



Collector Wind Farm

Preliminary Environmental Assessment

12 January 2011



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1. Introduction

1.1. Background

APP Corporation Pty Ltd has prepared this Preliminary Environmental Assessment (PEA) for the NSW Department of Planning (DoP) to provide preliminary details of a wind farm proposal near Collector, NSW in the Upper Lachlan Shire local government area. This PEA has been prepared to support a Project Application lodged by Transfield Services for the proposed Collector Wind Farm.

The purpose of the document is to provide a description of the proposed wind farm, along with a preliminary review of the potential environmental issues associated with the development. This will assist DoP's Director-General in developing the requirements for the environmental assessment to be prepared in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This document includes the following information:

- An overview of the project site;
- A description of the wind farm proposal;
- A summary of the planning context and approvals process;
- An outline of the key environmental issues associated with the wind farm development; and
- The proposed stakeholder and community engagement approach.

1.2. Applicant Details

The proponent of the Collector Wind Farm is Transfield Services Pty Ltd. Transfield Services is a leading international provider of operations, maintenance, asset management and project management services. It operates in Australia, New Zealand, the United States, the United Arab Emirates, Qatar, South East Asia, India and Canada across diverse industries, including mining and process, hydrocarbons, roads, rail and public transport, water, power, telecommunications, facilities management and defence.

Transfield Services owns three operating wind farms (Starfish Hill, SA; Toora, VIC; and Windy Hill, QLD) and has a development portfolio of 11 projects with the potential to produce approximately 1,000 megawatts of wind energy.



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2. Project Description

2.1. Project Site

The Collector Wind Farm site (Figure 1) - located 55km north-east of Canberra and 35km south-west of Goulburn – lies within the NSW Government's NSW/ACT Border Region Renewable Energy Precinct. Situated on the Great Dividing Range, the 3,300ha site is bounded by the Hume Highway to the north, Collector Road to the west and south, and Collector Creek to the east. Lake George lies 8km to the south of the site and the Cullerin Wind Farm is situated immediately to the north.

The site elevation ranges between 750m and 900m Australian Height Datum (AHD) and the topography is characterised by a series of broad north-south trending ridges. The eastern extent is formed by a steep escarpment rising from Collector Creek, which marks the northern extent of the Lake George Range. A number of ephemeral creeks drain the site to Collector Creek in the east (Lake George catchment), and Lerida and Cullerin Creeks in the west (Lachlan River catchment).

The escarpment has been grazed, with secondary vegetation cover still present, while the remainder of the ridge consists of cleared grazing land with scattered trees. Further west the site comprises undulating, cleared grazing land, covered mostly in native pasture.

2.2. Landowners

The wind farm site is privately-owned by seven separate landholders. Table 1 provides a schedule of land titles that would potentially host wind farm infrastructure. The broader wind farm investigation area is shown on Figure 2.

2.3. Wind Farm Design

The proposed wind farm is expected to have a total generating capacity of approximately 160 megawatts (MW), comprising 60-80 wind turbine generators (WTG). Figure 2 shows an indicative wind turbine layout. The ultimate layout of the wind farm and number of turbines would respond to a number of variables including the wind resource, proximity to residences, environmental conditions and constructability. The following sections provide a brief overview of the various components of the wind farm.

Monitoring Masts

There are currently two wind monitoring masts installed on-site; both 65m in height and of a cable-stayed lattice structure. These towers were established in 2003 and 2004 to capture the necessary wind data set to allow project planning to progress. Three permanent wind monitoring masts would be installed for the operational phase to allow performance monitoring of the WTG output. The permanent masts would extend to turbine hub height; that is 80-90m above ground level.



