companies which develop, finance, build and operate major projects in the field of renewable energy. Epuron has many years of experience in the development of solar photovoltaic, wind power, bioenergy and solar thermal energy projects.

Epuron proposes to develop a wind farm for the purpose of electricity generation on the Gullen Range, approximately 25 kilometres north-west of Goulburn, New South Wales. The wind farm would be located on private property within and adjacent to agricultural areas (Figure 2.1). The entire proposal falls within the Upper Lachlan Local Government Area (LGA) however, the proposal would be at the eastern edge of this LGA and therefore within close proximity to the Goulburn Mulwaree LGA.

This Project Application details the scope of the construction, operation and decommissioning / recommissioning phases of the proposal and undertakes a preliminary prioritisation of potential environmental impacts. Potential environmental impacts associated with the proposal have been categorised into **moderate to high** and **lesser** priority issues. Issues identified as moderate to high priority would be comprehensively investigated and assessed via specialist studies in the Environmental Assessment report, as directed by the Director General's Requirements. Lesser priority issues are anticipated to generate impacts which are readily manageable, requiring less intensive investigation.

It is anticipated that the turbines would be recommissioned as required until the decision is made to decommission the wind farm. As part of the decommissioning stage, all above ground infrastructure removed and the disturbed areas rehabilitated.

1.2 Statutory context

On the first of August, 2005, Part 3A of the *Environmental Planning and Assessment Act 1979* commenced. The new Part 3A consolidates the assessment and approval regime for all Major Projects that need the approval of the Minister for Planning, previously dealt with by Parts 4 and 5 of the Act. The new Part 3A applies to wind power developments with a capital cost of $30 million dollars or greater, defining these developments as Major Projects.

The proposed Gullen Range wind farm would have a capital cost of in excess of $30 million dollars and in the Minister's opinion, is considered to be a Major Project, under Part 3A of the Act (Minister's opinion dated 19/06/2007, included in Appendix A). Under the instruction of the Department of Planning, this document seeks to categorise the potential impacts of the proposal in terms of moderate – high and lesser priority issues. Epuron seeks the Director General's Requirements for the required Environmental Assessment Report of those issues assessed by the Minister to be of moderate to high priority. It is understood that upon validation of this document, the Department of Planning will issue the Director General Requirements within 28 days.

1.2.1 Planning Focus Meeting

Planning Focus Meetings can be required for complex assessments, involving the participation and input of several agencies. The Planning Focus Meeting for this proposal was held on August 15, 2007. Representatives were present from the Department of Planning, Upper Lachlan Shire Council, Goulburn Mulwaree Shire Council, Department of Environment and Climate Change (DECC), Hawkesbury Nepean Catchment Management Authority (CMA), NSW Rural Fire Service, Country Energy, Department of Primary Industries (Minerals) and the Department of Lands. The Roads and Traffic Authority, Department of Water and Energy, Lachlan CMA, CASA, Transgrid, Department of Primary Industries (Agriculture) and the Department of Defence were unable to attend but requested that they

be kept informed. Key issues identified by these agencies to date have been considered in the assignment of priority to potential impact areas related to this proposal (refer to Sections 5 and 6 and Appendix 2).

Epuron has also sought the involvement of the Upper Lachlan Shire Council and the nearby Goulburn Mulwaree Council outside of the PFM objectives, in order for them to better appreciate local issues associated with development. Members of these councils have been briefed as to the current stage of the proposal (Mr. Robert Mowle form ULSC and Mr. Chris Stewart at Goulburn-Mulwaree).

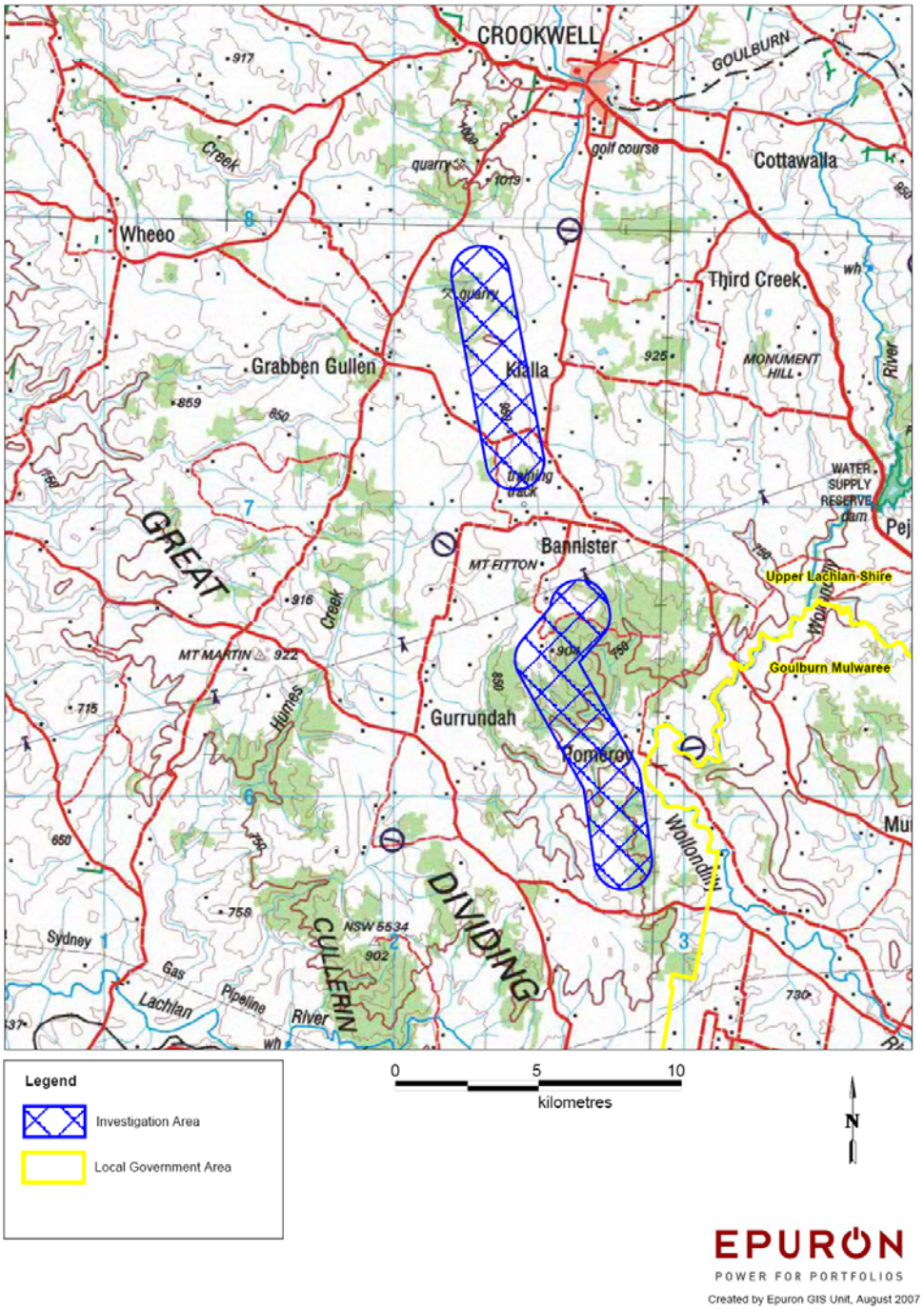

Figure 1.1 Location and indicative development envelope of the proposed Gullen Range wind farm

