

Rye Park *Wind Farm*

Response to Submissions

12 May 2016

Application No SSD 6693



EPURON

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1 EXECUTIVE SUMMARY

The proposed Rye Park Wind Farm consists of up to 109 wind turbines and associated infrastructure. The wind farm project is located to the north of Yass and south east of Boorowa in New South Wales. The site is approximately 250 km south west of Sydney. The Proponent for the Project is Rye Park Renewable Energy Pty Ltd, a wholly owned subsidiary of Trustpower Australia (New Zealand) Limited, an Australian renewable energy company.

An application for project approval for the Rye Park Wind Farm under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) was lodged with the Department of Planning and Environment (DPE) in January 2011. An Environmental Assessment (EA) report was prepared and placed on public exhibition from 2 May 2014 until 4 July 2014. 132 submissions were received in response to the exhibition of the Environmental Assessment of the wind farm.

The purpose of this Response to Submissions Report is to:

- describe the changes made to the Project layout since the public exhibition of the EA; and
- provide an updated environmental assessment for the project, taking into account those changes; and
- respond to the submissions made following the public exhibition of the EA.

In response to the issues raised during submissions a number of changes have been made to the Project so as to reduce the environmental impacts. The key changes made to the project include:

- a reduction in the number of wind turbines from 126 to 109;
- refinements to the locations of a number of turbines, access tracks, powerlines and associated infrastructure; and
- refinements to the transport access routes to the wind farm site.

The updated environmental assessment in this report includes revised assessments for key environmental impacts:

- Visual
- Environmental noise
- Biodiversity
- Aboriginal heritage
- Traffic and transport

The assessments considered locating wind farm infrastructure within specific corridors (Turbine Corridor and Infrastructure Corridor) which were developed to accommodate environmental exclusion areas and comply with relevant environmental and regulatory requirements.

The revised wind farm layout is presented in Figures 3-5 to 3-19 and is subject to detailed design and micro-siting within the Turbine Corridor and Infrastructure Corridor as described in section 3.3. Attachment 5 provides A1 scale maps showing the revised wind farm layout, Turbine Corridor and Infrastructure Corridor.

The final layout will comply with all conditions of approval and will be submitted to DPE prior to the commencement of the construction of each stage of the project.

A detailed response to the submissions received from the public and those received from government agencies are included in this report. Where an issue has been raised in a number of public submissions, a single response has been provided together with cross-references to the individual submission number. The government agency comments and issues are generally unique to that agency and individual responses have been provided.

Although Statement of Commitments are not specifically required to be provided by the Proponent for State Significant Development projects, they have been included in this Report to demonstrate to all stakeholders how the Proponent will implement measures for environmental mitigation, management and monitoring for the Project.

The Proponent is committed to ensure the best possible outcome for the Rye Park Wind Farm as well as the local and wider communities. This Report concludes that the project can be successfully implemented while meeting its environmental obligations and realising the significant economic and environmental benefits.



2 INTRODUCTION

2.1 Project Outline

The proposed Rye Park Wind Farm consists of up to 109 wind turbines and associated infrastructure (**Project**). The proponent for the Project is Rye Park Renewable Energy Pty Ltd (**Proponent**).

The wind farm Project is located to the north of Yass and south east of Boorowa, New South Wales. The site is approximately 250 km south west of Sydney and is located on freehold and leasehold land within and adjacent to agricultural areas, predominantly used for grazing sheep and cattle. The site sits on the edge of the Southern Tablelands and the South West Slopes in the vicinity of the rural township of Rye Park, as shown in Figure 2-1.



Figure 2-1 Proposed Rye Park Wind Farm location

An application for project approval for the Rye Park Wind Farm under Part 3A of the *Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act)* was lodged with the Department of Planning and Environment (DPE) in January 2011. Director General's Requirements were issued to the Proponent on 14 February 2011 and 16 August 2011 to guide the work required in assessing the proposed wind farm. An Environmental Assessment for the Rye Park Wind Farm, which addressed the issues raised in the Director General's Requirements, was submitted to the Department of Planning and Environment in early 2014. The project was subsequently transitioned from being a transitional Part 3A project to being State significant development (SSD) under the EP&A Act by an order made on 21 March 2014. Following this, the EA was placed on public exhibition from 2 May 2014 until 4 July 2014. 132 submissions were received in response to the exhibition of the Environmental Assessment of the wind farm, 15 of which was received from government agencies. 8 submissions supported the project.

In response to the issues raised during submissions a number of changes have been made to the Project so as to reduce the environmental impacts. The key changes made to the Project include:

- a reduction in the number of wind turbines from 126 to 109; and
- refinements to the locations of a number of turbines, access tracks, powerlines and associated infrastructure.

Full details of the changes made to the Project, compared to the components described in the EA, are contained in section 3.2.

The revised Rye Park Wind Farm Project would provide the following primary benefits:

- In full operation, it would generate more than 1,028,000 MWh of electricity per year - sufficient for the average consumption of more than 130,000 homes.
- It would improve the security of electricity supply through diversification of generation locations.
- It would save 800,000 tonnes carbon emissions per annum, equivalent to removing 260,000 cars off the road.
- It would contribute to the State and Federal Governments' target of providing 33,000 GWh from renewable sources by 2020.
- It would contribute to the NSW Government's target of reducing greenhouse gas emissions by 60% by the year 2050.
- It will provide full time employment for up to 250 staff during construction and up to 12 ongoing regional jobs during its operational life.
- It will result in a direct injection of approximately \$2-\$3m per annum to the local community through payments to landholders, permanent staff and community fund contributions.

In addition to these primary benefits there are also secondary benefits and opportunities for improvement in infrastructure, tourism and ecology as described in section 4.6.

2.2 Purpose of this Report

The DPE provided the Proponent with copies of the submissions received from members of the public and government agencies and asked the Proponent to respond to the issues raised in accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000*.

The purpose of this amended Environmental Impact Statement and Response to Submissions Report (Report) is to:

- describe the changes made to the project layout since the public exhibition of the EA; and
- provide an updated environmental assessment for the project, taking into account those changes; and
- respond to the submissions made following the public exhibition of the EA.

2.3 Proponent

The Proponent for the project is Rye Park Renewable Energy Pty Ltd, a wholly owned subsidiary of Trustpower Australia (New Zealand) Limited, an Australian renewable energy company. The parent company Trustpower Limited (“Trustpower”) is a publically owned electricity generator and retailer listed on the New Zealand stock exchange and is one of the 15 largest companies by market capitalisation on the NZX. Its current market capitalisation is around \$2.5 billion. Trustpower acquired the project from Epuron in November 2014.

Trustpower is one of the most experienced wind farm developers and operators in Australasia – its involvement in wind power dates back to its purchase of Stage 1 of the Tararua Wind Farm in New Zealand in 1999. Trustpower own and operate a number of renewable energy assets, including 42 hydro stations (39 in New Zealand and 3 in Australia) and 8 wind farms, of which 4 are located in Australia, including Stage 1 and Stage 2 of the Snowtown Wind Farm (the largest wind farm in South Australia) and the Blayney and Crookwell 1 wind farms in NSW.

Trustpower takes pride in being a responsible the owner and operator of its projects and in its reputation for establishing long term positive and supportive relationships with the communities within which its projects are located. It is committed to achieving strong involvement with, and the active support of, the community surrounding the Rye Park Wind Farm.

3 THE PROJECT

3.1 Overview of the Project

This section 3 contains an updated description of the Project which reflects the changes made to in response to submissions received during the public exhibition of the EA and follows a similar structure to the EA.

The Project involves the construction, operation and decommissioning of a wind farm with up to 109 wind turbines, together with associated and ancillary infrastructure. As outlined in section 2.1 above, following consideration of the submissions received and the outcomes of ongoing consultation with key stakeholders, the wind farm has been reduced from 126 turbines to 109 turbines.

The main components of the Project, are:

- ▶ up to 109 wind turbines, each with:
 - a capacity between 1.5 and 3.5 MW;
 - three blades mounted on a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of 157 metres;
 - an adjacent pad mounted wind turbine transformer (or located within the steel tower), crane hardstand area, and related turbine lay down area;
- ▶ a new 330 kV wind farm connection substation located adjacent to the existing TransGrid 330 kV transmission line (Yass – Bannaby) that traverses the southern section of the site;
- ▶ a new overhead powerline approximately 35 km in length, rated at up to 330 kV (nominal) capacity, running north-south along the length of the wind farm site and within the wind farm site boundary. The new powerline would be mounted on a single pole type structure and may be single-circuit or double-circuit as required;
- ▶ up to three new collection substations located across the wind farm site;
- ▶ underground and overhead 22 or 33 kV electrical cabling linking the wind turbines to each other and to the on-site collection substations. This will include the crossing of existing roads such as Rye Park Rugby Road toward the northern end of the site and Blakney Creek Road toward the southern end of the site;
- ▶ up to two operation and maintenance facilities incorporating a control room and equipment storage facilities;
- ▶ temporary concrete batching plants and construction facilities;
- ▶ access tracks required for each wind turbine and the related facilities above;
- ▶ minor upgrades to local roads, as required for the delivery, installation and maintenance of wind turbines and the related facilities above; and
- ▶ six temporary wind monitoring masts and approximately six permanent monitoring masts for wind speed verification, weather and general monitoring purposes. The permanent monitoring masts may be either static guyed or un-guyed structures and will be to a minimum height of the wind turbine hubs.

The Project also includes:

- ▶ the subdivision of land so as to create new lots for the proposed connection substation and the collection substations; and
- ▶ any deemed subdivision arising from the grant of leases or licences for project elements.

The revised wind farm layout for the project is shown in Figure 3-5 to Figure 3-20 and in Attachment 5.

The revised wind farm layout remains subject to detailed design and approval is sought to microsite wind turbines and project infrastructure within the corridors as set out in section 3.3 on the following pages.

The final layout will comply with all conditions imposed on any consent granted for the Project and will be submitted to the DPE prior to the commencement of construction of each stage of the project.

The Project may be constructed in stages if required. The Project elements may be constructed in sections over a number of years depending on market drivers and the specific construction work packages. Details of final staging and timing will be confirmed prior to construction.



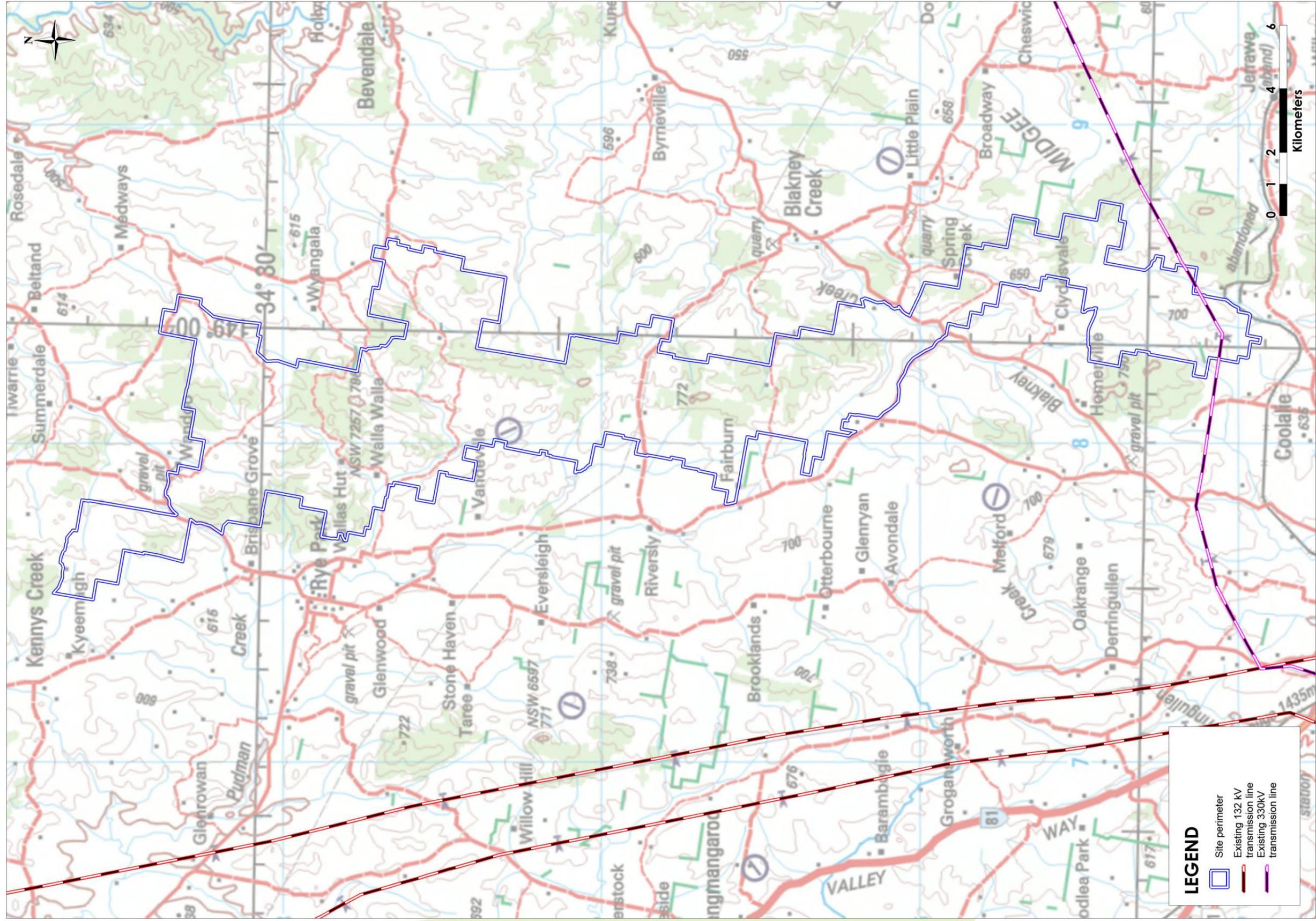


Figure 3-1 Locality and site boundary of the Rye Park Wind Farm

3.2 Changes to the layout since exhibition of the EA

The wind farm layout and design has been amended to respond to issues raised in submissions received during the public exhibition of the EA and to incorporate findings of further site investigations and through further consultation with key stakeholders, including the community. As a result the following key changes have been made to the project:

- ▶ a reduction in the number of turbines from 126 to 109; and
- ▶ refinements to the locations of a number of turbines, access tracks, powerlines and associated infrastructure.

Figure 3-2 shows a comparison of the indicative layout contained in the EA and the revised layout for the project.

Further detail on each of the changes made to the project as originally described in the EA is provided in Tables 3-1 to 3-4 below and in the maps in Attachment 6.