Table 1 Real Property Description

Lot	DP	Lot	DP
7002	94461	159	750031
7003	94490	160	750031
7004	94490	161	750031
1	119192	168	750031
2	126022	181	750031
1	126023	182	750031
1	126027	191	750031
1	126038	196	750031
2	126038	197	750031
3	126038	198	750031
1	126056	201	750031
1	126060	203	750031
9	133758	206	750031
10	133758	207	750031
1	191728	208	750031
2	304983	210	750031
M	400627	215	750031
O	403201	221	750031
C	403577	222	750031
D	403577	223	750031
E	403669	225	750031
F	403669	37	754110
H	403670	145	754110
J	403670	146	754110
K	404449	147	754110
L	404449	3	754127
G	404619	10	754127
5	439996	15	754127
221	652223	19	754127
23	735248	20	754127
15	750008	23	754127
18	750008	24	754127
40	750008	26	754127
41	750008	28	754127
43	750008	29	754127
44	750008	30	754127
50	750008	31	754127
51	750008	32	754127
53	750008	33	754127
54	750008	34	754127
55	750008	35	754127
77	750008	36	754127
81	750008	37	754127
83	750008	38	754127
84	750008	39	754127



Lot	DP	Lot	DP
85	750008	41	754127
86	750008	42	754127
87	750008	43	754127
88	750008	44	754127
89	750008	46	754127
90	750008	47	754127
91	750008	48	754127
92	750008	52	754127
93	750008	53	754127
94	750008	54	754127
95	750008	55	754127
96	750008	56	754127
97	750008	57	754127
118	750008	58	754127
127	750008	59	754127
129	750008	65	754127
188	750008	66	754127
106	750031	76	754127
107	750031	77	754127
108	750031	107	754127
109	750031	120	754127
110	750031	122	754127
111	750031	131	754127
112	750031	140	754127
113	750031	146	754127
114	750031	156	754127
115	750031	1	878685
158	750031		

Access Roads

On-site access roads would connect each WTG site and provide off-site access. Where possible existing farm tracks would be utilised; however it is likely that these tracks would require upgrading to handle the construction loads. Where existing tracks are not available, access routes would be chosen based on engineering requirements, optimal access for construction and operation, and avoidance of native vegetation.

For the construction phase, access tracks would be up to 10m wide to allow access for larger equipment (eg. mobile cranes). Operational phase access requires a 4m formed width.

Hardstands and Foundations

At each WTG site a hardstand approximately 1,000 square metres in size would be established. The hardstand is required for crane operations during the erection of the towers and WTG components. The hardstands would be maintained throughout the operational phase to permit scheduled maintenance activities.



Each WTG tower would be erected on a concrete and steel footing. Footings would be of either a gravity or rock-anchor type, depending on the prevailing geotechnical conditions. Gravity footings are essentially reinforced concrete slabs - embedded to approximately 2.5m depth below the ground surface – supporting the WTG tower by gravitational mass. This type of footing is a standard type for wind turbines and requires a substantial quantity of concrete and reinforcing steel. The alternative rock-anchor footing utilises a series of tensioned steel cables (or tendons) installed into competent rock to a depth of approximately 20m below ground. The benefit of this type of footing is the much smaller quantity of concrete and reinforcing steel required; however the condition of the founding rock needs to be suitable to allow its use.

Preliminary geotechnical investigations would be undertaken at the concept design stage to determine the likely foundation type.

Wind Turbine Generators (WTG)

The WTG model to be used at the wind farm has not been determined and this decision would be taken following a tender process. The capacity of the chosen model would determine the number of WTGs within the wind farm. The general characteristics of each WTG would include:

- three-bladed design with a blade length of between 45 and 60 metres;
- turbine capacity between 2 and 3 MW;
- 80-90m cylindrical steel towers; and
- total height (to blade tip) of 125-150m.

Electrical Works

Site electrical works would comprise the following:

- A medium voltage transformer situated either within the wind turbine or at the base of each tower to convert WTG electricity to 33 kilovolts (kV).
- Underground 33 kV electrical cabling and control cables linking each WTG to the substation and control room, respectively. Cable routes would, as far as possible, parallel the internal access roads to avoid unnecessary vegetation clearance and ground disturbance.
- Wind farm substation, comprising transformers and switchgear, to step-up the voltage from 33 kV to 330 kV allowing grid connection.

2.4. Grid Connection and Transmission Line

The proposed grid connection would be into either of the two TransGrid 330 kV transmission lines traversing the north of the site as shown on Figure 2. The wind farm substation would be sited in close proximity to the transmission line, limiting the length of overhead transmission line required to connect to the main line.



2.5. Wind Farm Construction

The following table outlines the main phases of the wind farm construction program, which has a duration of approximately 24 months.