2 SITE CONTEXT

The proposed development would occupy approximately four kilometres of ridge line at each of the proposed locations: Kialla, Bannister, Pomeroy and Gurrundah. The locations are relatively close to one another and the maximum distance between the northern-most and southern-most turbines would be approximately 25km. The landforms and vegetation, land use and density of settlement and wind resource relating to the sites are described below.

2.1 Land use and density of settlement

All four sites where infrastructure would be installed are located on private property within and adjacent to agricultural areas used for sheep and cattle grazing. As well, residential dwellings and two commercial operations (chicken farms) are located nearby.

In general, the density of development is sparse, although there are clustered settlements at Kialla, Bannister and Mummel. The township of Grabben Gullen is located approximately 3km to the west of the site.

2.2 Landforms and vegetation

The four locations proposed for this development fall within the administrative jurisdiction of the Hawkesbury Nepean Catchment Management Authority (CMA), Upper Wollondilly River Subcatchment (a small area may also fall within the Lachlan CMA, dependant on the final infrastructure layout). The Upper Wollondilly River Subcatchment is the highest point in the catchment and is located adjacent to the westward flowing Lachlan River Subcatchment. Several weirs and reservoirs occur in the Subcatchment.

In general, the locations that would be developed carry a combination of pasture and woodland. The ridges likely to carry the turbines on the four locations carry some remnant native vegetation in the form of scattered trees and small to medium sized (1-3 hectares) patches of remnant or regrowth forest. Some of the relevant paddocks consist of predominantly native pasture. Other areas consist of largely or entirely exotic ("improved") pasture or weeds.

The surrounding slopes and gullies are unlikely to become turbine sites but could be affected if access routes for vehicles or powerlines were routed through them. In most cases the slopes and gullies carry substantially more native vegetation than the ridge tops and this vegetation is of greater conservation significance.

Pasture and five woodland vegetation types occupy the study area. Woodland types under the South Coast - Illawarra Vegetation Integration (SCIVI) project classification) include:

1. Tableland Low Woodland or Western Tablelands Dry Forest. A large fenced and ungrazed remnant of this community occurs on the Gurrundah site, on highly exposed upper slopes on Ordovician metasediments.
2. Tableland Hills Grassy Woodland. This type differs from the preceding vegetation type in the near absence of scribbly gum and of a few groundcover species indicative of poorer site quality such as *Patersonia sericea*.
3. Tableland Grassy Box-Gum Woodland. This community could be regarded as belonging to the community White Box, Yellow Box, Blakely's Red Gum Woodland, listed as an Endangered Ecological Community (EEC) under the *Threatened Species Conservation Act 1995* and under the *Environment Protection and Biodiversity Conservation Act 1999*. It occurs at Pomeroy and Gurrundah.
4. Tableland Basalt Forest. A taller moist forest type dominated by mountain gum (*E. dalrympleana*) and broad-leaf peppermint, widespread on Bannister and Kialla. A variant dominated by narrow-leaf peppermint (*E. radiata*) occurs in the north-west

corner and south of Range Road on Bannister. Another variant dominated by ribbon or manna gum (*E. viminalis*) occurs along creek banks on Pomeroy.

5. Cool Montane Wet Forest. Snow gum (*E. pauciflora*) and ribbon gum (*E. viminalis*) are the dominant trees of a few remnants scattered on basalt on Bannister and Pomeroy. The large river tussock *Poa labillardierei* is a typical understorey component of this community. The largest patch of this community occurs on a steep south-facing slope on the eastern side of the southern part of Bannister.

Apart from past agricultural usage two main factors govern vegetation types on the locations, geology and altitude. These features are described briefly below.

Kialla

Kialla features Ordovician metasiltstone derived soils. These soils are generally skeletal and relatively infertile. Landforms are flat to moderately undulating with mean elevation approximately 970m ASL. Most of the site has been cleared of woodland. Remnant patches remain along the site's southern boundary and offsite, to the east and south.

Bannister

Bannister features the relatively infertile Ordovician metasiltstone derived soils as well as basalt in higher areas. The latter soils contain more clay and are of higher fertility, depth and moisture-holding capacity. Landforms are flat to moderately undulating with mean elevation approximately 970m ASL. Most of the site has been cleared of woodland. Remnant patches remain at the northern end of the site and in the south, with the latter more open and younger.

Pomeroy

Pomeroy features the relatively infertile Ordovician metasiltstone derived soils as well as the more fertile basalt in higher areas. Landforms are flat to very steep with mean elevation approximately 860m ASL. Approximately half of the site has been cleared. Small woodland remnants remain in cleared paddocks. An extensive area of regrowth woodland which features several gully systems is present to the east. Approximately one fifth of this woodland occurs onsite.

Gurrundah

Gurrundah features the relatively infertile Ordovician metasiltstone derived soils. Landforms are undulating to very steep with mean elevation approximately 780m ASL. Approximately two thirds of the site has been cleared. Small woodland remnants remain in cleared paddocks. An extensive area of regrowth woodland is present on the south-eastern side of the site, which continues off-site to the south. A steep area of woodland is also present in the north-western corner of the site.

3 PROJECT JUSTIFICATION

3.1 Project viability

In Australia, wind farms are viable because of renewable energy policies of the Federal and respective State Governments requiring electricity retailers to source a certain percentage of electricity from renewable sources. The NSW State Government has recently introduced new legislation to parliament called the Renewable Energy (NSW) Bill as part of the Governments Greenhouse Policy to encourage additional generation of renewable energy. The NSW renewable target is also referred to as NRET. NRET requires NSW electricity retail companies (such as Country Energy) to purchase a percentage of their power from renewable energy sources. This proposed wind farm will provide renewable energy which is eligible for Renewable Energy Certificates under the NSW Government scheme. NRET is a market based mechanism designed to encourage investment in renewable technologies that will provide the lowest cost generation of renewable electricity in the National Electricity Market. Projects like this will encourage renewable investment in NSW and will reduce the costs of production by reducing transmission losses to the NSW load centres.

