

***MAJOR PROJECT ASSESSMENT:
Flyers Creek Wind Farm
Blayney Shire, Central West NSW
(MP 08_0252)***



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

November 2013

ABBREVIATIONS

CIV	Capital Investment Value
Department	Department of Planning & Infrastructure
DGRs	Director-General's Requirements
Director-General	Director-General of the Department of Planning & Infrastructure
EA	Environmental Assessment
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPI	Environmental Planning Instrument
MD SEPP	State Environmental Planning Policy (Major Development) 2005
Minister	Minister for Planning & Infrastructure
PAC	Planning Assessment Commission
Part 3A	Part 3A of the <i>Environmental Planning and Assessment Act 1979</i>
PEA	Preliminary Environmental Assessment
PFM	Planning Focus Meeting
PPR	Preferred Project Report
Proponent	Flyers Rock Wind Farm Pty Ltd
RtS	Response to Submissions

Cover Photograph: Photomontage of proposed wind farm (Flyers Creek Wind Farm Pty Ltd, May 2011)

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*NSW Government
Department of Planning & Infrastructure*

EXECUTIVE SUMMARY

Flyers Creek Wind Farm Pty Ltd (the Proponent) proposes to construct and operate a wind farm and associated electrical and civil infrastructure with a maximum generating capacity of up to 132 megawatts (up to 43 wind turbines) known as the Flyers Creek Wind Farm. The site is located 20 kilometres south of Orange in Central Western NSW and wholly within the Blayney Shire Local Government Area.

The Capital Investment Value (CIV) of the project is \$195,000,000 and the proposal will create 100 full-time equivalent (FTE) construction jobs and 5 FTE operational jobs.

Pursuant to clause 2 of Schedule 6A of the *Environmental Planning and Assessment Act 1979*, the project is a *transitional Part 3A* project as Director-General's environmental assessment requirements were issued prior to the repeal of Part 3A of the *Environmental Planning and Assessment Act 1979*. According to clause 3 of Schedule 6A, Part 3A of the Act (as in force immediately before its repeal) continues to apply to transitional Part 3A projects. Consequently, the project is subject to assessment under Part 3A, and requires the approval of the Minister for Planning and Infrastructure (or his delegate).

The project is also classified as critical infrastructure pursuant to section 75C of the *Environmental Planning and Assessment Act 1979*.

The Environmental Assessment (EA) for the project was placed on exhibition for a period of 60 days from 21 October 2011 until 19 December 2011. The Department received 10 submissions from public authorities and 120 submissions from the general public (including 1 special interest group and 1 objection from an associated landowner). 81 of the public submissions objected to the project.

Although none of the public authorities objected to the project, they did raise issues for the Department's consideration including noise, traffic impacts and biodiversity. Concerns raised by the public related to noise, health, visual amenity, traffic, impacts on property values, and construction-related impacts, with a number of the submissions questioning whether the project should be approved. Two additional objections were also received from associated landowners during the assessment of the Project.

Whilst the Department acknowledges the associated landowners may have entered into a commercial agreement with the Proponent, the concerns of these landowners have been considered in the assessment of the project. As the project is deemed to be critical infrastructure the project can be determined without landowners consent provided the critical infrastructure notification requirements detailed under clause 8 of the *Environmental Planning and Assessment Regulation 2000* have been complied with.

A Submissions Report was submitted by the Proponent in June 2013 and described amendments made to the project since the exhibition of the EA in response to issues raised in submissions. The amendments to the project comprised:

- Siting of the northern portion of the proposed transmission line easement further west of the Cadia mining lease, however still on land owned by Cadia mine; and
- Removing turbine number 17.

The Department considers the key assessment issues to be noise, visual impacts, biodiversity and health. The Department sought independent expert advice in relation to the noise impact assessment as well as the preparation of a photomontage from a single residence to assist with its assessment.

Noting the objections from the associated landowners, the Department has recommended a condition that prior to the commencement of the Project Approval, the Proponent shall

demonstrate to the satisfaction of the Director-General that an agreement has been obtained with these landowners in relation to the construction and operation of infrastructure associated with the project on their property. An agreement is also to be sought with all landowners for the construction and operation of the overhead transmission line external to the project area.

Based on its assessment, the Department has also recommended the removal of turbines 9 and 12 as a result of the unacceptable impact they would have on visual amenity from the property known as "Willow Park".

Subject to the agreements with the associated landowners, the removal of turbines 9 and 12, and the recommended conditions of approval, the Department is satisfied that the project can achieve acceptable amenity, health and environmental standards through the recommended conditions of approval and the Proponent's Statement of Commitments, and can proceed in a sustainable manner with overall benefits to the State.

The Department therefore recommends that the project be approved.

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1. BACKGROUND

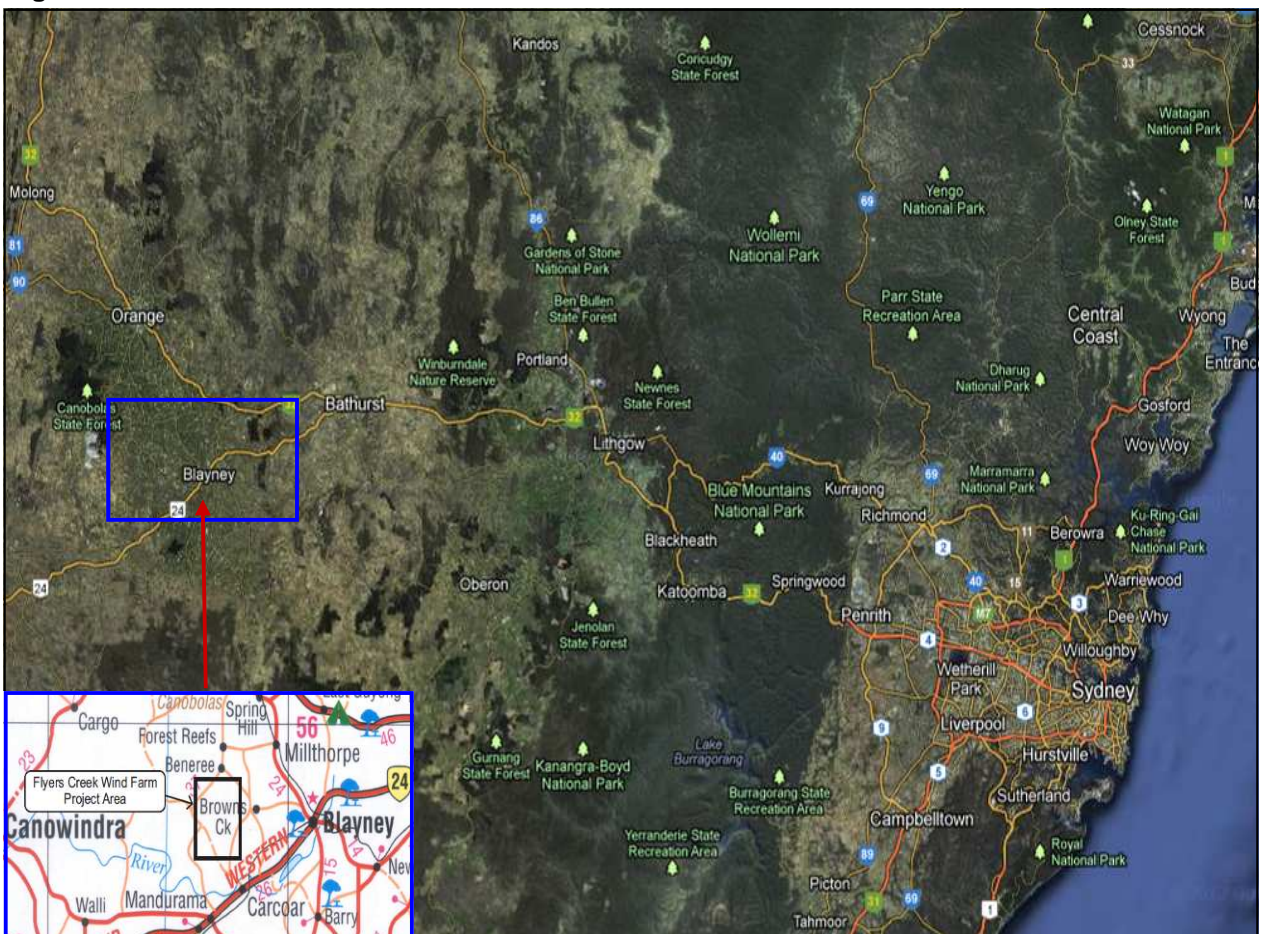
Flyers Creek Wind Farm Pty Ltd proposes to construct and operate a wind farm and associated electrical and civil infrastructure with a maximum generating capacity of up to 132 megawatts (up to 43 wind turbines). The Project is to be known as the Flyers Creek Wind Farm.

The Capital Investment Value (CIV) of the project is \$195,000,000 and the proposal will create 100 full-time equivalent (FTE) construction jobs and 5 FTE operational jobs.

1.1. LOCATION

The Site is located 20 kilometres (km) south of Orange and 15 km west of Blayney in Central Western NSW and wholly within the Blayney Shire Local Government Area. The project location is shown in **Figure 1**.

Figure 1: Site location



The wind farm is proposed to span an area of approximately 11km from north to south and 10km from east to west, encompassing around 61 km² (6,082 hectares). The topography is characterised by undulating and rolling low hills, as well as steep, densely vegetated ranges and cleared, flat grazing lands. The landscape of the site is predominantly rural in character, consisting of cleared pastoral lands used for sheep and cattle grazing on moderate sized properties. The existing agricultural uses of the site are proposed to continue.

1.2. SURROUNDING LAND USES

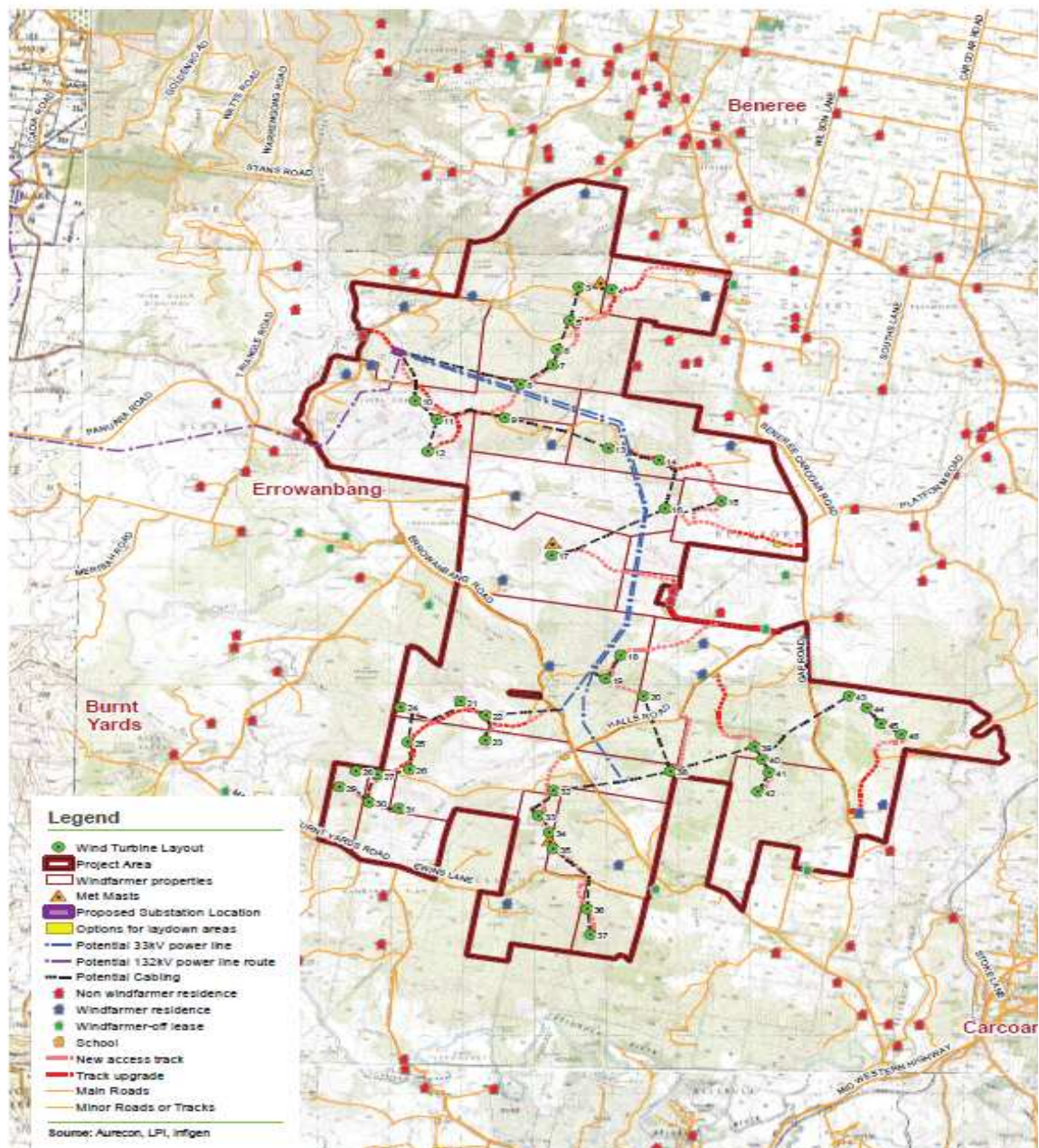
Land surrounding the site is predominantly rural, containing a number of farm and rural residential properties (See **Figure 2** for the location of the nearest sensitive receivers) as well as agricultural structures, local roads and access tracks ranging in elevation from above 900m to the north of the site to below 700m to the south of the site.

Most properties are used for stock grazing, with or without rural residential use and limited cropping. Several of the smaller neighbouring properties appear to have residential usage as their primary function. However, it is noted that the area is zoned primary production, and that this zone has a general minimum lot size of 100ha in relation to dwellings.

The Cadia mine is about 8km north west of the wind farm.

An Optus communications facility is located at the southern end of the proposed wind farm, and a 132 kV Essential Energy line runs from the Cadia Mine in the north-west towards the Orange substation. Orange aerodrome is located 13km to the north of the nearest turbine.

Figure 2: Location of surrounding residences



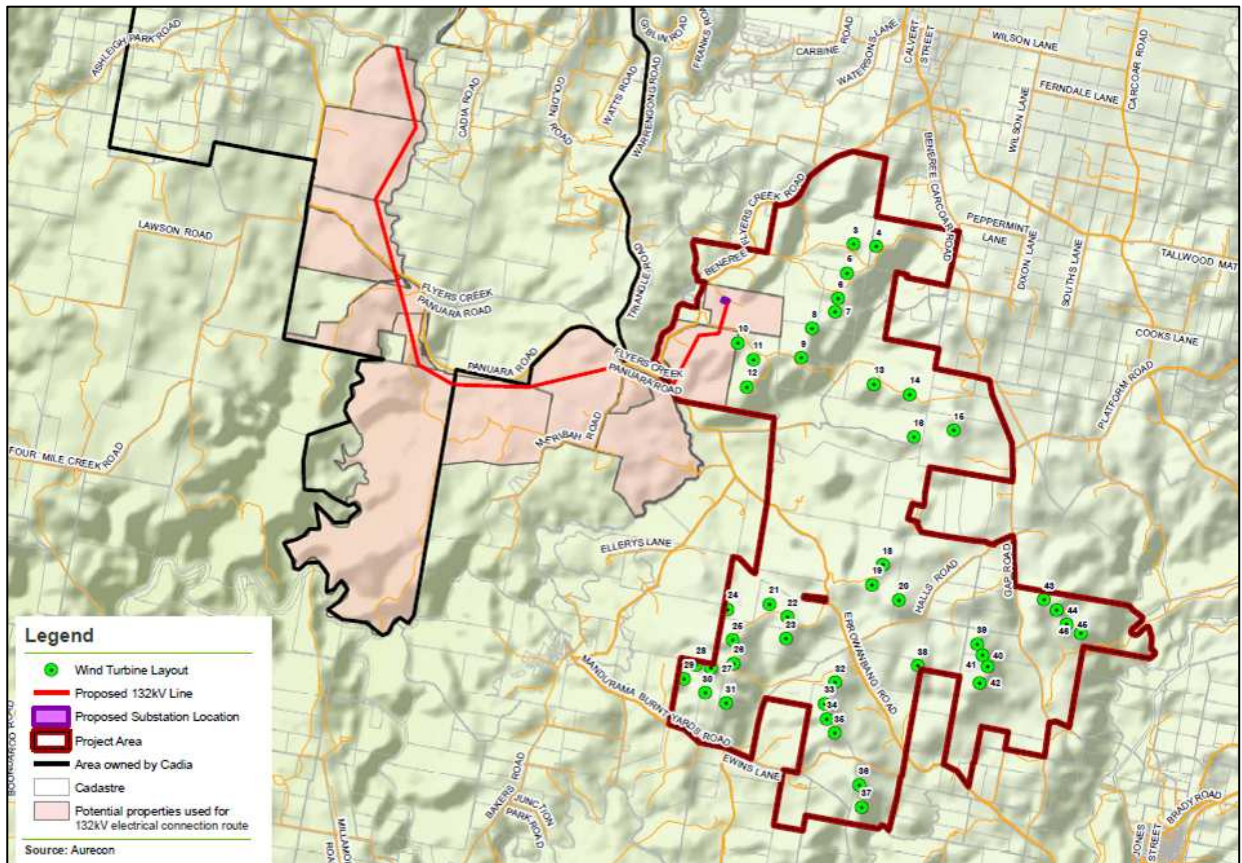
2. PROPOSED PROJECT

2.1. PROJECT DESCRIPTION

The proposal is for the construction and operation of a 132 MW wind farm at Flyers Creek. The project layout is shown in **Figure 3**. The key components of the project are listed in **Table 1**.

Table 1: Key Project Components

Aspect	Description
Project Summary	The construction and operation of a wind farm consisting of up to 43 turbines and maximum output of 132MW, connected 33kV transmission lines, including underground cabling, overhead lines and ancillary infrastructure.
Wind Turbines	The project consists of up to 43 wind turbines with a total maximum height (to blade tip) of 150m (three-blade design and rotor diameter of between 88m to 112m which sit atop tapered steel towers of up 100m in height).
Generator Transformers	Consisting of one per turbine located either near the base of the tower on a concrete slab or within the nacelle, these will be in the order of 3.5m long by 2.5m wide and 2.5m high.
Collection System	Turbines will be subdivided into groups of six to eleven turbines, and be connected to the substation via its own underground feeder cable or through the 33 kV overhead transmission line.
Underground Cabling	33 kV underground electricity cables will connect groups of turbines either directly to the on-site substation or to the central overhead line.
Overhead Transmission Line	Up to 11 kilometres of double circuit 33 kV overhead lines will connect turbines in the southern half of the site to the substation at the north-western part of the project area.
Substation	<p>Located at the north-western side of the site, the substation will occupy an area of approximately 120m x 80m. It will include two large 33 kV/132 kV transformers, busbars, circuit breakers, isolators and various voltage and current transformers.</p> <p>Infrastructure within the substation compound will include two or three small buildings including a switchroom, wind farm control room, auxiliary services building and staff amenities. A buried earth grid will be installed within the compound, with the surface covered in crushed rock and a 2m high fence.</p>
Overhead Transmission connection	An overhead transmission line up to 15km long will connect the substation site to the existing 132 kV Essential Energy transmission line along existing 11 kV/33 kV lines and Panuara Road, via the Cadia Mine Site to the north-west of the wind farm.
Construction	Construction period of approximately 18 months.
Jobs	100 full-time equivalent (FTE) and 5 FTE operational jobs.
CIV	\$195,000,000.