Detailed Design and Contracting	<ul style="list-style-type: none"> • Contracting arrangements • Final project design • Preparation of Environmental Management Plan
Pre-construction	<ul style="list-style-type: none"> • Detailed geotechnical investigations • Access arrangements – road upgrades, fencing works etc. • Site survey and pegging of infrastructure locations • Construction of works compound and concrete batch plant
Access Tracks, Hardstands and Cabling	<ul style="list-style-type: none"> • Construction of internal access tracks to turbine sites • Excavation and compaction of crane hardstands • Trenching and cable laying
Footings and Foundations	<ul style="list-style-type: none"> • Excavation and preparation of foundations • Footing construction according to geotechnical conditions
Substation Civil and Electrical Works	<ul style="list-style-type: none"> • Site survey, clearing and levelling, foundations and fencing • Erection and fit-out of control buildings • Installation of transformers, busbars, earthing system etc.
Turbine Erection	<ul style="list-style-type: none"> • Delivery of tower and turbine components (tower sections, turbine blades, generator/nacelle) • Tower erection and nacelle installation • Rotor assembly and installation • Electrical connections
Wind Farm and Substation Commissioning	<ul style="list-style-type: none"> • Turbine testing and commissioning • Testing and commissioning transformers, cables, switchgear, SCADA, communications, earthing
Grid Connection	<ul style="list-style-type: none"> • High voltage connections and commissioning • System energisation and turbine connection

Aside from the wind farm infrastructure footprint (access tracks, hardstands, turbine sites, substation), a works compound and concrete batch plant would need to be established for the construction phase.



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3. Planning Context

3.1. Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regulates actions that may impact on matters of national environmental significance including:

- World Heritage properties and National Heritage places;
- Wetlands of international importance;
- Listed threatened species and communities;
- Listed migratory species; and
- Commonwealth Marine Areas.

The proposed wind farm falls within the definition of “action” under section 523 of the Act. An action that is likely to have a significant impact on a matter of national environmental significance may not be undertaken without prior approval from the Commonwealth Minister for Environment Protection, Heritage and the Arts under Part 9 of the Act. Developments that are likely to have significant impacts are deemed “controlled actions” and would be subject to the assessment and approval processes under the Act. The mechanism for determining if the project is a controlled action is a referral to the Minister.

Civil Aviation Safety Regulations

The *Civil Aviation Safety Regulations 1998* require that the Civil Aviation Safety Authority (CASA) must be informed of proposals to build a structure that extends more than 110 metres above Australian Height Datum. This is required to allow assessment of whether the structure may represent a hazard to aircraft, and whether there is a requirement for obstacle lighting. CASA would be consulted regarding the need for obstacle lighting at Collector.

3.2. State Legislation

State Environmental Planning Policy (Major Development)

The Major Development SEPP has a number of aims including:

- (a) to identify development to which Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) applies; and
- (b) to identify development that is critical infrastructure under Part 3A of the EP&A Act.

Schedule 1, clause 24 of the SEPP refers to electricity generation developments with a capital investment value of more than \$30 million as being major projects. Given that the proposed wind farm’s capital value exceeds \$30 million, the proponent wrote to the Department of Planning on 12 February 2010 seeking an opinion on the application of the EP&A Act. In a letter dated 15 February 2010, the Minister for Planning’s delegate expressed an opinion that the Major Development SEPP is applicable and hence the project is to be assessed under Part 3A of the EP&A Act.



Environmental Planning and Assessment Act

By virtue of the Major Development SEPP, the project will be assessed in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Specifically, section 75F specifies the environmental assessment requirements for the proposed development. This document has been prepared to accompany a major project application to the Department of Planning. Following receipt of the application it is anticipated that the Department will determine if a Planning Focus Meeting will be required and subsequently issue the Director-General's Requirements for the environmental assessment.

Furthermore, in accordance with the Minister for Planning's declaration (dated 11 November 2009), renewable energy projects with a generation capacity of at least 30 megawatts (MW) are considered "critical infrastructure". Critical infrastructure projects – defined under section 75C of the EP&A Act – are developments considered essential to the State of NSW for economic, social and/or environmental reasons. As the proposed capacity of the wind farm is in excess of 30 MW, the critical infrastructure provisions of the EP&A Act would apply.