The Gullen Range wind farm is being developed by EPURON Pty Ltd. Commercial viability of an infrastructure project such as this is a complex product of the capital costs (and finance costs) of the project and the revenue it will generate over its operational life. While the energy from the wind is free, the energy produced must make sufficient return to cover the high up-front capital costs of building the wind farm. In the case of this project, the commercial viability is considered to be good, and is supported by the number of proposed turbines combined with good wind speeds.

CSIRO collected wind monitoring data have established that the Southern Tablelands have some of the fastest wind speeds in NSW. A wind mast has been in operation at each of the four sites for up to 5 years, establishing the viability of the sites.

3.2 Project benefits

The Gullen Range Wind Farm offers several benefits to the environment and local community:

- This project will directly inject funds into the local economy both during construction and during the operational phase);
- The project, in addition to others already proposed in the area, will provide further regional investment in the Southern Tablelands as the renewable energy sector and the businesses that supply and service it, grow;
- The wind farm will provide electricity into the NSW grid that will assist in meeting ongoing load growth in NSW;
- The project will reduce greenhouse gas emissions, helping to reduce the impact of climate change ;
- The project will supply renewable energy that will assist NSW electricity retailers fulfilling their obligations under the NSW Greenhouse Plan and the NSW renewable energy target;
- The proposal will include an annual funding allocation for community projects including environmental measures both on and offsite. Epuron will make an annual funding commitment (amount to be determined) which will be set aside into a community fund to be managed for community benefits. The purpose of the fund is to provide additional monies for community needs, whether they be weed management, landcare works, provision of local services (e.g. libraries, swimming pools), road improvements, community parklands etc.

State and Federal governments have been shown to support wind farms for their ability to produce renewable energy while reducing greenhouse gas emissions. The Gullen Range Wind Farm proposal is fully self-funding, producing no drain on the public purse. The project maximises use of existing resources (wind, power line, road access) while being remote from high population centres, thereby minimising adverse social impacts.

This wind farm would have a minimal impact on capital investment in other forms of power generation. It would provide power into the NSW electricity system.

Development of wind power is compatible with the current land uses at the site, sheep and cattle grazing, and should have minimal adverse impact on this activity. Opportunities exist to improve the management of the sites. The development would provide an additional income stream which would allow land managers to run lesser stocking rates in dry times, improving the resilience of the grasslands and thereby, the grazing enterprises.

4 SCOPE OF PROPOSED WORKS

4.1 General description

This section describes the wind farm project in detail, and provides the scope of works involved during the construction, operation, and decommissioning phases.

The proposal would generate renewable electricity and would involve the construction, operation, and decommissioning of:

- Wind turbines, each with three blades up to 47m long mounted on a tubular steel tower up to 85m high;
- Each turbine would be between 1.75 and 3MW in generation capacity;
- Electrical connections between wind turbines using a combination of underground cable and overhead concrete pole power lines;
- A substation and transmission connection linking the wind turbines to the existing Transgrid 330kV transmission system that crosses the site;
- An onsite control room and equipment storage facilities at each of the four locations;
- A temporary concrete batching plant at a number of the four locations;
- Access roads around each site, and minor upgrades to access on local roads, as required for the installation and removal of the wind turbines.

The project description is based on the current and initial wind farm design concept. In particular, any site layouts are based on the current proposal which may change due to the outcomes of further investigation and unexpected issues arising in relation to ongoing biodiversity assessment; archaeological assessment; geology; wind regime; wind turbine availability; and transmission connection design issues.

At this early stage of investigations, optimal turbine and easement locations have not been selected. These will be selected prior to submission of the Environmental Assessment report, after a full investigation of site constraints.

4.2 Wind farm infrastructure

4.2.1 Wind turbines and wind monitoring equipment

4.2.1.1 Wind turbines

Each wind turbine would have a capacity of between 1.75MW and 3.0 MW, and provide sufficient power to supply between 500 and 1000 homes.

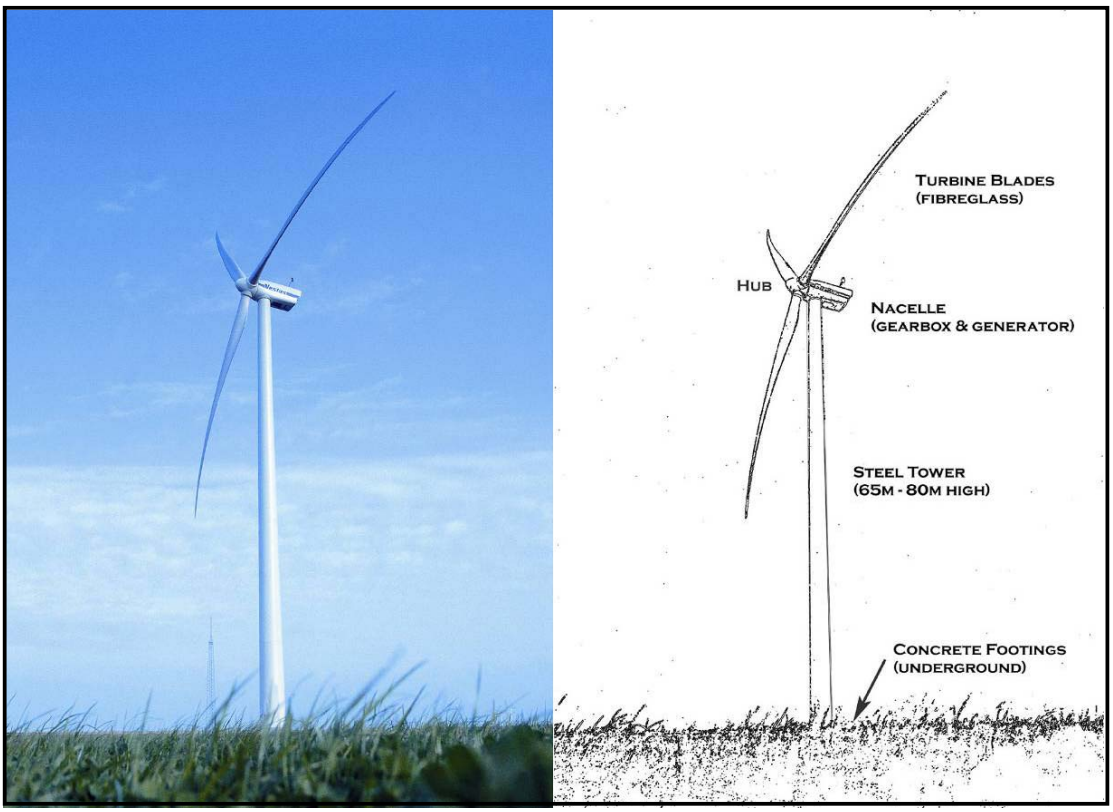

Figure 4.1 A typical wind turbine.

