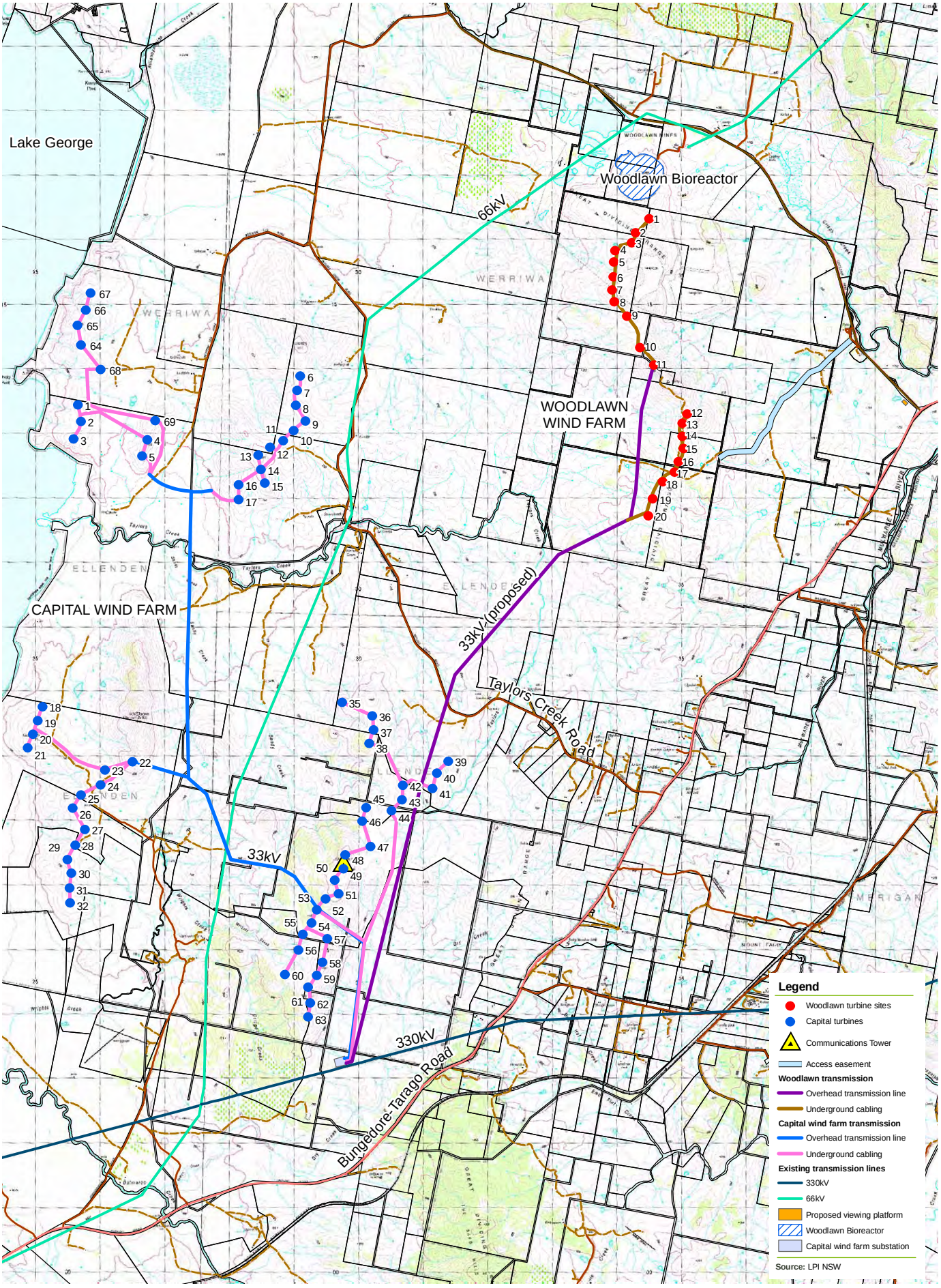


U:\GIS\Project-2\project\Woodlawn Wind Farm\wlwf_capitalhil_project site.mxd\20636\21-12-09\KADIRev 2