State Environmental Planning Policy (Infrastructure)

The Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across NSW. Clause 34 of the SEPP permits development for the purposes of electricity generation on land in a prescribed zone with consent. Prescribed zones under the SEPP include the RU2 Rural Landscape land use zone (see section 3.3).

3.3. Local Environmental Plans

The wind farm site is located within the Upper Lachlan Shire local government area (LGA). Under the *Upper Lachlan Local Environmental Plan 2010* the site is zoned RU2 Rural Landscape, which permits "*electricity generating works*" with development consent. However, as the project falls under the Major Development SEPP, the consent authority is the NSW Minister for Planning rather than Council.

Upper Lachlan Shire Council has established a development control plan (DCP) for wind farm developments, which contains a series of planning and environmental controls for these projects. As the proposed wind farm has been classified as a major project and will be assessed under Part 3A of the EP&A Act, the DCP does not apply. Nevertheless, the environmental assessment will examine the consistency of the proposal with the relevant matters in the DCP.



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4. Environmental Assessment

A range of environmental issues will need to be assessed as part of the wind farm approval process. The key environmental interactions likely to arise from the development are discussed below.

4.1. Visual Impact

The proposed wind farm is located in an elevated position in the landscape and hence would be visible from various locations in the surrounding area. APP has prepared a preliminary landscape assessment of the wind farm site in accordance with guidance provided in *Wind Farms and Landscape Values: National Assessment Framework* (2007). This assessment noted that the wind farm site is a highly modified agricultural landscape and therefore is considered unexceptional. The assessment concluded that there would be limited visual impact on nearby regional or state significant features such as Gundaroo Township, Roses Lagoon and Wet Lagoon.

A full landscape and visual impact assessment will be prepared as part of the environmental assessment in accordance with the Director-General's assessment requirements. This will include mapping of the zone of visual influence, preparation of photomontages and assessment of the visual impact of the proposal (including shadow flicker, blade glint and aviation obstacle lighting if applicable). The assessment will also consider the cumulative visual impacts associated with other nearby wind farms.

4.2. Noise Impact

A noise assessment is currently being undertaken by Marshall Day and Associates to predict noise levels at nearby residences from the construction and operation phases of the wind farm. The assessment - prepared in accordance with the *Wind Farms - Environmental Noise Guidelines* (SA EPA, 2003), *Interim Construction Noise Guideline* (DECCW, 2009) and *Environmental Criteria for Road Traffic Noise* (NSW EPA, 1999) - will predict noise levels from the construction and operation phases at nearby residences.

It is noted that Transfield Services has adopted as a key wind farm design principle a minimum 1km buffer between WTG sites and non-involved residences. Furthermore, it is anticipated that only five non-involved residences would be within 2km of the nearest turbine.

4.3. Flora and Fauna

NGH Environmental undertook a biodiversity assessment of the wind farm site, involving site surveys over the 2009-2010 spring/summer period with follow-up surveys in November 2010. The purpose of the assessment was to identify potentially significant ecological issues on site and assess the level of risk to flora and fauna posed by the development and operation of the wind farm.

The main ecological constraints identified included the presence of listed NSW Endangered Ecological Communities (EEC) and a Commonwealth Critically Endangered Ecological Community (CEEC) including:



- Box Gum Woodland (EEC, CEEC);
- Tablelands Basalt Forest (EEC); and
- Tablelands Frost Hollow Grassy Woodlands (EEC).

In addition, a number of threatened and migratory fauna species were identified with the potential to be impacted by the proposal including: Little Eagle, Spotter Harrier, Square-tailed Kite, Brown Treecreeper, Diamond Firetail, Varied Sittella, White-fronted Chat, Gang-gang Cockatoo, Superb Parrot, Powerful Owl, Eastern Bentwing Bat, Yellow-bellied Sheath-tail Bat, Large-footed Myotis, East Coast Freetail-bat, Greater Broad-nosed Bat and White-bellied Sea-eagle.

The environmental assessment will include an assessment of the potential for the wind farm to cause impacts on these ecological communities and species and their habitats.