Table 3-1 Changes to the indicative turbine layout

EA Turbine ID	Final Turbine ID	Distance relocated (m)	Bearing relocated	Reason for move
RYP_1	1	140	NE	Inter-turbine spacing
RYP_2	2	69	N	Improve constructability
RYP_3	3	6	E	Improve constructability
RYP_4	4	19	NW	Inter-turbine spacing
RYP_5	5	77	NE	Inter-turbine spacing
RYP_6	6	7	NW	Avoid blade boundary overhang
RYP_7	7	6	W	Improve constructability
RYP_9	9	54	SW	Inter-turbine spacing
RYP_11	11	121	SW	Inter-turbine spacing
RYP_12	12	48	NE	Improve constructability. Improve native vegetation separation.
RYP_15		Deleted		Original location is no longer on an involved property
RYP_16	16	23	S	Inter-turbine spacing
RYP_17	17	1	N	-
RYP_18	18	130	E	Inter-turbine spacing
RYP_19		Deleted		Original location is no longer on an involved property
RYP_20	20	1	N	-
RYP_21	21	239	SE	Improve constructability.
RYP_22	22	1	N	-
RYP_23		Deleted		Inter-turbine spacing
RYP_24		Deleted		Inter-turbine spacing
RYP_25	25	1	NW	-
RYP_26	26	177	N	Inter-turbine spacing
RYP_27		Deleted		Avoid Stripped Legless Lizard Habitat.
RYP_28	28	123	N	Inter-turbine spacing
RYP_29	29	138	NE	Avoid blade boundary overhang
RYP_30	30	70	NE	Inter-turbine spacing
RYP_31	31	78	S	Inter-turbine spacing
RYP_32	32	6	N	Improve constructability
RYP_33		Deleted		inter-turbine spacing
RYP_34	34	22	SE	Improve constructability
RYP_35	35	16	N	Inter-turbine spacing

EA Turbine ID	Final Turbine ID	Distance relocated (m)	Bearing relocated	Reason for move
RYP_36	36	231	N	Avoid Hollow Bearing Trees
RYP_37	37	38	SW	Inter-turbine spacing
RYP_38	38	26	S	Improve constructability
RYP_39	39	31	SW	Improve constructability
RYP_40		Deleted		Avoid native vegetation
RYP_41	41	10	E	Inter-turbine spacing
RYP_42	42	1	NW	-
RYP_43	43	143	NW	Inter-turbine spacing
RYP_44	44	31	N	Inter-turbine spacing
RYP_45	45	92	SW	Inter-turbine spacing
RYP_46		Deleted		Inter-turbine spacing
RYP_47	47	121	N	Inter-turbine spacing
RYP_48	48	20	N	Avoid overhang onto trig parcel
RYP_49	49	1	N	-
RYP_50	50	9	S	Inter-turbine spacing
RYP_51	51	46	SW	Inter-turbine spacing
RYP_52	52	197	N	Inter-turbine spacing
RYP_53	53	108	SW	Inter-turbine spacing
RYP_56	56	163	N	Avoid native vegetation
RYP_57		Deleted		Inter-turbine spacing
RYP_58	58	53	E	Avoid native vegetation
RYP_61	61	201	N	Inter-turbine spacing
RYP_62	62	199	NE	Inter-turbine spacing
RYP_63	63	41	W	Avoid native vegetation
RYP_64	64	469	E	Avoid native vegetation
RYP_65	65	1	N	-
RYP_66	66	28	E	Inter-turbine spacing
RYP_67	67	8	S	Avoid blade boundary overhang
RYP_68	68	0	N	-
RYP_69	69	9	W	Improve constructability
RYP_70		Deleted		Improve constructability
RYP_71	71	168	E	Improve turbine loading from turbulence
RYP_72	72	146	E	Improve turbine loading from turbulence
RYP_73	73	100	N	Inter-turbine spacing
RYP_74	74	60	N	Inter-turbine spacing
RYP_75	75	24	N	Improve constructability
RYP_76	76	33	N	Inter-turbine spacing
RYP_77	77	12	NW	Avoid blade boundary overhang
RYP_78	78	51	NW	Avoid native vegetation
RYP_79	79	18	W	Improve constructability
RYP_80	80	69	S	Avoid native vegetation
RYP_81		Deleted		Inter-turbine spacing
RYP_82	82	119	N	Inter-turbine spacing

EA Turbine ID	Final Turbine ID	Distance relocated (m)	Bearing relocated	Reason for move
RYP_83	83	55	N	Improve constructability
RYP_84	84	37	W	Avoid native vegetation
RYP_85	85	180	E	Avoid native vegetation
RYP_86	86	39	SE	Avoid native vegetation
RYP_87	87	6	SE	Avoid native vegetation
RYP_88		Deleted		Inter-turbine spacing
RYP_89		Deleted		Avoid native vegetation
RYP_90	90	262	SW	Offset 500m from Wedge-Tailed Eagle nest. Reduce native vegetation impact.
RYP_92		Deleted		Avoid WTE nest
RYP_93	93	225	NE	Avoid native vegetation
RYP_94	94	22	S	Avoid native vegetation
RYP_95	95	4	W	Avoid native vegetation
RYP_96	96	102	NE	Avoid native vegetation
RYP_97	97	65	N	Improve constructability
RYP_98	98	26	S	Improve constructability
RYP_99	99	100	S	Inter-turbine spacing
RYP_100		Deleted		inter-turbine spacing
RYP_101	101	1	N	-
RYP_102	102	27	SE	Improve constructability
RYP_103	103	26	NW	Improve constructability
RYP_104	104	78	E	Avoid native vegetation
RYP_106		Deleted		Avoid Superb Parrot flight path
RYP_107		Deleted		Avoid Superb Parrot flight path
RYP_109		Deleted		Avoid Superb Parrot flight path
RYP_110		Deleted		Avoid Superb Parrot flight path
RYP_119	119	43	N	Inter-turbine spacing
RYP_120	120	4	NW	Improve constructability
RYP_121		Deleted		Inter-turbine spacing due to relocation of RYP_125 to avoid native vegetation
RYP_122	122	1	N	-
RYP_123		Deleted		Avoid Bangor Reserve
RYP_124	124	51	N	Improve constructability
RYP_125	125	218	NE	Avoid native vegetation
RYP_126		Deleted		Avoid Bangor Reserve
RYP_127	127	90	N	Avoid native vegetation
RYP_128	128	6	W	Improve constructability
RYP_129	129	49	NW	Improve constructability
RYP_130	130	43	S	Inter-turbine spacing
RYP_131	131	49	S	Inter-turbine spacing
RYP_132		Deleted		Landowner withdrawn from project
RYP_133	133	8	NW	Avoid blade boundary overhang
RYP_134	134	11	SE	Avoid blade boundary overhang
RYP_135	135	74	NE	Inter-turbine spacing

EA Turbine ID	Final Turbine ID	Distance relocated (m)	Bearing relocated	Reason for move
RYP_136	136	131	NE	Inter-turbine spacing
RYP_137	137	31	NE	Inter-turbine spacing
RYP_138	138	20	S	Inter-turbine spacing
RYP_139	139	22	N	Inter-turbine spacing
RYP_140	140	1	NW	-
RYP_141	141	157	NE	Inter-turbine spacing
RYP_142	142	240	NE	Inter-turbine spacing
RYP_143	143	35	W	Avoid native vegetation
RYP_144	144	78	NW	Improve constructability
RYP_145	145	77	SE	Avoid Superb Parrot Habitat
	146	New		-
	147	New		-
	148	New		-
	149	New		-
	150	New		-
	151	New		-

Table 3-2 Changes to the access track layout

Item No.	Comment
1	Additional access track SE of turbine RYP_1 allowing access to new turbine RYP_151
2	Track leading to turbines RYP_19 and RYP_15 deleted as these turbines were removed
3	Major access point from Ryepark Rugby road shifted east and now enters onto different property
4	Track leading south to turbine RYP_21 has been shifted east
5	Track leading to turbine RYP_24 deleted as this turbine was removed
6	Track removed between turbine RYP_25 and RYP_135 due to SLL habitat constraint
7	Track east of turbine RYP_67 that extends to turbine RYP_64 moved south to avoid woodland vegetation
8	New track extending south of turbine RYP_56 allowing access to turbines RYP_58 and RYP_63
9	New track extending south of turbine RYP_68 allowing access to turbines RYP_146 - RYP_149
10	New track connecting turbine RYP_93 to RYP_95 as a result of track being removed between 94 and 95
11	Track connecting turbine RYP_95 to RYP_96 relocated north at landowner's request
12	Track heading east of turbine RYP_98 to site access point on Rye Park Dalton Rd moved south for improved constructability
13	Track heading south of turbine RYP_104 removed as alternate track to the west is now the preferred route
14	Track leading to turbines RYP_106, RYP_107, RYP_109 & RYP_110 deleted as these turbines have been removed
15	New track from turbine RYP_122 to RYP_128 to allow connectivity to southern part of the site. As a result, track between RYP_125 and RYP_127 removed.
16	Track leading to turbine RYP_123 and RYP_126 deleted as turbines have been removed

Table 3-3 Changes to the indicative powerline layout

Item No.	Comment
1	33 kV preferred line near turbine 21 moved east to avoid blade overhang
2	33 kV preferred line near turbine 144 moved east to avoid woodland vegetation
3	New 330 kV alternative line added east of turbine 77. This route is more direct and avoids woodland vegetation
4	330 kV alternative line moved east of turbine RYP_80 and west of turbine RYP_83 to avoid blade overhang
5	330 kV alternative and preferred line heading west shifted 220m north to join up with relocated substation location
6	Alternative 330 kV line near turbine 93 moved north to avoid blade overhang and woodland vegetation
7	330 kV preferred line moved west of turbine RYP_97 and east of turbine RYP_98 to avoid blade overhang
8	330 kV preferred line heading south has been removed. The 330 kV alternative line has now become the preferred route.
9	330 kV line heading east from turbine 127 has moved north to avoid blade overhang.

Table 3-4 Changes to the O&M facility, substation and concrete batch plant layout

Item No.	Comment
1	Collection substation 2 moved 300m NE
2	Existing O&M facility near collection substation 2 moved 225m N
3	New construction compound located 650m to the west of Collection substation 2
4	New construction compound 1.4km west of turbine 101
5	New O&M facility located 1.5km west of turbine 101 (adjacent to construction compound)
6	Southern concrete batch plant moved 20m NW
7	New O&M facility adjacent to southern connection substation
8	Alternate location for Collection substation 1 identified (refer Figure 3-17)

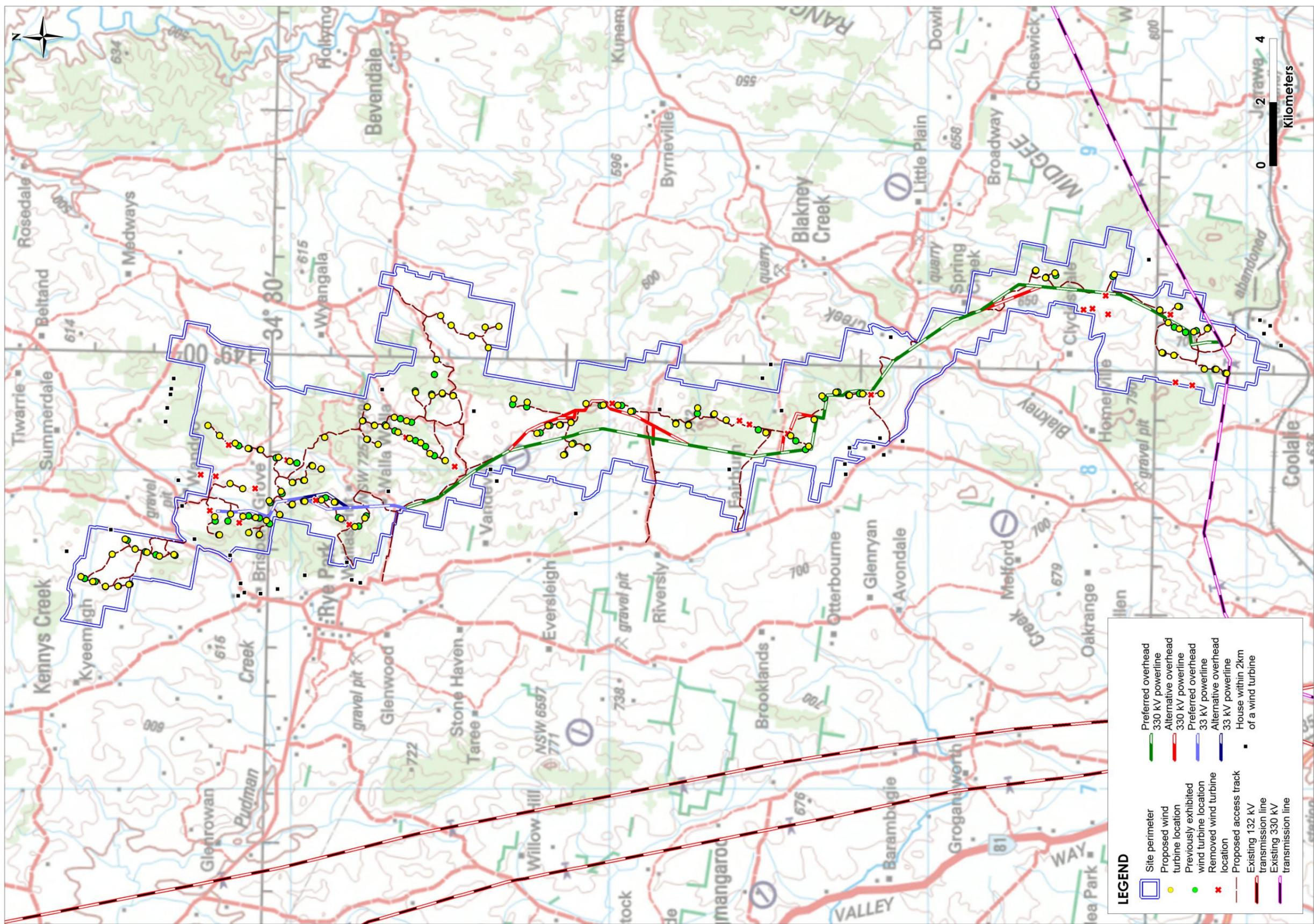


Figure 3-2 A comparison of the previously exhibited project layout and the revised layout



Figure 3-3 Example of revisions made to the layout

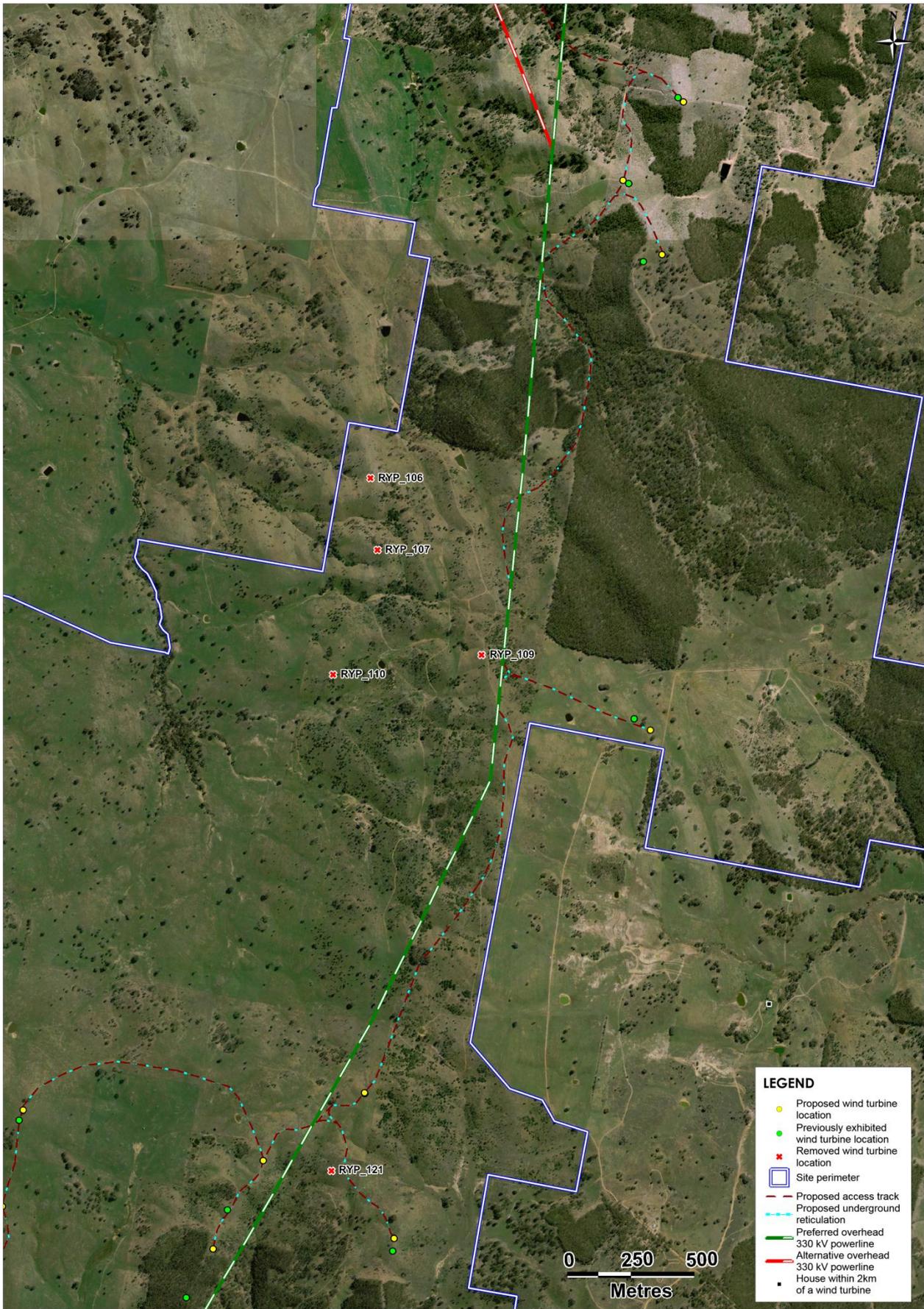


Figure 3-4 Example of changes made to transmission line and turbine location

3.3 Revised Wind Farm Layout

The revised wind farm layout presented in this Report has been through a number of design optimisations and iterations. The design process is focused around four core principles:

- ▶ minimising and/or avoiding where possible negative environmental and community impacts;
- ▶ maximising positive impacts (clean energy production and greenhouse gas reduction); and
- ▶ incorporating practical limitations in relation to the construction and operation of the site, including maximising positive impacts and costs: and
- ▶ responding to feedback from host landholders, community members and stakeholders.

Where there is a conflict or dynamic tension between these core principles, the Proponent has used its experience and judgement, taking into consideration a balanced view of the public good in finalising the layout.