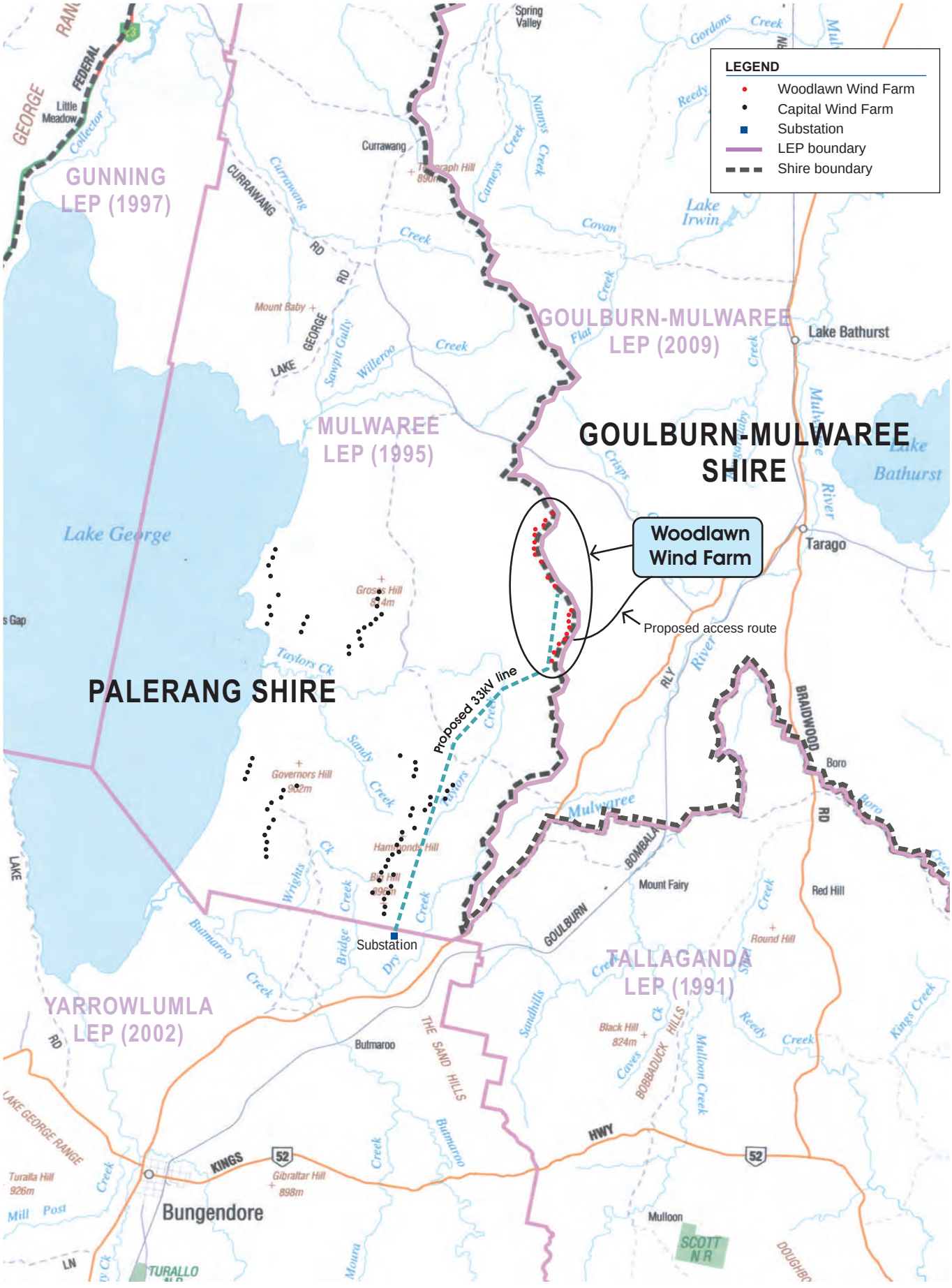
SCALE 1:80,000 @ A4

0 1.5 3 km

Projection: MGA

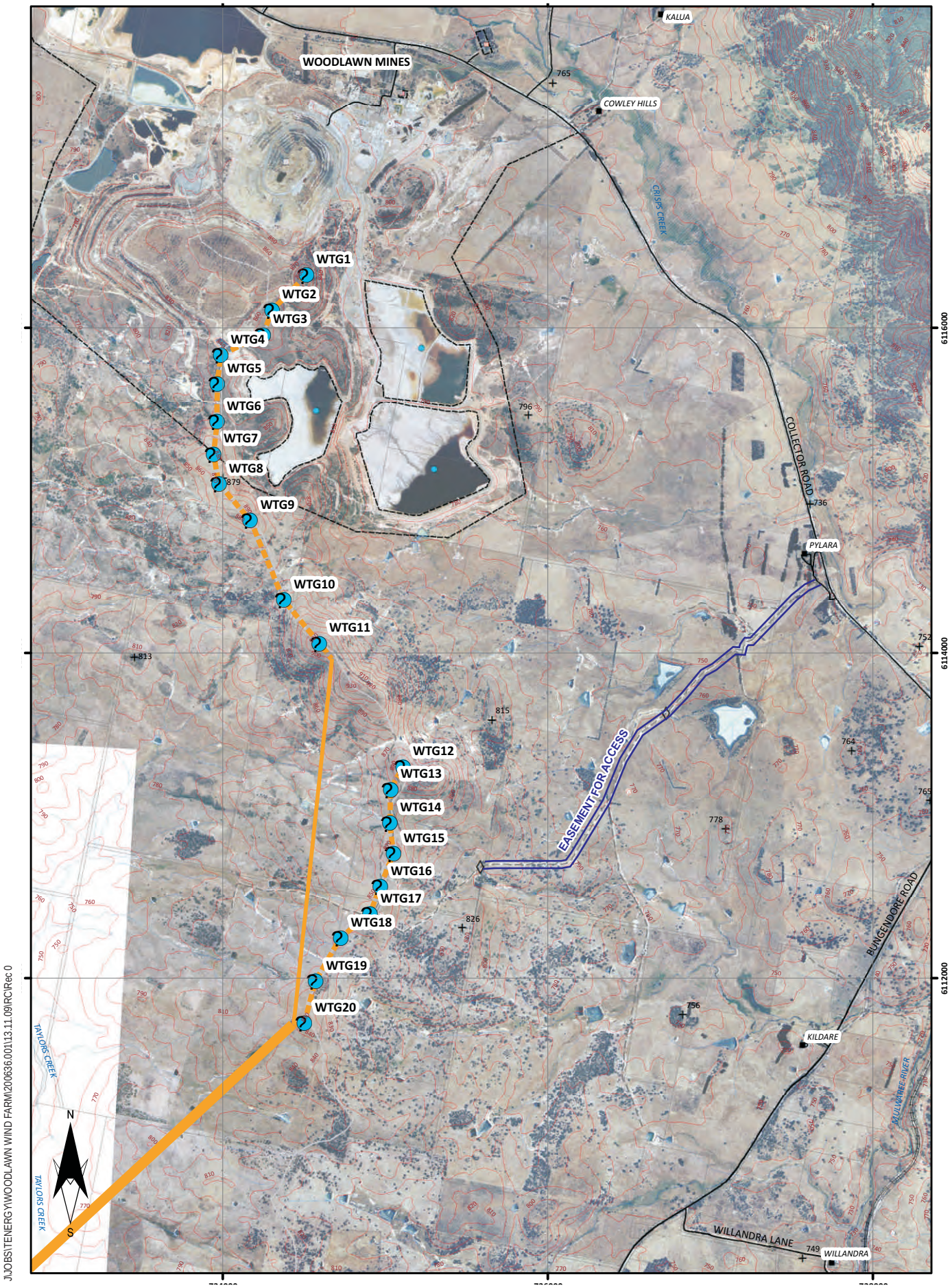
Woodlawn Wind Farm **Statement of Environmental Effects**

FIGURE 1.3: Project Site Plan



J:\JOBS\TENERG\Y\WOODLAWN WIND FARM\200636.001\13.11.09\RC\Rec 0

Figure 1.4: Boundaries of Local Government Areas



SCALE

0 500m 1km

Woodlawn Wind Farm **Statement of Environmental Effects**

Figure 1.5: Aerial view of Wind Farm site

1.4 Other developments at the general locality

Other existing or potential developments within the area surrounding the project site include the Woodlawn Bioreactor, former Woodlawn mine site and possible future mining activities and the recently constructed Capital Wind Farm. These projects are briefly described below.

1.4.1 Capital Wind Farm

Capital Wind Farm located to the south-west of Woodlawn Wind Farm site was granted project approval under Part 3A of the EP&A Act in 2006. Construction commenced in early 2008 and all 67 turbines, the substation and the electrical collections system have been constructed. The wind farm is currently being commissioned and will provide a total generation capacity of 140 MW. The Capital Wind Farm includes a 33 kV/330 kV substation located to the south-east of the wind farm (Figure 1.3).