A typical 90m diameter wind turbine installed using an 80m tower. The towers proposed for this project may be slightly larger with towers of up to 85m and blade diameters of up to 94m.

Each wind turbine would be a three bladed type of the "up-wind" design, that is, facing up into the wind and in front of the tower. The wind turbine would have a diameter of 70 to 94 metres and a hub height of 60 to 85 metres, with the blade tip at its apex 100 to 132 metres above ground level. Blades would be made of fibreglass attached to a steel hub, and would include lightning rods for the entire length of the blade.

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 is also noise insulated to minimise noise emissions from mechanical components.

Tower

The tower is a tubular steel tower of up to 85 metres high, tapering from around 4 - 6 metres at the base to around 2 - 4 metres at the top. Exact dimensions will depend on the wind turbine design selected. The tower is constructed in up to four sections, each section bolted together via an internal flange. Within the tower are the power and control cables, and access ladder to the nacelle (with safety climb system).

Footings

The tower would be seated in a reinforced concrete footing. Two designs of footing 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.

Transformer

Each generator would produce power at up to 1,000V. This is then transformed at each wind turbine to either 22,000V or 33,000V for reticulation around site. The transformer for each wind turbine would be located either within the base of the tower, in the nacelle, or adjacent to the tower as a small pad-mount transformer. The transformer would be either a dry-type transformer, or would be suitably bunded.

Wind turbine model selection

Wind turbines can be fixed speed or variable speed machines, that is, the turbine blades would either rotate at a constant speed (when operating) or a variable speed depending on wind speeds. Variable speed machines have better performance over a wider range of wind speeds, provide higher quality power to the electricity grid, and also help to improve wind turbine noise performance at low wind speeds. However, they are more expensive to install.

It is likely that variable speed machines would be used in this wind farm, with a rotational speed in the range of 5 to 25 revolutions per minute (RPM) depending on wind conditions. This rotational speed is slower than the existing New South Wales wind farms at Blayney and Crookwell which operate at a fixed speed of 25-30 RPM.

Each wind turbine would 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.

At this stage, the specific wind turbine model and manufacturer has not been selected. Final wind turbine selection would be carried out based on commercial considerations within the consent conditions stipulated by the Department of Planning.

Wind turbine layout

The layout has not been finalised and will undergo ongoing refinement during the development process. A preferred layout will be provided as part of the Environment Assessment after further investigations and environmental assessment have been carried out as it will be necessary to adjust the final placement of wind turbines, taking into account geology, final wind profiles, construction issues, local heritage, and flora and fauna issues. All turbines are expected to be located within the turbine envelope shown.

4.2.1.2 Wind turbine operation

Each wind turbine would have its own individual control system, and would 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 would commence operation at around 3 – 5 metres per second (11 – 18 kilometres per hour) and gradually increase in production to their maximum capacity, usually at 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 again 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 shut down whenever these conditions are present. For example, the noise control systems can be

programmed such that if the wind is blowing from a certain direction at a certain wind speed, the wind turbines can be switched off. Likewise, wind turbines can be switched off at a certain time of day during a period of the year when the sun angles may cause shadow flicker on nearby properties.

It should be noted that noise and shadow flicker are not expected to be an issue, as these impacts can be minimised in the design process. However, the control system would allow adjustment of wind turbine operation modes for unforeseen outcomes.

4.2.1.3 Ongoing wind monitoring equipment

Epuron has been evaluating the wind resource at all four turbine envelope sites via established wind monitoring masts. It is proposed to continue this evaluation to allow ongoing performance monitoring of the site. Data from the masts are also used for the acoustic noise assessment.

Pending final wind turbine placements, it may be necessary to move the existing wind monitoring masts to a different location within the site, to replace the wind monitoring mast with a shorter or taller wind monitoring mast, or to install an additional wind monitoring mast to assist with control and operation of the site.

4.2.2 Electrical connections

The onsite electrical works would include:

- Onsite power reticulation cabling (underground and overhead) between wind turbines and the substation;
- Onsite control and communications cabling;
- Onsite control buildings (one per site) housing control and communications equipment;
- A substation to step the voltage up from reticulation voltage to transmission voltage of 330,000V.

4.2.2.1 Onsite electrical connections

Within each wind turbine, or in the adjacent pad-mount transformer, the power voltage is stepped up from generation voltage to and expected 33,000V (33kV) for reticulation around the site. The selection of the final voltage for the internal reticulation would be a technical and commercial consideration following finalisation of the layout and power line easements.

Power reticulation cabling

Each wind turbine must be connected together at reticulation voltage, and then connected to the substation, most likely to be located at the Pomeroy site. These connections are to be made via a combination of overhead lines and underground cabling:

- Underground cabling is proposed between wind turbines along each ridge, to minimise visual impacts of the proposal.

  Underground cables would require a trench of approximately 1 – 1.5 metres deep and 0.5 – 1 metre wide. Cable trenches would, where possible, be dug within the onsite roads to minimise any related ground disturbance.

- Overhead lines are proposed between the wind turbine groups and the substation. This will minimise extensive ground disturbance and cost.

  Overhead 33kV lines would require an easement of 20 metres. These would be located to minimise clearing of trees, and to reduce visibility from neighbouring houses. Powerlines would be mounted on single wood or concrete poles approximately 17 - 25 metres high, spaced approximately 150 – 300 metres apart (depending on terrain), and coloured to blend in with the surroundings.

The routes for power reticulation would be finalised taking into account the ease of excavation of cable trenches, and with an effort to minimise impacts on areas with sensitive biodiversity, archaeology and heritage; to minimise clearing of trees; and to minimise erosion issues resulting from construction.

Control cabling

In addition to the power reticulation cabling, control and communications cabling is required from the control building to each wind turbine, and to the substation. This control cabling would be installed using the same method and route as the power cabling above, that is, strung from the same poles as overhead lines, or dug in the same cable trench as underground cables.

Control cables would consist of twisted pair cables, multi-core cables or optical fibres, and would be used for central and remote control of individual wind turbines; substation controls; monitoring of weather data and equipment; and communications to offsite control centres where required.

4.2.2.2 Control building

A control building (approximately 5m x 15m in area) would be built onsite for each turbine group, to house instrumentation and control equipment and communications equipment. These four buildings would also house routine maintenance equipment and stores, a small work area, and amenities for staff.

A communications link to the control building would be required to allow remote monitoring and control of the wind farm. This connection could consist of multiple buried telephone lines, microwave or satellite connection.

The buildings would be of concrete slab on ground construction with steel frame, metal or brick walls, a non-reflective sheet steel roof, and would include rainwater storage tank for domestic use. An onsite septic system or composting toilet system would be installed to treat waste water produced.