The revised layout includes 109 wind turbine locations spanning a distance of about 38 km from north to south and 10 km from east to west. Approval is sought for both the proposed and the alternate 330kV powerline routes identified on the site, although only one route, or a mix thereof, will be constructed.

An overview of the revised layout can be seen in Figure 3-5 and detailed figures showing the title boundaries, vegetation and revised turbine layouts can be seen in Figure 3-6 through Figure 3-11. These detailed maps have been spilt into northern and southern regions to show the revised layout in greater detail.

The revised turbine layout reflects the typical spacing required for the wind turbine models under consideration, while maximising the total energy output of the wind farm balanced against the identified constraints.

Micro-siting

In developing the project, allowance has been made for final micro-siting of infrastructure for engineering, commercial or environmental reasons. Such micro-siting would be carried out post approval and prior to construction.

To provide greater certainty as to the area within which the proponent can microsite infrastructure, a Turbine Corridor and Infrastructure Corridor has been defined within which all equipment is required to be located using the principles outlined below. The corridor maps and GIS files (Attachment 5) indicate the corridors for which the Proponent seeks approval, including:

- the Turbine Corridor, within which wind turbine tower centreline and related infrastructure such as hardstands, laydown areas, access tracks, powerline connections etc is to be located); and
- the Infrastructure Corridor, within which all infrastructure other than wind turbines may be located.

Turbine Corridor

The Turbine Corridor was developed based on the revised wind turbine layout and with the following considerations. Wind turbines may be relocated to:

- avoid adverse geotechnical conditions;
- maximise wind energy production;
- reduce costs; or
- reduce environmental impacts.

The ability to relocate wind turbines within the Turbine Corridor allows the project benefits to be maximised and impacts to be minimised. Wind turbines also have minimum spacing requirements between them to optimise energy yield and avoid early degradation of the equipment. These minimum spacing requirements also related to the design and physical size of the selected wind turbine. Accordingly, any final selection of the turbine model and micro-siting of a turbine location will likely require adjustments to the location of nearby turbines.

In developing the Turbine Corridor, wind turbine relocation was generally limited to movement along ridges where wind turbines have already been proposed:

- The Turbine Corridor was initially developed taking into consideration the topography of the land by following existing ridgelines.
- Consistent with previous approvals, maximum relocation distance is approximately 100 m from the turbine location across ridgelines or in the absence of a defined ridgeline, while retaining the flexibility to relocate wind turbines along ridgelines to ensure minimum turbine spacing requirements can be maintained.
- The width of the Turbine Corridor is adjusted to suit the terrain - wider where the ridge lines are wider / lower side grades, and narrower where ridgelines are narrower with steeper side grades.

A number of constraints were then applied to the Turbine Corridor to ensure that the corridor area excluded any constraint areas as follows:

- Biodiversity - All areas previously identified as “High Constraint” or native vegetation in “Moderate-Good condition with high diversity” were excluded from the Turbine Corridor except areas where existing turbines have been proposed (noting that such areas have appropriate management commitments). Note, all conditions set out in the SOCs related to protection and management of biodiversity (including offset obligations) will still apply to turbines relocated within the Turbine Corridor.
- Archaeology - The nature of the site, with low concentration scatter of archaeological items, means that no specific sites were identified with a requirement to be avoided. Accordingly, the Turbine Corridor is not affected by Archaeology impacts.
- Visual Impacts - Minor relocations of wind turbines along existing ridgelines within the Turbine Corridor will in general have minimal visual impact from a distance. However, in order to minimise any visual impacts, all houses within 2 km of the existing wind turbine locations were identified, and the distance to nearest turbine determined. A buffer was then mapped around these houses to ensure that no wind turbine moved more than 5% closer to the relevant residence. Note, 5% at 2 km relates to a maximum 100 m micro-siting distance. These buffer areas were excluded from the Turbine Corridor.
- Noise Impacts – The final layout for the project will be required to meet the project noise limits contained in any consent, consistent with the existing noise guidelines. The Turbine Corridor does not therefore include any noise exclusion areas.
- Project boundary - Wind turbine blades will not be permitted to overhang the project boundary. As a result, the Turbine Corridor was set back by a 65 m buffer from the project boundary. Should turbines with a larger than 65 m radius be selected then turbines will be microsited within the Turbine Corridor to ensure overhang outside the project boundary does not occur.

Infrastructure Corridor

The Infrastructure Corridor was developed by applying the following offsets from the revised locations of project infrastructure:

Table 3-5 Infrastructure Corridor extents for site infrastructure

Infrastructure Description	Extent of Infrastructure Corridor
Access Tracks	+/-25m from centreline (minimum +/-12.5m from centreline)
Underground reticulation	+/-25m from centreline (minimum +/-12.5m from centreline)
Overhead reticulation	+/-50m from centreline (minimum +/-25m from centreline)
330kV powerlines	+/-75m from centreline (minimum +/-50m from centreline)
Substations etc	+/-100m from boundary of the substation (minimum +/-50m

Infrastructure Description	Extent of Infrastructure Corridor
	from boundary
All other infrastructure (batch plants, communications etc)	+/-50m from boundary of the relevant infrastructure (minimum +/-25m from boundary)

Due to their location and type of infrastructure these relocations would have negligible additional environmental impact. Relocation of this infrastructure within the Infrastructure Corridor is subject to the commitments made in the revised SOC.

The revised turbine layout has undergone a preliminary review to determine if the layout is reasonably suitable for construction, meets planning guidelines and would comply with expected consent conditions. However, relocation of specific turbines and infrastructure within the corridors may be required prior to construction to take into account a number of factors including:

- ▶ final turbine selection and wind farm design;
- ▶ final wind speed assessment and energy yield analysis;
- ▶ additional site constraints identified through ongoing investigations;
- ▶ constraints identified in relation to constructability or construction cost minimisation; and
- ▶ constraints identified after the results of final geotechnical investigations at turbine locations are completed.

Depending on final turbine selection, it is possible that not all turbines proposed would be installed to ensure that the project continues to meet all conditions of approval.

To that end, a final layout would be prepared after final turbine selection has taken place and prior to the commencement of construction. This final layout would include adjustments to ensure all criteria are achieved. Further surveys and variations would be submitted for approval by the Secretary of DPE in accordance with the final conditions of approval.

Staging of Works

As outlined in the EA, it is possible that not all turbines, access tracks or other equipment outlined in this EA would be ultimately required for the project. Likewise, market, seasonal, or operational requirements may mean that the construction of the wind turbines may occur in stages or groups over a number of years.

Similarly, the construction works packages for each stage, such as civil and electrical works, may be required to commence at different times as a result of receiving certain final development approvals or certifications to commence at different times.

Where staging is proposed, each of the strategies, plans and programs required by the conditions of consent will be submitted on a progressive basis for each stage of the project.

Details of final staging and timing will be confirmed prior to the construction of each stage.