4.4. Aboriginal and European Heritage

A desktop heritage assessment undertaken in 2004 by Biosis concluded that there is a significant risk of encountering Aboriginal archaeological sites during the wind farm construction. The ridgeline landforms - where the majority of wind farm infrastructure would be sited - were identified as being archaeologically sensitive. European heritage impacts were considered to be a low risk.

A detailed archaeological assessment - including consultation with the Pejar, Onerwal and Ngunnawal Aboriginal communities - will be undertaken as part of the environmental assessment. The assessment will include field surveys and, if required, sub-surface archaeological investigations focussing on wind farm infrastructure sites.

4.5. Aviation Safety

The nearest commercial aerodromes to the wind farm site are Goulburn (33km east) and Canberra (46km south). In addition, there are a number of private airstrips in the vicinity. A preliminary aeronautical impact assessment undertaken in 2004 concluded that the wind farm should not adversely affect aircraft operations to and from these facilities.

The Civil Aviation Safety Authority (CASA) previously provided guidance for obstacle lighting of wind farms via Advisory Circular AC 139-18(0) *Obstacle Marking and Lighting of Wind Farms*. This circular, which required obstacle lighting for WTGs extending more than 110m above ground level, has now been withdrawn pending a CASA risk review. Recent correspondence with CASA suggests that an increased height limit of 150m may be adopted. While the total height of the WTGs expected to be used at Collector would be up to 150m, CASA has suggested that a prudent approach would involve, as a minimum, sufficient obstacle lights to define the boundary of the wind farm.

A contemporary aeronautical risk assessment will be prepared as part of the environmental assessment, including consultation with CASA, Department of Defence, Airservices Australia,



the Aerial Agricultural Association of Australia (AAAA) and owners of private airstrips in the local area.

4.6. Telecommunications Interference

Parsons Brinckerhoff (2010) undertook an electromagnetic interference assessment which identified the locations of telecommunications paths within the wind farm envelope. The potential for interference from the wind farm is considered to be low, with the wind turbine layout able to be designed to avoid these paths.

4.7. Traffic and Transport

The transport of materials and equipment to the site during the construction phase would involve a temporary increase in the local traffic volume and the transport of oversize loads. The environmental assessment will include a review of the suitability of existing roads to be used to access the site, any potential impacts on road safety and local traffic movements and the potential for traffic noise impacts.

4.8. General Environmental Risks

The environmental assessment will include an environmental risk analysis to identify any further potential environmental risks associated with the project. Where potential significant environmental impacts are identified these will be subject to detailed impact assessment.



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5. Stakeholder Engagement

The proposed Collector Wind Farm has a number of stakeholders including Commonwealth and State government departments and agencies, local councils, landowners and the local community. A Stakeholder Engagement Strategy has been prepared to ensure that consistent, accurate and timely information is provided to all stakeholders throughout the development approval process.

5.1. Government Stakeholders

Stakeholders will be engaged at all three levels of Government including:

- Upper Lachlan Shire Council;
- Department of Planning;
- Department of Environment, Climate Change and Water;
- Roads and Traffic Authority;
- Transgrid;
- Rural Fire Service;
- Civil Aviation Safety Authority; and
- Department of Environment, Water, Heritage and the Arts.

Communications with some of these agencies have already commenced, with the remainder to be engaged following submission of the Major Project Application to the Department of Planning. In addition, formal contact will be made with local elected representatives.

5.2. Community Consultation

Transfield Services' Collector Wind Farm community consultation approach is founded on the following five principles:

- Early and inclusive engagement;
- Open and transparent consultation;
- Timely and responsive feedback;
- Maximising community benefits; and
- Conflict resolution.

Initial consultation activities will include:

- a newsletter mail-out to all residents within 5km of the project site providing basic information on the project;
- contacting local community groups to offer project briefings; and
- a Community Open House forum to introduce the project and allow for community input to the environmental assessment and wind farm design process.

Information on the project will also be available on Transfield Services wind farm website – windfarms.net.au.

The community will also have an opportunity to comment on the environmental assessment in accordance with the statutory provisions under Part 3A of the EP&A Act.



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6. Conclusion

Transfield Services is investigating the feasibility of developing a wind farm near Collector, NSW. This Preliminary Environmental Assessment (PEA) provides an overview of the potential environmental impacts associated with the project, together with a summary of the environmental investigations proposed.