The control building would be located and coloured to be in keeping with the surrounding environment, and with consideration to the length of lines and control cabling necessary.

4.2.2.3 Site substation and proposed 330kV connection

The substation is proposed to be located at the Pomeroy site, adjacent to the existing 330kV Yass to West Sydney high voltage transmission line. The substation is required to convert power from an expected onsite reticulation voltage of 33kV to a transmission voltage of 330kV suitable to connect into Transgrid's transmission network. It would also include all necessary ancillary equipment such as control cubicles, voltage and current transformers, communications equipment 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 approximately 1 metre outside of the boundary of the security fence.

The substation would include a power transformer in the order of 200MVA in size. This transformer is likely to be of the oil-cooled variety, and therefore may contain considerable quantities of oil. Provision would be made in the design of the substation for containment of any oil which may leak or spill.

4.2.3 Site access work

4.2.3.1 Access route

Access routes to the site are expected to use the existing Hume Highway to Goulburn and then, to access each site, the smaller roads and tracks including:

To Kialla: Via Crookwell and either Grabben Gullen Road or Kialla Road to site entrance on East and West sides of the site.

To Bannister: Via Crookwell, Grabben Gullen, Range Road, then by internal farm tracks, to the north and south of Range Road.

To Pomeroy: Via Crookwell then Kialla Rd to Bannister or via Grabben Gullen to Storriers Lane or Prices Lane, then by private access roads south to the site and by internal farm tracks onsite.

To Gurrundah: Addison Street, Gurrundah Road, or via Breadlabane then by private access roads north to the site and by internal farm tracks onsite.

A traffic and transport study will fully investigate the most suitable access route.

4.2.3.2 Access tracks

Onsite access tracks for construction and operation would be unsealed formations up to 5m in width, and are required to the base of each wind turbine location and the location of the substation and control building.

From this main access track, side tracks would be taken to each wind turbine location. At each wind turbine base, a firm hardstand area would be required to provide a level and stable base for cranes necessary for construction.

Once the construction has finished, any tracks not used for normal farming practice would be spread with recovered topsoil and allowed to grow over or planted with appropriate grasses.

4.2.4 Other site services

Telephone and other remote connections are proposed at the control building, both for remote operation of the wind farm, and for use of operating staff at the site.

Standard 240 Volt / 415 Volt power would also be installed at the control building and solar panels may be located on the roof.

Water for ongoing domestic use by maintenance and operation staff would be provided via a rainwater tank and rooftop collection system at the control building. This building would also have a composting toilet or septic system for staff use.

Operating staff would be responsible for removal of all other wastes at the site; no waste management services would be required.

4.3 Staging of works

The works establishment of the wind farm can be considered as occurring in three phases. These include construction, operation and decommissioning of the wind farm. A description of activities under these headings follows.

4.3.1 Phase 1: Construction of the wind farm

The construction phase of the wind farm would include such activities as:

- Transport of people, materials and equipment to site
- Civil works for access track construction, excavation for footings and trenching for cables
- Establishment and operation of concrete batching plant and/or rock crushing equipment onsite, if required
- Installation of wind turbines using large mobile cranes
- Construction of substation and onsite power reticulation lines and cables
- Temporary site offices

- Restoration and revegetation of site on completion

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.

Wind turbine construction can be relatively fast once the footings are prepared, with wind turbines installed at a rate of 2 – 3 per week. The towers are erected in sections, the nacelles lifted to the top of the towers, and finally blades lifted and bolted to the hub.

The necessary 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 and connected and put into service.

On completion of construction, the site would be revegetated and all waste materials removed from the site. Any temporary road realignments would be restored and revegetated.

4.3.1.1 Wind turbine construction and installation

Installation of the wind turbine blades would require establishment of a level (<1% gradient) and stable hardstand area at the base of each wind turbine. This hardstand area would support cranes used for the major component lifts, and could have an area of up to 30 metres by 30 metres. It is also necessary to have a delivery area for the various components adjacent to the hardstand area, in most cases it is expected that the access road could be used as this delivery area.

Installation of the wind turbine blades would also require cleared areas at the base of each wind turbine to manoeuvre the wind turbine blades which are 80-94m in diameter. Generally, the three blades are connected to the hub on-ground, and the whole wind turbine lifted as one piece. There is some scope to avoid damage to or removal of native vegetation during this stage by careful positioning of the blades to avoid trees and shrubs, this would be carried out wherever possible.

The wind turbines would be anchored using large concrete gravity footings or smaller concrete footings bolted to rock, as determined by geological parameters. Some blasting of rock may be required to excavate footings, dependent on the geological properties of the rock and design of the footing. Should controlled blasting be required, it would be carried out in accordance with all relevant statutory requirements.

4.3.1.2 Rock Crusher

Materials excavated during the construction of wind turbine footings may be able to be reused as road base for the road surface upgrades. For this purpose, it is possible that a mobile rock crusher would be used onsite.

4.3.1.3 Concrete batch plant

It is likely that pre-mix concrete will be brought to site from local batch plants. However, a portable concrete batch may be required to supply concrete to each of the four sites. This would require a level area of up to 100 metres by 100 metres on each site to locate the loading bays, hoppers, cement and admixture silos, concrete truck loading hardstand, water tank, and stockpiles for aggregate and sands. The site would include an in-ground water recycling / first flush pit to prevent dirty water escaping onto the site, and would be fully remediated after the construction phase.

Sands and aggregate would be sourced from excavation of footings, where possible, or from existing sand and gravel pits within the local area. Every effort would be made to source clean sands and aggregates to prevent transport of weeds to site.

In the event that an on-site batch plant is developed, water would most likely be trucked in from off site. It is possible that, depending on water levels, water from existing dams on the property could be used to supplement water cartage.

4.3.2 Phase 2: Wind farm operation

Once installed, the wind farm would operate for an economic life in the order of twenty to thirty years. The economic life would depend on various considerations including the increasing costs of maintenance; requirements for major repair work; and cost and efficiencies of possible wind turbine replacement.

During the operation phase, the wind turbines and other equipment would require regular maintenance and it is possible that some equipment may require major repair or replacement, at some stage.

In addition, a site monitoring program would be established to determine additional impacts of the wind farm. The monitoring program would measure noise emissions from the operational wind farm as well as biodiversity impacts, given the paucity of information available on the impact of wind farms on Australian birds and bats. As well as provide information able to be used to minimise the operational impacts of the Gullen Range Wind Farm on birds and bats, it would be a source of information for other wind farms in Australia.