Figure 3: Project Layout

2.2. PROJECT NEED AND JUSTIFICATION

The Proponent has provided the following justification for the Project:

- Utilises renewable energy sources, displacing generation from fossil fuels and reducing greenhouse gases by up to 305,000 tonnes CO₂ per annum (at maximum capacity), contributing to fulfil Federal and State renewable energy requirements;
- Diversifies energy supply sources and provides additional electrical generation of 342,000 MWh/year (at maximum capacity) to the National Electricity Market (NEM) to meet forecast increased demands;
- When implemented in accordance with the EA, will have minimal effect on existing environmental values and can be easily integrated into the existing grazing lands; and
- Will provide additional income to associated landowners and a boost to the local economy.

Ecologically Sustainable Development / Renewable Energy

The National Strategy for Ecologically Sustainable Development, 1992 committed federal, state/territory and local governments to pursue ecologically sustainable development (ESD), with climate change being identified as a threat to a sustainable future. With energy production being the primary source of Australia's emissions, governments therefore recognised the need to reduce Green House Gas (GHG) emissions. The development of low or zero GHG emission energy technologies such as wind farms is essential to achieving significant reductions in greenhouse gas emissions.

In this respect, and pursuant to the NSW wind farm greenhouse gas saving tool developed by the Department of Environment, Climate Change and Water (DECCW) (now the Office of Environment and Heritage (OEH)) the Proponent states the Flyers Creek Wind Farm will reduce greenhouse gas emissions by up to 305,000 tonnes of annually (at maximum capacity), which is equivalent to removing approximately 70,000 cars off Australian roads. The lower emission intensity of the proposed project is therefore compliant with *The National Greenhouse Strategy*

(1998) which aims to lower the emissions intensity associated with electricity production. The Proponent therefore considers the wind farm to be consistent with the National and State Government objectives for sustainable production of electricity and abatement of greenhouse gas emissions as wind energy generation emits no greenhouse gases.

The Department considers that the proposed wind farm would make a contribution towards offsetting the emissions of Carbon Dioxide (CO₂) and other gases, particulate emissions and other pollutants that would otherwise be produced if the equivalent power supply was provided by fossil-fuel combustion. The project would also result in the avoidance of consumption of water that would otherwise have been used in coal or other fossil fuel fired power stations.

On 11 November 2009, the then Minister for Planning declared certain renewable energy projects (Flyers Creek Wind Farm being one of them) for the purpose of wind farms, plus any future applications for renewable energy with a capacity to generate at least 30 megawatts, to be critical infrastructure projects. In making this declaration, the then Minister recognised that renewable energy generating development of this scale was necessary to the State for economic and social reasons, and was required to help meet the Australian Government's commitment to achieving a 20 per cent share of renewables in Australia's electricity supply in 2020.

In this respect, the Australian Government's Mandatory Renewable Energy Target (MRET) scheme was also established in 2001 to expand the renewable energy market and increase the amount being utilised in Australia's electricity supply. The Renewable Energy Target (RET) scheme is an expansion of the MRET and has been established to encourage additional generation of electricity from renewable energy sources. In February 2011, the Enhanced Renewable Energy Target (ERET) was also introduced which consisted of the Small-scale Renewable Energy Target (SRET) and the Large-scale Renewable Energy Target (LRET). This was done to provide greater certainty for households, large-scale renewable energy projects and installers of small-scale renewable energy systems like solar panels and solar water heaters.

The Proponent has identified that the project would generate approximately 342 GWh of renewable energy each year (at maximum capacity) over the operating life of the farm, assisting to provide electricity to the Orange region and Cadia Mine. The wind farm would generate enough renewable energy to power up to 60,000 homes.

The Department supports the development of wind farms as a form of renewable energy, subject to the suitability of the location of these wind farms. This is consistent with the Commonwealth and State policies of promoting the production and uptake of renewable energies as a means of addressing climate change. The wind farm would contribute to Australia's Renewable Energy Target (RET) of sourcing 20 per cent of electricity from renewable sources by 2020.

The project is therefore consistent with the NSW Government's *NSW 2021* plan and draft *Renewable Energy Action Plan*, which each seek a target of achieving 20 per cent renewable energy consumption by 2020.

Generating Capacity

The Australian Energy Market Operator (AEMO) Electricity Statement of Opportunities 2012 (9 August 2012) states that NSW's average annual growth rate of energy consumption and maximum demand (based on medium economic growth forecasts) over the next 10 years is 1.2%. The projected summer 10% Probability of exceedence (POE) for maximum demand for 2012-2013 is 14,065MW, a reduction of 2,056 MW (13%) from the 2011 forecast, and is projected to grow at an average annual rate of 1.2%, or approximately 175MW. AEMO predicts that low reserve conditions (LRC) may occur in NSW by 2021-22. The LRC point is the time at which the network reliability standard may not be met, and at which point loadshedding may be required and brown-outs may occur in some areas. Continued demand

growth beyond the LRC without provision of additional generating capacity increases the need for loadshedding and exacerbates issues with the quality and reliability of supply (i.e. Increases in brown-out extent, severity and duration).

The Department notes that the timing of a generation capacity shortfall in New South Wales has shifted by three years since the 2011 projections. This in itself is sufficient to suggest that a level of caution should be applied to predictions made about events five to ten years into the future. Further, the changing regulatory, policy and market setting for electricity generation in New South Wales and more broadly across the National Electricity Market is another factor that has the potential to affect future predictions. However, the Department considers it prudent to take a strategic approach to the issue of timing of additional generating capacity by accepting that such additional capacity may be required at any point in the period 2014-2022, and that additional generating capacity should be available for implementation within that period, if required, rather than conclusively determining a date for implementation at this time. To do otherwise is to fail to recognise that estimates such as the LRC point are not fixed and determinative, but rather reflect the uncertainties inherent in the assumptions around matters such as future market conditions, domestic and global economics, demand management and energy efficiency uptake.

The Department considers that in conjunction with relevant demand management and efficiency measures, a diverse mix of local generating solutions would provide a risk-averse method of achieving a secure and reliable electricity supply base for the State, which is resilient to changing market factors including a more constrained carbon market and water restrictions associated with any future drought. Local generation in regional areas would promote greater transmission efficiencies (and associated greenhouse gas benefits from reduced transmission losses) by reducing the need for electricity to be delivered from further afield.

Although it is acknowledged that wind farms could not solely meet the future energy demands on either the Federal or State level, they are likely to play an increasing role in energy production and the development of wind energy will encourage and assist future industry development, reduce barriers to the national electricity market, and provide greater community access to renewable energy.

Additional Benefits

The Proponent also states that the project will provide a significant economic boost to the local community by providing employment opportunities through the creation of 100 FTE jobs during construction and 5 FTE operational jobs. It will also provide income to the landowners.

The Department notes that the proposal would involve a number of direct local benefits in addition to employment generation, such as potential tourist opportunities (tourists visiting the area wishing to view the wind farm) and opportunities for the local landowner to supplement rural income. *NSW 2021* also sets out goals and strategies for rebuilding and developing NSW and delivering sustainable growth. A key goal of *NSW 2021* is to invest in critical infrastructure as a means of achieving economic growth and improving productivity and competitiveness. Ensuring the supply of electricity is essential to the growth of communities and industries across the state both now and in the future.

On this basis, the Department considers the proposed Flyers Creek Wind Farm would have a role in helping to meet the energy requirements of the State as well as in addressing local demand and would have benefits for the local industry and community. It would also contribute to addressing the urgent challenges of climate change, reliance on fossil fuels and energy supply.

2.3. ASSOCIATED LANDOWNER OBJECTIONS

The Department received three objections from associated residences (residences 14, 24 and 56 (as identified within the PPR) who are landowners associated with the Project). All three of these landowners no longer wished to be associated with the Project.

Whilst the Department acknowledges these landowners may have entered into a commercial agreement with the Proponent, the concerns of these landowners are considered relevant to the assessment of the project. The Department however notes that given the project is deemed to be critical infrastructure (as detailed in **Section 3.2**), the application can be determined without landowners consent provided the critical infrastructure notification requirements detailed under clause 8 of the *Environmental Planning and Assessment Regulation 2000* have been complied with.

The Department's assessment recognises that given the transmission line runs south to north through the properties known as residences 14 and 56, the ability of the project to transfer the electricity generated from the turbines located in the south of the project, to the substation located to the north, could also be in question (should these landowners not agree to the location of the transmission line on their property).

Noting this, and the landowners objections, the Department has therefore recommended, that if the project is approved, a deferred commencement condition be applied. This would require that, prior to the commencement of the Project Approval, and within 12 months from the date of determination, the Proponent shall demonstrate to the satisfaction of the Director-General, that an agreement (following the date of the determination) has been obtained with these landowners in relation to the construction and operation of infrastructure associated with the project on their property. The Department considers that should the Proponent reach an agreement with these landowners, then it is reasonable to assume that these landowners have accepted the amenity impacts of any associated infrastructure, and any impacts could therefore be considered acceptable within the terms of any agreement. Electricity generated from the turbines located in the southern part of the project would also be able to be transferred to the substation as proposed.

The Department also notes that the offsite transmission line is proposed to pass through 3 private land holders, a small parcel of Crown land and the Cadia Mine. The Department also notes that no agreement has been obtained with any of these landowners, one of which has lodged an objection to the project. The Department considers that should the Proponent reach an agreement with all landowners for the construction and operation of the offsite transmission line, then it is reasonable to assume that these landowners have also accepted the amenity impacts associated with this, and any impacts could therefore be considered acceptable within the terms of any agreement. The Department has therefore further recommended that, if the project is approved, the deferred commencement condition stipulated above apply to landowners associated with the offsite transmission line.

3. STATUTORY CONTEXT

3.1. Major Project

The proposal is a major project under *State Environmental Planning Policy (Major Development) 2005* because it is development for the purpose of a facility for the generation of electricity that has a capital investment value of more than \$30 million (clause 24 of the then Schedule 1 of *State Environmental Planning Policy (Major Development) 2005*).

Although Part 3A of the EP&A Act was repealed on 1 October 2011, the project remains a 'transitional Part 3A project' under Schedule 6A of the Act. Consequently, the Minister for Planning and Infrastructure (or his delegate) is the approval authority for the project application.

3.2. Critical Infrastructure

On 11 November 2009, the then Minister for Planning declared a number of renewable energy projects, being development for the purpose of wind farms (Flyers Creek wind farm being one of them) to be critical infrastructure pursuant to Section 75C of the Act.

3.3. Permissibility

At the time the project application was lodged, the proposal was located on land zoned 1(a) General Rural under the *Blayney Local Environmental Plan 1998* (LEP). Electricity generation works are permissible with development consent within the land zoned 1(a).

Blayney LEP 2012 is now in force. The subject land is zoned RU1 Primary Production under this LEP. Electricity generation works are not permissible in this zone.

However, development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone under the *State Environmental Planning Policy (Infrastructure) 2007*. Therefore, as the proposal is for the purpose of generating electricity within a prescribed rural zone (which includes RU1) it is permissible.

Note also that LEP 2012 includes transitional provisions which provide that any development application lodged prior to the LEP taking effect should be determined as though it was not in force.

3.4. Environmental Planning Instruments

Under Section 75I of the EP&A Act the Director General's environmental assessment report is required to include a copy of (or reference to) the provisions of environmental planning instruments that substantially govern the carrying out of the project.

The Department has considered a range of planning instruments including *State Environmental Planning Policy (Infrastructure) 2007* and is satisfied that there are no environmental planning instruments that substantially govern the carrying out of the project other than the LEP as detailed in **Section 3.3**.

3.5. Objects of the EP&A Act

The Minister should consider the objects of the EP&A Act when making decisions under the Act. The objects of most relevance to the Minister's decision on whether or not to approve the project are found in Section 5(a) (i), (ii), (iii), (vi) and (vii). They are to encourage

- (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;*
- (ii) *the promotion and co-ordination of the orderly and economic use and development of land;*
- (iii) *the protection, provision and co-ordination of communication and utility services;*
- (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- (vii) *ecologically sustainable development.*

These objects form key areas of consideration within the environmental assessment and are of particular relevance to the eventual determination of the subject project application.

The Department is satisfied that the project involves the proper management and conservation of the environment (such as agricultural land and natural areas) for the purpose of promoting the social and economic welfare of the community, which has been considered in **Section 5.2** of this Project.

Also, the orderly and economic use and development of land has been considered in relation to potential impacts of the project on existing receptors, and landuse. The project also seeks to protect future energy supply through the generation of electricity.

Sections 5(a) (iv),(v) and (viii) are not relevant to this proposal as the proposal does not raise significant issues relating to the provision of land for public purposes, community services and facilities or affordable housing. With respect to ecologically sustainable development, the EP&A Act adopts the definition in the *Protection of the Environment Administration Act 1991*, including the precautionary principle which is discussed in **Section 3.6** of this report.

In addition, the agency and community consultation undertaken as part of the assessment process (see **Section 4** of this report), address objects 5(b) and (c) of the EP&A Act.

3.6. Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) *the precautionary principle,*
- (b) *inter-generational equity,*
- (c) *conservation of biological diversity and ecological integrity,*
- (d) *improved valuation, pricing and incentive mechanisms.*

The Department has considered the need to encourage the principles of ecologically sustainable development, in addition to the need for the proper management and conservation of natural resources; the orderly development of land considering land use; the need for the project as a whole (which comprises a utility provision); and the protection of the environment including threatened species in **Section 5** of this report.

The Department's assessment of the ecological impacts of the project is based on a conservative and rigorous assessment of the likely impacts and of likely offset requirements to ensure that appropriate and adequate measures are put in place to prevent the threats of serious or irreversible environmental damage consistent with the precautionary principle and the principle of conservation of biological diversity and ecological integrity.

As a source of renewable energy, the proposal has the potential to address future degradation of the global environment by reducing use of fossil fuels whilst most of the potential impacts from the proposal are likely to be localised and would not diminish the options regarding land and resource uses and nature conservation available to future generations.

The development has significant social and environmental benefits on a national, state and local level and can be argued to have global environmental benefits on the basis that the project would lower greenhouse gases created in the production of electricity. The project will not significantly affect the conservation values of the locality, with surveys demonstrating low utilisation of the site by threatened species. The development will see a decrease in costs to the community as a result of a reduction in the externalities involved with burning fossil fuels, such as those resulting from particulate air pollution and greenhouse gas emissions.

On the basis of the assessed impacts and their ability to be managed, it is considered that the development would be ecologically sustainable within the context of the above principles.

3.7. Planning Assessment Commission

On 14 September 2011, the Minister for Planning and Infrastructure delegated his approval functions under Section 75J of the EP&A Act to the Planning Assessment Commission (PAC) in the cases where applications have been made by private companies (including reportable political donation applications), and if an objection is received by the local Council and if there are 25 public submissions in objection.

The Proponent is a private company and has made a statement indicating it has made a reportable political donation (refer to **Appendix D**). In addition, the Department received 119 public submissions (of which 81 objected). Consequently, pursuant to the Minister's delegation of 14 September 2011, the project application is subject to determination by the PAC.

4. CONSULTATION AND SUBMISSIONS

4.1. Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the environmental assessment (EA) of an application publicly available for at least 30 days. After accepting the EA, the Department publicly exhibited it from 21 October 2011 until 19 December 2011 (60 days) on the Department's website, and at:

- Department of Planning & Infrastructure, Information Centre, 23-33 Bridge Street, Sydney NSW 2000;
- Blayney Shire Council, 91 Adelaide Street, Blayney NSW 2799;
- Millthorpe Pharmacy and Post Office, 44 Victoria Street, Millthorpe NSW 2798; and
- Nature Conservation Council of NSW, Level 2, 5 Wilson Street, Newtown NSW 2042.

The Department also advertised the public exhibition in the Blayney Lyndhurst Shire Chronicle and Orange Central Western Daily on 20 October 2011, and notified landholders and relevant State and local government authorities in writing.

The Department received a total of 130 submissions during the exhibition of the EA. Of these submissions, 10 were from public authorities and 120 submissions from the general public. A summary of the issues raised in these submissions is provided below.

4.2. Public Authority Submissions

A total of 10 submissions were received from public authorities. None of the agencies objected to the proposal, however they did raise issues for the Department's consideration (refer to **Appendix B** for a copy of the submissions).

The **NSW Department of Health-Western NSW Local Health District** notes issues on noise and shadow flicker, air quality, water resources and the operation of the existing Blayney wind farm, however it supports the conclusions of the National Health and Medical Research Council (NHMRC), that *"there is currently no published scientific evidence to positively link wind turbines with adverse health effects"* and notes it is undertaking a review of evidence around wind farms and health impacts, and the NSW Ministry of Health is supportive of this process and will update its policy should this review bring any new evidence to light.

Health also note that the operation of the wind farm will not impact on the quality of local water supplies, however raised concern regarding air quality impacts during the construction phase of the proposal from dust and particulate generation, noting this will be controlled by watering access roads. Health further notes that it has not received any complaints in regards to operation of the Blayney Wind Farm, which contains 15 wind turbines.

The **Department of Education & Communities** raised concerns regarding the level of community consultation undertaken, and that it was not identified within the DGRs as a relevant stakeholder for consultation with the Proponent. The Department of Education requests that the Proponent identifies and clarifies the impacts on the school facilities (Errowanbang Public School, located within the 1-2km zone around the turbines. Note, if the Department's recommendations to remove some turbines are accepted, the school would be about 2km from the nearest turbine) with regards to noise, vibration and Electro Magnetic Radiation from transmission lines, substations and telecommunication towers.

The **Lachlan Catchment Management Authority** supports the provisions for conservation within the EA and suggests that an Operation Management Plan accompany the EA to address road access, groundwater flows, native vegetation, soil degradation, fauna impact studies and water quality.

The **Environment Protection Authority (EPA)** advises that the regulation of environmental pollution under the *POEO Act* during construction and operation of the proposal should be given to Blayney Shire Council. However, subsequent to this advice, the EPA has taken on a regulatory role of large scale wind farms, with particular emphasis on noise management.