This PEA, which accompanies a Major Project Application, is designed to inform the Department of Planning and other government agencies about the project, so that environmental assessment requirements may be developed. It is expected that the Department of Planning Director-General's Requirements will be issued in response to the application informing the scope of an environmental assessment under Part 3A of the *Environmental Planning and Assessment Act 1979*.

Transfield Services anticipates that the Collector Wind Farm project would make a substantial contribution to the Federal Government's renewable energy target, while providing benefits to the local community at minimal environmental cost.



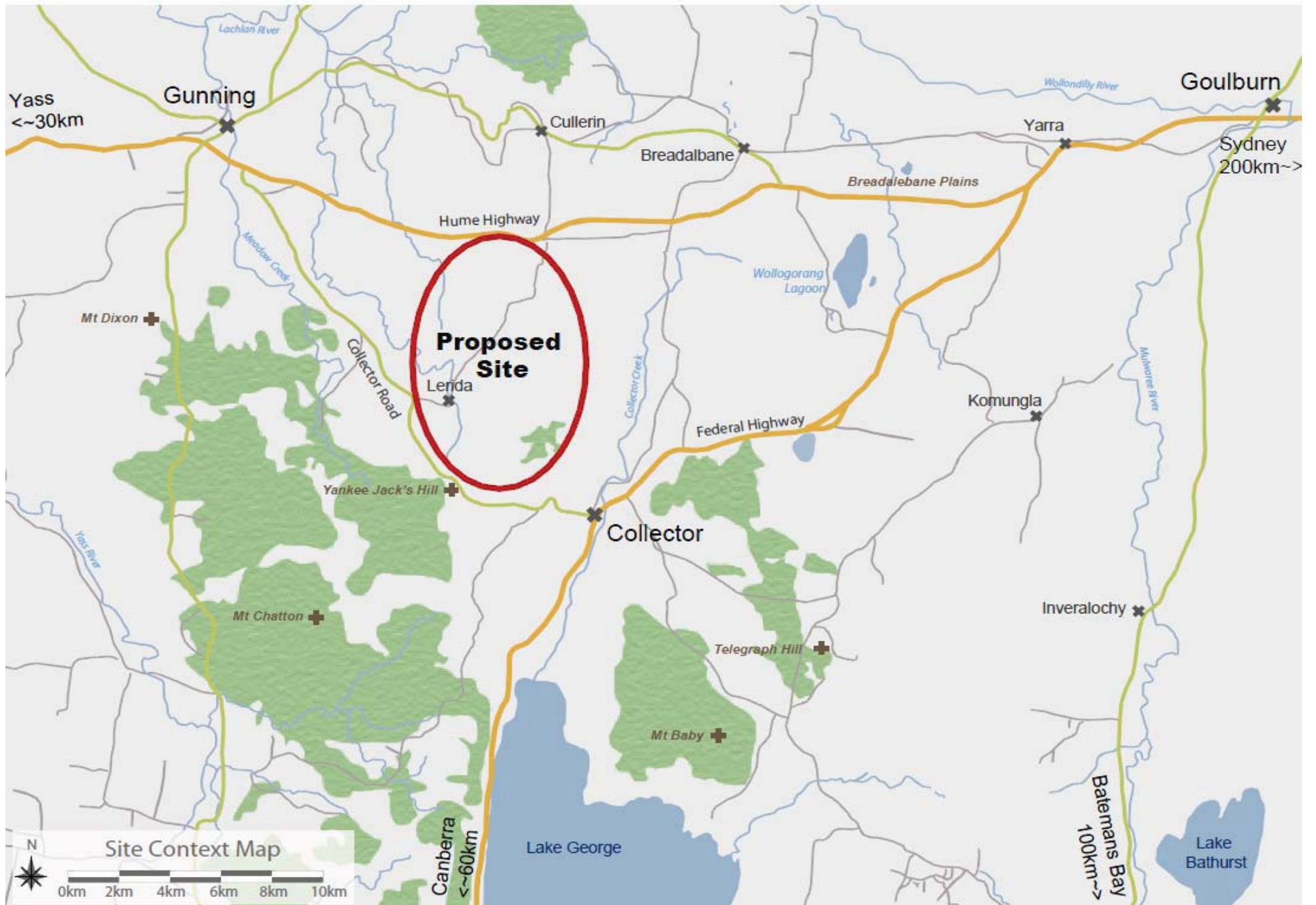
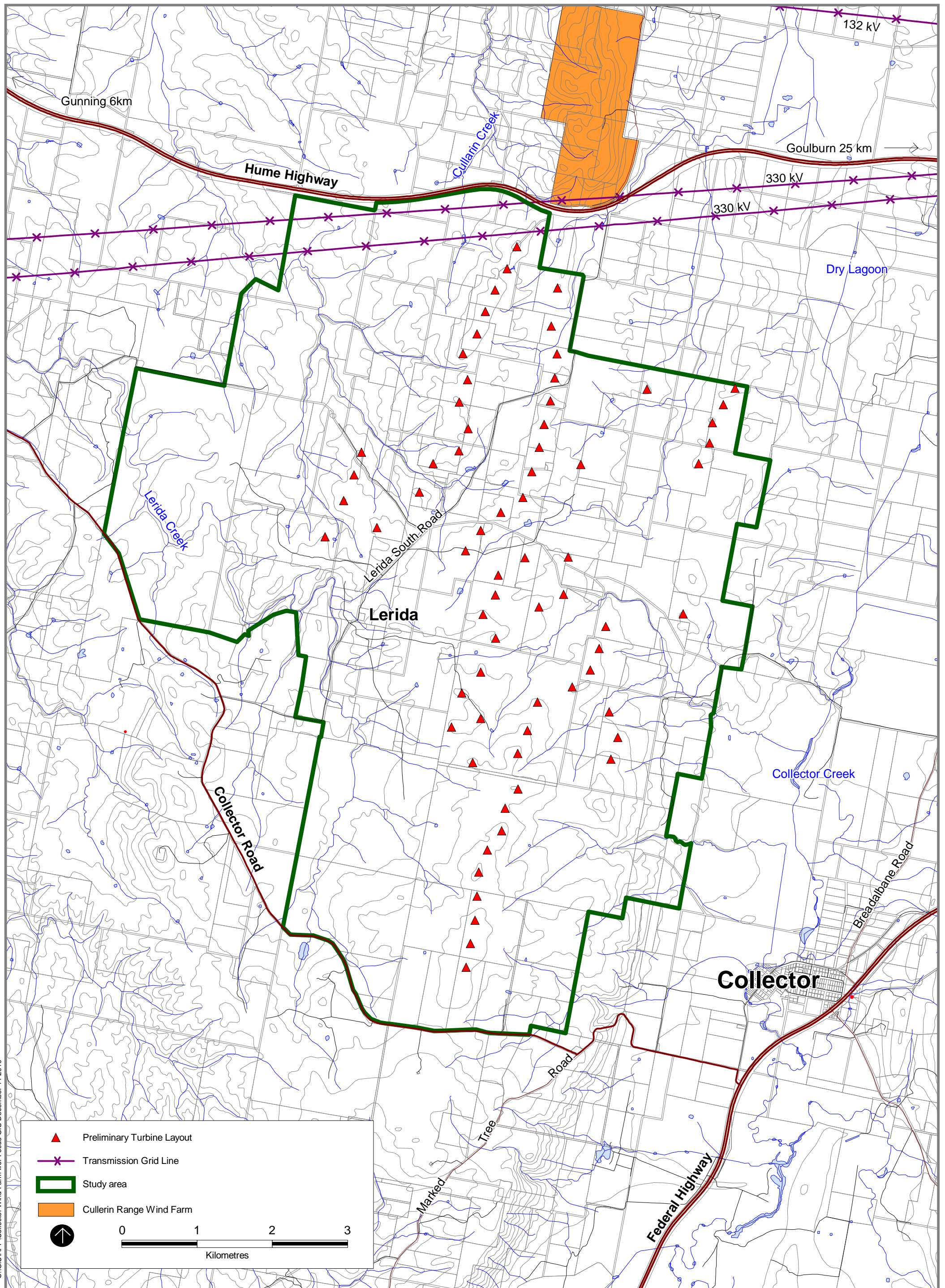


Figure 1 Collector Wind Farm Location



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Figure 2 Preliminary Wind Farm Layout