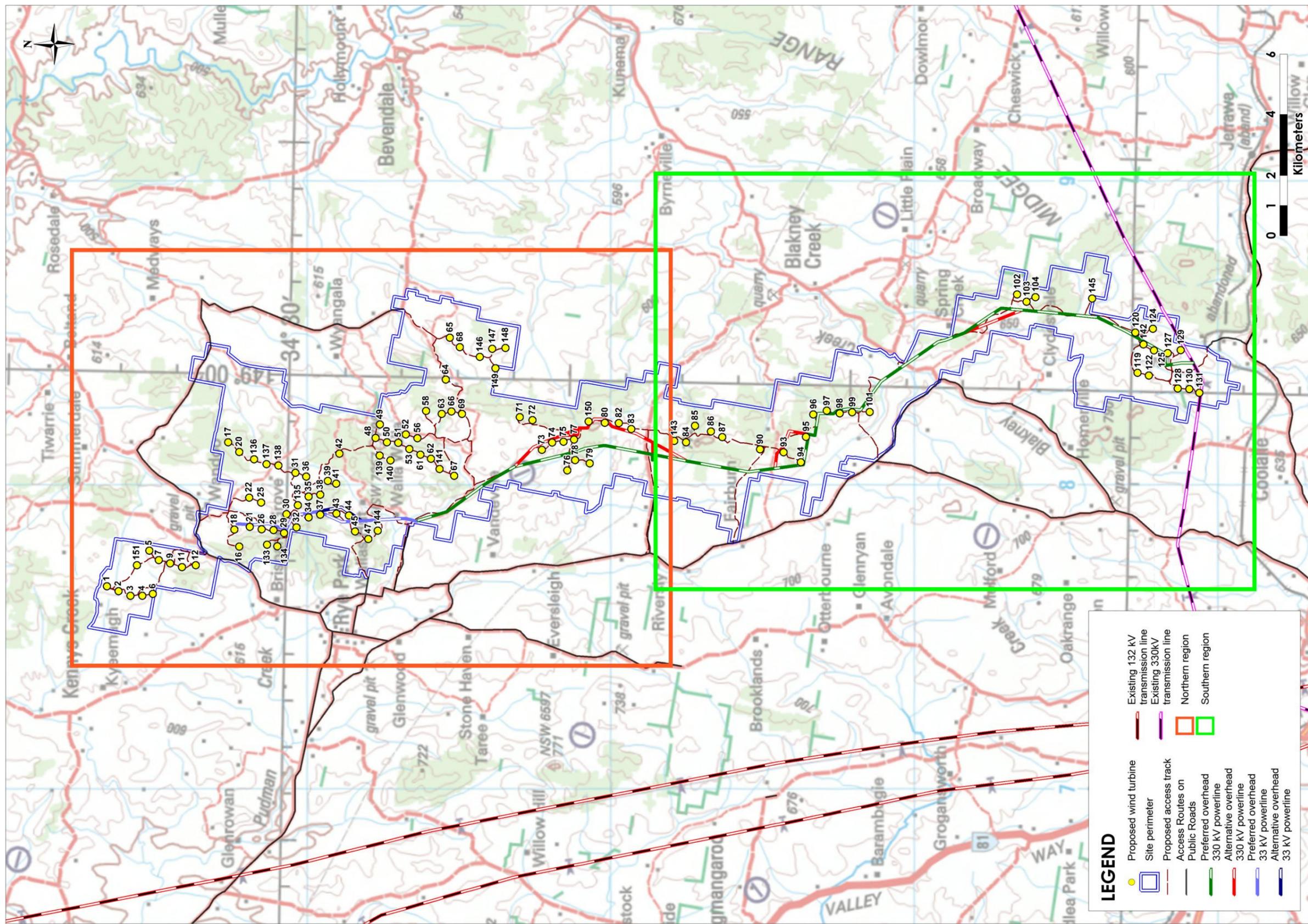


Figure 3-5 Wind farm site northern & southern regions

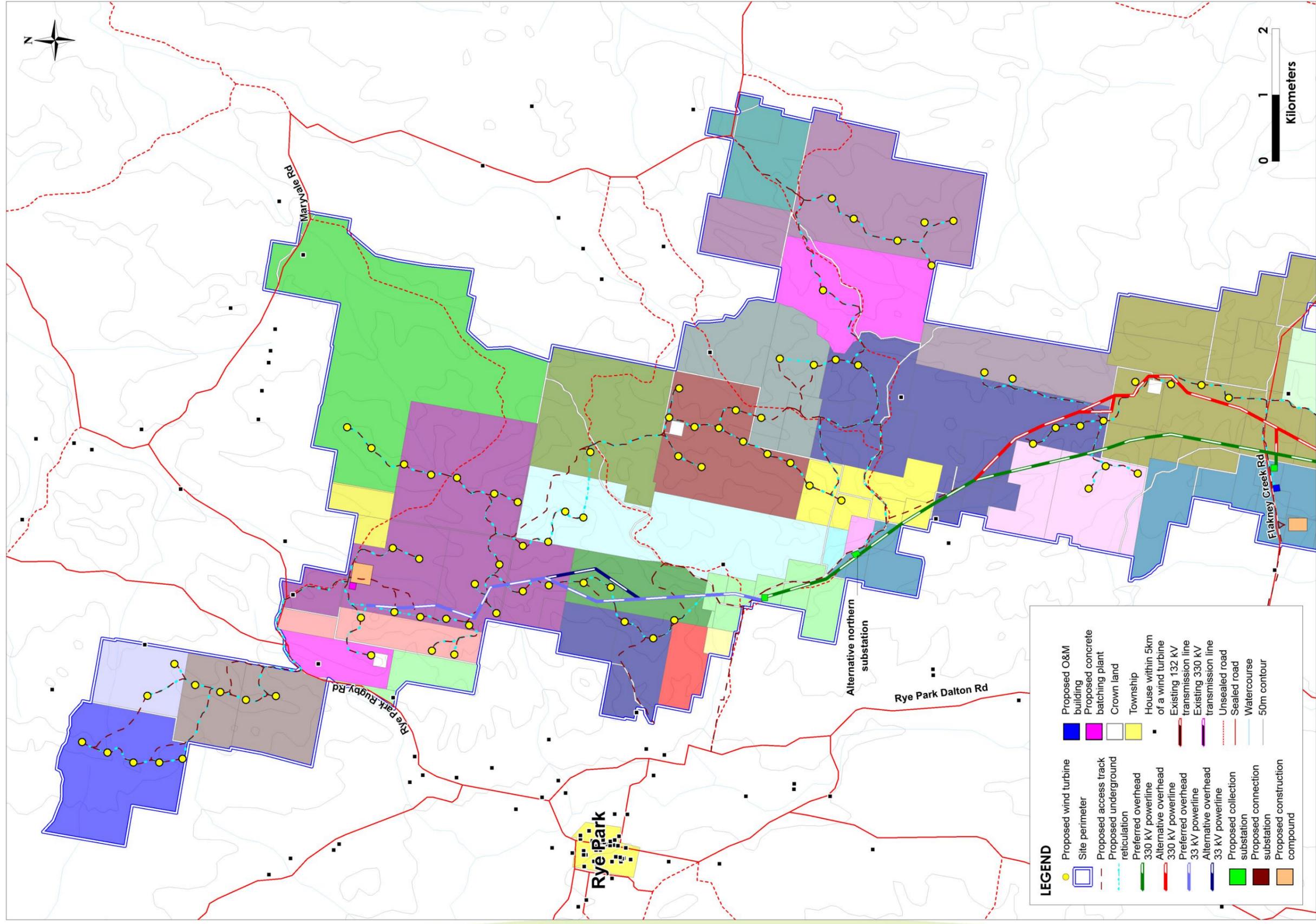


Figure 3-6 Northern region land parcels

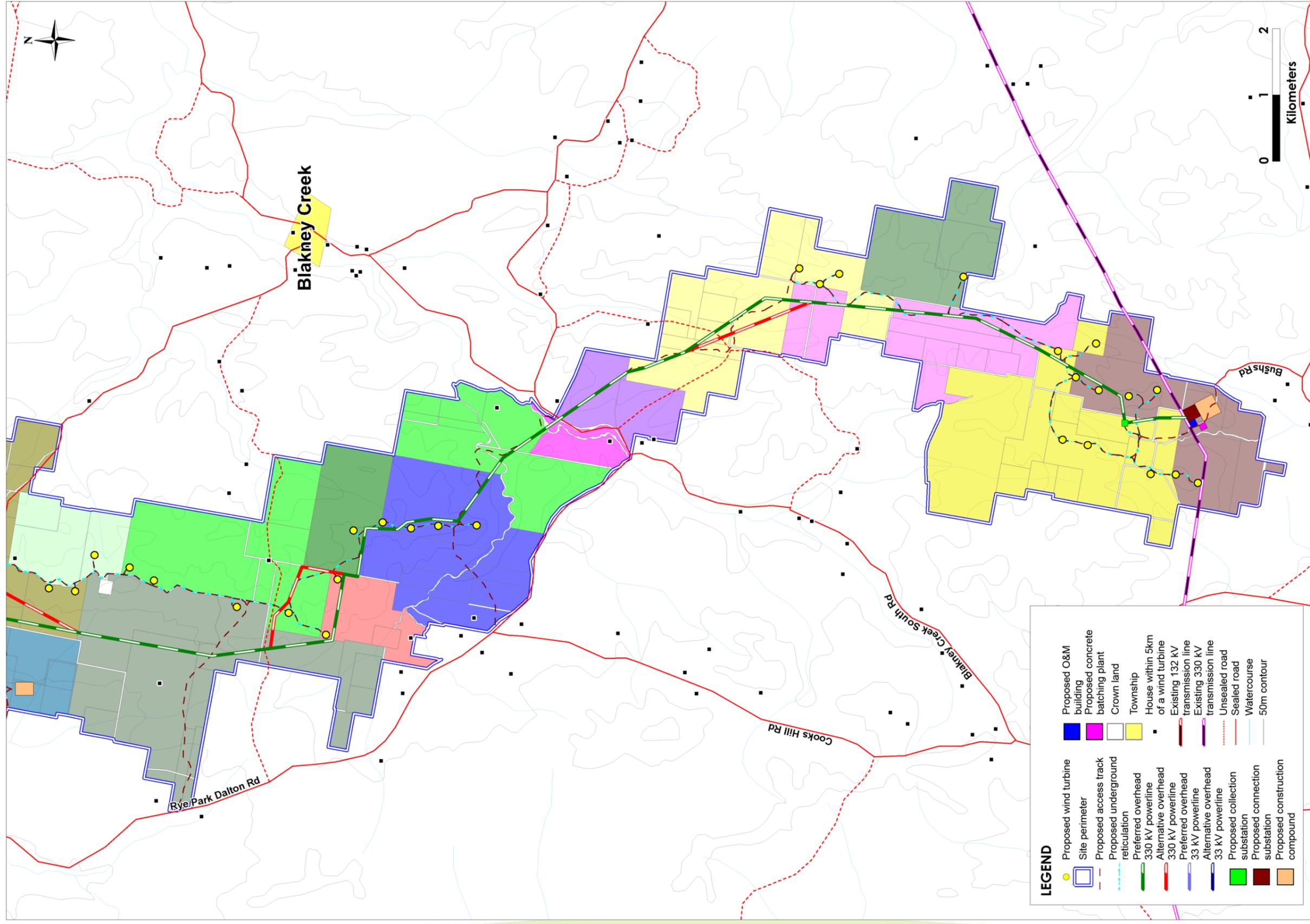


Figure 3-7 Southern region land parcels

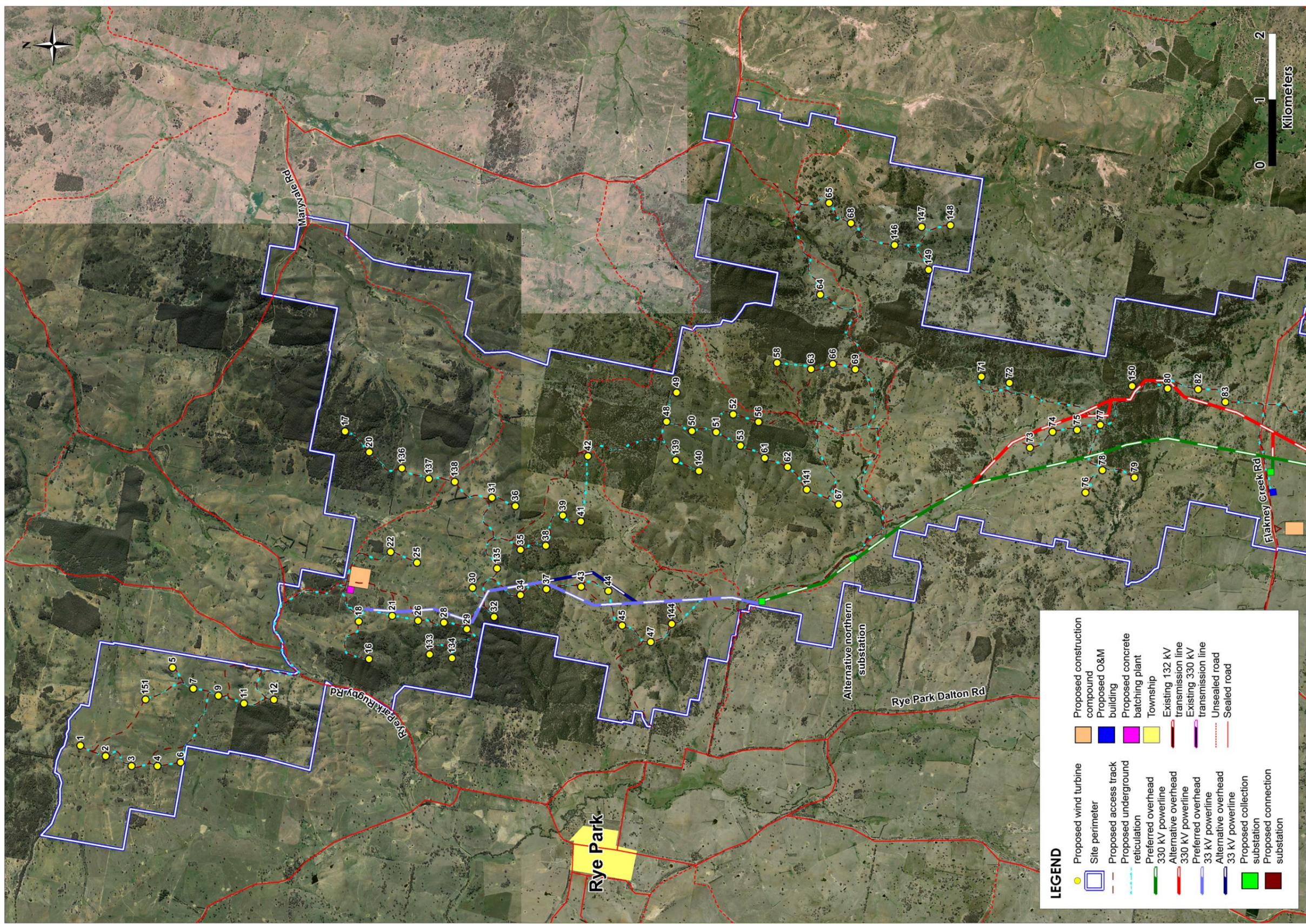


Figure 3-8 Northern region site layout

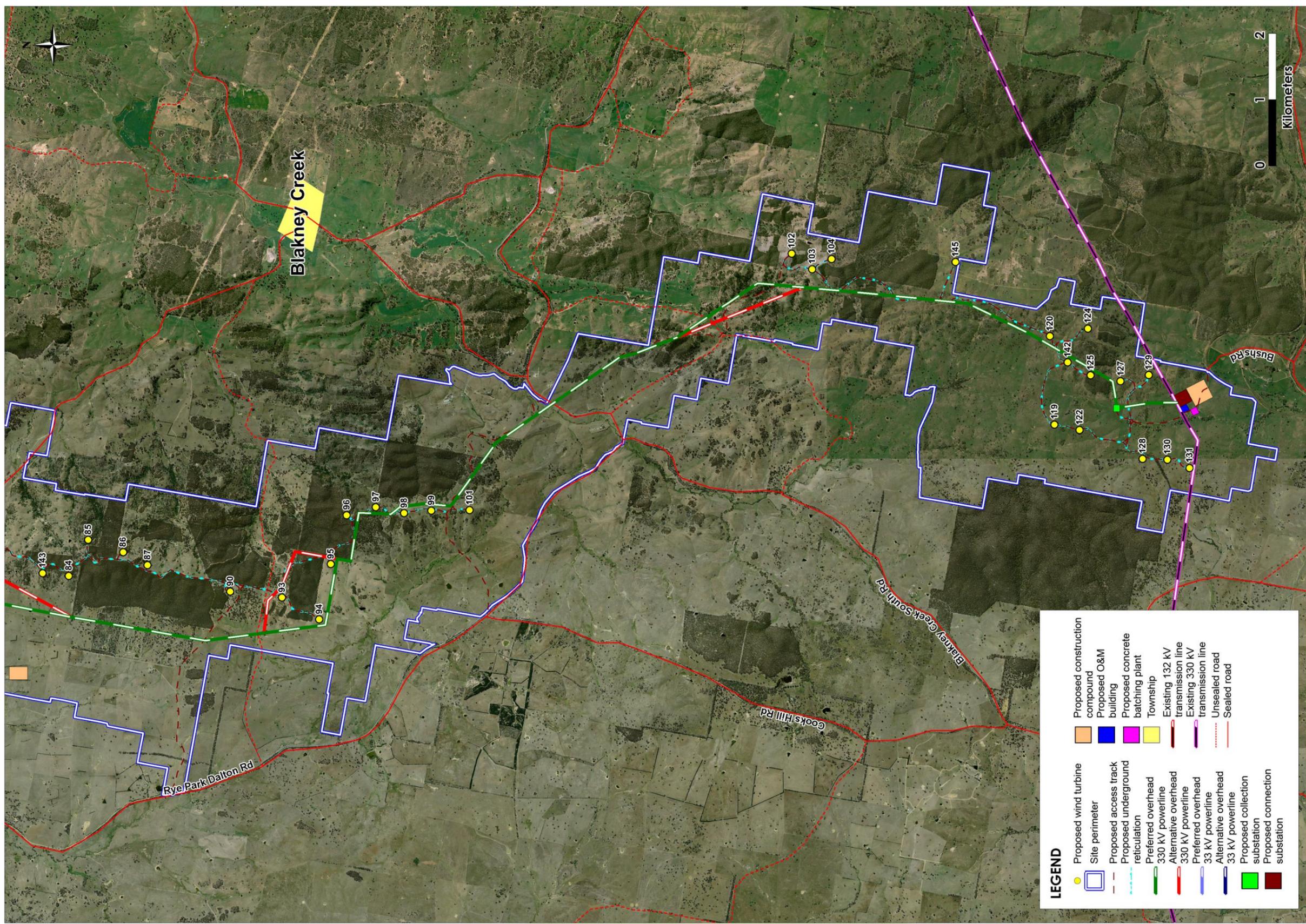


Figure 3-9 Southern region site layout

3.4 Wind Turbine Selection

Wind Turbines under Consideration

A number of wind turbine models are under currently consideration for the Project, each with varying characteristics including physical dimensions and technical attributes, production capacity and cost considerations.

In general, different characteristics of turbine models require different turbine layouts, however to simplify the environmental assessment of the project, a revised layout has been developed that reflects the characteristics of a large range of turbine models.

This project has not pre-selected a preferred model or models so as to enable consideration and selection of the most appropriate and efficient model for this site. Selection of the final turbine model or models would occur as part of the turbine supply tender process following planning consent.

Assessment Approach

For the purposes of impact assessment, consideration has been given to the likely impact characteristics of turbines (size, footprint, noise) in the context of different assessment issues (transport, access, noise, visual etc.). In order to 'model' these impacts a turbine model has been selected to represent the realistic possible extent of impact. In this case, the range of turbines selected represents an option that is currently commercially available from a reputable supplier and where detailed documentation was readily available as a basis for impact considerations.

Having regard to the impact issue to be assessed, a suitable indicative turbine model has been selected to provide a realistic assessment of impact and design requirements. For instance:

- ▶ The landscape and visual impact assessment assumes a model type that has the maximum tip height.
- ▶ The transport assessment utilises an existing model that represents a best fit to the project dimensions (size and weight) for the maximum tip height.
- ▶ The noise impact assessment utilises an existing model that is a realistic balance between noise generation and layout footprint.

This has enabled the Proponent to establish design standards and corridors, based on these model characteristics, within which the project will be confined. The assessments have considered the maximum extent of impact for the proposed layout.

Following planning approval, the project would commence the construction tender and detailed design period. At this point, turbine models will be assessed to ensure that they fit within the design standards and corridors including:

- ▶ Does not exceed the maximum tip height specified below;
- ▶ Does not exceed the noise compliance limits under the South Australian Environmental Noise Wind Farm Guidelines 2003;
- ▶ Does not exceed the EPHC Draft National Wind Farm Development Guideline limits for shadow flicker;
- ▶ Does not affect existing communication facilities;
- ▶ Is compliant with set aviation limits; and
- ▶ Can be transported to the project area and turbine sites within the defined transport corridors.

Before construction starts, the turbine model will be confirmed and final layout plans showing exact locations of all infrastructure within the surveyed Turbine and Infrastructure Corridors area will be prepared to the satisfaction of DPE.

Wind Turbine Characteristics

The wind turbines under consideration have a typical hub height of 80 m – 101 m and a typical blade length of 45 m – 65 m (or 90 m – 130 m overall rotor diameter). The tallest wind turbine tip height combination currently under consideration is 157 m, unchanged from the maximum height proposed in the EA.

Each wind turbine would be a three bladed type of the “up-wind” design, meaning that the blades face into the wind and in front of the tower and nacelle. This design reduces noise levels generated during operation.

Each wind turbine would have a rated power capacity of between 1.5 MW and 3.5 MW, subject to final turbine selection.

Nacelle

The nacelle is the housing at the top of the tower that encloses the generator, gearbox (unless direct drive), and control gear including motors, pumps, brakes and electrical components. This control gear ensures that the wind turbine always faces into the wind, and adjusts blade angles to maximise power output and minimise blade noise. The nacelle also houses winches to assist in lifting maintenance equipment or smaller replacement parts to the nacelle.

The nacelle design takes into account acoustic considerations to minimise noise emissions from mechanical components.

Tower

The tower is of tubular steel or concrete construction which is typically 80 - 101 m high, tapering from around 5 - 6 m in diameter at the base to around 3 - 4 m at the top. Exact dimensions would depend on the wind turbine design selected. The tower is constructed in up to five sections, each section bolted or welded together via an internal flange arrangement. Within the core of the tower are the power and control cables and an access ladder or mechanical person lift to the nacelle (with safety climb system).