The EPA also makes a number of recommendations with respect to conditions of approval in relation to the Aboriginal Cultural Assessment, bird and bat monitoring, and offsets and recommends that the Proponent be required to clarify the proposed 100m buffer mitigation measure before a determination is made by the Department.

The EPA further recommends that the Proponent update the impact assessment and project design after considering any additional Superb Parrot and Eastern Bent-Wing bat surveys prior to a determination being made.

The **Department of Primary Industries – Catchments & Lands (DPI)** states that Crown parcels of land should not be impacted or involved in the proposal's development without the written consent from Catchments & Lands. DPI also notes that access to Crown land will require its prior permission.

The **Department of Primary Industries – Office of Water (NoW)** supports the development of a Soil and Water Management Plan to minimise waterway impacts during construction, and in particular, mitigating measures for proposed waterway crossings under section 7.6.3 of the EA. NoW notes that while a range of water supply options have been identified for the construction phase, they have not been secured or explored by the Proponent and that any licensing requirements have been deferred to post determination of the project. NoW recommends two conditions of approval in relation to the preparation of a Soil and Water Management plan and the requirement to obtain relevant licensing.

The **NSW Rural Fire Service (RFS)** advises that they have no comment providing the comments submitted previously by the RFS are adopted in relation to the preparation of a bushfire risk management plan and the project meeting the requirements of the aims and objectives of *Planning for Bushfire Protection 2006*.

The **Roads and Maritime Services (RMS)** make a number of recommendations in relation to the movement of vehicles, required permits, licences and deeds, road improvements, dilapidation, maintenance, construction standards, financing and need for an independent risk analysis and inspection of the transport route.

The **Department of Trade and Investment** advises the project raises no concerns from the perspective of agriculture, forests and fisheries, however there are concerns about potential restrictions on mineral exploration, and that mining of any identified economic mineral resource might be incompatible with the wind farm. Concerns were also raised about possible impacts on the Cadia mine, including noise levels and the location of the grid connection and reliability of electricity supply. It was requested that the proponent commit to ensure that these issues are avoided or minimised.

The **Blayney Shire Council** raised the following concerns:

- The traffic impacts, proposed routes, potential traffic volumes and impacts on the existing road infrastructure, and requests that the Proponent prepare a Traffic and Transport Issues paper for consideration by Council and RMS;
- Notes that it would prefer the EPA to act as the regulatory body for the proposal in relation to noise;
- Notes that no comprehensive study addressing the cumulative impacts of the Cadia Valley mine and the proposal have been undertaken and a Bushfire Management Plan has not been provided;
- Notes that the EA does not comment on the tourist potential of the site;
- Requests that a mobile batching plant is used to supply concrete to the site, and the Proponent should detail its proposed location to allow for community input; and
- Requests that the Proponent provide advanced notification of any blasting that is required during the construction process and requests that the Proponent prepares dilapidation reports on the neighbouring properties in the event that blasting operations are undertaken.

The Council also suggests a number of conditions including a bond to specify the method and cost of de-commissioning the wind towers and the payment of an annual contribution for the life of the project, adjusted for CPI (Sydney) be paid to Blayney Shire Council.

4.3. Public Submissions

A total of 120 submissions were received from the public, one of which was a special interest group “Flyers Creek Wind Turbine Awareness Group”. 35 supported the project, 81 objected and 4 were neutral.

Table 2 identifies points raised by supporters of the project, and **Table 3** identifies the key issues raised by the remainder of submitters.

Table 2: Key points identified by supporters

Issue	Concerns
Income stream	<ul style="list-style-type: none"> The wind farm will provide a reliable income for farmers hosting turbines, which will enable them to support other industries within their community.
Tourism	<ul style="list-style-type: none"> The wind farm will benefit the local tourism economy.
Sustainable	<ul style="list-style-type: none"> The wind farm will generate energy from a renewable source that will benefit the local community and State of NSW and move away from polluting fossil fuels; and The wind farm will not generate large streams of waste during its operation nor will it require large amounts of water.
Jobs	<ul style="list-style-type: none"> The project will create employment opportunities for the area.
Visual	<ul style="list-style-type: none"> The turbines are more visually appealing than stacks of power stations.

The Key issues identified by objectors are identified in **Table 3**.

Table 3: Key Issues identified by the remainder of submitters

Issue	Concerns
Community Consultation	<ul style="list-style-type: none"> Indicated that the level and extent of community consultation from the Proponent was inadequate and the general lack of opportunity given for public questions and inquiry.
Noise	<ul style="list-style-type: none"> Concern over the use of the GE 2.5x1-2.5 MW turbine in noise modelling as it is believed that this turbine under represents the noise impacts of the turbines to be constructed; Tests carried out by independent acoustic experts have raised concerns over the reliability, accuracy and compliance of background noise levels and noise impact predictions for the proposal; and Absence of a measurement or prediction of the tonality from the turbines.
Health	<ul style="list-style-type: none"> Concern over health impacts of infrasound; and Shadow flicker effects on young children and people with epilepsy or autism.
Visual Impacts	<ul style="list-style-type: none"> Criticism that the visual impact assessment was carried out using an indicative turbine design, not the committed design; Criticism that the visual impact assessment and shadow flicker assessment were modelled at different heights, with the general visual impact assessment done at 100m and the shadow flicker assessment done at 85m; Concern over the suitability of the location of the substation in addition to the lack of photographs that accurately show its position; Claims that the maps and charts submitted with the EA are inaccurate, missing data or obscure important data; The maps are missing some surrounding residences; Concern of the unrealistic representation of wind turbines in the photomontages issued by the Proponent in addition to lack of photographs of Blayney Wind Farm. Inclusion of these photos would demonstrate the cumulative impact of the two wind farms; Concern over visual impact on Errowanbang Public School where 33 turbines will be visible; and Concern over lack of photographic evidence illustrating cumulative impacts of the wind turbines and substation on the surrounding area.
Flora and Fauna	<ul style="list-style-type: none"> Concern over absence of a Soil and Water Management Plan and Construction Environmental Management Plan within the EA; Lack of explanation as to how the 1.1Ha area of native vegetation which will be removed was calculated and no indication in the EA that recommendations given in the flora and fauna survey by KMA will be put in place; Lack of assessment of the impact of transmission lines passing through the Canobolas State Forest as a requirement of the DGRs; and Presence of a wedge tailed eagle nest in the northern sector of the proposal area and two micro bat species within the proposal area.

Issue	Concerns
Water	<ul style="list-style-type: none"> Concerns of the adequacy of water studies in the EA; Water supplies for bush and turbine fires have not been addressed in the EA; Water demand for the site does not account for water requirements in the event of a fire, and water surface flows are not detailed in the event of an oil spill or hazardous material accident; and There is no assessment of the leaching of heavy metals from turbine foundations during and after their operational lifespan or the specifications of the concrete to be used for the turbine foundations.
Traffic and Transport	<ul style="list-style-type: none"> Absence of a Transport and/or Traffic Management Plan; Insufficient detail surrounding the rectification, maintenance and upgrade of local Council roads; and Insufficient detail concerning the upgrade and construction of farm access tracks to meet environmental standards.
Indigenous and Historic Heritage	<ul style="list-style-type: none"> Concern over the scope and extent of Aboriginal stakeholder involvement; Presence of a significant wedge tailed eagle nest in the Northern part of the proposal's area holds Aboriginal significance; Concern that the aesthetic significance can only be determined by Aboriginal stakeholders, which has not been addressed by the EA; Queries over the potential to guarantee that the 8 recommendations made within the Aboriginal Cultural Heritage Assessment will be implemented; Lack of recognition in the EA over buildings with heritage significance; and The village of Carcoar as a whole is a listed heritage item.
Cumulative Impacts	<ul style="list-style-type: none"> Concern over the adequacy of the EA to address the cumulative impacts of surrounding industrial activity.
Hazards and Risks	<ul style="list-style-type: none"> Concerns over potential interference with agricultural operations; Potential impact of the extension of the Orange Aerodrome and future local radar requirements; Compromised aerial fire fighting capability in proximity to wind turbines; No defined mitigation techniques or organisation responsible in the event of digital television reception failure; Concerns that the siting of the substation is approximately 300 metres from a local residence. Potential health impacts from Electric and Magnetic Fields have not been addressed; and The proposed turbine height within the EA exceeds Airservices Australia's limits for Orange Airport air traffic.
Decommissioning	<ul style="list-style-type: none"> Concern over compliance with the DGRs relating to the decommissioning bond; and Suggests that a \$4,200,000 bond is implemented to guarantee decommissioning and removal costs.
Property Values	<ul style="list-style-type: none"> Potential reduction of local property values.
Local Contributions	<ul style="list-style-type: none"> Lack of clarity and transparency within the EA regarding monetary contributions to be made to Blayney Shire Council over the life of the project.

The Department has considered the issues raised in the submissions in its assessment of the project.

4.4. Proponent's Response to Submissions

Following the completion of the formal exhibition period, the Department directed the Proponent to prepare a Submissions/Preferred Project Report to address each of the issues raised. As part of this process, the Proponent reviewed each submission and provided comment on the key issues. A copy of the final Submissions report is attached at **Appendix C**.

The Proponent's response to submissions led to changes to the project. Consequently a Preferred Project Report was prepared as part of the Submissions Report. The changes to the project included:

- The removal of turbine 17 (resulting in a total of 43 turbines), its electrical cabling and track access; and
- The relocation of the proposed route of the transmission line further west out of the active mining lease of Cadia mine.

The draft Submissions Report was forwarded to Blayney Council, the Office of Water, the Department of Education, NSW Health, Crown Lands, the Office of Environment and Heritage and Environment Protection Authority and the Roads and Maritime Services.

Subsequent to the consultation with Government agencies, the Proponent undertook additional noise and traffic assessments that were presented in the final Submissions report (**Appendix C**).

4.5. Compliance with the Draft NSW Wind Farm Planning Guidelines

The Department has recently developed the *Draft NSW Wind Farm Planning Guidelines* ('the Guidelines'), which were publicly exhibited from 23 December 2011 to 14 March 2012. The Guidelines provide a regulatory framework to guide investment in wind farms across NSW while minimising potential impacts on local communities, and it is intended that the guidelines will be finalised in 2014. The interim arrangements for transitional Part 3A wind farms such as the Flyers Creek Wind Farm and the application of the draft Guidelines vary depending on the stage of an application in the assessment process.

As the Flyers Creek Wind Farm has substantially progressed (the project had been exhibited but not determined) the Proponent had not addressed the new requirements of the Guidelines in the EA. However the Proponent has addressed, where possible, the relevant sections of the Guidelines in the Response to Submissions. The Department has also considered relevant provisions of the Guidelines in its assessment and in developing conditions of approval.

Table 4 below shows how the Flyers Creek Wind Farm has adopted, where possible, the Guidelines.

Table 4- NSW Planning Guidelines Wind Farms Checklist

Issue	NSW Planning Guidelines Checklist	Response
Consultation	<ul style="list-style-type: none"> • Form a Community Consultation Committee (CCC); • Document the consultation process undertaken, including stakeholders consulted. Identify and tabulate issues raised by stakeholders during consultation. Describe how issues raised have been addressed; • Consult with all neighbours with dwellings within 2km of a proposed wind turbine. Identify the neighbours' issues and potential approaches to mitigate any adverse impacts; and • Consider seeking agreement with neighbours with dwellings within 2km of a 	<ul style="list-style-type: none"> • Section 6 of the EA and section 2 of the Submissions Report documents the consultation process; • The Proponent has formed a CCC for the Project; • The Department has recommended a condition requiring the Proponent establish a CCC for the life of the project; • The Proponent consulted with immediate neighbours of the project, which at a minimum involved a phone call, and in some cases a face-to-face meeting. Two community information days were also held by the Proponent; • All neighbours within 2km of a turbine received mailouts concerning the project, as well as information regarding information days. Infigen indicates it has spoken to the majority of these neighbours; and

Issue	NSW Planning Guidelines Checklist	Response
	proposed wind turbine.	<ul style="list-style-type: none"> The Proponent has not reached agreements with all properties within 2km.
Landscape and visual amenity	<ul style="list-style-type: none"> Provide photomontages from all non-host dwellings within 2km of a proposed wind turbine; Identify the zone of visual influence of the wind farm (no less than 10km) and likely impacts on community and stakeholder values. Consider cumulative impacts on landscape and views; and Outline mitigation measures to avoid or manage impacts. 	<ul style="list-style-type: none"> Section 9 and Appendix C of the EA and section 5 of the Submissions Report; Photomontage locations were selected from publically accessible sections of surrounding road corridors as well as areas of private property in the vicinity of residential dwellings or from residential dwellings. Photomontages were selected to provide representative views from a single or multiple residential properties located within the vicinity of the photomontage location where possible; and The zone of visual influence and mitigation measures to avoid or manage impacts were addressed within section 9 and Appendix C of the EA.
Noise	<ul style="list-style-type: none"> Undertake an assessment based on separate daytime (7am to 10pm) and night-time periods (10pm to 7am); Predict noise levels at all dwellings within 2km of a proposed turbine; Consider special audible characteristics, including tonality, amplitude modulation, and low frequency noise (apply penalties where relevant); and Outline measures to avoid, minimise, manage and monitor impacts. 	<ul style="list-style-type: none"> The noise assessment in Section 12 of the EA was produced giving consideration to the South Australian Guidelines, which was required by the DGRs. The NSW Guidelines follow closely but improve on the methodologies and practices of the SA Guidelines. The NSW Guidelines give greater consideration to low-frequency noise, tonality, excessive amplitude modulation and auditing and compliance issues. The Proponent's EA addresses these issues, however, not in the detail required by the Guidelines. The Department accepts the Proponent has assessed the impacts under the SA Guidelines, however, the Department has considered the NSW Guidelines in formulating conditions to ensure acceptable night/day performance.
Health	<ul style="list-style-type: none"> Consider and document health issues, focusing on neighbours with dwellings within 2km of proposed wind turbines. 	<ul style="list-style-type: none"> Section 16 of the EA addresses health impacts, in particular magnetic fields, shadow flicker and infrasound. In addition section 4 of the Submissions Report also expands on health concerns.
Ecological issues	<ul style="list-style-type: none"> Consider potential impacts on birds and bats, particularly migratory species and outline the proposed monitoring and mitigation strategy 	<ul style="list-style-type: none"> Section 10 of the EA and 6 of the Submissions Report; and The Department considered ecological issues in section 5.2 of the report and has recommended a number of conditions to minimise impacts. Key conditions include the need to prepare a bat and bat adaptive management strategy and a biodiversity offset package.

Issue	NSW Planning Guidelines Checklist	Response
Aviation safety	<ul style="list-style-type: none"> Outline current agricultural aerial uses on neighbouring properties; and Consider the potential for the proposed wind farm to impact on aviation safety associated with agricultural aerial uses consistent with the draft guidelines. 	<ul style="list-style-type: none"> Section 16 of the EA and Section 12 of the Submissions Report; and The Department considered aviation issues in section 5.5 of the report and has recommended a number of conditions to minimise impacts. Key conditions include the need to consult with aerodrome operators, AirServices Australia, the Aerial Agricultural Association and the RFS, the provision of turbine location data to relevant authorities and users, and the need to consider aviation hazard lighting.
Bushfire hazard	<ul style="list-style-type: none"> Consider bush fire issues consistent with the draft guidelines, including the risks that a wind farm will cause bush fire and any potential impacts on the aerial fighting of bush fires. 	<ul style="list-style-type: none"> Section 16 of the EA and section 12 of the Submissions Report; and The Department considered bushfire issues in section 5.5 of the report and has recommended a number of conditions to minimise impacts. Key conditions include the need to prepare bushfire management plans, comply with RFS guidelines and consult with the RFS (including on aerial fire fighting).
Blade throw	<ul style="list-style-type: none"> Assess blade throw risks consistent with the draft guidelines; and Outline measures to avoid, minimise, manage and monitor impacts. 	<ul style="list-style-type: none"> Section 16 of the EA and section 12 of the Submissions Report; and The Department's recommended conditions include the requirement to develop a comprehensive Safety Management System.
Economic issues	<ul style="list-style-type: none"> Consider whether the wind farm use is consistent with relevant local or regional land use planning strategies; Consider potential to impact upon mining/petroleum leases and exploration licences; and Consider any potential impacts upon property values consistent with the draft guidelines, including properties within 2km. 	<ul style="list-style-type: none"> Section 5 of the EA addresses relevant local or regional land use planning strategies; Section 4.4.5 of the EA addresses mineral exploration; and Section 7.8.3 and section 7.9.5 of the EA and section 7 of the Submissions Report address the potential impact on property values.
Decommissioning	<ul style="list-style-type: none"> Include a Decommissioning and Rehabilitation Plan in the EA, including proposed funding arrangements; and Confirm that the Proponent not the landowner is responsible for 	<ul style="list-style-type: none"> Decommissioning is addressed in section 3.7.5 of the EA, and Appendix N of the Submissions Report; and The Department has also recommended a condition of approval requiring the lease to ensure that the Proponent is responsible for

Issue	NSW Planning Guidelines Checklist	Response
	decommissioning.	decommissioning.
Monitoring and compliance program	<ul style="list-style-type: none"> Outline program to monitor environmental performance to ensure compliance including mechanisms for reporting outcomes and procedures to rectifying non-compliance – including any provisions for independent reviews. 	<ul style="list-style-type: none"> Monitoring and compliance programs have been discussed in the EA (and included in the statement of commitments), however the Department has recommended specific conditions ensuring suitable monitoring and compliance programs are in place.
Council planning controls	<ul style="list-style-type: none"> Outline whether the proposal is consistent with any relevant provisions of the relevant council's Development Control Plan and list any variations. 	<ul style="list-style-type: none"> Section 5 of the EA addresses relevant local or regional land use planning strategies.

5. ASSESSMENT

The Department considers the key environmental issues for the project to be:

- noise;
- biodiversity;
- visual impacts; and
- health impacts.

5.1. Noise

A noise assessment was undertaken by the Proponent's consultants in accordance with the 2003 South Australian EPA "*Environmental Noise Guidelines: Wind Farms-February 2003*". **Figure 4** identifies the location of associated and non-associated residences, and the location of the noise logger and weather stations used for the assessment.

The surrounding background acoustic environment was determined to be typical of a rural residential environment with existing noise levels ranging from approximately 24dB(A) up to 51dB(A) depending on wind speed. Noise predictions at 2 receivers (23 and 78) however were predicted to exceed the noise criteria by 0.5dB(A) at wind speeds of 6ms⁻¹ and 7ms⁻¹.

Concerns were raised in the submissions regarding the noise impacts of the wind farm, including noise generated during both construction and operation, as well as specific issues with the noise impact assessment. In this respect, the Department sought independent expert advice in relation to the noise impact assessment. This report is located in **Appendix D**.