1.4.2 Woodlawn Eco-Precinct

The Woodlawn "Eco-precinct" is an area of about 6,000 hectares consisting of the Woodlawn and Pylara properties. The area includes the former Woodlawn Mine site where copper and zinc were extracted from ore recovered from open cut and underground mine workings. Landforms and structures left after mining include a mine void, a revegetated out of pit spoil pile, tailings dams, evaporation ponds, other disused mining infrastructure and the former mine office block. As part of the rehabilitation of this former mine site, municipal waste is being deposited in the mine void by the landowner, Veolia Environmental Services. Putrescible waste from Sydney is placed in containers and transported by rail to the Crisps Creek Intermodal facility south of Tarago where the containers are transferred to trucks and delivered to the mine site.

At the mine site the waste is unloaded from the containers into the mine void. As the waste builds up it is progressively capped to retain and direct methane gas that can be used to generate electricity. The waste to energy system is referred to as the Woodlawn Bioreactor and has been in operation since 2005. Utilisation of the methane released from the waste to create electricity has dual benefits. It prevents some 90% of methane from the waste becoming a greenhouse gas and the energy produced avoids the use of fossil fuels for the production of an equivalent amount of electricity generation.

In November 2007, Veolia was granted approval for the development of a 240,000 t/year waste processing and resource recovery operation and the 40,000 t/year green waste facility which forms part of the Eco-precinct. Resources recovered from municipal and commercial waste include recyclables like scrap metal and plastic and organic material (Umwelt, 2006). This facility occupies approximately 20 hectares and is located 1.2 kilometres north-west of the Woodlawn Bioreactor that is shown on Figure 2.1.

1.4.3 Woodlawn Special Mining Lease (SML 20)

In late 2006, Tri Origin reached agreement with Veolia Environmental Services and the administrators of Denehurst Ltd, the mine's previous operator, for the transfer of mining lease SML 20 to Tri Origin prior to or upon completion of a feasibility study.

The Company believes that the Woodlawn Mining Lease has the potential to sustain a long-life, profitable mining and processing operation, producing a range of base and precious metals. Tri Origin is taking a long-term view of the region and is indicated to have a controlling interest in over 60 kilometres of strike length of prospective Silurian rocks within a major zinc province in the Woodlawn District.

It is understood that future mining may involve reworking material in the tailings dams as well as some underground mining. The underground mining is indicated to be away from the area of the proposed wind farm.

1.5 Project participants and stakeholders

Woodlawn Wind Pty Ltd acquired the development rights for the project in 2009 including access rights for the land on which the project will be developed. Woodlawn Wind Pty Ltd has been established to carry out the construction and operation of the Woodlawn Wind Farm and is 100% owned by Infigen Energy. Woodlawn Wind Pty Ltd is the sole proponent for the amended Woodlawn Wind Farm project.

The 2005 development consent was in the name of Woodlawn WindEnergy Joint Venture, a company comprising ActewAGL, Collex Pty Ltd, EHN (Oceania) Pty Ltd and ANZ Infrastructure Services. The parent companies for the Joint Venture have now divested their interest in the project and have no ongoing role in the project.

The following sections provide details of:

- Infigen Energy's business profile and role in the development of Australian wind energy projects.
- other organisations having a role in project definition or regulation

1.5.1 Infigen Energy

Infigen Energy is a renewable power generation development company whose principal function is to develop and operate commercially viable renewable energy projects. In carrying out this function, Infigen Energy plans its projects to ensure that they:

- operate efficiently and safely
- comply with statutory environmental requirements
- sensitively consider the concerns of the local and indigenous communities.

Infigen Energy is currently involved with a large number of Australian wind farm projects including those shown in Table 1.2.

Table 1.2 – Proponent's other Australian wind farm projects

Name of wind farm project	State where wind farm is located	Number of turbines	Total generation capacity (MW)	Status of development
Alinta	Western Australia	54	89	Operating
Lake Bonney 1	South Australia	46	80	Operating
Lake Bonney 2	South Australia	53	159	Operating
Lake Bonney 3	South Australia	13	39	Constructed
Capital	NSW	67	140	Commissioning
Glen Innes	NSW	26	78	Approved
Flyers Creek	NSW	40	100	Planning
Walkaway II	Western Australia	195	400	Approved
Woakwine	South Australia	200	500	Planning
Total		**694**	**1,585**	

Full implementation of the projects in the Table above together with the Woodlawn Wind Farm would result in the installation of over 1,720 MW of wind energy generation capacity and substantial capacity for Australian greenhouse gas abatement.