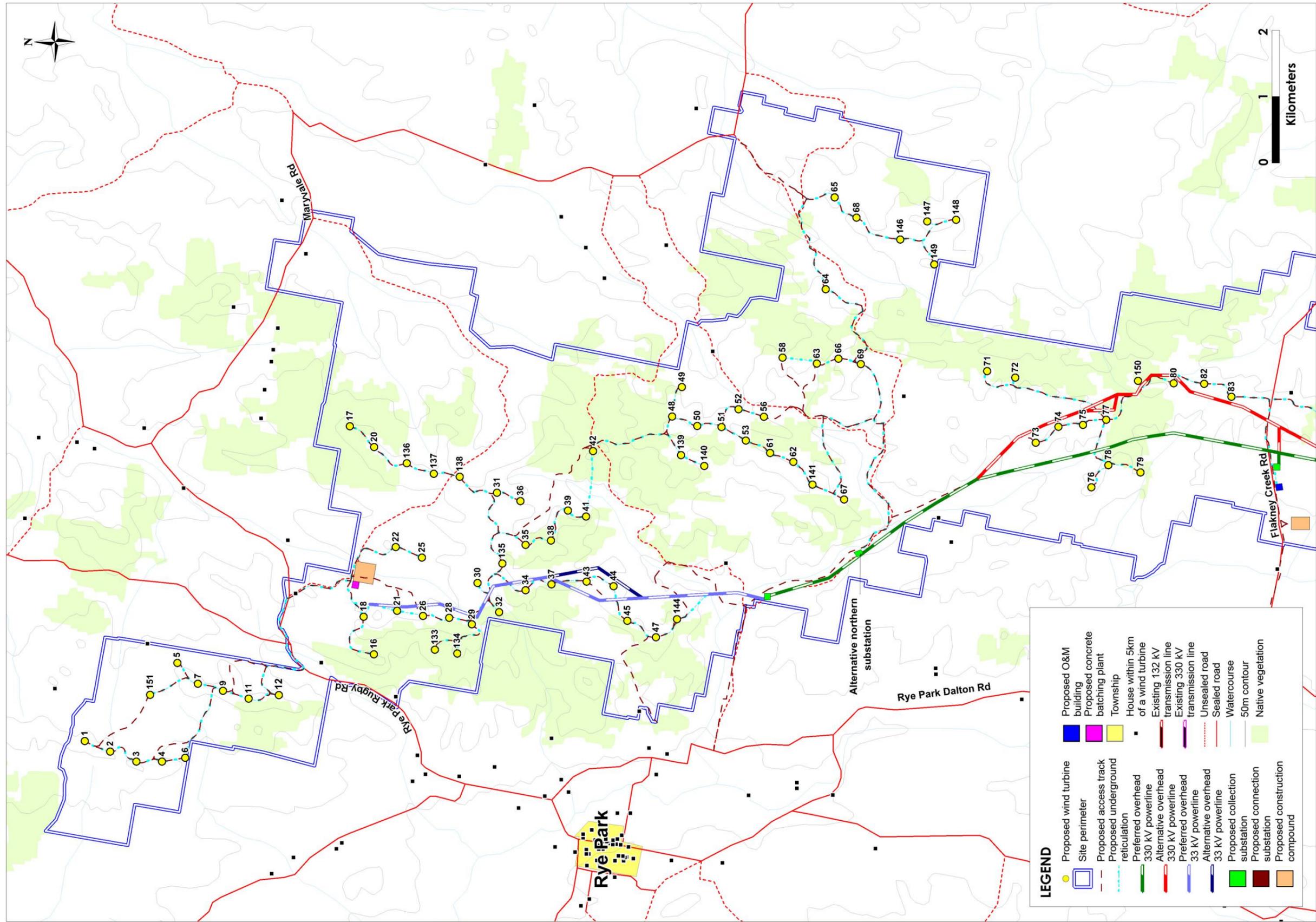


Figure 3-10 Northern region turbine layout

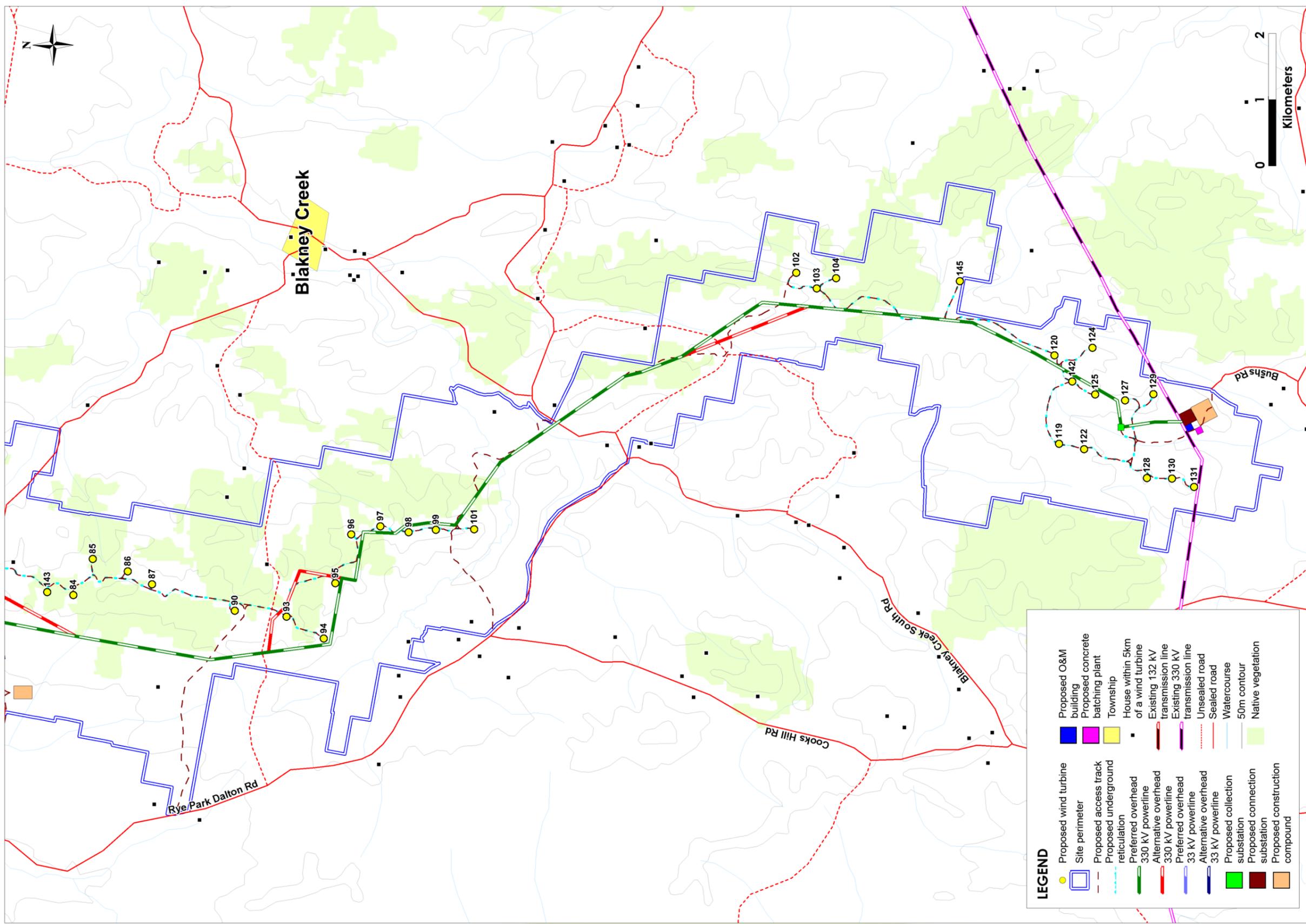


Figure 3-11 Southern region turbine layout

3.5 Connection to the Electricity Grid

Introduction

To export power from the wind farm, it is necessary to connect the wind turbines to the national electricity grid. This is achieved through a combination of underground and overhead electricity cables connecting the turbines to the collection substations, which then connects into the electricity grid via an overhead powerline and connection substation.

The Proponent has submitted a Grid Connection Enquiry to TransGrid and carried out a grid connection assessment to confirm that TransGrid's existing 330 kV transmission line proposed for the respective connection options has sufficient capacity to allow export from the wind farm.

The primary onsite electrical works would include:

- ▶ A 330 kV wind farm connection substation will be located adjacent to the existing 330 kV TransGrid transmission line that crosses the southern section of the site.
- ▶ An overhead 330 kV powerline, approximately 35 km long, will run north-south along the length of the wind farm site to the three collection substations. The powerline will be suspended from single pole type structures. The powerline may be single-circuit or double-circuit as required.
- ▶ Up to three collection substations will be located on the wind farm site. The three collection substations will collect power generated by the turbines and deliver to the overhead powerline.
- ▶ A network of underground and overhead electrical cables, at 22 kV or 33 kV, will transfer power from the turbines to the collection substations. The underground and overhead electrical reticulation network will include the crossing of existing roads, such as Rye Park Rugby Road toward the northern end of the site and Blakney Creek Road toward the southern end of the site.
- ▶ Associated communications network necessary for site operations and control.
- ▶ An operations and maintenance facility including wind farm controls and power supply.

Wind Farm Connection Substation and Connection to TransGrid Transmission Line

A new 330 kV wind farm connection substation will be constructed to connect the wind farm into the existing 330 kV TransGrid Yass – Bannaby transmission line at the south of the site. This connection substation would cover an area approximately 3 - 4 hectares plus an access road, Transgrid switching station, car park, communications tower and site facilities.

The connection substation may require up to two large power transformers to change the voltage, from reticulation voltage (22 kV or 33 kV) and overhead powerline voltage (up to 330 kV), up to the transmission voltage (330 kV). The transformers are likely to be of the oil-cooled variety, and therefore may contain considerable quantities of oil. Provision would be made in the design of the substation for containment of any oil which may leak or spill. Other equipment in the substation includes circuit breakers and a busbar arrangement.

The connection substation will include all necessary ancillary equipment including a number of short spans of 330 kV connecting transmission line, control room and amenities, communication equipment, control cubicles, voltage and current transformers, and circuit breakers for control and protection of the substation. The connection substation also requires a telecommunications tower (cable, optic fibre and/or microwave links) and low voltage electricity connections (415 V – 11,000 V) from local services.

The connection substation area would be marked by a security fence to prevent trespassers and stock ingress. The ground would be covered partly by crushed rock or bitumen and partly by concrete pads for equipment, walkways and cable covers, and would have an earth grid extending outside of the boundary of the security fence.

The connection substation will include an appropriate bushfire Asset Protection Zone (APZ) that complies with the RFS *Planning for Bushfire Protection* guidelines. This has been evaluated based on the vegetation type and slope. The site parameters (predominantly flat land with limited continuous canopy cover) indicate that a compliant inner protection area (which can be maintained under continued grazing practices) and outer protection area would be achievable.

Typically the 330 kV connection substation would take up an area of approximately 3 - 4 hectares and would be generally on an east-west layout orientated in parallel to the existing 330 kV Transgrid transmission line. The proposed location for the connection substation has been identified and is shown in Figure 3-13. A number of short spans of 330 kV connecting transmission line would connect the connection substation to the existing 330 kV TransGrid transmission line.

Typical civil works will be required in the construction of the new connection substation, including;

- ▶ Site preparation and earthworks
- ▶ Drainage and major cable trenches
- ▶ Minor equipment footing and security fencing
- ▶ Access road
- ▶ Substation surfacing
- ▶ Landscaping
- ▶ Auxiliary services buildings

In addition to the connection substation construction, the substation confines would include a car park, an auxiliary services building, staff amenities, two secondary system buildings (which are modular buildings) and communications facilities. A connection substation access road approximately 6m in width would be connected to the wind farm access roads.

A new transmission line corridor shown on Figure 3-19 is to be established to connect the existing TransGrid Line 330kV transmission line to the new connection substation. The transmission line will include a 60 m easement in which any vegetation with a mature height of 4 m or above will be selectively cleared. This is considered a reasonable clearing methodology given the limited amount of vegetation located within any new alignment between these structures and the riparian zone needing to be maintained as much as possible.

Works will also be required to be carried out on the existing Transgrid owned 330 kV transmission line to connect it to the new connection substation. These works form part of this project and include the following:

- ▶ Construction of up to 6 off 330kV transmission line steel lattice structures will be required to connect the new connection substation into the existing Transgrid owned 330 kV transmission line. Final location will be determined at the detailed design stage. Each new structure will require a construction footprint of approximately 40 m x 30 m to establish up to 2 pads at each structure and to erect the structures. New structures will be of similar height and appearance to the existing Transgrid transmission line structures.
- ▶ In addition, once the transmission line is deviated to connect the existing 330 kV transmission line to the new connection substation, a portion of the existing Transgrid owned 330 kV transmission line will become redundant (between existing structures 45-48). All redundant structures and associated conductors shall be dismantled and removed.

Radio Repeater Site

Route diverse communications paths are required to maintain transmission network system security and reliability. As such, the establishment of the Rye Park 330 kV Connection Substation will require protection grade communications from the site to TransGrid's Yass and Gullen Range switchyards, including appropriate SCADA signals back to TransGrid's system operations control centre.

To meet these requirements, a radio repeater site (RRS) is to be located within the connection substation confines. The RRS is to comprise of the following:

- ▶ Installation of a 60 m steel lattice communications tower at the Rye Park 330 kV Connection Substation adjacent to the substation auxiliary services building, including the installation of antennas, waveguides, cable tray and earthing;
- ▶ Supply and installation of duplicated PDH microwave equipment for a single hop microwave link from the Rye Park 330kV Substation – Yass RRS; and
- ▶ Supply and installation of duplicated P MUX equipment at the Rye Park 330kV Substation Station.

Overhead Powerline

A new overhead powerline, approximately 35 km long, will run up the length of the wind farm site and connect into the three new collection substations. Only one of the alternative powerline routes will be constructed although the final route may include a mix of the two routes shown in the revised project layout.

Powerline structures come in many designs however most are either steel or concrete pole design or a steel lattice tower design. The type of design used may vary depending on the preferred voltage, different ground conditions, carrying weights, strain angles, clearance requirements as well as local environmental conditions including local constraints (e.g. archaeological) and visual amenity.

Based on electrical design assessments for the wind farm it is proposed the new overhead powerline will be rated at up to 330 kV (nominal) capacity and will be mounted on a single pole type structure as shown below and would be up to 45 m high. The new overhead powerline would be either single-circuit or double-circuit design.

Collection Substations

It is proposed up to three new collection substations will be located on the wind farm site. The three new collection substations will collect power generated by the turbines and deliver it to the new overhead powerline running north-south along the length of the wind farm site. Two alternative locations have been identified for the northern most collection substation (No. 1), however only one of substation will be constructed. Refer to Figure 3-6 and Figure 3-7 for more details.

Each collection substation will include all necessary ancillary equipment such as a control room and amenities, communication equipment, control cubicles, voltage and current transformers, and circuit breakers for control and protection of the substation. The collection substation also requires telecommunications (cable, optic fibre and/or microwave links) and low voltage electricity connections (415 V – 11,000 V) from local services.

The perimeter of each collection substation area would be marked by a security fence to prevent trespassers and stock ingress. The ground would be covered partly by crushed rock or bitumen and partly by concrete pads for equipment, walkways and cable covers, and would have an earth grid extending outside of the boundary of the security fence.

The collection substation will include an appropriate bushfire Asset Protection Zone that complies with the RFS Planning for Bushfire Protection guidelines. This has been evaluated based on the vegetation type and slope. The site parameters (predominantly flat land with limited continuous canopy cover) indicate that a compliant inner protection area (which can be maintained under continued grazing practices) and outer protection area would be achievable. Typically each collection substation would occupy an area of approximately 100 m x 100 m. The proposed locations for each collection substation have been identified and are shown in through Figure 3-17 to Figure 3-19.

Onsite Electrical Reticulation

From each wind turbine, the power voltage is stepped up from generation voltage to either 22 kV or 33 kV for either underground or overhead reticulation cabling from each group of turbines to the collection substations.

In general, overhead cabling offers benefits as it minimises ground disturbance and is significantly lower in cost. There are practical limitations installing overhead cabling on ridges where turbines are located, as well as increased visual impact.

Typically underground cabling is used to connect turbines along the ridgelines and overhead cabling is used to transport power between adjacent ridges and from groups of turbines to the collection substations. Cable trenches would, where practical, be dug within or adjacent to the onsite access tracks to minimise any related ground disturbance. Short spur connections would diverge from the main cable route which would approximately follow the main access route at each group of turbines. Subject to ground conditions underground cables would require a trench of 0.75 – 1 m deep and be typically 0.3 – 1 m wide. Parts of the underground network will cross existing roads such as Rye Park Rugby Road at the northern end of the site.

A detailed view of the proposed overhead powerline and onsite electrical reticulation can be seen in Figure 3-12 and Figure 3-13.

Communications

A suitable communications network will be established across the wind farm site to enable appropriate operation and control including the required interaction with the TransGrid electricity grid. This may involve underground, overhead or microwave communication systems.

Operations and Maintenance Facilities

Up to two permanent operations and maintenance facilities will be constructed on the wind farm site. Each will require connection to low voltage electricity supply (415 V – 11,000 V) from local services. The facilities will each be approximately 100 m x 100 m each in size.

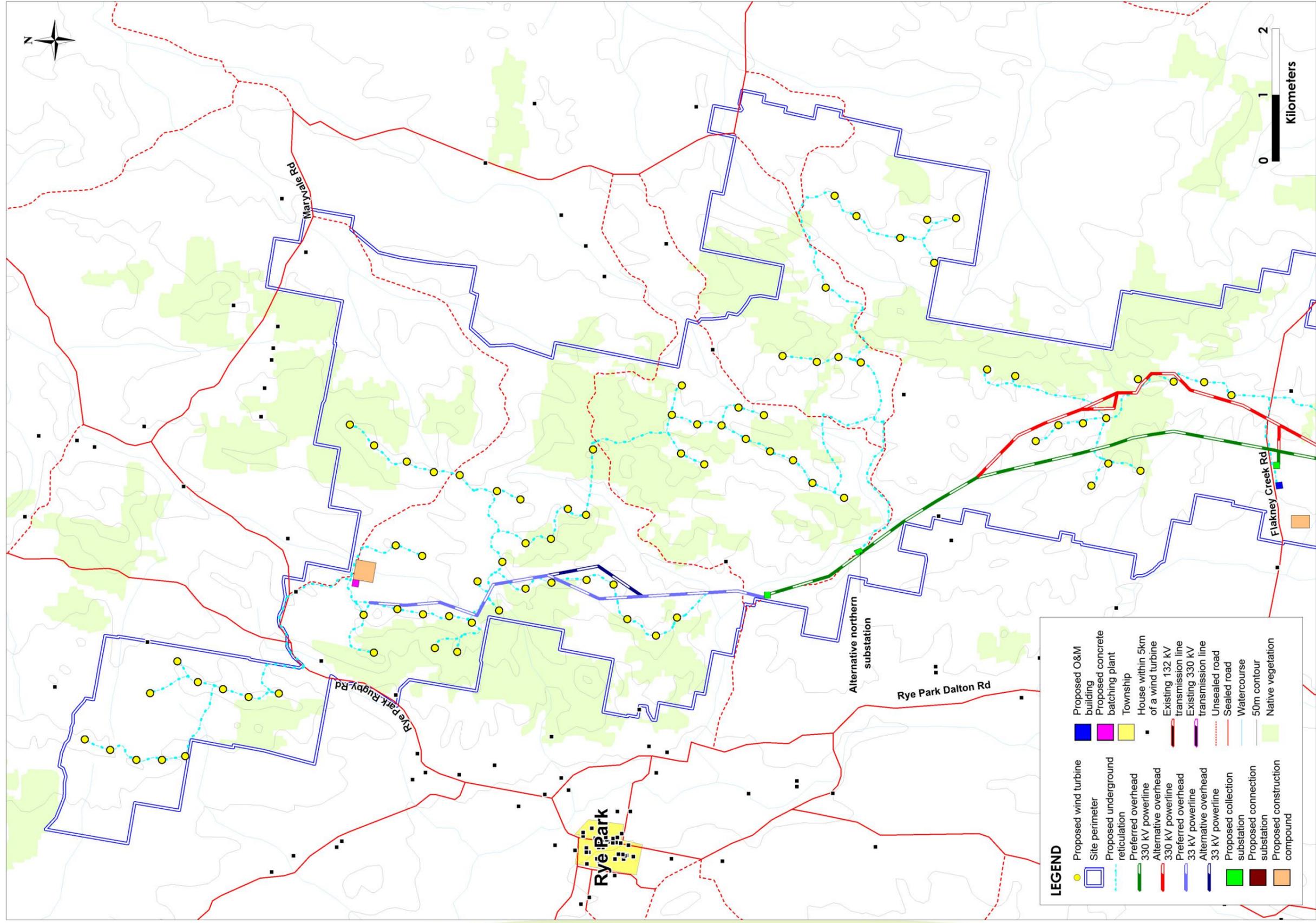


Figure 3-12 Northern region overhead powerlines & underground electrical reticulation