The review of the Proponent's noise impact assessment concluded that additional detailed information should be provided to support the application, in particular:

1. More information on the meteorological conditions in the area particularly on dominant wind directions and the probability of occurrences of conditions that exacerbate impacts;
2. Clearly outline noise mitigation, monitoring and management measures that would be applied to the project;
3. Clearly define input data to the ISO and CONCAWE models and explain clearly what was used and why;
4. Clearly explain the choice of noise logger locations and the rationale for choosing the background noise levels for each residential location;
5. Clearly explain the rationale for choosing the single mast as a basis for wind data; and
6. Clearly explain the difference between "accuracy" and "uncertainty". Clearly explain the application of +/- 4 – 5 dB and the implication with respect to certainty of compliance and management of potential exceedances.

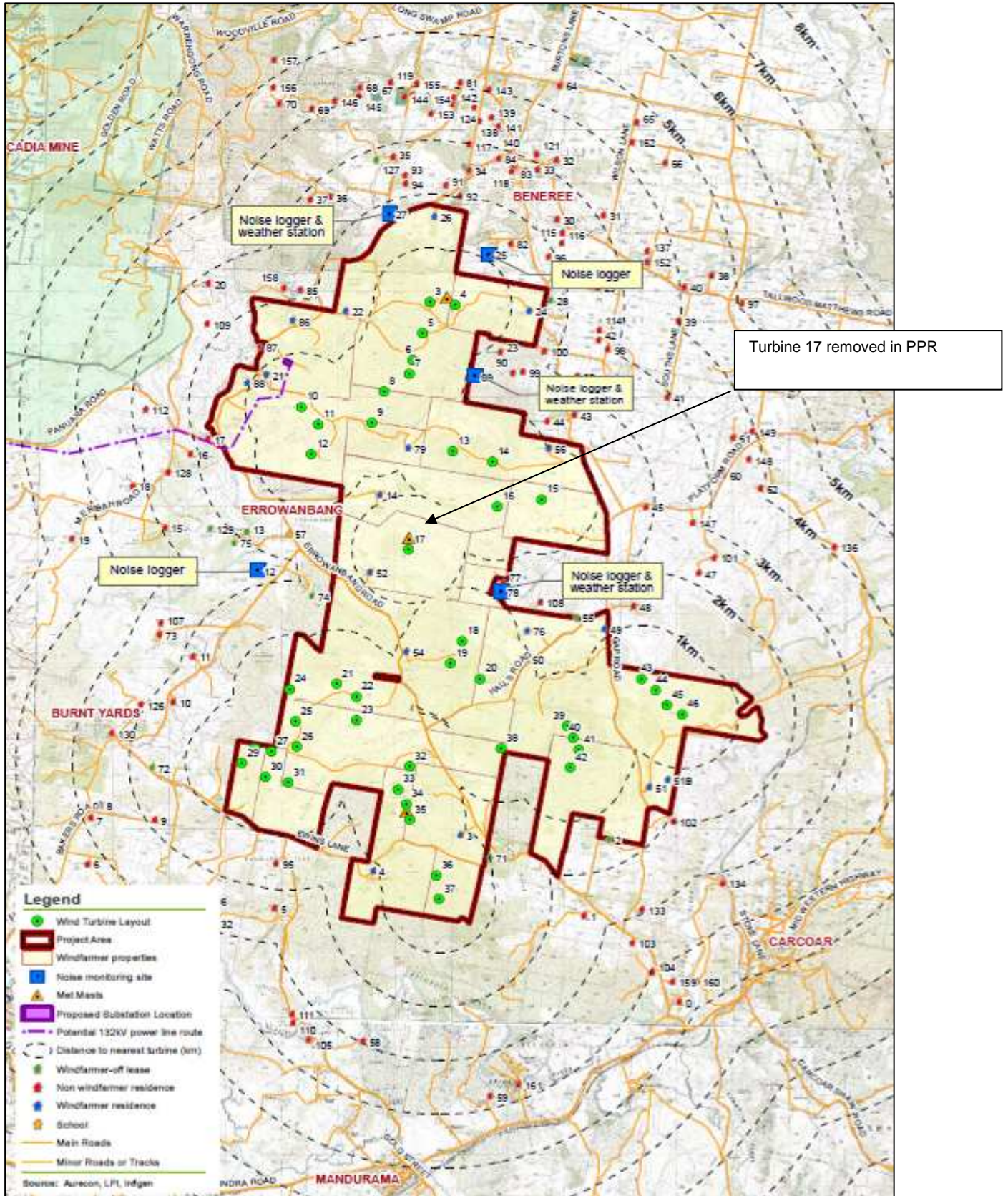
The Proponent provided a response to the issues raised throughout the review (refer to **Appendix E**), which was considered satisfactory by the Department subject to the further re-monitoring of the background noise levels at receiver locations 78 and 89.

The review further indicated that should the requested additional information be found to be satisfactory, then the Proponent will have satisfied its obligations in relation to the Director-General's requirements and South Australian EPA – Wind Farms – Environmental Noise Guidelines, 2003.

The Department considers that the further re-monitoring of the background noise levels does not impact on the Department's ability to form a view on the noise impacts of the proposal as the recommended operational noise criteria at these receivers will still likely be met.

However, the Department has recommended a condition that prior to the commencement of the Project Approval, the Proponent shall undertake additional background noise monitoring at receiver locations 78 and 89, and provide a report to the satisfaction of the Director-General detailing the revised noise levels and criteria for these receivers, and clearly outline the noise mitigation, monitoring and management measures that would be applied.

Figure 4: location of nearest residences, noise logger and weather stations



Subject to this recommended condition being adopted, the Department is satisfied that the noise assessment undertaken is satisfactory, and enables the Department to form a view on the noise impacts of the proposal. In this respect, the expected operational and construction noise impacts from the wind farm and any mitigation measures are detailed below:

Operational noise - turbines

The dominant noise sources associated with the operation of the wind farm include rotating electrical and mechanical parts, noise as the blades pass through the air, transformer noise and maintenance activities.

The SA Guidelines require that the noise generated by the operation of the wind turbines do not exceed a noise level of 35dB(A) L_{Aeq} or the background noise level by more than 5dB(A) (whichever is greater) at surrounding “non-associated” landowners. The 2003 SA Guideline does not identify specific noise limits for “associated” landowners noting that this is subject to agreement between parties as part of commercial negotiations. Despite this, in order to protect the amenity of residents in commercial agreements, the Proponent has committed to ensuring that sound levels will comply with the World Health Organisation (WHO) guidelines for sleep disturbance. The WHO Guidelines recommend an indoor level of 30dB(A), which equates to an outdoor noise level of 45dB(A) with windows open, or 52dB(A) with windows closed. The assessment has concluded that the criteria for sleep disturbance will not be exceeded for any associated receivers.

The SA Guidelines require the predicted noise levels from the wind farm to be compared against the measured background noise levels for the area, with sufficient data considered to be approximately 2000 data points.

Measurement of the existing background sound levels occurred at five representative residences located in the vicinity of the wind farm. The resultant noise criteria, for wind speeds of 3m/s to 9 m/s, are shown in **Table 5** (with the locations being representative of a number of receivers with the same noise criteria).

Table 5: Derived background noise criteria

Location	Noise levels for reference wind speed (metres per second) (10 metres AGL central met mast)						
	3	4	5	6	7	8	9
R012	35	36	38	39.5	40.5	41.5	42.5
*R025	35	35	36	37.5	38.5	40	40.5
R027	35	35	35	37	38.5	40	41
R078	35	35	35	36.5	39	41.5	43.5
R089	40.5	42.5	44	45.5	47	48.5	50

* includes receiver R023 being a receiver where the noise criteria is exceeded by 0.5dB(A)

Noise modelling was undertaken for residences up to approximately 5km away, and it was determined that with all (of the original total of 44) turbines operating at maximum operating output, compliance with the relevant criteria would be met for all receivers except receivers 23 and 78. Noise predictions at these 2 receivers were predicted to exceed the criteria by 0.5dB(A) at wind speeds of 6ms⁻¹ and 7ms⁻¹ (at 10m AGL) (with residence 77 expected to experience noise equal to the criteria). However with four turbines operating in noise reduction mode (turbines 4,5,16 and 18, which involves changing the angle of the turbine blade) during these wind speeds, the predicted dB(A) noise levels are compliant with the project specific noise goals at all existing relevant receiver locations.

The noise assessment also determined that the operation of the turbines will not emit a significant amount of infrasound or low frequency noise. The Proponent states that in earlier

models of turbines, when the blades were located downwind of the tower, these turbines produced significant levels of infrasound (sound below 20 Hz) as a result of the wake caused by the tower. Modern wind turbines however are constructed with blades upwind of the tower resulting in infrasound noise levels well below the level of perception (further detailed in **Section 5.4**). With respect to low frequency noise, the Proponent undertook additional noise modelling for the Submissions Report which predicts that the highest low frequency noise level at a non-associated receiver would be 54.5dB(C) at receiver 89, and 55.0dB(C) at two associated receivers (3 and 79). These predicted levels are lower than the low frequency noise criteria within the draft NSW wind farm planning guidelines of 65dB(C) and 60dB(C) for day and night time.

With respect to the potential for tonality of noise emissions from the turbines, the Proponent states that wind turbines that exhibit tonality will not be selected for the project.

Concern has also been raised in submissions that the turbine utilised for the noise modelling is not representative of the “worst case” noise impact. The Proponent has confirmed however in its Submissions Report that the GE2.5MW turbine modelled is representative of a ‘worst case’ noise impact given its noise characteristics and distance to sensitive receivers.

Operational noise – substation and transmission line

In addition to the turbines, a substation for the project, located in the north-western corner of the site is approximately 400m from the closest residential receiver. Noise generated by the operation of the substation is required to comply with the *NSW Industrial Noise Policy* (INP). Under the INP the most stringent project specific noise limit that can apply to a sensitive receiver is 35 dB(A) for $L_{Aeq}(15 \text{ minute})$ noise and 45 dB(A) for peak noise events $L_{A1}(1 \text{ minute})$ in the night time period. The noise limits under the INP apply to all receivers (associated and non-associated). The assessment concludes that the predicted noise levels from the substation are likely to be approximately 30dB(A) at the closest receiver, and up to 32dB(A) under certain worst case meteorological conditions.

Potential tonality of noise emissions from the substation however has not been discounted by the Proponent, with the Proponent stating in the Submissions Report that “*it is possible the substation noise will be tonal in nature at neighbouring residences*”. Although the Proponent states that it will ensure the substation acoustic levels comply with the NSW industrial noise standards, should tonality be present, a 5dB(A) penalty will be applied to compensate for the annoying characteristics of the tonal nature of the noise source.

The Proponent's assessment states that noise generated by the transmission line for the project (due to corona or aeolian noise), is not significant or potentially annoying at short distances from the lines (greater than 100m). As no receivers will be within 100m of the transmission line, noise is unlikely to be an issue.

Construction noise

The construction period would be approximately 18 months, with the more significant construction works occurring over a 12 month period. Construction is proposed to occur during normal working hours (7am to 6pm Monday-Friday; 8am to 1pm Saturday), with the main noise sources including:

- the delivery of equipment and materials;
- the use of excavators and associated earthworks for the turbine footings, substation structures and access tracks; and
- the use of cranes.

The Proponent's predicted noise levels for construction activities within the project site are presented in **Table 6** (with each of the 5 locations being representative of a number of receivers with similar noise criteria). Noise levels would exceed the noise criteria as specified

in the *Interim Construction Noise Guidelines* by 2dB(A) during standard construction hours at 5 non associated receivers R023, R025, R048, R077 and R078.

Table 6: Predicted Construction noise levels

Location	Closest Turbine	Distance km	Maximum Predicted Noise Level LAeq dB(A)	Noise Management Levels LAeq dB(A)	Exceedance dB(A)
R012	24	2.3	45	45	-
R025*	4	1.1	45	43	2
R027	3	1.8	45	50	-
R078**	18	1.2	45	43	2
R089	6	1.2	45	50	-

*representative area includes receiver R023

**representative area includes receiver R048 and R077

The Proponent states that noise impacts at turbine locations will progress across the site, with significant construction in any one area likely to be less than 3 months. Further, the predicted noise exceedances are only related to the use of certain noisy equipment (mainly compactors) utilised during the construction of the roads, and so none of the non-associated receivers detailed above would experience noise exceedances for more than one week. Measures will also be investigated as part of the Construction Environmental Management Plan to reduce any impacts, including using quieter compactors and/or operating the compactor at reduced vibration levels.

Vibration levels generated from construction machinery are not anticipated to be above the threshold of detection, and so the assessment concludes there are not likely to be any vibration sensitive receivers. Blasting activities are also to be avoided where practical, however if unavoidable, the Proponent has included a statement of commitment that restricts any blasting to within the construction hours and includes levels to achieve human comfort. The Department has recommended best practice vibration and blasting limits be incorporated into the conditions of approval to provide performance standards that must be achieved during the construction and operation of the project.

Traffic Noise – construction and operation

The Proponent's assessment focussed on traffic generated during the construction of the project, as a low level of traffic is expected during the operation of the project. The assessment concluded that there could be a 5 dB(A) increase in noise traffic noise levels at sensitive receivers, however this would be safely within the relevant noise goals under the *Environmental Criteria for Road Traffic Noise* (which is LA_{eq1hr} 55dB(A)).

Department's Consideration

Operational noise – Wind turbines

The Department has developed draft *NSW Planning Guidelines – Wind Farms* (December 2011). As part of the Guidelines the Department has developed the NSW Wind Farm Noise Guidelines. The NSW Guidelines follow closely, but improve on, the methodologies and practices of the SA Guidelines, although the NSW Guidelines give greater consideration to low-frequency noise, tonality, excessive amplitude modulation and auditing and compliance issues. The Department accepts the Proponent has assessed the impacts under the SA Guidelines (as it was required to do within the DGRs), and that those impacts are acceptable, however, the Department has considered the NSW Guidelines in formulating conditions to ensure acceptable performance.

The Department notes the Proponent has undertaken a comprehensive assessment of the operational noise impacts of the project's wind turbines, which indicates that noise levels at 2

non associated receivers will be exceeded by 0.5dB(A). However with 4 turbines operating in noise reduction mode, noise compliance levels can be achieved at all non associated receivers. The project will also comply with the WHO criteria for sleep disturbance for all associated and non-associated receivers.

The Department has also recommended a condition of approval requiring the project to be designed, operated and maintained to ensure the noise level does not exceed 35dB(A) or the existing background level by more than 5dB(A) at non-associated residences. Further the Proponent is to prepare a revised noise assessment for the final turbine model and turbine layout selected that demonstrates consistency with the noise predictions made in the EA.

Furthermore, the Department has recommended stringent compliance monitoring requirements following the commencement of operation of the project to confirm the performance of the project as well as procedures and corrective actions to be undertaken where a non compliance is detected. The Department has also recommended a condition that any landowner/resident within 3km of a turbine can ask for an independent review of the impacts of the project on their land, and monitoring be undertaken if required by the Director-General, to determine the project's compliance with the noise levels inclusive of corrective measures if required.

With respect to infrasound (below 20 hertz) and low frequency (20 hertz to 250 hertz) noise, the Department is satisfied, based on the consensus of research both in Australia (i.e. literature reviews undertaken in the development of the SA Guidelines, a recent study undertaken by the SA Environment Protection Authority (EPA) and the technical document produced by the Victorian Department of Health) and overseas technical reports (as reviewed by the Proponent and presented in the EA and PPR), modern turbines are not a significant source of low frequency noise or infrasound.

The Department notes that the SA EPA conducted a study on infrasound levels near operating wind farms, which concluded that measured infrasound levels at rural locations both near to, and at a distance away from, wind farms were no higher than infrasound levels experienced in other urban and rural environments, and that both indoor and outdoor infrasound levels were well below the perception threshold.

The Victorian Department of Health technical document titled "*Wind farms, sound and health*" (April 2013) further concluded that infrasound levels at a short distance (<360m) from wind farms have been shown to be below 85dB(G), which is the hearing threshold for infrasound. At this level the infrasound was concluded to be imperceptible, even for people with sensitive hearing. Further, the document concluded that evidence indicates that sound can only affect health at sound levels that are loud enough to be easily audible, which means that if you cannot hear a sound, then regardless of the frequency, there is no known way it can affect health.

The Proponent's noise assessment also predicts that low frequency noise levels will be below the criteria stipulated within the draft NSW Wind Farm Planning Guidelines.

Any noise emissions are therefore expected to be below the recognised perception for acoustic energy within these ranges, and are therefore unlikely to pose an unacceptable risk of infrasound and low frequency noise impacts to surrounding receivers.

Based on this assessment, the Department is satisfied that the project, subject to the recommended conditions, can be designed and operated to meet relevant noise criteria and achieve acceptable operational noise outcomes at nearby associated and non-associated receivers.

Operational Noise - Substation

The Department is satisfied that given the distance of the substation from the closest receiver, and predicted noise levels provided by the Proponent, the operation of the substation will not result in unacceptable noise levels or noise levels likely to result in sleep disturbance (the emission of instantaneous, short-term, high level noise events). Notwithstanding, to ensure the amenity of the surrounding sensitive receivers is maintained, the Department has recommended a condition requiring the Proponent to comply with the most stringent noise limit of 35 dB(A) for $L_{Aeq}(15 \text{ minute})$ noise and 45 dB(A) for peak noise events ($L_{A1} (1 \text{ minute})$) in the night time period pursuant to the INP.

The Department has also included a condition to ensure that noise generated from the overhead transmission line for the project (in particular that part outside the site linking with the existing Essential Energy 132kV transmission line) is designed, constructed and operated to minimise the generation of corona and aeolian noise as far as reasonable and feasible at the nearest existing sensitive receivers.

Construction Noise

The Department concurs with the Proponent's assessment that construction of the project is unlikely to pose a significant detrimental impact on the amenity of existing receivers.

Although the Director General's Environmental Assessment Requirements for the project stipulate that the assessment of construction noise is to be consistent with the *Environmental Noise Control Manual* (EPA 2004), the Proponent notes that these guidelines have been superseded by the *NSW Interim Construction Noise Guidelines* (DECC 2009) (ICNG). The construction noise goals as stipulated in the ICNG are background + 10dB(A). The assessment concludes that under the worst case scenario, noise management levels would be exceeded by 2dB(A) at 5 receivers (R23, R25, R48, R77, R78). The Department is of the opinion that this level of noise exceedance is acceptable due to the relatively short duration of the noisier construction activities (approximately 1 week at any one non-associated receiver), only occurring during the formation of the roads due to the use of heavy machinery such as compactors, and the relatively minor nature of the exceedance.

In regards to traffic noise, the Department acknowledges that increases in noise levels of up to 5dB(A) are predicted to occur at receivers located adjacent or nearby these roads to be used by construction traffic. The Department considers that this increase in noise will not adversely impact on the acoustic amenity of the receivers. Notwithstanding, to allay concerns regarding the construction traffic noise impacts, the Department has recommended that the Construction Noise and Vibration Management Plan include requirements whereby the Proponent must identify measures to manage construction traffic noise impacts. The assessment is to include the identification of feasible and reasonable measures to be implemented where noise levels exceed the applicable noise management level.