4.3.2.1 Routine maintenance

The wind farm operates largely unattended but requires an operation and maintenance team to monitor the turbine controls and attend to routine maintenance activities. To maintain the wind farm operating in a safe and reliable manner, it would require regular inspection and operation on an as needs basis. This would generally be carried out using standard vehicles.

In addition, regular maintenance is required for each turbine, generally at 3, 6 and 12 monthly intervals. This does not require use of major equipment, and could be carried out in a normal utility or small truck and would not require any additional works or infrastructure.

4.3.2.2 Major repairs

It is possible that major unexpected equipment failures could take place during the life of the wind farm. While wind turbines and electricity connections are designed for a 20 - 30 year life, failures can occur due to a number of factors including lightning strike (either onsite on the wind turbines or offsite on the transmission line) and design or manufacturing flaws to key components (such as transformers or gearboxes).

Most repairs can be carried out in a similar manner to routine maintenance, with some exceptions:

- Replacement of wind turbine blades, if necessary, would require bringing new blades to site and installation of these blades using large cranes. The requirements are similar to the construction phase, and the access tracks established for construction may need to be brought into operation again, although helicopters may sometimes be used for one-off replacements.
- Replacement of wind turbine generators or gearboxes would require a crane and low loader truck to access the site.
- Replacement of the substation transformer would require a low loader truck to access the site.

4.3.2.3 Site monitoring program

Monitoring of the wildlife impacts of the wind turbines would occur at regular intervals during the initial phase of operation in accordance with the EMP. This could be carried out using a standard vehicle and would not require any additional works or infrastructure.

4.3.3 Phase 3: Wind farm decommissioning / recommissioning

The life of the wind turbines is 30 years. It is anticipated that the turbines would be recommissioned as required until the decision is made to decommission the wind farm.

Recommissioning would involve similar road access arrangements to construction, and would require access for large cranes and transport vehicles to dismantle and remove the existing turbines and to install replacement turbines. Again, the scrap value of turbines and other equipment is expected to be sufficient to cover the costs of their dismantling and site restoration. The existing substation and cabling could be reused, and it is possible that the existing footings could also be reused. This would allow a significant cost saving for a subsequent project, and it is therefore likely that recommissioning the wind farm could be commercially appropriate.

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 other equipment would be removed from site. No concrete batching plant or materials delivery would be required, therefore the decommissioning period would be significantly shortened and with significantly less truck movements than the construction phase.

The scrap value of turbines and other equipment is expected to be sufficient to cover the costs of their dismantling and site restoration.

4.4 Rehabilitation guidelines

The proposed works would involve excavation and construction activities, with high traffic volumes on unstable surfaces. This would increase the potential for spread of weeds and erosion and potentially an adverse impact on water quality.

All disturbed areas would be stabilised as soon as practicable, following the construction period. In particular, sloping sites and sites where vegetation has been disturbed would require immediate rehabilitation. Rehabilitation principles would be developed in a Rehabilitation Plan, to guide the rehabilitation of the sites following the construction phase.

5 MODERATE TO HIGH PRIORITY ISSUES

The following issues are considered potentially able to generate moderate to high level impacts and would therefore be given greater priority in terms of investigation and mitigation of impacts. These are impacts which may be, for example:

- Highly contentious within the community (impact on visual values and noise in the locality);
- Non reversible (impact on Aboriginal heritage features);
- Have potential to cause population level impacts to threatened species (particularly birds and bats).

These issues will require additional investigation/consultation and will be dealt with more fully in the **Environmental Assessment Report** in order to ensure that impacts are managed and kept to acceptable levels. Table 5.1 summarises the sources of impact and proposed strategies for investigation for each issue of moderate to high priority.

Table 5.1 Issues of moderate to high priority.

Issue	Sources of impact	Risk Priority	Investigation strategy
Visual	• Loss of visual amenity • Impact on scenic character • Cumulative visual impacts.	High	Further investigation via visual assessment and community consultation.
Noise	• Operational noise may impact residences nearby.	Moderate to high	Further investigation via acoustic assessment including modelling and mapping.
Archaeology	• Potential to impact Aboriginal heritage values and items.	Moderate	Further investigation via archaeological assessment including desktop literature review and onsite field work. Subsurface work would only be undertaken if required.
Biodiversity	• Clearing of vegetation during construction and maintenance. • Loss of modification of habitat. • Potential for spread of weeds through soil disturbance during the creation of access tracks, footings and underground cable routes. • Impact on threatened species or endangered ecological communities.	Moderate	Further investigation via biodiversity assessment including desktop literature review and onsite field work.
Traffic and roads	• Turbines may distract drivers (either by their movement or as other motorists pullover to view the development). • Increased traffic may be a safety risk in the local area. • Construction traffic may contribute to road pavement deterioration.	Moderate	Further investigation via traffic assessment and consultation with the Upper Lachlan Council and RTA.

Issue	Sources of impact	Risk Priority	Investigation strategy
Community	• Potentially divisive development.	Moderate to high	Further investigation via community consultation. Implementation of a community consultation plan.

5.1 Specialist reports

Further investigation is proposed to include specialist reports for a number of priority issues identified above. These include visual, acoustic, archaeology, biodiversity and road and traffic impacts. A summary of the proposed approach to each of these areas is provided below. A community consultation plan will be developed and implemented to identify and respond to community impacts.

5.1.1 Visual Assessment

A landscape and visual assessment report would be prepared to, consider the proposed wind turbines and associated infrastructure, including transmission lines, roads and substation. The impacts would be assessed through a qualitative and quantitative assessment based upon site investigations, photomontages and information gained from stakeholders. The assessment will also include cumulative visual impacts of existing and approved wind farms within a visual catchment of 15-17km.

The Visual Assessment will incorporate:

- Visit the site and photographically document the proposal from public and private viewpoints;
- Review of photomontages from key locations with respect to visual impact;
- Incorporate the community's and stakeholder's values of the visual amenity and visual quality of the local and regional area and their perception of the wind farms during the consultation phase;

The Landscape and Visual Impact Assessment will:

- Provide an outline of the defined viewshed based on the proposed turbine height;
- Discuss the landscape character of the viewshed;
- Discuss existing research on community research with wind farms;
- Discuss the visual impact associated with the ancillary infrastructure;
- Assessment of public viewpoints;
- Assessment of private viewpoints: and
- Assessment of cumulative impacts.

5.1.2 Archaeology

The Aboriginal Heritage project would be conducted in accordance with the requirements of the NSW DEC Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS draft 1997). In addition the study will be undertaken following the new requirements for Community Consultation – Interim Guidelines for Aboriginal Community Consultation-Requirements for Applicants. Accordingly, the study would include:

- Consultation requirements including Notification and Registration of Interests and Preparation of Assessment;

- Consultation with relevant Aboriginal organizations;
- A review of heritage listings and relevant literature;
- A synthesis of local and regional archaeology;
- A comprehensive field survey of the zones of proposed impact conducted in accordance with the NSW DEC Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS draft 1997);
- A significance assessment of cultural heritage sites located within the study area;
- An assessment of whether or not further archaeological investigations are required;
- Recommendations for the mitigation and management of cultural heritage based on the results of the investigation, significance assessment and a consideration of the impacts of the proposed activities; and
- Provision of a draft document to registered Aboriginal stakeholders.