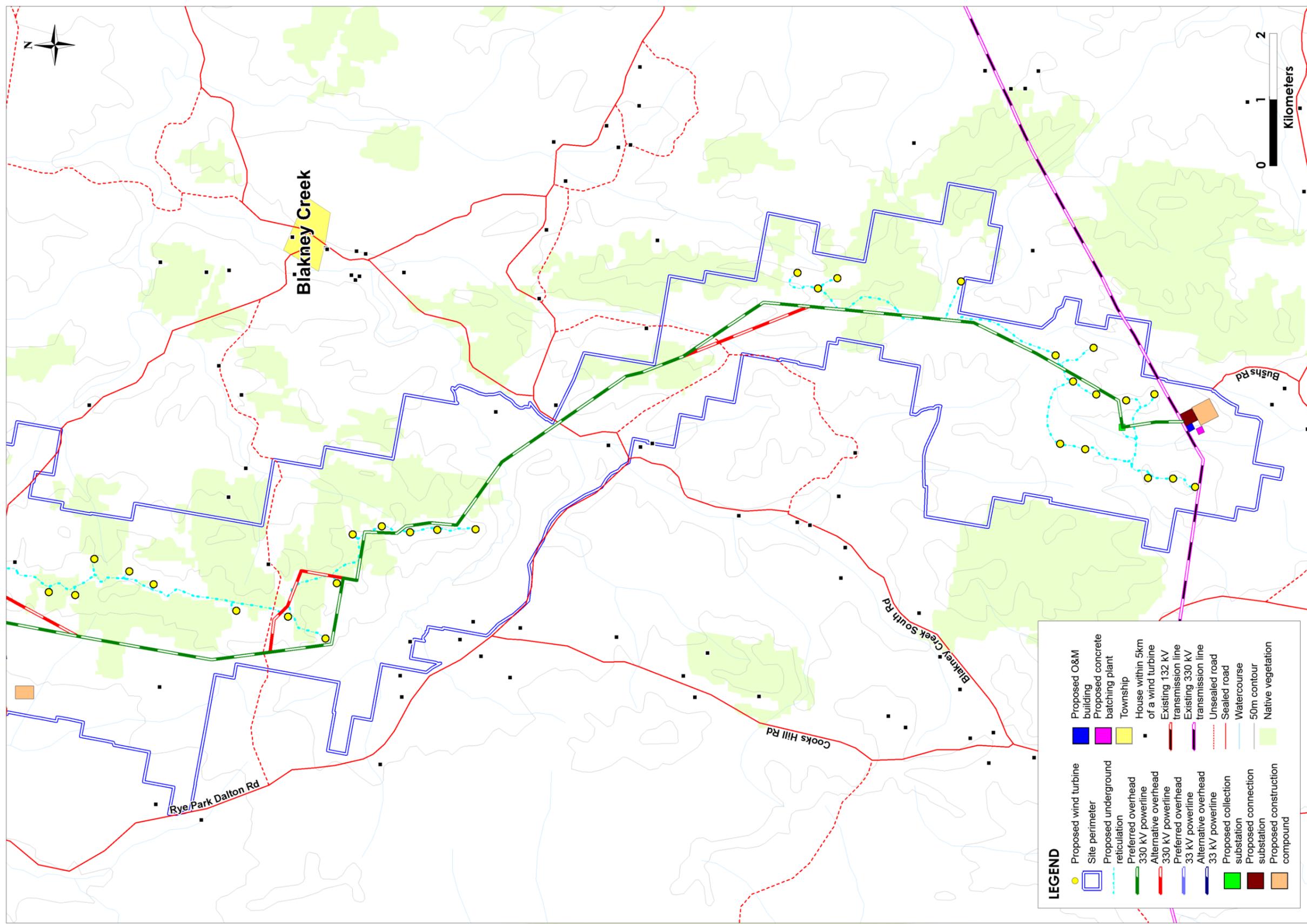


Figure 3-13 Southern region overhead powerlines & underground electrical reticulation

3.6 Access to and around the site

Main Access

The primary access to the project site will be via the Hume Highway, Lachlan Valley Way and Boorowa – Rye Park Road. The Hume Highway is a major dual carriageway highway between Sydney and Yass and will comfortably handle the additional traffic generated during the construction of the wind farm. The turn off to and from the wind farm site will be signposted and designed to allow vehicles to exit and enter the highway safely.

Access onto the wind farm site on the local road network will be from the west via upgraded access points off the Rye Park – Dalton Road. These access points will cross involved landowners property and provide access to various parts of the site.

A detailed Traffic and Transport Assessment has been conducted and is summarised in Section 5.5. A full copy of the Traffic and Transport Assessment is contained in Appendix E.

Access tracks

On site access tracks required for construction and operation would be unsealed formations with a minimum width of 5 - 6 m. Access tracks are required to the base of each wind turbine location and to the location of the connection substations, collection substations, overhead powerline route and operation and maintenance facilities. New gates and new or realigned fences or appropriate alternative measures, such as cattle grids, will be required to protect stock during the construction phase and at property boundary crossings.

Once the construction phase has finished, the crane hardstands and access tracks would be maintained to allow maintenance and repairs to the wind turbines. These tracks can also be used for normal farm access and for emergency or fire vehicle access.

In determining the revised locations for access tracks on site, every effort has been made to:

- ▶ minimise the number and length of access tracks;
- ▶ locate access tracks along the route of existing farm tracks;
- ▶ locate access tracks to minimise clearing of native vegetation;
- ▶ locate access tracks to minimise impact on sensitive ecological or heritage areas;
- ▶ construct access tracks with due regard to erosion and drainage; and
- ▶ construct access tracks with due regard to landowners ongoing farming practises.

A detailed view of the location of the proposed access tracks can be seen on the following pages in Figure 3-14 and Figure 3-15.

Vehicle management

Prior to the commencement of construction a Traffic Management Plan (TMP) would be prepared to properly manage traffic impacts on public roads as detailed in Appendix E. It would be developed in consultation with the roads authorities to ensure that the measures are adequate to address potential safety and asset degradation impacts.

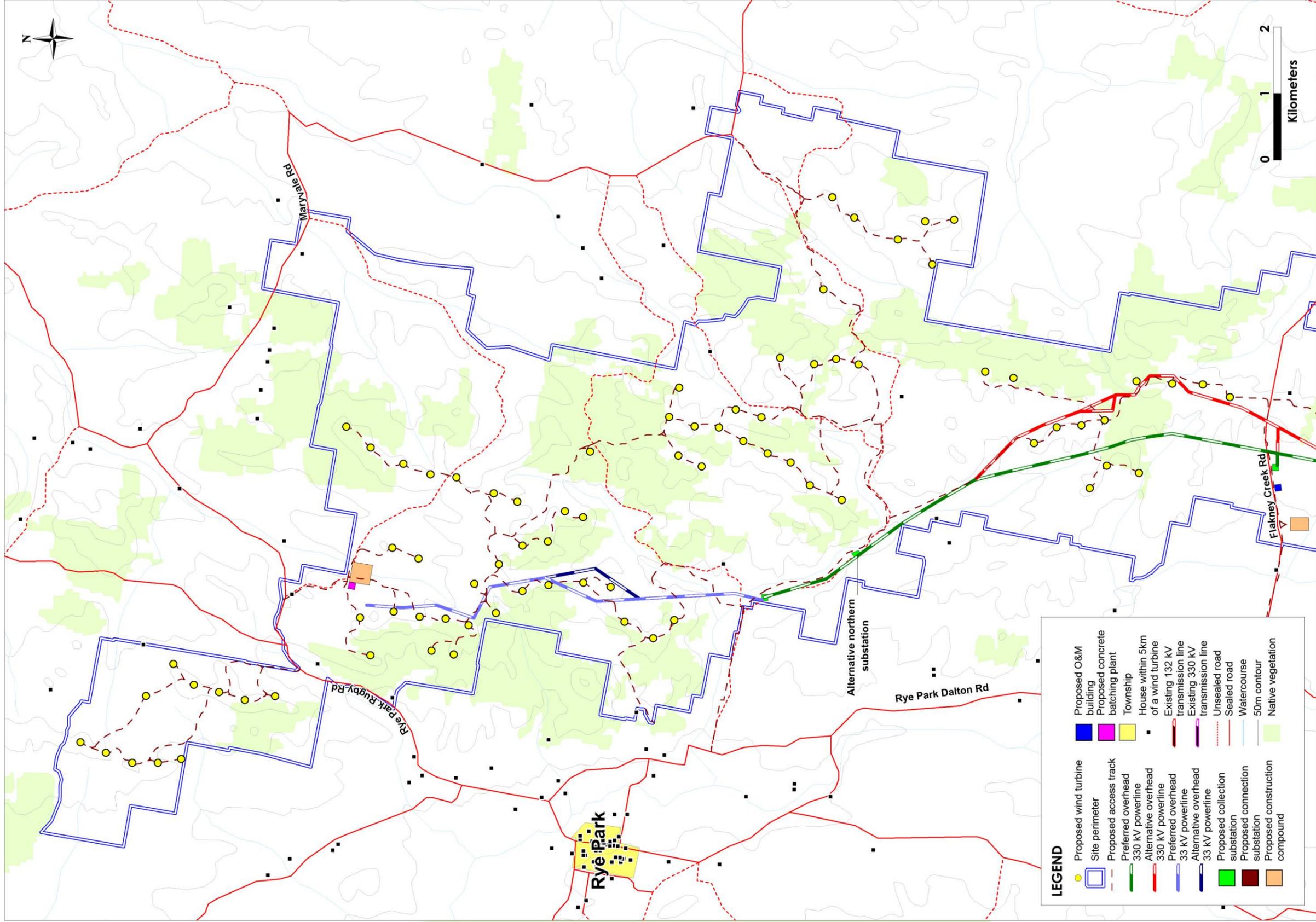


Figure 3-14 Northern region site access tracks

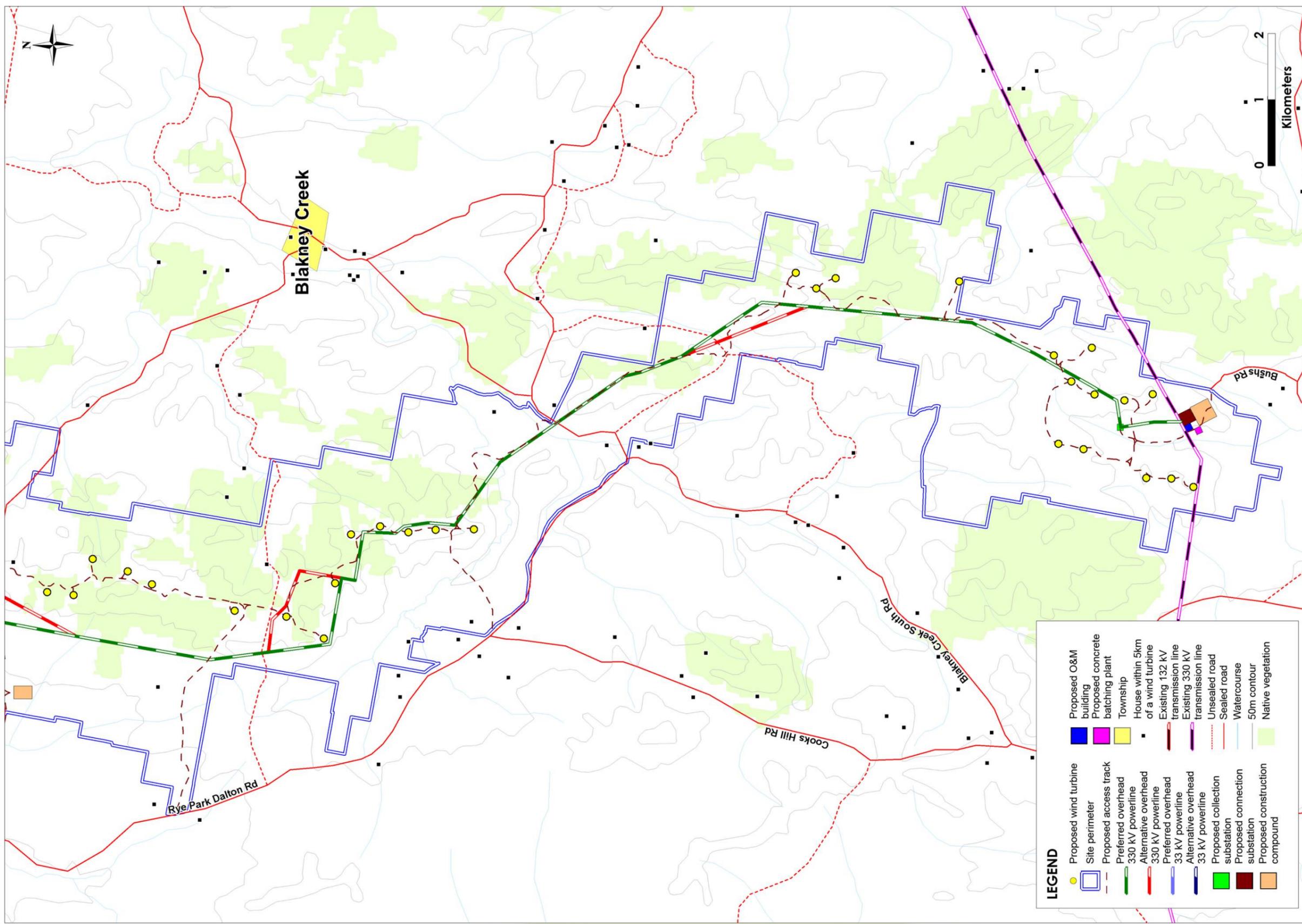


Figure 3-15 Southern region site access tracks

3.7 Additional permanent facilities

Operations and Maintenance Facilities

Up to two permanent operations and maintenance facilities, approximately 100 x 100 metres in size each, will be constructed on the wind farm site for managing operations and maintenance activity. Approval is sought for the three proposed alternative locations, however only two will be constructed. The operations and maintenance facilities will include car parking, offices and amenities for the maintenance staff, a control room and storage facilities for spares and equipment needed for the maintenance and operation of the wind turbines.

Electrical, Control and Communication Cabling

In addition to the electrical cabling, control and communications cabling is required from the operations and maintenance facilities to each wind turbine, and to the various substations. This communication cabling is typically optical fibre cable and would be installed using the same method and route as the power cabling described above, that is, strung from the same poles as overhead lines, or buried in the same cable trench as the electrical cables.

Wind Monitoring Equipment

Six temporary wind monitoring masts are currently operating on the site to assess wind speeds at or near proposed turbine locations. Pending final wind turbine placements, it may be necessary to move or install additional temporary wind monitoring masts to verify wind speeds across the site.

Following construction of the wind farm, up to six permanent wind monitoring masts would be erected to assist the control and operation of the wind farm. These would be either static guyed or un-guyed structures and will be to a minimum height of the wind turbine hubs with remotely operated wind monitoring equipment installed at multiple heights on each mast.

The temporary and permanent masts would be located within the Infrastructure Corridor. CASA and the Department of Defence will be informed of the location of any monitoring masts constructed.

3.8 Temporary construction facilities

Construction Compounds

During the construction phase up to three construction compounds will be established on the site. The compounds will include car parking, site offices, and amenities for the construction work force, and lay down areas for the temporary storage of construction materials, plant, equipment and wind turbine components. A temporary power supply will be required to be connected to the construction compounds.

Site Offices

During the construction phase up to 250 staff would be working on site at any time. Suitable locations for up to three site offices would be selected, avoiding areas that are regarded as having environmental constraints. The site offices may include several demountable buildings and amenities blocks which would be located on site for the duration of construction. Sufficient parking would be provided for the expected usage.

Rock Crushing

Materials excavated during the construction of wind turbine footings may be able to be reused for other purposes such as road base for the access roads and upgrades. Mobile rock crushers would be used for these purposes during construction.