5.2. Biodiversity

Flora review

To assess the impacts of the project (inclusive of the wind farm site and transmission line easement) on ecological values, the Proponent undertook an ecological impact assessment, which included flora and fauna surveys (in 2008, 2009 and 2011) and vegetation mapping. The review was undertaken to identify threatened species, populations and ecological communities that could potentially occur on the site and surrounds, based on suitable habitats present.

The majority of the existing remnant trees, patches of trees and occasional patch of native grassland present are part of the one plant community, the Yellow Box-Blakely's Red Gum woodland, which form part of the White Box Yellow Box Blakely's Red Gum Woodland extensive community complex listed as an endangered ecological community under both the

NSW Threatened Species Conservation Act 1995 (TSC Act) and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Other recorded vegetation communities found in the project area are listed in **Table 7**, which includes woodland, native grassland/pasture and exotic grassland. In total 50 indigenous and 72 exotic plant species were recorded within the study area.

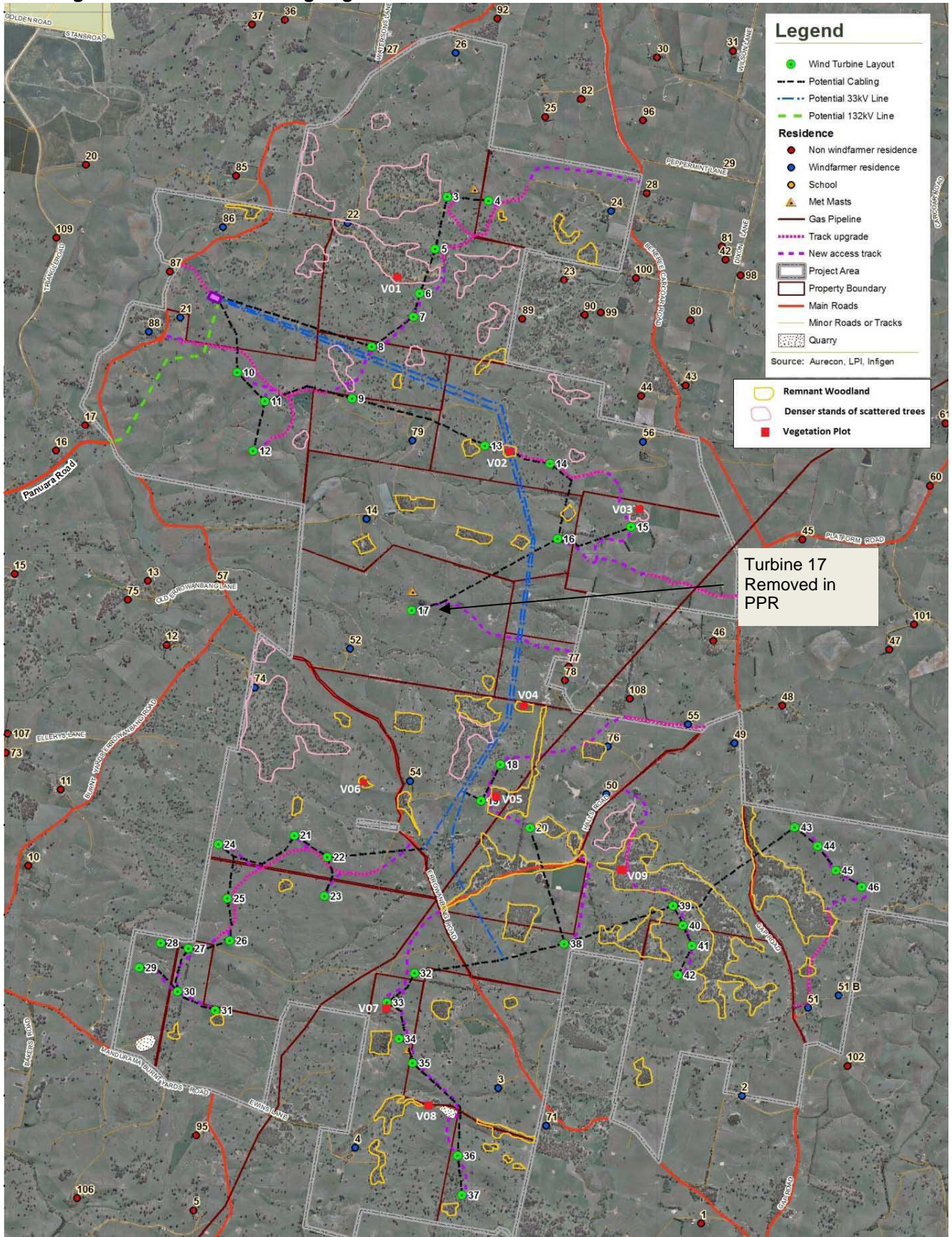
Table 7: Recorded vegetation communities

Community	Key species	Occurrence
Yellow Box – Blakely's Red Gum Woodland	Yellow Box <i>Eucalyptus melliodora</i> , Bundy <i>Eucalyptus goniacalyx</i> and Blakely's Red Gum <i>Eucalyptus blakelyi</i> .	Most of the remnant trees, patches of trees and occasional patch of native grassland in the area. Part of a community complex found extensively across central western New South Wales
	Broad-leaved Peppermint <i>Eucalyptus dives</i> and Red Stringybark <i>Eucalyptus macrorhyncha</i>	Scattered across the southern part of the area on soils derived from old sedimentary rocks and form occasional stands
Native Grassland - Native Pasture	Corkscrew <i>Austrostipa scabra</i> , Weeping Grass <i>Microlaena stipoides</i> , Wallaby Grasses <i>Austrodanthonia</i> spp., Swamp Dock <i>Rumex brownii</i> and Oxalis <i>Oxalis perennans</i> .	Little native grassland in the area with patches on rocky outcrops and roadsides.
Exotic Grasses	Phalaris, * <i>Phalaris</i> sp., Ryegrass * <i>Lolium</i> sp., Barley Grass * <i>Hordeum</i> sp. and Brome Grasses * <i>Bromus</i> spp.	Exotic grasses are common throughout the project area and understory of paddock trees.

The vegetation community surveys identified that the forests and trees that were once widespread no longer exist, with only a scattered representation of trees currently present. The survey identified that the land was highly modified, much of which is pasture improved as a result of the high quality agricultural soils, having been fertilised and sown with exotic species for many years. Consequently, there is very little native ground cover and native shrubs are quite rare with very little native understorey vegetation. An assessment of significance undertaken by the Proponent concluded that most of the remnant woodland can be avoided through appropriate layout of the project, however the removal of some trees, if unavoidable, is not likely to reduce the long-term viability of the Box-Gum endangered ecological community.

An assessment of significance undertaken by the Proponent concluded that the project would not have a significant impact on any threatened flora species listed under the TSC Act. No threatened plant species were recorded within the study area, nor have there been any threatened species recorded within 20km of the study area (NSW Wildlife Atlas). Further, given the land is largely pasture improved with little native vegetation, the exotic grassland cover over most of the area precludes the likelihood of threatened plants occurring within the project site. The quality of the patches of native grassland is also considered to be low, with the stands of woodland being quite sparse (refer to **Figure 6**).

Figure 6: location of existing vegetation



A significant impact criteria assessment was undertaken by the Proponent for the White Box Yellow Box Blakely's Red Gum Woodland threatened community pursuant to the requirements of the EPBC Act, in accordance with the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (Department of Environment, Water, Heritage and the Arts, 2009). The assessment concluded that whilst the woodland and the trees are of conservation value, there is almost no native grassland and few of the sites meet the criteria for the listed community. The areas of woodland community that do meet the criteria are very patchy covering only a small area and are of low floristic quality.

The proponent further concluded in its Preferred Project Report, that the land traversed by the re-alignment of the transmission line route is similar to the original route, and whilst some of the trees along this route may be White Box Yellow Box Blakely's Red Gum, the condition of the community would be poor.

It was concluded that the project can be constructed without removing stands of woodland and as such the project is not likely to have a significant impact on the White Box Yellow Box Blakely's Red Gum woodland community and derived grassland community. Referral to the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities was therefore not deemed necessary. The Proponent has also detailed within its commitments specific turbine locations where scattered trees are located and are to be avoided and/or clearing of the trees is to be minimised.

Fauna review

The surveys identified a total of 9 mammal, 90 bird (4 observed during the 2011 survey), 7 reptile (1 observed during the 2011 survey), 4 frog, 1 tortoise, 2 skink and 3 snake species within the Project area (other than bats). Fauna survey methods included direct observation, call recognition and a ground search was conducted for animal scats, tracks and diggings.

Five vulnerable species were identified during the field surveys. These were all birds and included the Diamond Firetail, Little Eagle, Varied Sittella, and white-browed Woodswallow listed as 'vulnerable' under the TSC Act, and Superb Parrot, listed as 'vulnerable' under the TSC Act and EPBC Act.

Bat fauna surveys were also undertaken in 2008, 2009 and 2011, using echolocation monitoring, analysis and habitat review. During the 2008/2009 surveys (surveys at meteorological towers and woodland remnants) a total of 10 bat species were identified, one of which is the Yellow-bellied Sheath-tail Bat, listed as 'vulnerable' under the TSC Act. The 2011 bat survey was undertaken during the migration of the Eastern Bentwing Bats from a maternity cave at Wee Jasper, NSW, over open areas utilised by the wind farm turbines. Although the 2011 survey identified 8 microbats, the Large Bentwing Bat, Large-footed Myotis and Yellow-bellied Sheath-tail Bat, all listed as 'vulnerable' under the TSC Act, were not recorded. The project area is at the margin of the range of the Eastern Bentwing Bat, which was not recorded during the survey.

Information from previous studies and databases (including the Cadia Mine Site) indicate the following threatened species (vulnerable or endangered) have been previously observed in the study area, however the likelihood of these species being present was considered low to moderate:

- threatened mammals (Koala, Spotted-Tailed Quoll, Squirrel Glider).
- threatened birds (Brown Treecreeper, Flame Robin, Gang-gang Cockatoo, Hooded Robin, Little Lorikeet, Regent Honeyeater, Scarlet Robin, Speckled Warbler, Turquoise Parrot, Swift Parrot and White-fronted Chat).

All of the above species were listed as 'vulnerable' under the TSC Act, with the exception of the Regent Honeyeater and Swift Parrot which are listed as 'endangered'. The Regent

Honeyeater and Swift Parrot are also listed as 'endangered' under the EPBC Act, but are considered to have a low potential presence in the project area.

Assessments of significance conducted by the Proponent concluded that the project would not have a significant impact on threatened fauna listed under the TSC Act. The results of the significant impact criteria assessment for the Superb Parrot concluded that this species is less likely to be impacted by blade strike than by the removal of breeding sized tree hollows (being the critical habitat for the Superb Parrot). It was considered however that the loss of 10 trees containing hollows is not likely to adversely affect habitat critical to the survival of the Superb Parrot as long as appropriate measures are taken in the design and construction of the project to minimise any additional hollow bearing tree loss. The Proponent further concluded that whilst there may be old trees that provide tree hollows within the revised transmission line route, a pre-construction survey (included as a commitment) would identify these trees, which could then be easily avoided.

Impacts that can potentially occur on bat species from wind farms include habitat loss or disturbance during the construction phase, or during operation, collision of bats with turbines or air turbulence and air pressure effects. The Proponent states that no significant impact will occur upon the local or regional population of the Yellow-bellied Sheath-tail Bat species as there is a low level of activity of this species in the area and the turbines will generally be located on cleared ridges, and so no major habitat clearance for this bat species will occur. With respect to the incidence of Barotrauma, the Proponent's assessment concludes that it is difficult to understand why bat fatalities occur at turbines, and therefore difficult to mitigate for bat barotraumas.

No migratory species listed under the EPBC Act were recorded, however many are known to occur in the locality of the project area. These include diurnal birds of prey (eg Nankeen Kestrel) and waterfowl (ie native ducks) migratory species that are not threatened in Australia and are in some cases very abundant.

The results of the significant impact criteria assessment conducted by the Proponent concluded that the project would not have a significant impact on any listed migratory species. Habitat in the vicinity of the project area is unlikely to support an ecologically important proportion of a population of such species.

Department's Consideration

The Department has considered the Proponent's ecological assessment and is satisfied that the level of information is sufficient to enable the Department to form a view of the existing biodiversity values within the project footprint and likely extent of significance of impacts associated with the construction and operation of the project. The Department also notes that the EPA (who at the time undertook the regulatory responsibilities of the Office of Environment and Heritage) did not object to the project.

The Proponent states that the wind farm has been specifically designed to avoid woodland and forest where possible, as it would predominately be located on the ridge tops of grazing paddocks supporting exotic grassland, much of which is pasture improved, with few to no native trees other than scattered trees. The majority of the project footprint (i.e. turbine footings and hardstand areas, substation and access routes) therefore will be located on cleared land. In total 55 hectares of land is proposed to be cleared, of which 23 hectares of the cleared area is required for a temporary period during the construction phase (access tracks, trenching for underground cables, overhead transmission line and site office e.t.c.) and will be rehabilitated later.

In regards to impacts on biodiversity values arising from any clearing of Yellow Box-Blakely's Red Gum woodland, whilst micro-siting of the turbines and associated infrastructure will ensure stands of woodland will not be removed and therefore reduce the loss of trees, this

exact loss cannot be determined until detailed design of the Project. However it is estimated that a maximum of 1.1 hectares of native tree vegetation will be removed (inclusive of any dead trees removed within 100m of a turbine as a mitigation measure for reducing blade strike), some of which includes a native understorey, which equates to approximately 0.02% of the land to be disturbed.

The Department acknowledges the configuration identified by the Proponent would represent the worst-case level of clearing that would be required for the project. The assessment also concluded that the woodland community is very patchy in its occurrence, covers only small areas and is of low floristic quality. Nevertheless, the Proponent has included a commitment that in the event treed vegetation cannot be avoided, a suitable offset metric and strategy will be determined in consultation with OEH. This could be the fencing of a suitable stand or stands of woodland from grazing and planting of appropriate native species (The Proponent has identified potential sites for woodland offsets within the project boundary which include areas within the woodland remnants north of Halls Road and on either side of Gap Road). The EPA has also raised no objection on the final amount of native vegetation being lost determined following detailed design and micro-siting prior to construction, provided a suitable metric is determined.

The Department accepts that the project could, if micro-siting of the turbines fails to avoid some of the woodland, represent a net loss of biodiversity values with respect to this endangered ecological community. Consequently to ensure that any biodiversity values lost as a result of the project will be offset in perpetuity, the Department has recommended conditions of approval that require the Proponent to develop and implement a Biodiversity Offset Package, in consultation with OEH, which describes the final suite of offset measures to be implemented as well as ongoing management and monitoring strategies.

The significant impact criteria assessment for White Box Yellow Box Blakely's Red Gum Woodland concluded that the project can be constructed without removing stands of woodland. As such the project is not likely to have a significant impact on the woodland and derived grassland community.

In order to maintain or improve biodiversity levels, the Proponent has also committed to developing and implementing a flora and fauna management plan detailing methods to manage impacts on flora and fauna, including rehabilitation and a weed management strategy. Specific areas have also been identified where careful planning, pre-clearing reviews and monitoring are required to ensure impacts are minimised.

Although no threatened flora species were identified, there is the potential for their occurrence within the project site. Consequently, the Department has recommended a condition of approval requiring the Proponent to develop a procedure for dealing with unexpected finds of threatened species during construction, including stopping works and notification procedures, and updating of biodiversity offset requirements. The Department notes the Proponent's commitment to undertake a pre-construction survey of the revised transmission line route, however considers this needs to be further re-inforced by recommending a flora (and fauna) survey within the revised transmission line route and assessment of its impacts be undertaken to the satisfaction of the Director-General prior to commencement of the Project Approval.

To ensure that impacts to native vegetation are limited during construction, the Department has also recommended that the Proponent be required to:

- develop and implement a Construction Flora and Fauna Management Plan comprising plans of the location of all native vegetation communities, endangered ecological communities, and potential threatened flora habitat; fencing of sensitive areas; measures for maintaining existing habitat features; seed harvesting measures; top soil management; and construction worker education;

- minimise the clearing of native vegetation;
- undertake pre-clearing surveys; and
- implement a revegetation and rehabilitation plan for areas disturbed during construction which are not required for the ongoing operation of the project.

The Department considers that with the measures outlined above, any impacts on flora can be adequately mitigated and/or offset, and do not pose a constraint to approval of the project.

The Proponent's ecological assessment indicates that all of the fauna habitats located in the study area were identified as being typical of the surrounding rural environment, with no large wetlands and most of the watercourses ephemeral. The most important fauna habitats were identified as the woodland and remnant paddock trees which provide areas for foraging for food and breeding sites for 5 bird species listed under the TSC Act and/or EPBC Act.

70 hollows were identified within 41 trees located on the ridge tops of which 36 were living trees and 5 were dead trees. The key threatened species located within the project area that is dependent on hollow-bearing trees is the Superb Parrot. The impact on this species however was not determined to be significant as long as the removal of hollow bearing trees is minimised. The Department has further recommended that no more than 10 hollow bearing trees are to be removed.

The Proponent also undertook a targeted survey of the Superb Parrot during the breeding season which confirmed the majority of observations of the parrot were in four locations. One of these locations is adjacent to proposed wind farm infrastructure (a turbine and access road are proposed on the ridge above and to the east of the identified habitat area). However it was concluded that with the current location of the turbines and appropriate routing of the access road, no removal of trees in the identified location is required. The Department has also recommended a condition that during detailed design and micro-siting all efforts are to be made to locate turbines at least 60m from hollow-bearing trees which have the potential to provide roost or nesting habitat, however should the loss of trees containing hollows be unavoidable, the Biodiversity Offset Strategy shall address measures for offsetting the loss of hollows.

Although the project will result in the clearing of potential fauna habitat, the Department concurs with the conclusion of the Proponent that the project is unlikely to have a significant impact on the Diamond Firetail, Little Eagle, Varied Sittella and White-browed Woodswallow given stands of woodland are being avoided and the removal of hollow bearing trees will be minimised. Micro-siting will minimise the loss of any habitat, however if required, any offset may involve fencing off a suitable stand of woodland from grazing that will allow it to regenerate and exist in perpetuity.

With respect to impacts on bird and bat species from rotor interaction (which includes direct collision or barotrauma), the Department accepts that whilst some level of mortality to individual bird and bat species is unavoidable, the project should be designed to minimise this risk as much as possible. The Department notes that the risk of bird or bat interaction is generally greater if the turbines are located within migratory flight paths, in proximity to forested areas or close to wetlands where large flocks of birds may reside. In this respect, there is no important habitat in the area for listed migratory species, and therefore such species are unlikely to congregate in large numbers. Further, it is noted that a number of other factors mitigate against adverse impacts occurring. These factors include that the surrounding woodland is patchy in occurrence and the Proponent has committed to removing a limited number of dead trees providing potential nesting sites within 100m of a turbine (with the maximum number being 10). This would help reduce any impacts to the Superb Parrot. No large wetlands exist. In regards to the Yellow-bellied Sheath-tail bat, the Department acknowledges that this species of bat requires large areas of habitat to forage within, which is not present within the project site, ensuring that any impacts to the local population would

be minimal. This species of bat was also not recorded in the larger open areas where the turbines would be located.