1.5.2 Other project participants

The planning, construction and operation of the wind farm involves a range of stakeholders in various roles. Key participants either involved directly or in an indirect role will include:

- Woodlawn Wind Pty Ltd as the proponent will arrange the construction and operation of the wind farm
- The wind turbine generator supplier and the balance of plant contractor(s) will be required to undertake the construction work in accordance with the Construction Environmental Management Plan (CEMP) and their performance will be subject to regular review by the Environmental Representative to ensure that the project construction and operation is undertaken in accordance with the Development Consent.
- Landowners of properties where the project is located will lease their land to Woodlawn Wind Pty Ltd. There are four landowners who will lease their lands to the proponent for construction and operation of the project.
- TransGrid is the owner and operator of the main electricity transmission network in NSW and is the owner and operator of the existing Kangaroo Valley to Canberra 330 kV transmission line and the 330 kV switchyard, which is a part of the Capital Wind Farm substation. The Woodlawn Wind Farm will be connected to the TransGrid 330 kV switchyard.
- The Minister for Planning is the consent authority for the project including the transmission line route and is supported by the NSW Department of Planning.
- Palerang and Goulburn-Mulwaree Councils have responsibility for the local public roads that are used to access parts of the site. The Councils are also the Appropriate Regulatory Authorities (ARA) under the Protection of the Environment Operations Act for non-scheduled premises.
- The NSW Land and Property Management Authority is the custodian of the Sally Trig Station and the associated Trig Reserve that is wholly enclosed by the lands leased for the project.
- The output of the wind farm will be sold in the National Electricity Market (NEM). The Electricity Grid connects NSW, Queensland, Victoria, South Australia and Tasmania which is connected via Basslink.
- Woodlawn Wind Farm will have the potential to create Renewable Energy Certificates (RECs) under the expanded renewable energy target scheme. These RECs may be purchased by electricity retailers to meet their commitments under the Expanded Renewable Energy Target Scheme (ERET).

Aurecon has been engaged by Woodlawn Wind Pty Ltd to undertake elements of the SEE and to prepare this SEE to support an application by Woodlawn Wind Pty Ltd for modification of the development consent for Woodlawn Wind Farm.

1.6 Context for wind energy developments and the amended project

The rate of wind energy development has grown rapidly over the last decade on a global and national scale. Its growth is a result of worldwide recognition of the need to integrate renewable energy projects into electricity generation systems and the established position of wind energy as a technically proven and commercially available form of renewable energy that can deliver large scale generation of electricity with manageable integration in existing electricity supply systems. It's well developed technology and demonstrated track record of deployment supports its ongoing role in future development of electricity supply networks.

The need for renewable energy projects of the scale of the Woodlawn Wind Farm project has been confirmed and reinforced since the 2004 EIS was prepared with the Federal Government legislating for an ERET. The ERET scheme extends the life of the previous Mandatory Renewable Energy Target

(MRET) scheme and also significantly increases the total generation target to be supported by the scheme.

The 2004 EIS for the approved 25 turbine Woodlawn Wind Farm Project provided information on wind energy developments, the alternatives considered when selecting the turbine locations and emission reductions in a global, national and state context. While the installed generating capacity of the amended wind farm has decreased marginally from the approved 50 MW to the currently proposed 42 MW project, the amended design is regarded as a more practicable and feasible form for implementation when considering site characteristics, property matters, other activities at the locality and transmission infrastructure requirements. The amended project has a greater annual power output than the approved project. Reasons for the key changes to the project are addressed in the following sections.

1.6.1 Consideration of feasible alternatives

In formulating the variations to the Woodlawn Wind Farm project, Woodlawn Wind Pty Ltd recognises the broad government and community support for development of renewable energy projects, but is also aware of the need to ensure that wind farm developments are appropriately planned and fully consider the environmental and social issues associated with their development. This SEE outlines the proponent's proposed measures to mitigate potential environmental impacts of the amended project.

The following sections review aspects considered by Woodlawn Wind Pty Ltd in the planning of the project to be implemented including variation to the turbine design and associated access and electrical reticulation infrastructure.

1.6.2 Design options considered

The layout of the conceptual design and the associated grid connection presented in the 2004 EIS has been reviewed by Woodlawn Wind Pty Ltd in the context of its project objectives and constraints. Consideration of the design options was undertaken in the context of environmental, social and commercial impacts for the proponent and stakeholders.