Concrete Batch Plants

During construction up to two concrete batching plants would be required on site and would typically be located proximate to the construction compounds. A typical concrete batch plant would involve a level area of approximately 100 x 100 m to locate the loading bays, hoppers, cement and admixture silos, concrete truck loading hardstand, water tank and stockpiles for aggregate and sands. The batching plant would include an in-ground water recycling / first flush pit to prevent dirty water escaping onto the surrounding area, and would be

fully remediated after the construction phase. The proposed locations of the batching plants are shown in Figure 3-19 and Figure 3-20.

Each concrete batching plant would produce around 400 m³ of concrete per day when a turbine foundation is being poured. The batching plants would only be used during construction of each stage of the project, and each plant would produce around 850 tonnes of concrete per day during its operation. This is equivalent to around 110,000 tonnes of concrete during the construction phase for foundations. The batch plant operations would therefore constitute 'concrete works' under Schedule 1 of the *Protection of the Environment Operations Act 1997* and this activity would be included in the environment protection licence which would be required for the construction of the wind farm.

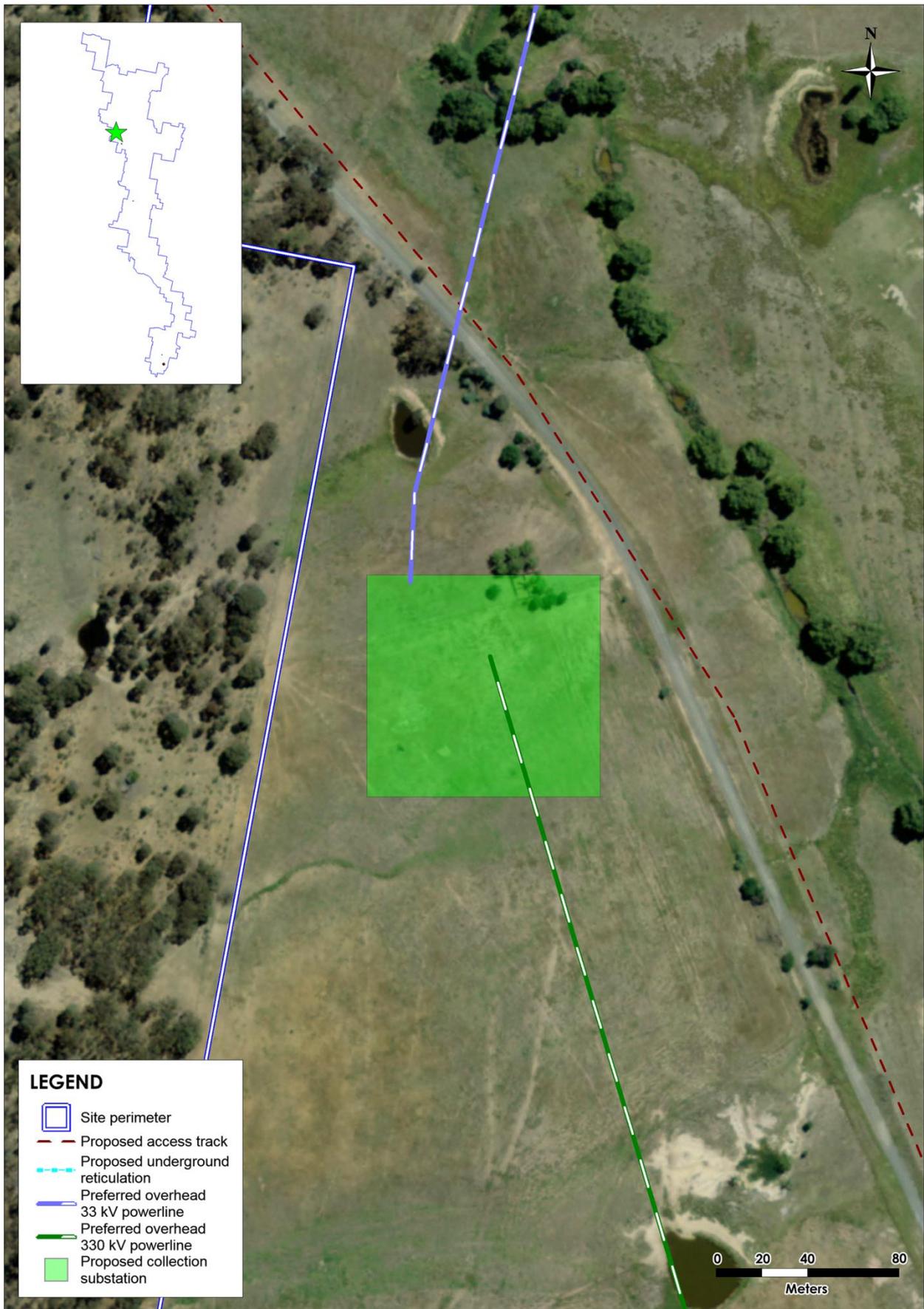


Figure 3-16 Proposed northern wind farm collection substation



Figure 3-17 Proposed alternative northern wind farm collection substation

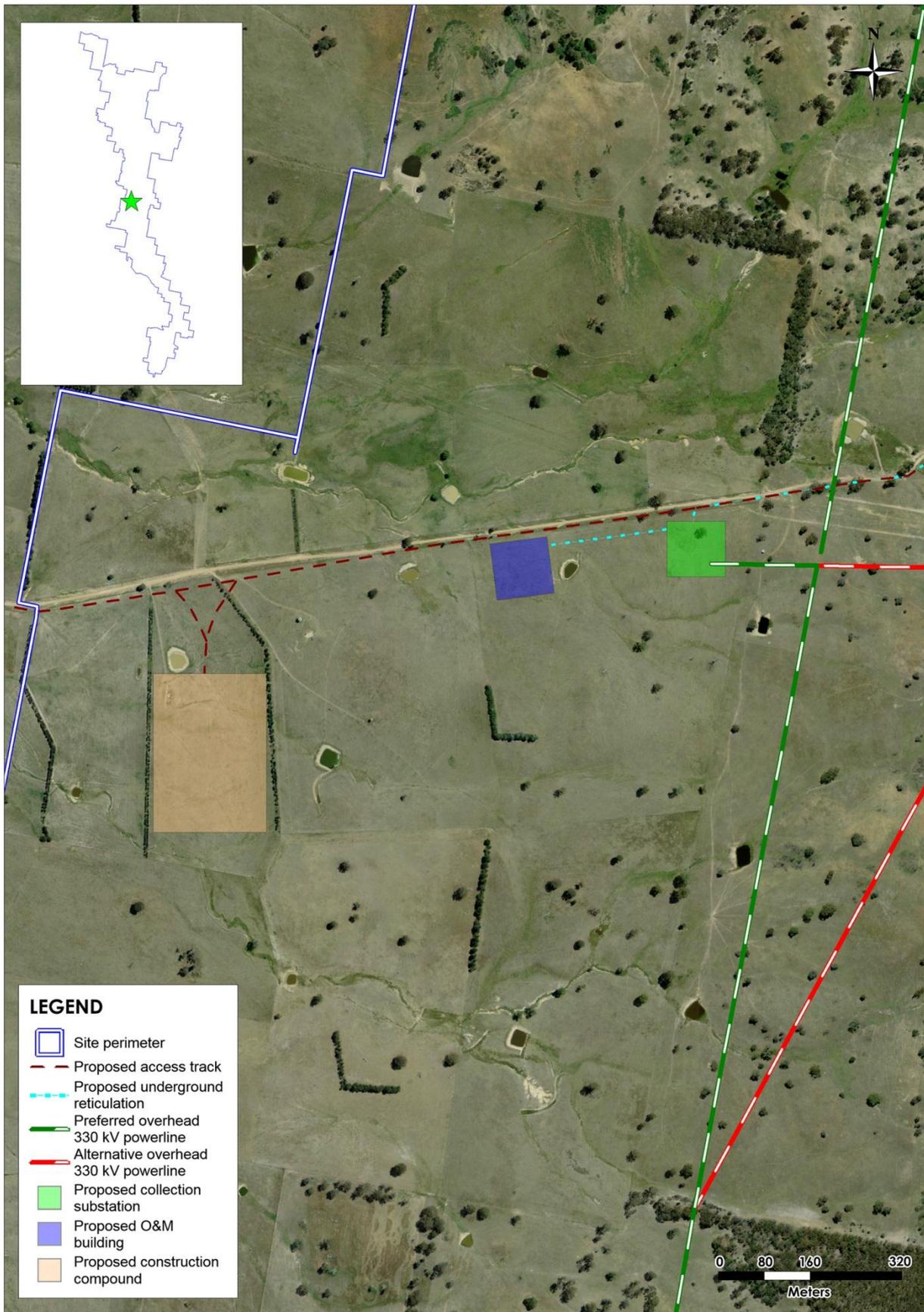


Figure 3-18 Proposed central wind farm collection substation, construction compound & permanent operation and maintenance facility

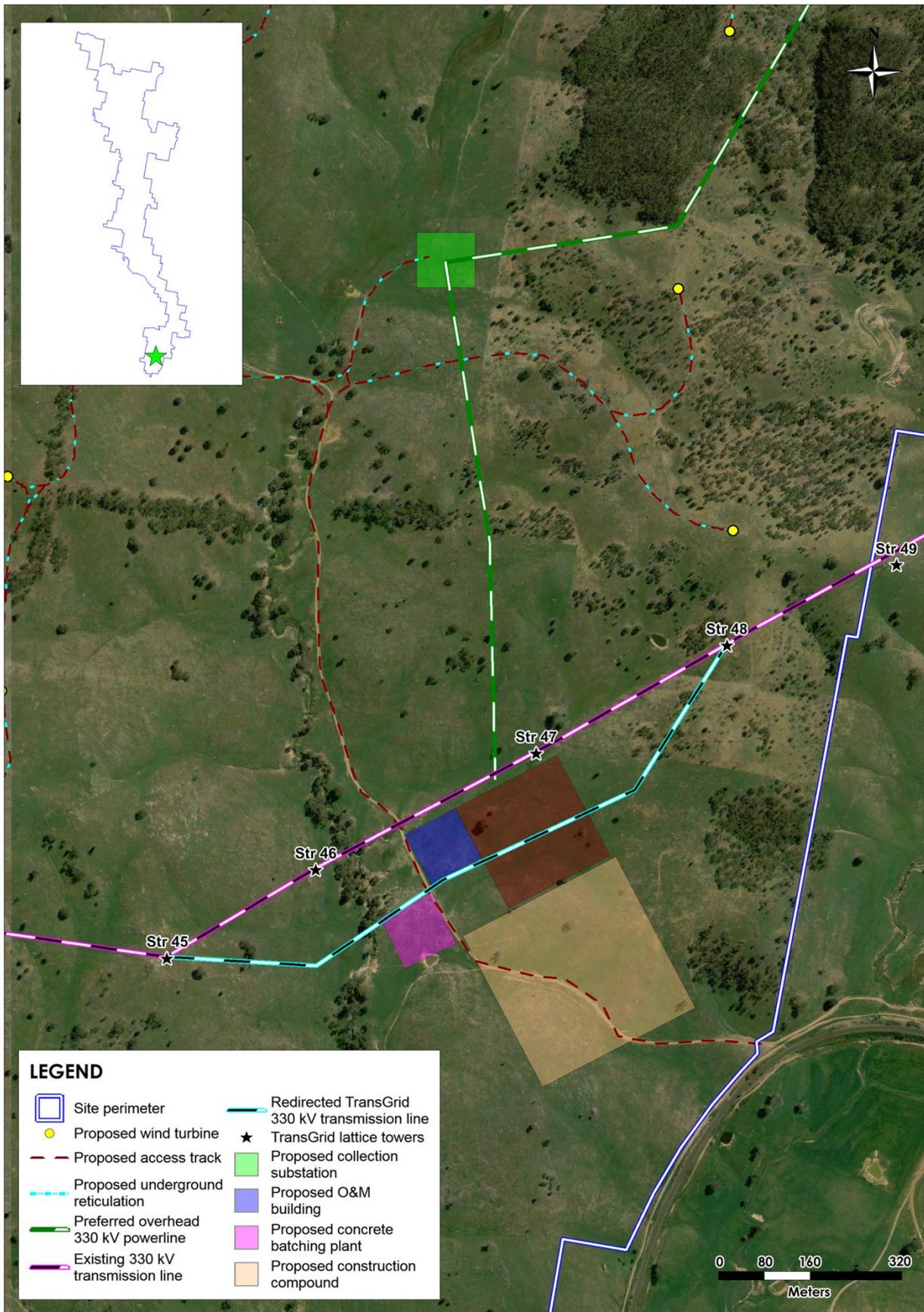


Figure 3-19 Proposed wind farm connection substation, collection substation, construction compound, line deviation route, concrete batch plant & permanent operation and maintenance facility

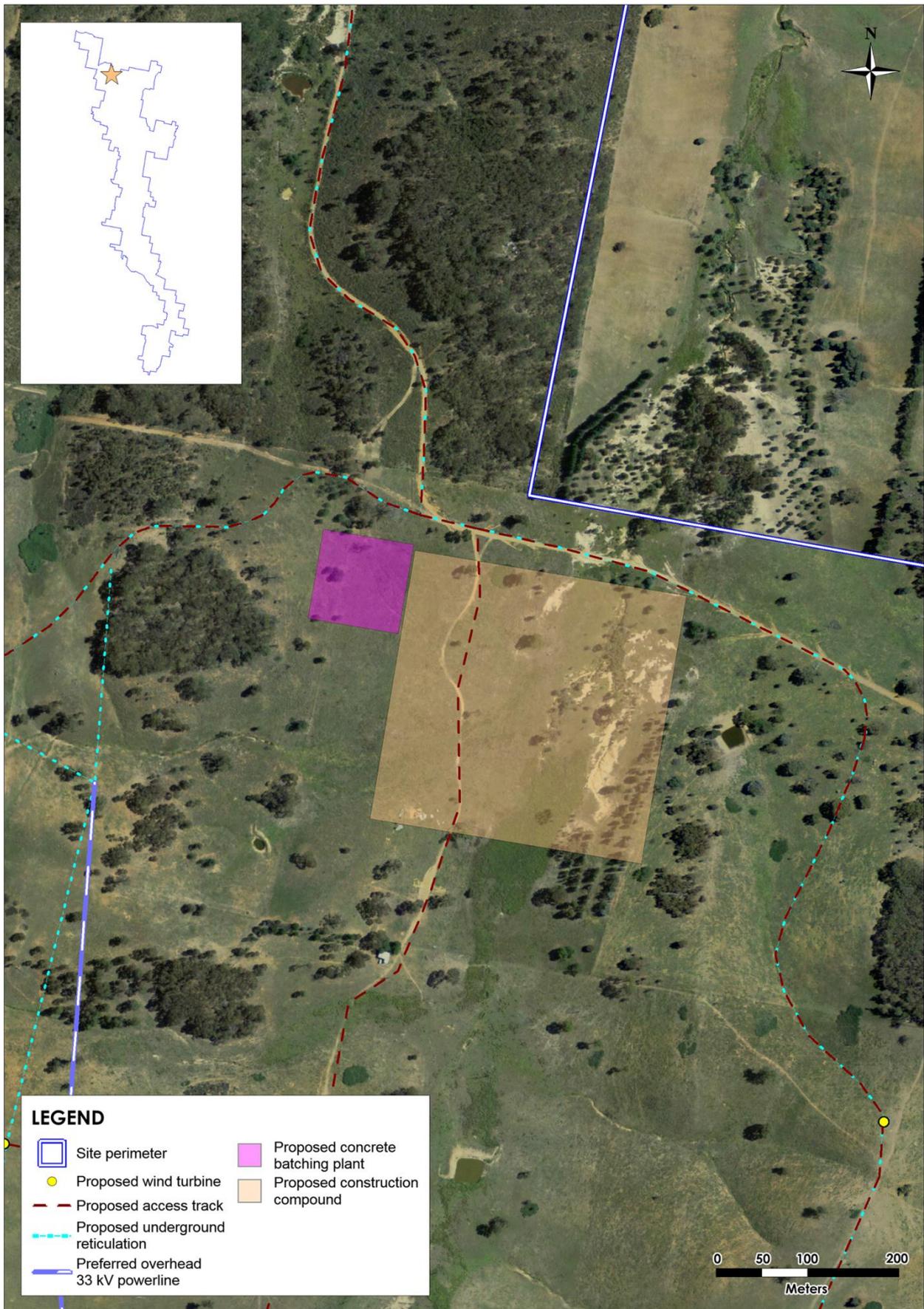


Figure 3-20 Proposed northern construction compound and concrete batch plant

3.9 Site disturbance and impact areas

The proposed wind farm requires the construction of a number of elements including turbines, turbine foundations, underground and overhead powerlines, substations, control buildings and access roads on the site.