The Department therefore considers that the project is unlikely to result in an unacceptable level of risk to bird and bat species resulting from blade interaction. Nevertheless the ecology assessment has recommendations to minimise blade interaction (particularly for high flying bird species looking for prey) such as removing dead animals from within 200m of a turbine, precluding areas for perching on turbines and to ensure lambing does not occur in paddocks.

Further, the Proponent has committed to undertaking an avifauna monitoring program, the results of which will inform the incidence of blade strike and/or barotrauma and implementation of any additional mitigation measures. The Department has also recommended the Proponent develop and implement a Bird and Bat Adaptive Management Program to set out the monitoring requirements for the project in relation to bird and bat populations and any mitigation measures to reduce impacts.

To compensate for the loss of rocky outcrops and bush rock, which also provide valuable habitat for fauna such as reptiles and small mammals, the Department has recommended a condition of approval requiring the Proponent to undertake all feasible and reasonable measures to minimise their clearance and place them in adjacent areas to provide habitat for fauna such as reptiles and small mammals.

The Proponent has also committed to ensuring no large dams are constructed within 1km of a turbine on associated property, which will discourage and thereby reduce impacts to migratory waterfowl.

The Department is of the opinion that provided the recommended conditions are adopted, and that the Proponent implements the mitigation measures outlined in the EA and Submissions Report, as well as the actions described in the Proponent's Statement of Commitments, impacts on fauna and their habitat can be adequately mitigated and/or managed, and do not pose a constraint to the approval of the project.

5.3. Visual Impacts

The land surrounding the site is predominantly rural in nature, containing a number of farm and rural residential properties ranging in elevation from above 900m to the north of the site to below 700m to the south of the site. The surrounding landscape contains a number of elements that contribute to the local visual character, including a number of agricultural structures, local roads and access tracks. Many public submissions have expressed concern that the project is of an industrial nature, with high visual prominence, given the height the turbines will protrude above the existing landscape, and therefore conflicts with the existing rural landscape. Concerns have also been expressed that there will be a cumulative impact because of the proximity of the Blayney wind farm and Cadia mine.

The most prominent structures of the project with the potential to impact on the visual environment are the wind turbines, which are located on elevated sections of the project area up to a maximum height of 150m (to blade tip) above ground level. Other components include the internal overhead transmission line, external overhead transmission line connecting to the Essential Energy 132kV transmission line located west of the Cadia Mine substation, and the substation located within the project area and associated buildings.

Turbines

The Proponent undertook a visual assessment of the project as part of the EA to establish the visual impact of the wind farm. This assessment was based on the worst case scenario of turbine height, being up to a maximum of 150m. The turbine sites are located on ridges at levels between 750m to 950m (equating to a maximum turbine height of 1100m AHD). The

assessment included a visibility matrix that considered the approximate number of visible turbines, distance, viewfield, elevation angles and any screening.

The Proponent states that the wind farm could be visible at distances greater than 10km on clear days, particularly to the south, southeast and southwest of the site and from elevated points such as Mt Canobolas. However, the impact of the turbines on any viewfield at a distance greater than 5km was considered low, and so the Proponent's impact assessment concentrated on viewpoints within 5km of the project. A total of 158 residences were identified within 5km of a turbine (inclusive of a school), of which 132 were neighbours (non-associated) (see **table 8** for the distribution of residences within 5km). Additionally, 8 surrounding viewpoints were considered representative of public viewpoints.

Table 8: distribution of residences within 5km of the project

<i>Distance of residence from nearest turbine</i>	<i>Total number of residences</i>	<i>Associated⁽¹⁾</i>	<i>Neighbours (non-associated)</i>
0-1km	6	6	0
1-2km	43 ⁽²⁾	19	24 ⁽²⁾
2-3km	47	1	46
3-4km	36 ⁽³⁾	0	36 ⁽³⁾
4-5km	26	0	26
Total	158⁽²⁾⁺⁽³⁾	26	132⁽²⁾⁺⁽³⁾
<p>Note: ⁽¹⁾ A wind-farmer residence is one where the owner has leased part or all of their land for the wind farm development. Some neighbouring residences are owned by wind farmers and are included here as wind farmer residences.</p> <p>⁽²⁾ Includes school – "Residence 57"</p> <p>⁽³⁾ Includes community hall</p>			

The Proponent prepared photomontages from 6 residences (89, 25, 94, 12, 44 and 17) and the 8 identified viewpoints. The location of identified dwellings and viewpoints are shown in **Figure 7**.

Based on the visual assessment, the Proponent concluded that (refer to **Table 9** and also **Figure 8** and **Figure 9** for an example of photomontages taken from non-associated residences located to the east and north of the Project):

- 7 out of the 158 residential receptors (5 being "associated" and 2 being "non associated" dwellings) were likely to experience a moderate to high visual impact;
- 41 out of 158 residential receptors (13 being "associated" and 28 being "non associated" dwellings (including the community hall) were likely to experience a moderate visual impact;
- 54 out of 158 residential receptors (5 being "associated" and 49 being "non associated") were likely to experience a moderate to low visual impact;
- 47 out of 158 residential receptors (3 being "associated" and 44 being "non associated") were likely to experience a low visual impact; and
- 9 out of 158 residential receptors (all being non-associated) were likely to experience Nil visual impact.

Table 9: visual impact assessment on residences within 5km

<i>Impact Assessment</i>	<i>Number of Residences</i>	<i>Associated</i>	<i>Non-Associated</i>
Nil	0	0	0
Low-Nil	9	0	9
Low	47*	3	44*
Moderate – Low	54	5	49
Moderate	41**	13	28**
Moderate-High	7	5	2
High	0	0	0
Total	158	26	132

*community hall

**school

Figure 7: location of identified dwellings and viewpoints

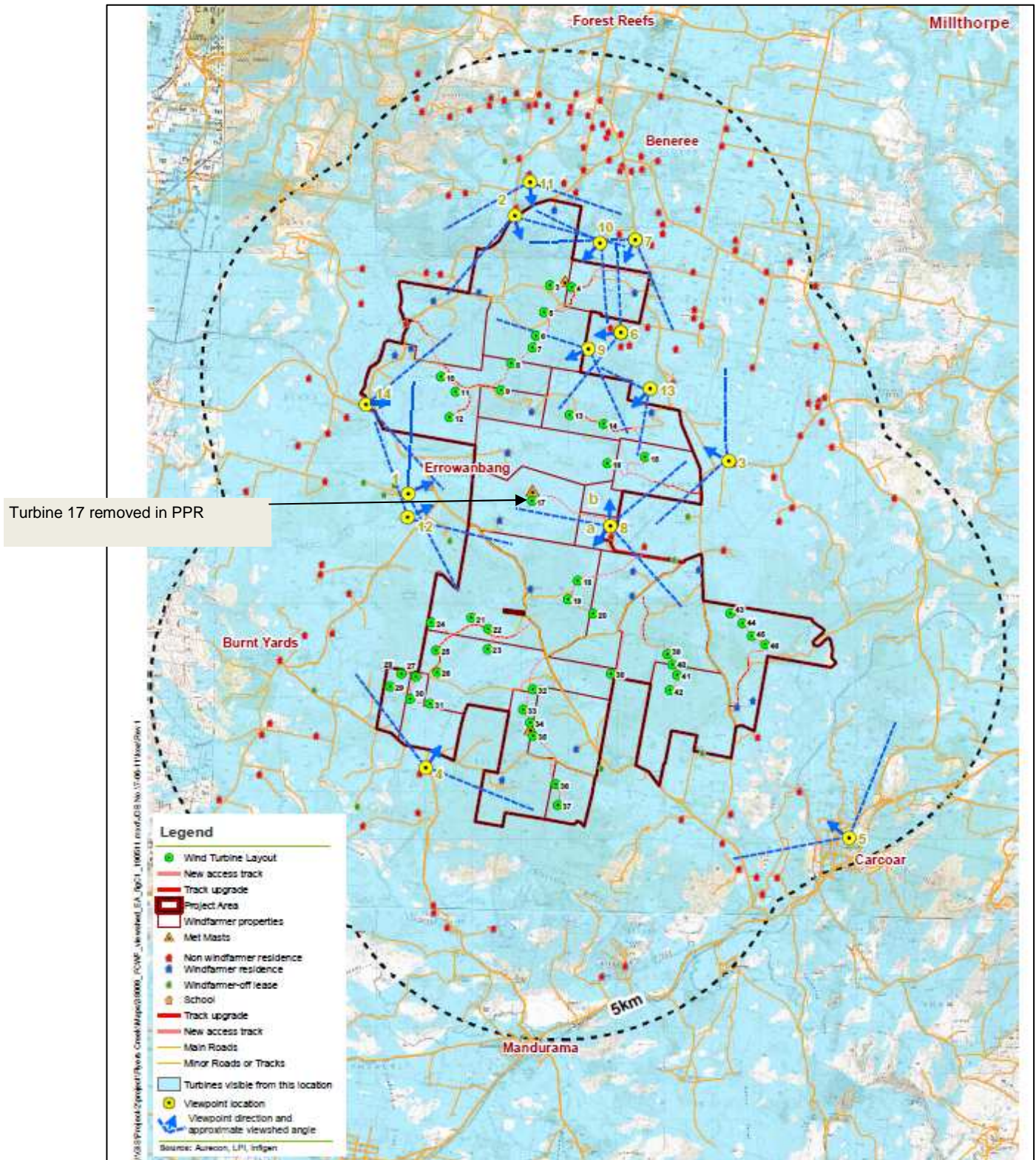


Figure 8: Residence 89 looking south west (deemed to be High to Moderate impact in the Proponent's assessment)

Closest Turbine: Turbine 7 - 1.2 km to the west



Figure 9: Residence 94 looking south (deemed to be Moderate impact in the Proponent's assessment)

Closest Turbine: Turbine 3 - 2.2 km to the SSE



Figure 10: Watersons lane intersection looking south over the project

Closest Turbine: Turbine 3 - 1.7 km to the south



Figure 11: Mandurama to Burnt Yards Road looking north east over the project

Closest Turbine: Turbine 31 - 1.2 km to the North



The Proponent's assessment also considered that none of the public viewpoints identified would be highly impacted from a visual perspective. The Watsons Lane intersection, located north of the project boundaries, was identified as being the most affected, having a moderate to high visual impact, with approximately 6 turbines located within 1-3km, 7 turbines within 3-5km and 25 located outside 5km (refer to **Figure 10**).

The Mandurama to Burnt Yards Road viewpoint, located south of the project boundaries, was identified as having a moderate visual impact, with approximately 14 turbines located within 1-3km and 6 turbines within 3-5km (refer to **Figure 11**).

The remaining 6 viewpoints assessed in the EA were considered to have a moderate to low or low visual impact as a result of the project.

Further, the Proponent states that at a distance of over 18km, the turbines will have negligible visual amenity impact on views from Mount Canobolas, and although the wind farm will be visible over a large area, local topography and vegetation will limit visibility from many locations.

Overall the wind farm is considered to be a prominent addition to the local landscape by the Proponent, with its visual impact dependent on the number and distance of the turbines from any residence, combined with subjective factors relating to what perception the viewer held of wind turbines. The Proponent states that, as in the case of Blayney wind farm (located 8km to the south east), any initial changes to the landscape may seem significant, however over time these concerns may diminish to one of acceptance.

The Proponent further concluded that elements of the existing landscape will still be visible once the wind farm is constructed (so the turbines will not obscure views of the existing rural landscape features), and so combined with the adjoining landscape, would result in a significant part of the overall landscape remaining unchanged. Overall though, it is expected that the wind farm will be viewed in both a positive and negative light depending on the viewers' perception of the turbines and their location within the surrounding environment.

Ancillary Infrastructure

The Proponent states that the location of the ancillary facilities (combined with appropriate design such as minimising access roads and locating roads where the clearing of woodland would be minimised) have been selected with the intention of reducing their visual impact. Therefore compared to the wind turbines, the visual impact of the ancillary works (substation, grid connections, transmission lines and access tracks) will be minor. The Proponent has also committed to implementing mitigation measures such as vegetation screening at the location of the ancillary works, and to reduce the visibility of disturbed ground via construction methods.

Shadow Flicker, Blade Glint and Night Lighting

With the rotation of the blades, and depending on the position and intensity of the sun, an intermittent shadow of the revolving blades is formed on the ground or surrounding objects referred to as "shadow flicker".

At present there are no assessment guidelines governing shadow flicker in New South Wales, however the draft Wind Farm Planning Guidelines recommend that shadow flicker at any neighbouring dwelling should not exceed 30 hours per year.

The Proponent undertook shadow flicker modelling, which determined the number of shadow flicker hours that surrounding dwellings are likely to experience in a year. The results of the modelling indicate that, in the worst case scenario, 26 of the surrounding residences would encounter shadow flicker from the project, with 10 of these being non-associated. No non-associated residence would experience more than 30 hours of flicker per year, with receiver

number 23, located approximately 1.2km from the nearest turbine, receiving the most, being approximately 17 hours per year (as shown in the Response to Submissions with a revised shadow flicker assessment based on the maximum tip height of 150m).

The reflection of the sun from one or more rotating blades is referred to as blade glint, and can be dependent on a number of factors including the location of the viewer, angle of the blade, sun and degree of cloud cover. The Proponent has identified that blade glint could be a potential distraction to drivers passing the wind farm, however it is not considered a significant issue as a low reflectivity finish will be utilised that minimises the potential for glint.

The Proponent is not proposing lighting for aviation safety purposes, unless required by CASA. An assessment was undertaken by the Proponent which concluded that should night lighting be required, the impact on the surrounding residences would be low as the lights would only be visible at night or in conditions of poor visibility when the majority of people are indoors with little or no view of the turbines. Should lighting be required however, mitigation measures such as shielding and focussing of the lights are available to ensure any impact to surrounding residences will be low. Any lighting would be installed in accordance with CASA requirements.

Cumulative

The cumulative impact of the Blayney wind farm was considered to be negligible, due to the smaller size of the turbines and distance from the proposal (8km).

The closest visual part of the Cadia mine are the tailing dams, however the Proponent considers there to be only a minor cumulative impact of the dams and wind turbines given residences at lower locations will have limited visibility of Cadia mine and at higher elevations the visual characteristics of the two (although both are industrial) are considered to be different.

Department's Consideration

The Department has considered the visual impact assessment undertaken by the Proponent. The Department notes that 26 of the affected receptors are "associated residences", and have a commercial agreement with the Proponent, and so the visual impact on these residences (if no objection has been lodged) has therefore been accepted.

Turbines - Non-associated residences

With respect to non associated residences surrounding the wind farm, the Department notes that no residence is within 1km of a turbine, however there are 24 (including a school) within 1-2km, 46 within 2-3km, 36 within 3-4km and 26 within 4-5km. The Department undertook a site visit in April 2013, which included visiting areas adjacent to the proposed site.

Following this, the Department agrees with the Proponent that the visual impact of turbines on residences outside of 5km for this project is low, and so it is acceptable for the impact assessment to be confined to within this radius. The Department further considers that for the vast majority of non associated residences, (those greater than 2km from a turbine) the distance between turbines and the distance between the residences and turbines, would be sufficient to ensure that their view field would not be dominated by the turbine structures. From outside of this distance sufficient natural and other man made elements would exist to add variety and "break up" any views towards the turbines.

The Department also concurs with the Proponent's view that the turbines would not result in a high visual impact for residences within the 2km-5km distance. The Department therefore considers that reducing the number or height of turbines would result in little material benefit to the views from these residences.

The Department visited a number of locations within 2km of a turbine during its site visit, both in and around the Project area. Whilst the Department understands the surrounding topography to be undulating in nature, the majority of surrounding residence locations are located on ridgelines of similar elevation to the turbines. Whilst some of these residences may have numerous turbines within their overall viewfield, the Department considers that the visibility of any part of the turbine or group of turbines does not necessarily equate to its level of impact when viewed from a residence. In this respect the relative elevation of the residences with respect to the turbines, combined with the presence of vegetation, undulating topography and other existing intervening features would preclude any residences within 2km of a turbine from experiencing unacceptable visual impacts.

The Department notes that the Proponent, in its PPR, removed turbine number 17, which will reduce impacts of the proposal on residences to the west and east of this turbine. Overall though, the Department considers that impacts to the visual amenity of residences within 2km of a turbine are acceptable and the deletion of any further turbines would result in little material benefit. The Department also considers that visual impacts on the school are acceptable given the above factors in combination with the intermittent nature of turbine views due to children and teachers being within the classrooms during the majority of school hours. The Department does note however, that people's view of what constitutes an acceptable impact differs. In this respect the Department acknowledges the subjective nature of the visual impact of wind turbines. It is possible that some residents may consider views of turbines as having minimal landscape impact, while other residents may consider the same view as having a significant and detrimental impact.

However, to further ensure that any visual impacts are minimised as far as possible to all surrounding non-associated residences, the Department has recommended a condition that any owner of a residential dwelling, business or the Errowanbang Public School within 5km of a turbine can request the proponent to provide landscape treatments to visually screen these residences, businesses or school if desired

As part of the site visit, the Department also visited the "Willow Park" property (known as residence number 14). Whilst this property is considered an associated residence in the EA and PPR, an objection was lodged by the landowner, which included concerns based on the proximity and visibility of the turbines located on the adjoining property, as well as the desire to have the turbine removed from their property (number 16). The Department was concerned with the potential visual impacts the cluster of turbines 9-12 may have on this residence, resulting from the location of the residence on the valley floor versus the location of the turbines on-top of the adjoining ridgetops which rise steeply, combined with the short distance between the turbines and the residence, short separation distance between the turbines and lack of screening vegetation. The Department was therefore concerned that there was potential for the viewfield of this residence to be unacceptably dominated by the turbines.

The Department sought an expert to prepare a photographic simulation (photomontage) of turbines 9-12 from this residence (refer to **Appendix F**). It was deemed by the expert that a single image photograph of the landscape was the best base onto which to fit the 3D computer model of the turbines, to provide the most realistic photographic representation.

The photomontage(s) confirms the Department's concerns that the viewfield from this residence would be unacceptably dominated by the turbines. This concern relates predominately to turbines 9 and 12, given the location of the residence on the valley floor and the steepness of the ridge, these turbines would appear to "tower" over the residence, as the top most tip of the turbines (987m) would be in excess of 255m above the level at the residence (731.5m). These turbines are also both only (approximately) 1400m from the residence, with a separation distance of only 1200m between the turbines. An unimpeded view of the turbines would therefore be seen from this residence.