The variations proposed for the Woodlawn Wind Farm are described in Chapter 3. Key variables considered as part of the wind farm formulation have included:

- number, type and size of turbines to be considered, including hub height and turbine diameter, and distance between each turbine
- use of an external wind generator transformer based on the turbine model selected
- site access arrangements including slope and grade for access tracks and area required for turbine placement
- interconnection arrangements for the proposed turbines
- variations to transmission line arrangement and location of connection to the grid
- construction methods

These variables are discussed in more detail below.

1.6.3 Wind farm layout

The site's wind energy resource distribution largely determines the suitability of individual turbine sites and wind analysis software is used to optimise the layout for the site. The optimised layout is then reviewed in terms of practicality and important site constraints such as ease of access, tree cover and potential impact on neighbours.

Detailed examination of the wind energy characteristics was undertaken during the review of the approved layout. As a result, Woodlawn Wind Pty Ltd has confirmed the suitability of the ridgeline for positioning of wind turbines. However, practical considerations such as constraints of terrain,

telecommunications paths and survey activities have meant that the total number of turbines has been reduced and in some places the distance between some turbines has increased.

All turbine sites are still within the extent of the approved array that was assessed in the 2004 EIS and most of the amended turbine sites are very close to the originally proposed sites. Within the area of the approved array, four turbine sites are located between 100 and 250 metres from the former turbine sites. The amended array is able to provide a greater power output to the approved array.

Given the maintenance of the approved turbine array envelope, the lesser number of turbines to be installed, the relatively minor variations in most turbine site locations together with the extent of the previous assessments and avoidance of identified sensitive areas it is considered reasonable that the proposed variations can be implemented without significant additional environmental impact.

Changes are also proposed to the approved grid connection and these are discussed in Section 1.6.7.

1.6.4 Turbine selection

Development Consent was granted for 25 Vestas V80 wind turbines each of 2 MW capacity wind turbines with 19 turbines having a hub height of 60 m and 6 turbines having a hub height of 78 metres. The rotors would have three 40 metres blades and rotor diameter of 80 metres.

Woodlawn Wind Pty Ltd is now proposing to install 20 Suzlon S88 2.1 MW wind turbines, the same turbines currently installed and operational at Capital Wind Farm. All 20 turbines will have a hub height of 80 metres and 44 metres blades (88 metres rotor diameter). The increased hub height and rotor diameter allows greater wind farm output to the 25 turbine array, with only 20 turbines.

1.6.5 Site access

The approved wind farm layout included access to the project site from Collector Road with entry points at Pylara Farm and the Woodlawn Bioreactor. Woodlawn Wind Pty Ltd is now proposing to use only Pylara Farm as a site access point. Access via the Woodlawn Bioreactor site would be beneficial for access to the northern part of the wind farm but would only be used if agreement of Veolia was obtained.

The site entry point for the wind farm will need to be designed in consultation with Goulburn Mulwaree Council and will be required to have adequate site distances and clearances for large vehicles to enter and exit the site.

The on-site access routes have been selected for suitable grades, to provide adequate curvature on bends and to avoid areas of sensitive native vegetation, fauna habitat or archaeological sensitivity. Details of the site access routes are provided in Chapter 10.

1.6.6 Electrical collection system

The electrical interconnection between the turbine sites will be via 33 kV underground cables. The use of underground cables between turbines is favoured due to the elevated locations of the turbines and visual impact considerations. Two circuits are proposed, one for the northern half of the wind farm and a second for the southern half. The design of the trenches will remain similar to that for the approved project with routes varying slightly based on the amended positioning of the turbines. Aspects of ground disturbance and avoidance of environmentally sensitive areas as indicated by the 2004 EIS will be taken into account in preparing the Construction Environmental Management Plan (CEMP).

1.6.7 Grid connection

The existing development consent allows for a 22 kV/66 kV substation at the Woodlawn Wind Farm site and a three kilometre section of 66 kV overhead line to connect to the existing 66 kV Goulburn to Queanbeyan line that passes to the northwest of the wind farm site. The review of planning for the Woodlawn Wind Farm has indicated that the existing 66 kV line may be near capacity and is also

expected to receive an increased output over time from the Woodlawn Bioreactor. As such the proponent has considered alternative connection arrangements including connection via the existing Capital Wind Farm substation.