5.1.3 Acoustic Assessment

The Acoustic Assessment would detail the noise criteria, background noise measurements and the predicted noise level at all potentially impacted receivers from the operation of the proposed wind farm.

Results would be assessed in accordance with the South Australian EPA Noise Guidelines for Wind Farms (February 2003), World Health Organisation limits and construction noise guidelines. Noise monitoring would determine baseline conditions and establish indicative criteria for surrounding residential receivers. A detailed computer noise model would be used to predict wind turbine noise levels.

In general the assessment procedure contains the following steps:

1. Predict and plot the LAeq 35 dBA noise level contour from the wind farm under reference conditions. Receivers outside the contour are considered to be within acceptable wind farm noise levels;
2. Establish the pre-existing background noise level at each of the relevant assessment receivers within the LAeq 35 dBA noise level contour through background noise monitoring;
3. Derive appropriate wind farm noise limit criteria in accordance with published guidance.
4. Predict wind farm noise levels at all relevant assessment receivers for the wind range from cut-in to approximately 10 m/s;
5. Assess the acceptability of wind farm noise at each relevant assessment receiver to the established limits.
6. Prepare a statement of noise impact for both the construction and operational phases of the project.

Where the assessment of a receiver is shown as unacceptable, a process of noise mitigation and alternative wind farm layouts would be considered. Steps 4 and 5 would be repeated until an acceptable arrangement is developed.

5.1.4 Biodiversity Assessment

The biodiversity assessment would target mammals, birds (woodland and wetland species), amphibians and reptiles by direct searches and habitat assessment and flora via the 'random meander' method and vegetation mapping. Field work would be completed over a period of eight days.

A specialist report would include:

- A literature review of regional and local biodiversity values;
- The results of field investigations;
- Consideration of collision and avoidance risks;
- Consideration to Commonwealth and State listed species, populations and communities;
- Mitigation to reduce the risks and identified impacts.

Mitigation measures are anticipated to include an outline of an adaptive management monitoring program to ensure collision impacts are quantified and responded to in order to ensure that population level impacts do not eventuate.

5.1.5 Community consultation

A community consultation plan incorporating face to face meetings, phone contact, newsletters, editorials, an Open House session and focussed presentations as required, would be carried out in parallel to the design and assessment of the proposal. The aim of the consultation process is to establish two-way channels of communications between the public, the proponents and the environmental assessment personnel whereby information can be distributed and feedback incorporated into the design and assessment of the proposal.

6 LOWER PRIORITY ISSUES

This section outlines issues considered to be of lesser priority. These are issues which pose environmental risks which are considered to be readily identifiable and manageable. It is anticipated that these issues identified as of lesser priority will be investigated by desktop based research rather than specialist reports. Liaison with relevant agencies and stakeholders would occur where appropriate.

Table 6.1 Issues of lesser priority

Issue	Sources of impact and potential risks	Risk Priority
Land use and land value	• Permissibility of the development on the site selected, under local government legislation and planning instruments. • Impact on onsite and adjacent land uses, including mineral leases.	Low to moderate
Aircraft and tele-communication impacts.	• Television, radio and telecommunications may be impacted. • Turbines may cause a collision hazard.	Low to moderate
Defence	• Television, radio and telecommunications may be impacted. • Turbines may cause a collision hazard.	Low
Services and Infrastructure	• Potential to affect transport routes and telecommunications (such as mobile, TV and radio). • Access to the site may be improved as a result of the development. Provision of new substation may allow future electricity network improvements for properties in the area.	Low to moderate (Positive)
Bushfire Risk	• Potential for wind turbines to start or influence the pattern of bushfire. • Potential to impact bushfire-fighter access.	• Low to moderate
Construction noise	• Operation of equipment. • Transportation of equipment and materials to and from the site.	Low to moderate
Safety	• Potential to generate electromagnetic fields. • Potential to cause injury.	Low to moderate
Climate and air impacts	• Dust and emissions generated during excavation, road works, transport of machinery. • Greenhouse gas emissions. The proposal would make a positive contribution to the reduction in greenhouse gas emissions by providing alternative electricity sourced from fossil fuels.	Low to moderate (Positive)
Soils and landforms	• Soil disturbance from vegetation clearing. • Erosion from excavation works. • Soil compaction from the transport of heavy equipment.	Low to moderate

Issue	Sources of impact and potential risks	Risk Priority
Hydrology (water quality and water-table impacts)	• Mobilisation of sediment and pollutants generated during excavation, road works, transport of machinery. • Risk of oil leaks during operation and maintenance.	Low to moderate
Economic impact	• Property prices may be impacted by the infrastructure. • Local employment would be created during construction - net economic gain to the local community.	Low to moderate (Positive)
Tourism	• Potential to affect the number and type of visitors to the area.	Low
Removal of infrastructure	• Ability to finance removal of infrastructure. • Potential to Environmental rehabilitation of site.	Low to moderate

7 CONCLUSION

This Project Application summarises the scope and receiving environment of the Gullen Range wind farm proposal, as of July 2007. This proposal would be assessed under Part 3A (Major Projects) of the *Environmental Planning and Assessment Act 1979*.

This document is intended to give a preliminary prioritisation of potential impacts, in order to guide the full investigation of issues in the Environmental Assessment. Epuron now seeks the Director General's Requirements, identifying the key issues and any required methods of inquiry in order to complete the Environmental Assessment for this proposal.

8 AUTHORS

Authors	Experience
Nicholas Graham-Higgs *Bachelor of Applied Science*	Nick has worked as an environmental planning consultant since 1992, specialising in environmental impact assessment and natural resource management. His work demands an in-depth knowledge of current planning and environmental legislation coupled with a comprehensive understanding of development-related impacts, especially those relating to the provision of recreational facilities. Nicholas has acquired his knowledge in this field over the last 18 years, during which he has worked with a number of land management organisations within and outside Australia. Much of the work undertaken has been within sensitive areas, including major works for infrastructure development; the augmentation of water supplies at Perisher Range and Adaminaby, environmental assessment for a wind farm on the Snowy Plains, near Kosciuszko National Park.
Brooke Marshall *Bachelor of Natural Resources (Hons)*	Brooke is a Senior Project Officer with **ngh**environmental and has prepared impact assessment reports for a range of proposals including wind farms, aquifers, road construction, water pipeline installation, residential development, river modification and prescribed burning activities. These reports have included threatened species assessments requiring research, fieldwork and GIS components. Some of this work has been completed in sensitive coastal and alpine environments. Brooke has also undertaken a study to monitor the utility of habitat for a fragmented population of Yellow-bellied Gliders, strategic biodiversity assessments for local councils (Bega Valley and Snowy River Shire), and a Species Impact Statement investigating 32 subject species. She has experience with cage and Elliot traps, hair tubes, spotlighting, scat and sign searches and bird / reptile / amphibian transects and anabat recording of microchiropteran bats.
Simon Davey *Master of Science* and Andrew Durran *Bachelor of Engineering (Elec), Masters of Business Administration (Technology Management)*	Research and report writing, Sections 3 and 4.