In addition, there is no intervening vegetation between the residence and turbines. Whilst screening vegetation could be planted, given the close proximity of the turbines to the residence, and ground level difference between the residence and turbines, any screening vegetation would completely remove the view of the surrounding landscape from this part of the residence. Therefore, screening is considered to be an unacceptable mitigation measure, in this instance.

The combination of all these factors (inclusive of potential shadow flicker impacts detailed below) therefore results in the Department recommending turbines 9 and 12 be removed to prevent any unacceptable visual impacts to this residence.

In relation to turbine 10 and 11, these turbines are placed in positions where an intervening ridge will largely obscure the tower of turbine 10, and partially obscure the tower of turbine 11. Given the alignment of turbine 10 and 11, they will also largely appear as 1 turbine from this residence. At a distance of approximately 1750m, turbine 11 is also further away from the residence than turbines 9 and 12. With the removal of turbines 9 and 12, the Department considers that the residence will not experience unacceptable visual impacts from turbines 10 and 11.

The Department has also received additional objections (since exhibition of the EA) from associated landowners known as residences 24 and 56 (as identified within the PPR). Given the transmission line runs south to north through the properties known as residences 14 and 56, the ability of the project to transfer the electricity generated from the turbines located in the south of the project, to the substation located to the north, could also be in question (should these landowners not agree to the location of the transmission line on their property).

Noting this, and the landowners objections, the Department has recommended a condition that prior to the commencement of the Project Approval, and within 12 months from the date of determination, the Proponent shall demonstrate to the satisfaction of the Director-General, that an agreement (following the date of the determination) has been obtained with these landowners in relation to the construction and operation of infrastructure associated with the project on their property. The Department considers that should the Proponent reach an agreement with these landowners, then it is reasonable to assume that these landowners have accepted the amenity impacts of any associated infrastructure, and any impacts could therefore be considered acceptable. Electricity generated from the turbines located in the southern part of the project would also be able to be transferred to the substation as proposed.

Turbines - Landscape and public viewpoints

The Department is satisfied that the turbines would not detrimentally impact views from public viewpoints, and could, for some people, provide an interesting addition to the landscape. The Department is also satisfied that the turbines would not pose a significant intrusion on the townships of Blayney or Millthorpe given their distance from the project site (over 10km). Similarly, significant visual impacts are considered unlikely for other townships such as Forest Reefs and Carcoar (refer to **Figure 12**), given their distance from the closest turbines (over approximately 4.5km) and the presence of intervening vegetation, buildings and landform.

Figure 12: view from Carcoar looking north west

Closest Turbine: Turbine 46 - 4.5 km to the North



With respect to views from roads surrounding the site, the Department notes the Proponent's view that the turbines will introduce a noticeable new "man made" element into landscapes that contain a number of existing natural or modified elements, however they would add to the visual diversity of the landscape. The Department considers that road side views, especially from moving vehicles, are unlikely to be significantly affected by the project. Additionally passing motorists will only have an intermittent view of the turbines, which could provide a point of interest for visitors of the area.

Ancillary Infrastructure

The Department is satisfied that through the implementation of appropriate landscaping design and rehabilitation measures, it is unlikely that significant visual impacts will result from the project's ancillary infrastructure. Whilst the Proponent has committed to incorporating measures to reduce their visual impact via appropriate design and location, a commitment has also been given to utilising vegetation planting at the location of ancillary works, if required. The Department has reinforced these measures through recommended conditions that require the implementation of appropriate visual treatment, and for any disturbed areas to be rehabilitated to reduce the impact of the project's footprint.

With respect to the transmission line, the Department notes that the internal overhead transmission lines are largely contained within the centre of the wind farm site, which will minimise any visual impact from outside the project area given the distance to surrounding receivers.

The EA states that the external transmission line (for grid connection) is to follow Panuara Road to the west and then head northward through the Cadia Mine, well clear of any uninvolved residences, and largely follow the existing lower voltage distribution line and therefore is an augmentation of the existing line. The PPR also proposes a revised transmission line, with the proposed route of the 132kV transmission line moved further west. The Proponent considers there to be no discernible change on the community's amenity impact from this change, as both the former, and revised section of the transmission line route are contained within the Cadia Mine property boundary, with no nearby residences.

The Department notes that the external transmission line is proposed to pass through 3 private land holders, a small parcel of Crown land and the Cadia Mine. The Department also notes that no agreement has been obtained with any of these landowners, and therefore these landowners (and residences) should be considered as "non-involved" or neighbours with the project.

Whilst these residences are shown as "non-associated residences" within Figure 4.1b of the PPR, the visual assessment provides little assessment of the impact on these residences (and so is assuming that an agreement for the location of the transmission line has been reached with the landowners). The Department therefore considers that further visual impact assessment on these residences and the impact of a transmission line dissecting private property is required. The Department has also been advised by the Proponent that the transmission line does not follow an existing distribution line for any significant distance, and so will most likely be a new, separate power line (and so cannot be considered an augmentation of an existing line as detailed within the EA).

The Department considers that should the Proponent reach an agreement with all landowners for the construction and operation of the transmission line, then it is reasonable to assume that these landowners have accepted the visual amenity impacts associated with this, and any impacts could therefore be considered acceptable within the terms of any agreement. The Department has therefore recommended a condition that the Project Approval does not commence/have effect until the Proponent has demonstrated to the satisfaction of the Director-General, within 12 months from the date of determination, that an

agreement has been obtained with all relevant landowners for the construction and operation of the overhead transmission line (outside of the wind farm project area as defined in the PPR).

The Proponent has also advised that the distance of the transmission line to any additional non involved residence (a non involved residence that does not contain any transmission line infrastructure) is approximately 1.5km (residence #129). The Department considers that this distance provides sufficient buffer to ensure that no unacceptable visual impacts will result from the transmission line infrastructure on this, or any additional neighbouring residences.

With respect to concerns of the visual impact of the substation when viewed from residence 87, the Response to Submissions confirms that due to an intervening hill between this residence and the proposed location of the substation, the substation will not be visible from this residence, and so the visual impact is deemed to be nil. The Department concurs with this conclusion.

Shadow flicker, blade glint and night lighting

Shadow flicker in exceedence of 30 hours per annum is not predicted at any non associated residence. The Department notes that these predictions are based on conservative modelling assumptions for a worst case scenario, which includes the location of the turbine with respect to the sun, excluding any cloud cover. Nevertheless, to further reinforce that this maximum level will not be exceeded, the Department has recommended a condition that shadow flicker from the project must not exceed 30 hours/annum at any residence not associated with the project. The Department also considers that shadow flicker is only a consideration in terms of amenity and possible annoyance (see discussion on health impacts in **Section 5.4**).

The Department further notes that shadow flicker is not expected in excess of 30 hours/annum at residences 26 and 56. However should no agreement be reached with residence number 14, and should turbines 9 and 12 (that are currently recommended to be removed) remain within the project, then there is potential that shadow flicker, based on the maximum tip height of 150m (the shadow flicker assessment in the EA was based on a maximum tip height of 135m, which is not the maximum tip height proposed), could be in excess of 30 hours/annum on residence number 14.

The Department also notes that in excess of 30 hours/annum is predicted at 2 associated residences. Notwithstanding, the Department understands that the owner of these residences would have reached a commercial agreement with the Proponent and expect that any residual amenity impacts at these residences would be accounted for in such agreements.

With respect to potential impacts from blade glint, the Department agrees that this can be effectively managed through the use of appropriate turbine treatments such as the use of a low reflectivity finish. The Department has therefore recommended a condition to this effect, that stipulates the blades shall be finished with a surface treatment that minimises any potential for glare or reflection.

Following detailed design, updated details of the final turbine locations, their elevations and heights will be provided to CASA. Should CASA deem that night lighting is required for aviation safety purposes, then the Proponent will implement this in accordance with any CASA requirements. The Department has further recommended a condition that the Proponent consult with CASA on the need for aviation hazard lighting in relation to the wind turbines, and any aviation hazard lighting shall be implemented in a manner that minimises visual intrusion to surrounding non-associated receivers as far as reasonable and feasible.

5.4. Health Impacts

A number of concerns regarding health impacts of wind turbines were raised in submissions. These concerns were predominantly aimed at the potential for "Wind Turbine Syndrome", and the effects of infrasound, shadow flicker and electric and magnetic fields on humans.

Infrasound

Infrasound is sound that is lower in frequency than 20Hz, and has been raised in many submissions as being a sound frequency emitted by wind turbines that causes adverse health affects or "Wind Turbine Syndrome". The Proponent states that earlier wind turbines were constructed with the blades located downwind of the tower, and the positioning of these blades resulted in a wake (the blades cutting through the turbulence generated around the downside of the tower) that emitted significant levels of sound below 20Hz.

The Proponent further states that modern turbines, and the turbines to be constructed at Flyers Creek, are constructed with the turbine blades in front of the tower which results in insignificant levels of infrasound noise which are well below the level of human perception and therefore would not cause health affects.

Department's Consideration

The Department has consulted with NSW Health regarding potential health impacts resulting from wind farms. NSW Health advised it supports the National Health and Medical Research Council position.

In this respect the National Health and Medical Research Council (NHMRC) conducted a rapid review of the evidence relating to the adverse health impacts caused by the wind turbines and concluded that it supports the statement that "There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines". The NHMRC is also currently conducting a systematic review of the potential health impacts of wind farms and an update of the Public Statement: Wind Farms and Health is anticipated to be completed shortly.

The Planning Assessment Commission, as reported in its Bodangora Wind Farm assessment, also consulted with NSW Health which stated that noise from turbines would only cause disturbance to people who were within 700m of a turbine. No associated, or non associated receivers are within 700m of a turbine.

Further, as discussed in **Section 5.1**, the Victorian Government recently released Fact Sheets on wind farms, sound and health which recognise that many symptoms have been attributed to wind turbines, including "wind turbine syndrome" and that these have been reported in individual studies or non peer-reviewed literature. Based on the evidence reviewed, it did not support claims that inaudible sounds (such as infrasound when at an inaudible level) can have direct physiological effects.

Also as discussed in **Section 5.1**, the noise assessment has determined that the operation of the turbines can comply with the noise criteria and will not emit a significant amount of low frequency noise or infrasound. The Department in considering the Proponent's assessment, statement of commitments and the draft NSW Wind Farm Guidelines has taken a precautionary approach to the issue of potential health impacts from infrasound, noting that the draft NSW Wind Farm Guidelines require compliance with stringent noise limits compared to world standards which represents a very conservative and precautionary approach to mitigating any potential health impacts.

For associated residences, the Proponent has adopted the WHO criteria for sleep disturbance of an outside noise level of 45dB(A), which the Department supports.

Accordingly, the Department considers that the Proponent has adequately assessed the impacts of any infrasound from the project and that no adverse health impacts are expected.

Shadow Flicker

Submissions have noted that shadow flicker can have health implications, particular on young children and people with epilepsy or autism.

The Proponent states in the EA that the turbines that would be used in the Flyers Creek Wind Farm will rotate at between 8 and 18 revolutions per minute. With three blades, this corresponds to a maximum flicker frequency of 1 cycle per second (1 Hz). The Proponent further states that it is uncommon for epileptics to be photosensitive at frequencies less than 5 Hz (The National Society for Epilepsy (UK), 2005), and so therefore considers the risk of shadow flicker inducing seizures, to be insignificant.

Department's Consideration

The Department accepts the findings of the Proponent's assessment, which states the shadow flicker frequency of the wind turbines to be used at Flyers Creek are well below that which could potentially affect people with epilepsy. The Department therefore considers that no adverse health impacts are expected from the project arising from shadow flicker.

Electric and Magnetic Fields

Electric and Magnetic Fields (EMF) are produced by virtually all electrical equipment and occur wherever electricity is being used. The electric field is proportional to the voltage, whilst the magnetic field is proportional to the current. For the wind farm, the main sources of EMFs would be the electrical equipment within the turbine structures, the substation, interconnecting underground cables and overhead transmission lines.

The Proponent's assessment predicts the following contribution to the magnetic field environment:

- the substation's estimated MF contribution at the switch yard fence would be 30milligauss (mg) (<2% of the current international guideline level (ICNIRP) of 2000mg), less than 2mg at a distance of 50m from the substation fence, and nil at the nearest receiver;
- the estimated MF directly under the 132kV line is 76mg (<4% of the ICNIRP guideline level), and drops off quickly as you move away, being 11mg at 20m, 5mg at 30m and 0.5mg at 100m, and nil at the nearest receiver;
- the estimated MF directly under the 33kV line is 40mg (2% of the ICNIRP guideline level) and drops off quickly as you move away, being 5mg at 20m and 0.7mg at 50m, and nil at the nearest receiver; and
- the estimated MF directly above the 33kv cable is 190mg (<10% of the ICNIRP guideline level), and drops off quickly as you move away, being 6mg at 10m and 1mg at 25m, and nil at the nearest receiver.

The Proponent's assessment predicts the following contribution to the electric field environment:

- the substation's estimated EF contribution at the switch yard fence would be 0.1 kv/m or 2% of the relevant health guideline;
- the estimated EF directly under the 132kV line is 1kV/m or 20% of the relevant health guideline; and
- the estimated EF directly under the 33kV line is 0.15kV/m or 3% of the relevant health guideline.

The Proponent also gives an indicative estimation of the MF for a turbine, based on measurements undertaken by an overseas wind energy company, which resulted in 0.4mg at the base of the turbine and 0.04mg 8m from the turbine.

The Proponent concludes that all equipment will be constructed according to industry accepted practices and standards and all EMFs associated with the proposed wind farm will be well within the relevant health standards and in all cases will be localised to areas not frequented by the general public.

Department's Consideration

Assessments of EMF with respect to the potential of any health affects largely focus on magnetic fields (MFs), as electric fields (EFs) have been known to diminish rapidly with distance from a source in addition to being effectively shielded by common building materials and human skin (the Proponent's assessment also indicates that the measured levels, at source, are well within the relevant health guidelines). MFs however are not readily shielded by common building materials and human skin like EFs are, although they also diminish rapidly with distance from the source.

In Australia there is no established health standard for the assessment of MFs, however in 2006 the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) issued a draft guideline for public comment ("Draft Standard on Exposure Limits for Electrical and Magnetic Fields") which proposes a 24 hour exposure limit for MFs to the general public of 1000mG. The ARPANSA draft standard has not to date been finalised.

More recently (in 2010), the International Commission on Non-Ionising Radiation Protection (ICNIRP), an independent international organisation which works in close collaboration with organisations such as the World Health Organisation, published a guideline on EMF – "Guideline for Limiting Exposure to Time-Varying Electric and Magnetic Fields 1Hz-100kHz". This guideline recommends a MF exposure level for the general public unrelated to exposure time of 2000mG. This level has not been adopted in Australia.

Although any adverse effects of MF are yet to be proven, the Department takes the conservative approach and does not rule them out. For the project, the main source of any MF for the general public would be with the transmission lines, which is related to the current (amps) flowing through the line. The field strengths are also dependent on other factors such as the height of the wires above ground, line design and geometry.

The Department is satisfied that the Proponent has demonstrated the principles of prudent avoidance by locating transmission and power lines as far as practical from residences. The Department is also satisfied that as the levels of MF (even for the worst case scenario being directly under/beside the source of MF) are significantly lower than the current international acceptable level for human health (under the ICNIRP levels), impact on human health would not occur. It is also noted the levels produced by the turbines themselves, are extremely low.

5.5. Other Issues

The Proponent has assessed the potential impacts of the project in relation to aviation safety, aboriginal heritage, telecommunications, socio-economic and traffic and transport issues. The Department is of the opinion that in most cases the Proponent has undertaken an adequate assessment of the issues. However, conditions are required to ensure that residual impacts are appropriately mitigated and managed. The Department's consideration of these issues is provided in **Table 10**.

Table 10: other issues

Issue	Department's Consideration
Traffic and Transport	<u>Construction</u> Construction of the project involves the delivery of plant and materials, inclusive of the movement of over size or over-mass vehicles. Some of the project components will be imported from overseas and may pass through

either the Newcastle or Wollongong ports.

The Proponent estimates that for the 18 month construction period, there would be approximately 4,500 one-way vehicle movements related to construction traffic, inclusive of 457 restricted access vehicles (RAV) movements and 1,040 vehicle movements related to the delivery of concrete. In addition there would be approximately 5,000 employee vehicle movements.

Local access to the site is proposed to be via one of the following route options:

- From the North
 - from Millthorpe through Forest Reefs via Cadia Road or Forest Reefs Road via Beneree.
- From the South
 - from Mandurama via the Mid Western Highway to Burnt Yards and Errowanbang; or
 - from Carcoar via the Mid Western Highway to Errowanbang or Beneree.
- From the East
 - from Blayney via Browns Creek Road or from Millthorpe via Carcoar –Tallwood Road.

Access through the site would be via Errowanbang and Gap Roads to Halls Road and Beneree Road and via newly constructed access tracks.

Council raised concerns with the selected routes, however considers that the proposed Restricted Access Vehicle (RAV) route from the Mid Western Highway, along Errowanbang, Gap and Beneree Roads to be the most suitable routes (routes 1 and 2), following upgrades, and requests that access to the site is restricted to these routes only following upgrades.

Whilst the Proponent has indicated the possibility of a number of different routes, the Errowanbang/Gap Road route has been deemed the most suitable as the main access route to the site. The Proponent further acknowledges that this route is the most appropriate route for the majority of construction traffic, however some access will be required via the other routes for the construction of select turbine clusters (i.e. turbines 21-31).

The daily construction movements for the most suitable route detailed above, compared to the daily current vehicle movements are detailed in **Table 10.1**.