The amended proposal has excluded a substation at the Woodlawn Wind Farm site and instead involves use of 12 kilometres of 33 kV double circuit overhead transmission line to connect to the existing Capital Wind Farm substation. Grid connection by this means requires the addition of a new 33 kV/330 kV transformer and associated 33 kV equipment within the existing Capital Wind Farm substation area. The Capital Wind Farm substation has been designed with space for augmentation and no significant additional earthworks are required at that location. The noise assessment in relation to project variations has also considered the installation of an additional 33 kV/330 kV transformer at the substation.

The proposed 33 kV overhead transmission line will pass through a number of properties that are already leased for the Capital Wind Farm project and an additional property between the Capital and Woodland Wind Farm sites. The owner of the intervening property 'Nardoo' also has an existing interest in the Capital Wind Farm through the lease of land for a number of turbine sites. Additional flora and fauna and heritage assessments have been undertaken to investigate the possible impacts of the new transmission line route (Chapters 8 and 9). A review of visual impact and other aspects is also included in Chapter 6 of this SEE.

1.6.8 Construction alternatives

The methods of construction and wind farm component delivery options described in the 2004 Woodlawn Wind Farm EIS are expected to remain essentially unchanged. Minor differences are noted in Chapters 3 and 10.

The approved access tracks were described in the 2004 EIS. Although the routes will remain relatively unchanged, it has been proposed that the width of the access tracks be increased from 6 to 10 metres to accommodate the temporary use of large cranes for erection of the towers, nacelles and rotors. Once constructed most of the tracks are able to be reduced in width however some may be retained at full width for practical access arrangements over the project life.

1.6.9 Greenhouse gas emission savings

Wind farms produce electricity from a renewable energy source and without combustion of fossil fuel resources that are becoming subject to increased demand pressures. These characteristics means that they have potential to reduce the greenhouse gas intensity of electricity generation where they displace generation sourced from fossil fuels.

The approved Woodlawn Wind Farm project was estimated to have potential net greenhouse gas emissions savings of up to 126,840 tonnes of greenhouse gas emissions per year and up to 3.2 million tonnes over 25 years. The emissions savings are estimated in respect of electricity that would be otherwise produced by the NSW 'pool' of generators comprising mostly fossil fuels.

The proposed variations would result in a reduction in overall installed capacity of the wind farm from 50 MW to 42 MW but changes to dimensions of the turbines means the amended project will have a greater annual power output than the approved project. The wind farm's power output has been used to determine the overall greenhouse gas emission savings for the project. Based on the relevant considerations, the savings will be in the order of 146,000 tonnes of greenhouse gas emissions each year and up to 3.65 million tonnes over 25 years. This would be equivalent to providing the electricity needs for around 29,000 standard households using renewable energy in place of fossil fuel sources.

1.7 Outline of planning requirements and purpose of this document

The Woodlawn Wind Farm project obtained Development Consent from the NSW Minister for Planning under Part 4 of the EP&A Act in 2005. The project was considered a "State Significant Development", an Integrated Development, under Section 91 and a Designated Development under Clause 18(1)(c) of Schedule 3. The EP&A Act includes provision for modifications to be made to a Development Consent in accordance with Section 96 of the Act.

Director-General's requirements (DGRs) relevant to the proposed variations and matters to be addressed for the preparation of the SEE were issued on 10 July 2009 (Appendix A). These DGRs are considered fully in this SEE.

This SEE focuses on the proposed variations to the original project description and implications for changes to environmental impacts relative to the original Development Application and as reported in the 2004 EIS prepared by URS. It addresses the DGRs as relevant to the proposed variations. The SEE has also evaluated and updated the associated mitigation measures to address the proposed variations. This is considered to assist the Department of Planning to undertake a review of the key matters arising from the project changes and the need for any additional conditions to be considered in respect of its determination of the application for a modified consent.

In summary, the purpose of this document is to:

- satisfy the assessment requirements under the EP&A Act in respect of the proposed variations
- describe the proposed variations relative to the approved project
- examine the potential environmental impacts associated with the proposed variations
- describe measures to mitigate the impacts of the amended project and which will form part of the project implementation.

Further details on the planning context for the project are provided in Chapter 4 of this SEE.

1.7.1 Application for modification of approval

The lodging of the application for modification of the Development Consent initiates a process whereby the Department of Planning in conjunction with relevant government agencies reviews the application and associated supporting information for adequacy prior to formal acceptance of the SEE.