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APPENDIX 1

Ministers opinion, as to the planning status of the proposal

NSW GOVERNMENT
Department of Planning

Contact: Neville Osborne
Phone: (02) 9228 6337
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Email: neville.osborne@planning.nsw.gov.au

Our ref: S07/00846
Your ref

Ms Brooke Marshall
Project Officer
ngh environmental
P O Box 470
BEGA NSW 2550

Dear Ms Marshall

Gullen Range Wind Farm Proposal – Application of Part 3A of the Environmental Planning and Assessment (EP&A) Act

I refer to your letter dated 31st May 2007, written on behalf of Epuron Pty Ltd, which sought advice on the application of Part 3A of the EP&A Act to the Gullen Range Wind Farm proposal.

The Director-General of the Department of Planning, as delegate of the Minister for Planning, has formed an Opinion that the Gullen Range Wind Farm proposal (as described in your letter) will be subject to Part 3A. A copy of the Opinion is enclosed for your information.

Please contact me on 9228 6337 if you would like to discuss this matter.

Yours sincerely

Neville Osborne 19/6/07

Neville Osborne
Manager, Water and Energy
Major Infrastructure Assessments

Record of Minister's opinion for the purposes of Clause 6(1) of the State Environmental Planning Policy (Major Projects) 2005

I, the Director-General of the Department of Planning, as delegate of the Minister for Planning under delegation executed on 26th February , 2007, have formed the opinion that the development described in the Schedule below, is development of a kind that is described in Schedule 1, Group 8, clause 24 of State Environmental Planning Policy (Major Projects) 2005 namely development for the purpose of a wind electricity generation facility that has a capital investment value of more than $30 million. It is therefore declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies for the purpose of section 75B of that Act.

Schedule

Proposed Gullen Range Wind Farm

A proposal by Epuron Pty Ltd for the Gullen Range Wind Farm, a wind electricity generating facility located within the Upper Lachlan Council area, with an installed generating capacity of about 160 MW comprising up to 80 turbines, as generally described in the attached letter to the Department of Planning dated 31st May, 2007 from ngh environmental, on behalf of the Proponent.

S Haddad

Sam Haddad
Director-General
Department of Planning

Date: 13/ 6/ 2007

APPENDIX 2

Summary of Planning Focus Meeting Issues

The Planning Focus Meeting for this proposal was held on August 15, 2007. The attached summary is drawn from the draft minutes taken onsite. Finalised minutes will be forwarded to the Department of Planning as well as agencies that registered interest. These were intended to 'kick-off' agency consultation. They have also informed the assignment of priority to issues related to the potential wind farm environmental impacts.

Participants included:

- Neville Osborne and Ricardo Prieto-Curiel, Department of Planning
- Robert Mowle, John Bell, Cr. Brian McCormack, Cr. Gary Cosgrove and Cr. Bill Martin, Upper Lachlan Shire Council
- Dianne James, Goulburn-Mulwaree Shire Council
- Mathew Rizzuto and Craig Jones, Department of Environment and Climate Change
- Col Hackney, Country Energy
- Iain Paterson, Department of Primary Industries
- Ian Kennerley, Rural Fire Service Crookwell
- John Daunt, Department of Lands
- Rob Adam, Hawkesbury Nepean Catchment Management Authority
- Nick Graham-Higgs, Brooke Marshall and Rodger Ubrihien, nghenvironmental and Duo Designs
- Andrew Durran and Simon Davey, Epuron

Meeting format

Participants met in Goulburn on the 15th of August 2007 and proceeded to each of the four sites in turn; named for nearby localities, Gurrundah, Pomeroy, Bannister and Kialla. At each site, Simon Davey and Andrew Durran gave an overview of likely infrastructure placement. The number of turbines and their placement will not be decided until after the results of specialist studies are known. Nick Graham-Higgs described the Part 3A assessment process, under the *Environmental Planning and Assessment Act 1979,* and the purpose of the Planning Focus Meeting. Questions and key concerns were then voiced by agency representatives. Questions were answered by Simon Davey (SD) or Andrew Durran (AD), as indicated below. Minutes were taken by Brooke Marshall (BM). Key issues that arose are indicated below.

The following key issues were minuted on the day and by email prior to the 17th August, 2007, for agencies unable to attend the PFM.

Agency	**Key issues**
Upper Lachlan Shire Council	Proximity to houses and compliance with DCP (including the community benefit).
Goulburn-Mulwaree Shire Council	Traffic impacts, visual impact and community consultation (including outside the 5km radius from the site).
Department of Environment and Climate Change	Noise and aboriginal heritage.
Hawkesbury Nepean CMA	Even though the *Native Vegetation Act* is 'turned off' for Part 3A assessments, the CMA will be providing feedback based on the same methodology: ie requiring offsets for any impacts to native vegetation. Strategically, we will want to see that avoiding impacts was the first approach. HN CMA will also represent the Lachlan CMA and keep them in the loop until such time as they decide they want to represent themselves in this process.
Department of Lands	Use alternative access to undeveloped crown roads where this is possible. No issues with crown land (in this case only likely to involve trig points) as long as the Surveyor General's permission is sought. Perpetual leases, if relevant, may affect the ability of persons to enter into additional leases, so you need to check this.
Department of Primary Industries (Minerals)	The impact on the exploration of mineral deposits.
Department of Primary Industries (Agriculture and Fisheries)	Fisheries will be concerned about road construction near waterways. Refer to their guidelines.
Defence	Flight Safety, communications, defence radars (is the proposed wind farm site in proximity to a Defence radar?).
Department of Primary Industries (Agriculture)	Managing weeds, soil erosion and dust, existing farming operations, containment of any substances from any proposed substation is required to ensure that the contamination of pasture and dams does not occur, consult with landholders in the vicinity of the wind farm to assess community issues and concerns.
CASA	There is a requirement to notify CASA due to the height of structures. Concern for aviation activity. Recommends consulting CASA publications with regard to these issues.