Table 10.1: existing and predicted traffic volumes

Road	Est. typical RAV one-way trips/day	Est. typical heavy vehicle one-way trips/day	Est. typical light vehicle one-way trips/day	Current one-way trips/day
Gap Road (#2)	4	12	30	44
Halls Road (#2a)	2	7	17	9
Beneree Road (#2b)	1	3	9	24
Upper Errowanbang Road (#3b)	1	4	10	15

In regards to over-dimensional / over-mass sized vehicles, the Proponent's assessment states that the RAV trips may result in some traffic delays due to the RAV speed and traffic control requirements at intersections, however the additional light vehicle and heavy vehicle movements would have minimal impacts on traffic conditions. The Proponent has also advised of a number of potential upgrades that would be required to the local road network to accommodate the construction

	<p>traffic, and in particular to intersections to assist in the movement of the RAVs.</p> <p>The Department has therefore recommended that prior to the commencement of construction, the Proponent further assess where modifications or improvements to the road(s) are required, and these shall be implemented in consultation with the relevant road authority, at the Proponent's expense.</p> <p>Although the increase in traffic will not have an unacceptable impact on the operation of the traffic system, the Department acknowledges that an increase in vehicle movements, particularly heavy vehicles, has the potential to impact on the safety and operation of the traffic system, the safety of pedestrians and cyclists, and condition of the roads if not managed appropriately. To mitigate potential impacts, the Proponent has included a commitment to consult with the relevant road authorities during the detailed design phase regarding haulage routes and prepare and implement a Traffic and Transport Management Plan. The plan would be inclusive of a community information program to ensure details of the status of the works are available.</p> <p>The Department has also reinforced the Proponent's commitment by recommending a condition of approval requiring the Proponent to prepare and implement a Construction Traffic and Access Management Plan. The Plan is to include details on construction traffic volumes and haulage routes and the management measures that would be implemented to minimise construction traffic-related impacts including traffic control measures, restrictions on haulage routes, responses to construction traffic incidents and procedures for notifying the public in regards to road modifications (e.g. upgrades, detours or part road closures).</p> <p>The Department also acknowledges that the use of local roads by construction traffic could result in damage. As such, the Department has recommended a condition of approval for road dilapidation reports to be prepared and for the Proponent to restore any damage.</p>
Aviation Safety	<p>The proposed turbines are up to 150m tall to the tip of the turbine blades, which may have the potential to impact on aviation safety. Consequently the Proponent undertook an assessment on air safety.</p> <p>The wind farm is located 13km south-west of the Orange Aerodrome. The Obstacle Limitation Surface (OLS) of the aerodrome identifies the lower limits of the aerodrome airspace above which objects are regarded as probable obstacles to aircraft operations. Orange City Council, being the operator of the aerodrome, was notified of the proposed turbine locations and heights, as well as the Civil Aviation Safety Authority (CASA) and Airservices Australia (AA).</p> <p>The OLS of the aerodrome is approximately 6.5km from the nearest turbine. AA has indicated that the location of 6 turbines will affect the non directional beacon approach (NDB-A) procedure, however no other sector or circling altitude, nor any approach or departure procedures for Orange airport are affected. AA has further indicated (appendix H of the Submissions Report) that a re-design of the NDB approach is feasible for the current layout of the proposal. The Proponent has stated in the Submissions Report that it would commission AA to undertake this work should the project receive approval.</p> <p>AA has further indicated that no sector or circling altitude, nor any approach or departure procedures at Bathurst airport are affected.</p> <p>It was concluded therefore by the Proponent that the wind farm would not encroach on the Orange aerodrome OLS (including the OLS of the current</p>

	<p>airport improvement program). The Proponent has also committed to providing final details of the turbine height and location to CASA, AA and the Department of Defence prior to construction of the project, and the 'as constructed' details following completion of the turbine erection.</p> <p>The Department has also recommended a condition which requires the Proponent to provide construction coordinates, heights and ground levels of the base of each turbine to the CASA, AA, Royal Australian Air Force - Aeronautical Information Services, the Aerial Agricultural Association of Australia and rural Fire Service, as well as all known users of privately owned local airfields.</p> <p>With respect to privately owned local airfields, the Proponent has identified five that are currently in use. However, the Proponent states that they are all more than 2.2km from the nearest turbine and will not have landing or approach paths that would be impacted by the proposed project.</p> <p>The Proponent also states that the wind farm is not considered to be a safety hazard to aerial agriculture operations as the structures are readily visible to pilots. Given the turbines are setback from neighbouring properties, it is also considered unlikely that the turbine positions would reduce the areas of neighbouring properties that can be sprayed by aerial methods.</p> <p>The Department is satisfied that the turbines will not pose an unacceptable risk to local air fields or aerial agriculture operations. The Proponent will supply all known users of privately owned aviation operations with construction coordinates and heights of the turbines, which will make them readily identifiable. However, should increases to the costs of aerial spraying on any non-associated property surrounding the site be attributable to the operation of the project, the Department has recommended a condition requiring the Proponent to fully fund the cost difference between the current aerial spraying and the increased cost to affected landowners.</p>
Bushfire	<p>With respect to bushfire risk, the Department is satisfied that this risk has been adequately addressed in the Proponent's EA and Statement of Commitments. The Proponent has also provided a number of mitigation measures which include the preparation of a Bushfire Risk Sub Management Plan in consultation with the Rural Fire Service as part of the Construction and Operation Environment Management Plans.</p> <p>In addition, a condition of approval has been recommended requiring the Proponent to provide for asset protection consistent with relevant Rural Fire Service guidelines and provide for necessary emergency management such as the provision of sufficient water storage for fire fighting purposes.</p> <p>The Department's notes that the RFS did not raise any particular concerns about wind farm impacts on aerial bush fire fighting.</p>
Aboriginal Heritage	<p>The Department notes that there were no agency objections to the wind farm on Aboriginal Heritage grounds.</p> <p>Seven Aboriginal archaeological sites were located within the Project area, comprising four artefact scatters and three isolated finds. In addition two Potential Archaeological Deposits (PADs) were identified (refer to Table 10.2).</p> <p>The artefact scatters and isolated finds were considered to have low or low to moderate archaeological potential. The two PADs were considered to have high archaeological significance due to their rarity and possible</p>

research potential to provide new information.

The Proponent indicated in its assessment that consultation was undertaken in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment & Community Consultation 2005* (DEC, July 2005).

FCWF-PAD-01 was considered to be an area of high potential as the artefact scatter FCWF-S-01 was also located in direct association and within the bounds of this PAD, and it is within a suitably sheltered area, has good drainage and is located near watercourses on raised but level ground.

Table 10.2: Aboriginal site locations

No.	Site Name	Potential for new information	Representativeness	Rarity	Research Potential
1	FCWF-S-01	Low	Low	Low to moderate	Low
2	FCWF-S-02	Low	Low	Low	Low
3	FCWF-IF-01	Low	Low	Low	Low
4	FCWF-S-03	Low	Low	Low	Low
5	FCWF-IF-02	Low	Low	Low	Low
6	FCWF-S-04	Low	Low	Low to moderate	Low
7	FCWF-IF-03	Low	Low	Low	Low
8	FCWF-PAD-01	High	Low	High	High
9	FCWF-PAD-02	High	Low	High	High

FCWF-PAD-02 was also considered to represent an area of high potential as it is within a suitably sheltered area, has good drainage and is located near Slattery's creek on raised ground. Although no artefacts were found in direct association, FCWF-S-04 and FCWF-IF-03 were nearby which indicates a history of Aboriginal land use within the immediate vicinity. Each Pad was considered to display the potential to produce rare and distinctive information concerning human movement in the past landscape.

The Proponent has further identified that there would be a low to moderate potential for Aboriginal archaeological finds (artefact scatters and scarred trees) within the revised transmission line route, which could be confirmed via an additional Aboriginal and cultural heritage assessment prior to construction, which would also recommend appropriate strategies to avoid harm to any identified sites. The Department notes this commitment, however considers this needs to be further re-enforced by recommending a detailed Aboriginal archaeological and cultural survey within the revised transmission line route be undertaken to the satisfaction of the Director-General prior to commencement of the project approval.

The Proponent has included a number of commitments relating to the management of the identified Aboriginal sites. This includes slightly modifying the wind farm infrastructure to avoid the two identified PAD's. Temporary fencing of the PAD's will also occur during construction. The layout of cables and tracks will also be slightly modified to avoid the surface artefacts FCWF-S-01 to 04 and FCWF-IF-01 to 03. The Proponent has also committed to developing and implementing a care and control artefacts strategy in consultation with Aboriginal stakeholders, for the known artefacts and a process if unrecorded Aboriginal artefacts are discovered. The Department considers this is a satisfactory approach and has reinforced these commitments through recommended conditions of approval.

The Department therefore considers that the Proponent's commitments in regards to the management of Aboriginal sites in conjunction with the recommended conditions of approval would ensure that the project would

	not significantly impact on Aboriginal cultural heritage.
Telecommunications	<p>The Proponent's assessment concluded that it is unlikely that the Central Tablelands FM Services radiated from Mt Canobolas will be affected by the proposed wind farm, and similarly the wind farm effects on MF and FM radio are considered unlikely.</p> <p>No significant impacts to cellular, two-way mobile or CB radio coverage are expected as a result of the operation of the wind farm. The Proponent has however committed to ensuring that prior to construction the final turbine layout is re-considered in terms of potential impact on fixed path radio links and the communications facility at Hope Hill.</p> <p>No impact to the operation of aviation radar is expected due to the adequate separation of the turbine locations.</p> <p>There is some probability of noticeable ghosting at times of analogue TV reception within 3km of a turbine, should antennas have turbines located within an +/- 20 degrees angle of reception direction. However, analogue television signal transmission is scheduled to end well before the wind farm would be operational.</p> <p>Impacts to satellite pay television are only anticipated to occur if the antenna reception direction and elevation is closely aligned with a turbine, which is considered unlikely.</p> <p>Following commissioning of the Project however the Proponent has committed to investigating the status of television reception at residences immediately surrounding the wind farm and rectifying any interference that is a result of the Project via potential measures such as replacing aerials or installing a digital set top box.</p> <p>The Department is generally satisfied these matters have been addressed in the Proponent's EA and Submissions Report and / or Statement of Commitments. Notwithstanding, the Department has recommended conditions of approval that require the Proponent to consult with the NSW Government Telecommunications Authority, and to undertake a pre-commissioning assessment of the existing quality of the television/radio transmission available at a representative sample of receivers located within 5 kilometres of any wind turbine. In the event of a complaint from a receptor located within 5 kilometres of a wind turbine regarding television/radio transmission during the operation of the project, the Proponent shall investigate the quality of transmission at the receptor compared with the pre-commissioning assessment and where any transmission problems can be reasonably attributable to the project, rectify the problems within three months of the receipt of the complaint.</p>
Socio-Economic / Land Use	<p><i>Community Enhancement Fund</i></p> <p>In its submission, the Blayney Shire Council sought development contributions totalling \$220,000 per annum to contribute towards a sponsorship of a Community Environmental Program; an Economic Development Employee; Community Grants and Facilities funding and a Community Education Grant Fund.</p> <p>In this respect the Proponent advised the Department on 30 August 2013, that it is in negotiations with Council with regards to a Voluntary Planning Agreement covering such items as a community fund and a road maintenance fund.</p> <p>The Department also notes that the necessary infrastructure support for the construction of this project, such as road upgrades, will be provided by the Proponent. In addition it is noted that infrastructure development of this</p>

	<p>type is unlikely to place any significant demands on Council services particularly with a maximum workforce of only 5 people employed during operation.</p> <p><i>Property Impacts</i></p> <p>The Proponent's assessment states that the issue of decreased property values was raised by concerned residents during the assessment of the Crookwell and Blayney wind farm projects. Following completion of these wind farms however, the outcome of a number of property sales has diminished the view that property prices would be affected by the construction of the turbines. The Department also acknowledges that, in relation to impacts on land values, the NSW Valuer-General commissioned a report on the impacts of wind farms on land values in Australia. The report states as its principal finding, based on analysis of previous studies and its own investigations, that the majority of wind farms erected in Australia appear to have had no quantifiable effect on land values.</p> <p><i>Agricultural Land Use</i></p> <p>The project site is located on properties that are predominately used for cattle and sheep grazing. The project site occupies an area of 6,082 hectares, and the wind farm components will comprise approximately 32 hectares or 0.5% of the site. Given the relatively small footprint of the project components, the Department considers that the project will not have a significant impact on the existing agricultural activities of the site. The project will also provide an additional source or income for the landowners.</p> <p><i>Minerals Resources Land Use</i></p> <p>Three mining exploration licences exist over the project site (under the ownership of two companies), with one of these companies expressing concern regarding the extraction of minerals underneath the wind farm, should a viable resource be discovered. The Department of Trade and Investment has also raised concern with the potential impact of the project on mineral exploration and potential future mining.</p> <p>The Proponent advises that the maps identifying the prospective areas were utilised in the design of the wind farm, with only 1 turbine existing within a highly prospective area. The owner of the exploration licence for this area has not raised any concerns with the turbine's location.</p> <p>The Department acknowledges there could be some impact on future mining exploration during the construction and operation of the wind farm. The wind farm however would not preclude exploration from occurring within the project site, only in proximity to the turbines and associated electrical infrastructure. In this respect mineral exploration drilling over the majority of the site can still occur, as well as electromagnetic surveying. The wind farm will also be decommissioned following the completion of its working life (around 20 years), therefore ensuring the land beneath, and in proximity to, infrastructure will not be sterilised in the long term.</p> <p>Nevertheless, the Department has recommended conditions that require the Proponent to consult with the Department of Trade & Investment, Regional Infrastructure & Services (Mineral Resources section), and any other licence holders with respect to measures to be applied during construction and operation of the project so as to minimise the potential for any sterilisation of resources.</p>
Cumulative Impacts	<p>Approximately 8km to the north-west of the Proposal is the Cadia mine (from turbine to open pit) and approximately 8km to the south-east of the Proposal is the Blayney wind farm.</p>

	<p>As detailed in the Submissions Report by the Proponent, the Cadia Mine has different noise and visual characteristics than the proposed wind farm. The Proponent states that compliance testing for the mine is only valid at wind speeds less than 3m/s at 10 metres, at which time the turbines, at most, will be operating at low power and result in low noise levels, and minimal cumulative impact. There is also limited visibility of the Cadia mine site, which may result in only the tailing dams or rock piles being visible in the same viewfield as a turbine.</p> <p>The Proponent also notes that any cumulative acoustic impacts of the Blayney wind farm and proposal would only be relevant if residences were located within 3km of turbines from both projects, which is not the case, and so no cumulative noise impact is anticipated. The cumulative visual impact is also considered to be insignificant by the Proponent given the 8km distance between the 2 wind farms.</p> <p>The Department notes that both the Cadia mine and Blayney wind farm are required to meet their applicable noise criteria, and given the distance between these activities and the proposal, unacceptable cumulative noise impacts are not expected.</p> <p>With regard to cumulative visual impact of the proposal, it is not expected that the Project will contribute significantly to additional impacts on the landscape. The Department's proposed condition, that at the request of any owners of non-associated dwellings with views of a turbine(s) located within 5km of their dwellings, to be provided with reasonable landscaping treatments to visually screen these dwellings, will assist in mitigating any cumulative impact.</p>
Consultation	<p>Concerns were raised in public submissions that the level and extent of community consultation from the Proponent was inadequate.</p> <p>In this respect the Department issued Supplementary Director-General's Requirements in August 2011 requiring a comprehensive, detailed and genuine community consultation and engagement process to be undertaken for the project.</p> <p>The Department is satisfied that these matters have been adequately addressed in the Proponent's Submissions Report.</p>
Decommissioning	<p>An issue of concern raised in submissions was how wind farm infrastructure removal and land restoration could be guaranteed, once the wind farm reached the end of its operational life.</p> <p>In the Submissions Report, the Proponent provided a Decommissioning and Rehabilitation Plan which details timeframes and mechanisms for the dismantling and removal of the wind farm infrastructure.</p> <p>In order to ensure appropriate decommissioning of the wind farm is undertaken by the Proponent, the Department has recommended a suite of requirements regarding decommissioning of the Project, including that:</p> <ul style="list-style-type: none"> the Proponent shall provide written evidence that the lease agreements with the site landowners have adequate provisions to require that decommissioning occurs in accordance with this Approval, and is the responsibility of the Proponent; the Proponent shall update the Decommissioning and Rehabilitation Plan, including funding arrangements, including provision for a decommissioning bond or other funding mechanisms, every five years, and provide a copy to the Director-General and Council; within 18 months of the cessation of operation of the Project, the site shall be decommissioned by the Proponent; the Proponent shall prepare a Road Dilapidation Report; and

	<ul style="list-style-type: none">the Proponent shall prepare and implement a Decommissioning Environmental Management Plan.
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6. RECOMMENDATION

The Department has undertaken a detailed assessment of the proposed Flyers Creek Wind Farm, having regard to the Proponent's EA, Submissions Report/Preferred Project Report and Statement of Commitments. In assessing the Project, the Department has also considered the views of local and State authorities and the public as raised in their submissions during exhibition of the EA.

Based on this assessment, the Department considers the key environmental issues associated with the project to be noise, biodiversity, health and visual impacts. The Department sought independent expert advice in relation to the noise impact assessment and considers the project, subject to recommended conditions, can be designed and operated to achieve acceptable operational noise outcomes at nearby receivers, both associated and non-associated. The Department further considers that impacts on fauna and their habitat can also be adequately mitigated and/or managed and that no adverse health impacts are expected.

To minimise potential impacts which may arise with respect to these issues, the Department has recommended stringent conditions of approval which require not only mitigation measures to be implemented, but also places strict limits on operational noise.

The Department has also recommended that impacts on biodiversity values be offset through the implementation of a Biodiversity Offset Package and the Department has recommended that the construction and operational management plans for the project address the management measures that would be implemented in respect to each of the issues.

The Department also undertook the preparation of a photomontage from a single residence to assist with its assessment of visual impacts. The Department has recommended the removal of turbines 9 and 12 as a result of the unacceptable impact they would have on visual amenity from the property known as "Willow Park".

Overall though the Department considers that the surrounding non associated residences would not experience unacceptable visual impacts from the proposal and that the removal of any additional turbines would result in little material benefit to the views from these residences.

Given that there has been objections from some of the associated landowners, the Department has also recommended a condition the Project Approval can only take effect if the Proponent has demonstrated to the satisfaction of the Director-General that an agreement (following the date of the determination) has been obtained with these landowners in relation to the construction and operation of infrastructure associated with the project on their property. In addition to this, as an objection has been lodged by a landowner within the route of the external transmission line, as part of this condition, the Proponent must also demonstrate to the satisfaction of the Director-General that an agreement has been obtained with all landowners for the construction and operation of the overhead transmission line external to the project area.


Although some residual impacts may result from the remaining turbines and associated infrastructure, the Department considers that on balance the Project is justified in terms of helping to meet the energy requirements of the State as well as addressing any future electricity demand shortfall without the production of additional greenhouse gases and therefore approval of the project is in the public interest.

Overall the Department is satisfied that with the implementation of the Proponent's proposed mitigation measures and the measures outlined in the recommended conditions of approval,

the potential impacts would be appropriately mitigated and/or managed to an acceptable level of environmental performance.

The Department considers the Project to be justified and in the public interest and the Department therefore recommends that the Planning Assessment Commission consider the findings and recommendations of this report and determine to approve the Project, subject to the recommended conditions.


Karen Jones 25/11/13
A/Director
Infrastructure Projects

 25.11.13
Chris Wilson
Executive Director
Development Assessment Systems & Approvals

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2644

APPENDIX B SUBMISSIONS

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2644

APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2644

APPENDIX D NOISE IMPACT ASSESSMENT REVIEW

APPENDIX E NOISE IMPACT ASSESSMENT REVIEW RESPONSE

APPENDIX F PHOTOMONTAGE FROM “WILLOW PARK”



APPENDIX G POLITICAL DONATION DISCLOSURES

See the Department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2644

APPENDIX H RECOMMENDED CONDITIONS OF APPROVAL