Once the Department is satisfied with the material provided, the application is registered and the SEE can be, if required, placed on public exhibition and comments sought from interested stakeholders. The relevant government agencies may also provide comment to the Department and may make recommendations for potential conditions associated with a modified Development Consent.

As integrated development, specific responses will be required from:

- Department of Environment, Climate Change and Water (DECCW) under the following Acts
  - National Parks and Wildlife (NPW) Act 1974
  - Water Management Act 2000
  - Heritage Act 1977
- NSW Department of Primary Industries
  - Mine Subsidence Compensation Act 1961
  - Mining Act 1992
- Goulburn Mulwaree Council under the Roads Act 1993

1.8 Contributors to the SEE process

The organisations involved in the process for assessment of impacts and the preparation of this SEE are shown in Table 1.3.

Table 1.3 – Contributors to the SEE preparation process

Project component / Role	Organisation
Project management and initial project engineering	Woodlawn Wind Pty Ltd and Suzlon Energy Australia
Detailed design	Turbine supplier
SEE preparation and selected environmental impact studies other than those listed below	Aurecon
Flora & Fauna Assessment for the 33 kV overhead line	Kevin Mills & Associates (2009)
Aboriginal Cultural Heritage (33 kV overhead line)	Austral Archaeology (2009) Pejar Local Aboriginal Land Council, Buru Ngunawal Aboriginal Corporation
Noise Assessment	Vipac Engineers and Scientists (October 2009)
Telecommunications Interference	Lawrence Derrick & Associates (November 2009)
Trig Station Review	Land and Property Management Authority in respect of Sally TS
Community Consultation	Woodlawn Wind Pty Ltd
Transmission Connection	Woodlawn Wind Pty Ltd, TransGrid, turbine supplier and Aurecon
Aircraft Safety Lighting	CASA
Sydney Outer Catchment Management	Sydney Catchment Authority
Goulburn Mulwaree Council	Work activities within Goulburn Mulwaree Shire
Palerang Council	Work activities within Palerang Shire

1.9 Structure and content of this SEE

The content of this SEE draws on material presented in the September 2004 EIS (Volumes 1 & 2) prepared by URS and the revised report assessing the former transmission line options also prepared by URS (February 2005).

This SEE also addresses the Director-Generals' Requirements dated 10 July 2009 (Appendix A).

To address the project variations and the assessment requirements, specialist practitioners have reviewed the previous studies and changes to the proposed activities and have provided revised assessments where required. These reports form part of the appendices to the SEE, while the main body of the SEE provides a summary of the assessments, including the potential impacts and any recommendations for their mitigation.

This SEE aims to concisely describe the previously approved wind farm and the proposed variations to the project so that its revised form can be clearly understood by the regulators and the general public while providing supporting studies for those that require more detail.

The structure of the SEE is intended to assist the reader to gauge the potential impacts of the proposal as amended. Specific key environmental issues for project variations are addressed in the following format:

- Introduction to the issues in relation to the wind energy proposal
- Description of assessment methodology
- Existing character of the environment
- Potential impacts relative to the issue
- Measures proposed to mitigate the impacts
- Conclusion

Table 1.4 – Structure and content of the SEE

Chapter	Description
2	Outlines details of the lands leased by Woodlawn Wind Pty Ltd for the amended project
3	Provides a detailed description of the project activities and stages and an outline of the proposed management of those activities
4	Outlines the planning context of the amended development and consultation undertaken
5 to 14	Provide a review of environmental issues relevant to the proposed variations. It sets out the existing environment, potential environmental impacts and proposed mitigation measures
15	Provides the updated compilation of mitigation measures to be incorporated in the amended project and suggestions for modifications to consent conditions
16	Describes the justification of the amended project
17	References
Appendix	**Description**
A	Director Generals' Requirements in relation to the project variations
B	Key consultation correspondence
C	Planning context
D	Noise impact assessment
E	Flora and fauna assessment
F	Aboriginal and non- Aboriginal heritage
G	Telecommunications

1.10 Contact details for further information

The contact details for Woodlawn Wind Pty Ltd and the Department of Planning are as follows.

Persons with enquiries regarding the modification application and the review process or wishing to make a submission regarding the project may contact the proponent or the Department of Planning as follows.

	Woodlawn Wind Pty Ltd	Department of Planning
Contact	Mr David Griffin	Major Infrastructure Assessment
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