During the construction activities additional areas of the site would be impacted to provide construction compounds, concrete batching plants and storage areas. These areas can be rehabilitated and restored following the completion of the construction program. Table 3-6 presents the estimated area of the site to be impacted by the project based on the revised layout. Most of the impacts would be for the duration of the wind farm operation. The batch plant and construction compound impacts are temporary impacts during the construction phase only.

Table 3-6 Estimated development footprint and site disturbance areas

Infrastructure	Quantity	Approx. Width (m)	Approx. Length (m)	Approx. Area (ha)
Turbine footing	109	20	20	4.4
Crane hardstand (in woodland and forest)	16	25	45	1.8
Crane hardstand (in pasture areas)	93	25	45	10.5
New tracks (permanent formed width)	1	12	103,400	113.2
Existing tracks (widening)	1	2	15,390	3.0
Underground reticulation (outside of tracks)	1	12	5,227	5.8
Transmission (33kV) (in woodland and forest)	1	30	694	2.0
Transmission (330kV) (in woodland and forest)	1	60	12,510	73.0
New tracks for transmission connectivity (33kV)	1	4	5,681	2.2
New tracks for 330 kV transmission	1	4	18,610	6.3
New tracks for transmission connectivity (330kV)	1	200	200	4.0
Wind farm substation	3	100	100	3.0
Operation and maintenance facility	2	100	100	2.0
Concrete batch plant	2	100	100	2.0
Construction compound	3			23.6
				256.8

Notes:

Access tracks around the site are anticipated to be 5 - 6 metres in width, however, a 12 metre width has been used to assess the likely impact due to cut and fill operations in order to achieve the required slope and increased width needed at bends. The impact area associated with underground cables has been incorporated into the figures for access tracks where they follow tracks.

The footprint for widening of existing racks includes some tracks that are outside of the site boundary.

3.10 Project implementation

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

3.10.1 Phase 1: Wind Farm Construction

Subject to the final project staging, the construction phase of the wind farm is likely to occur over an 18-24 month period and would include activities such as:

- ▶ transportation of people, materials and equipment to site;
- ▶ civil works for access track construction, turbine and monitoring mast footings and trenching for cables;
- ▶ establishment, operation and removal of any required construction equipment such as rock breaking equipment and concrete batching plants;
- ▶ potential use of blasting for foundation excavation, if required;
- ▶ installation of wind turbines using large mobile cranes;
- ▶ construction of site substations, connection to on-site 330kV transmission line, and onsite overhead powerlines and electrical cables;
- ▶ construction and commissioning of additional facilities (temporary and permanent) as required;
- ▶ construction, use and removal of temporary offices and facilities;
- ▶ temporary storage of plant, water, aggregates and other equipment; and
- ▶ restoration and revegetation of disturbed onsite areas on completion of construction works.

In general, construction would commence with site establishment, construction of access tracks and all other site civil works, including preparation of hardstand areas, and laying of cables. This would be followed by the preparation of concrete turbine footings, which must be cured prior to installation of wind turbines and monitoring masts.

The construction and erection of individual wind turbines can be relatively fast once the footings are prepared, with wind turbines able to be installed at a rate of approximately 2-3 per week, subject to weather. The towers are erected in sections, the nacelles lifted to the top of the towers, and finally blades lifted and bolted to the hub or preassembled on the ground and lifted as a unit.

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

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

On completion of construction, any disturbance caused by temporary construction facilities which are no longer required for operations would be remediated and all waste materials removed and disposed of appropriately.

3.10.2 Phase 2: Wind Farm Operation

While the wind farm operation would be controlled remotely, the wind turbines and other equipment would require regular maintenance. It is also possible that some equipment, including wind turbines, may require major repair or replacement.

During the initial operating years, operator attendance may be more regular while wind farm operation is being fine-tuned and optimised.

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

Routine Maintenance

To ensure the wind farm operates in a safe and reliable manner, require regular inspections and maintenance would be scheduled on an 'as needs' basis. This would generally be carried out using standard light vehicles.

In addition, regular scheduled maintenance is required, generally at 3, 6 and 12 monthly intervals. As a guide, each turbine requires approximately 7 days of maintenance per year. This does not typically require the use of major equipment, and could be carried out in a normal utility or small truck.

Major Repairs

It is possible that major unexpected or unscheduled equipment failures could take place during the life of the wind farm. While wind turbines and electrical components are designed for a 20 - 30 year life, failures can occur, for example due to lightning strike.

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

- ▶ Replacement of wind turbines would, if necessary, be carried out using the same process as for turbine construction.
- ▶ Replacement of wind turbine blades, if necessary, would require bringing new blades to the affected turbine and installation of these blades using large cranes. The requirements are similar to the construction phase, and the access tracks established for construction would be used.
- ▶ Replacement of wind turbine generators or gearboxes may require a crane and low loader truck to access the wind farm.
- ▶ Replacement of substation transformers would require a low loader truck to access the site.

Site monitoring program

A post-construction monitoring program would be established to determine any additional impacts resulting from the operation of the wind farm. The Operational Environmental Management Plan would contain specific monitoring programs required and would address key issues such as noise compliance, weed management, and additional erosion measures if required.

3.10.3 Phase 3: Wind Turbine Refurbishment / Replacement

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

Replacement, refurbishment and recommissioning would involve similar road access arrangements to construction, and would require access for large cranes and transport vehicles to dismantle and remove the existing turbines and to install replacement turbines.

Existing substations and cabling would be largely reused. It is also possible that the existing footings and towers could also be reused, subject to the design of turbines available at the time of replacement / recommissioning. This would allow a significant cost saving for the wind farm.

Any refurbishment or turbine replacement would comply with the ongoing requirements of the project approval under this application. Should replacement turbine locations be located in different locations to approved locations, separate planning approval consent will be sought.

3.10.4 Phase 4: Wind Farm Decommissioning

Decommissioning the wind farm at the end of its commercial life would be undertaken by the Proponent at its cost. It would involve reinstating similar road access arrangements to construction, and would require access for

large cranes and transport vehicles to dismantle and remove the turbines and associated infrastructure. All underground infrastructure, such as foundations and cable trenches, would remain in situ and all above ground infrastructure would be removed. Some infrastructure such as access roads and buildings may be required by the landowner to remain in place after decommissioning and will not be removed. The decommissioning period is likely to be significantly shorter and with significantly fewer truck movements than the construction phase.

A draft Decommissioning and Rehabilitation Plan for the project is attached as Appendix G.

3.10.5 Construction Hours

In general, construction activities associated with the project that would generate audible noise in excess of the requirements of the NSW Interim Construction Noise Guidelines at any residence would be undertaken during the daylight hours of:

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

These working hours have been proposed to allow reasonable efficiencies of effort to achieve maximum productivity and to minimise the overall construction duration but should not be restricted to daylight hours. Variations to these hours may be required subject to weather and seasonal impacts.

However, some activities (including delivery to site of major equipment, and turbine installation) will need to occur outside of these hours due to logistic, safety or weather related reasons.

Turbine crane lifts, for example, can only be carried out during periods of lower wind speeds because of operational limitations with the tall cranes and it is possible that out of hours work would be required for this purpose. This scenario has occurred at other wind farms (for example Cape Bridgewater, Victoria) where night crane operations have been required because of strong winds occurring during the day.

Likewise, the requirements of NSW Police or roads authorities may limit transport of major equipment to and from the site to outside of normal working hours.

Any construction activities outside of the standard construction hours will only be undertaken in the following circumstances;

- ▶ Construction activities that generate noise that is:
 - no more than 5dB(A) above rating background level at any residence in accordance with the ICNG (Table 2 of the ICNG); and
 - no more than the noise management levels specified in Table 3 of the ICNG at other sensitive receivers; or
- ▶ for the delivery of material required outside those hours by the NSW police Force or other authorities for safety reasons (section 10.11.2);
- ▶ where it is required in an emergency to avoid the loss of life, property and/or to prevent environmental harm; or
- ▶ works as approved through the out-of-hours work protocol outlined in the Construction Noise and Vibration Management Plan as part of the Construction Environmental Management Plan.

3.11 Crown Land

There are five parcels of crown land within the site perimeter. These are Lot 7001 DP 1026328, Lot 7301 DP 1147658, Lot 7001 DP 1033069, Lot 7002 DP 1033069 and Lot 7001 DP 1026213. Figure 3-21 through Figure 3-24 shows the revised indicative infrastructure layout relative to these respective Crown Parcels. No turbines, associated blades, facilities, access tracks, underground cabling and overhead powerlines encroach and impact on any Crown Parcels. In addition, claim area ALC 10992 has been avoided and no infrastructure is proposed on this land.

In some instances:

- access tracks and underground cabling cross or run along Crown Roads; and
- access tracks, underground cabling and overhead powerlines cross Crown Waterways.

Appropriate access rights will be obtained where required to authorise this and no project infrastructure will encroach on any crown land, roads or waterways without such access rights having been obtained.

There are no turbines or infrastructure placed on, encroaching or impacting Trig Reserves. The Survey Infrastructure and Geodesy department in the Land and Property Information Division has been consulted and the project has considered the requirements set out in 'General Guidelines for positioning of and construction of Wind Turbines near Trigonometrical Stations' V1.3 dated Jun'12.

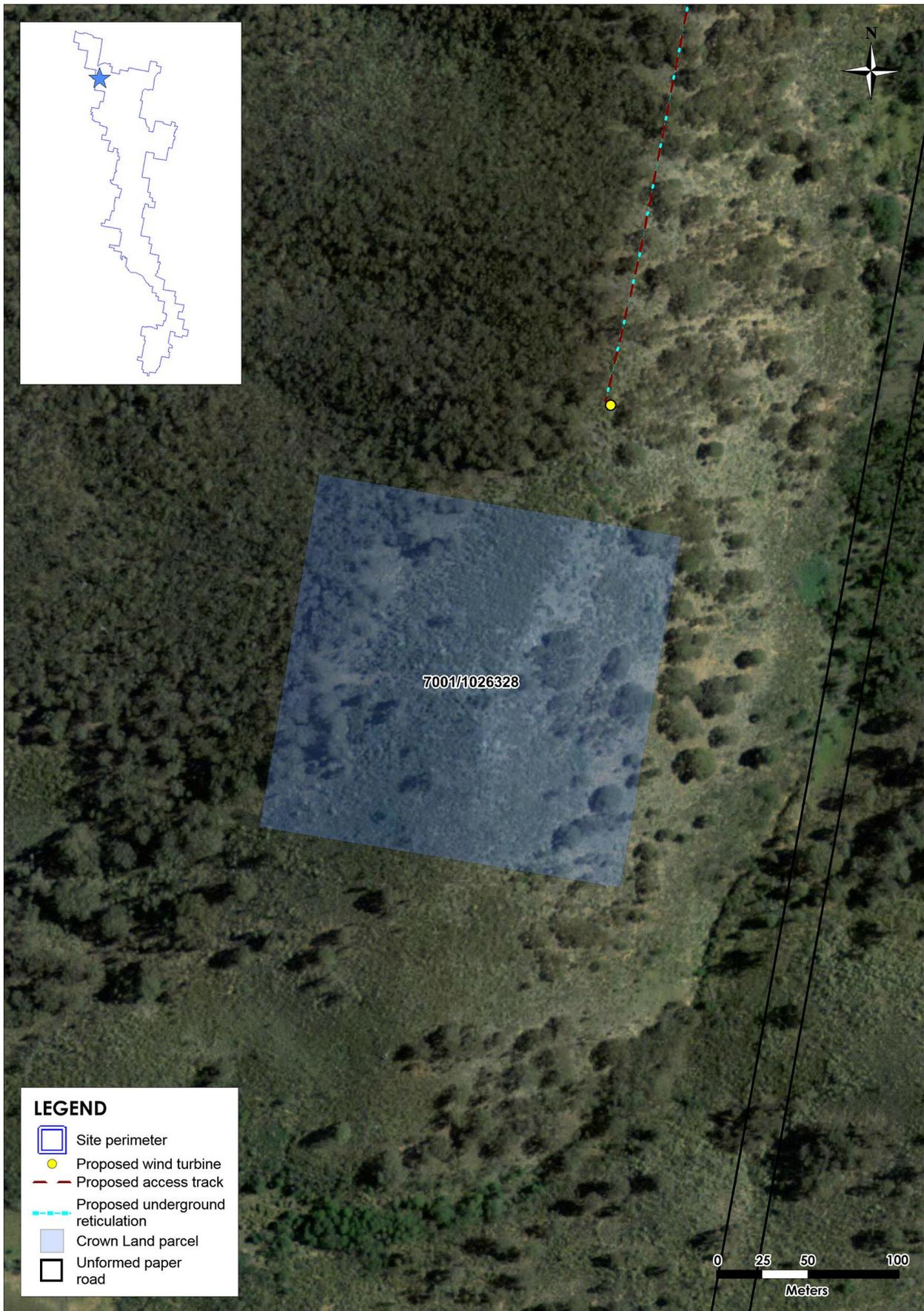


Figure 3-21 Crown Lands parcel located within the project boundary

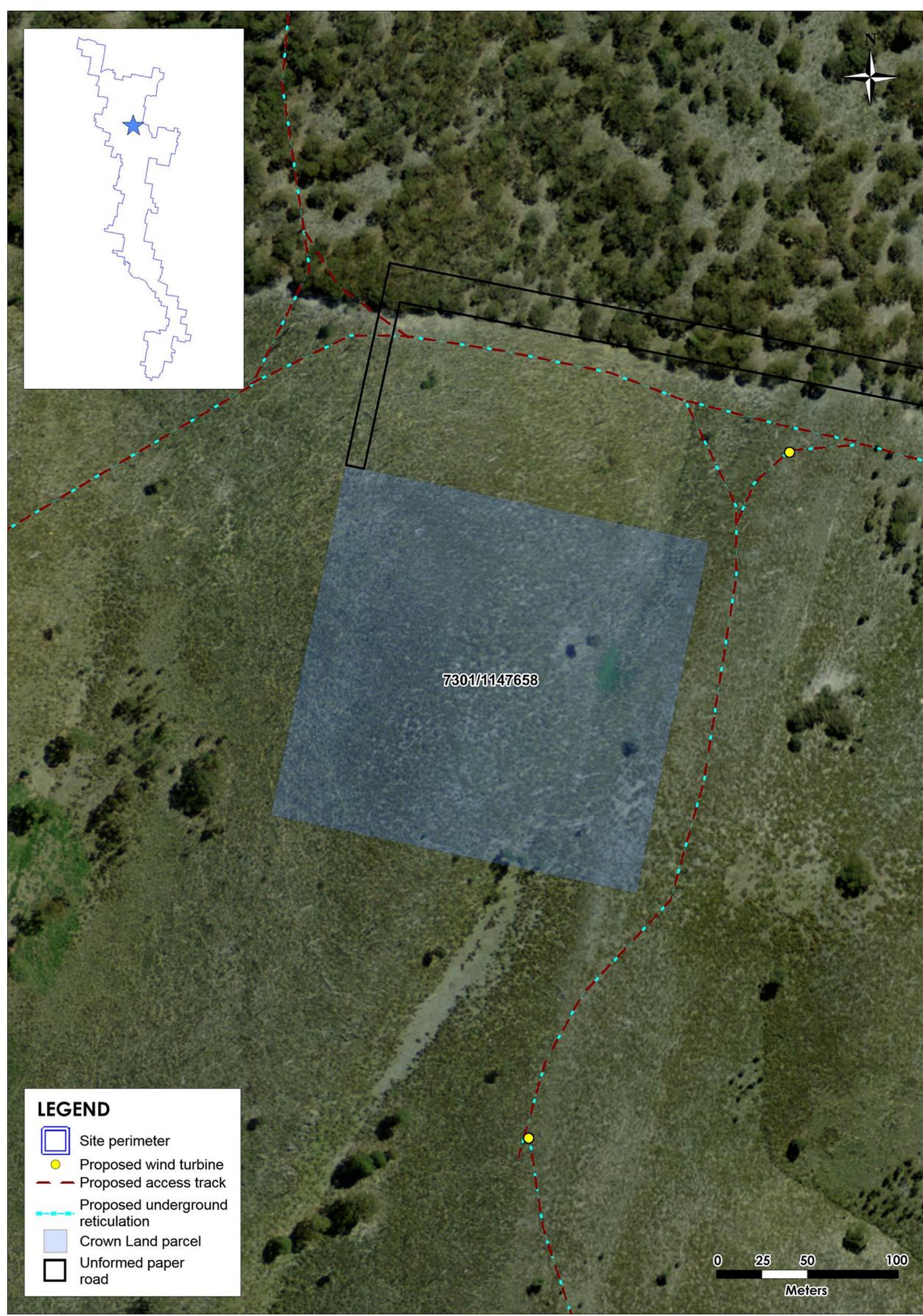


Figure 3-22 Crown Lands parcel located within the project boundary

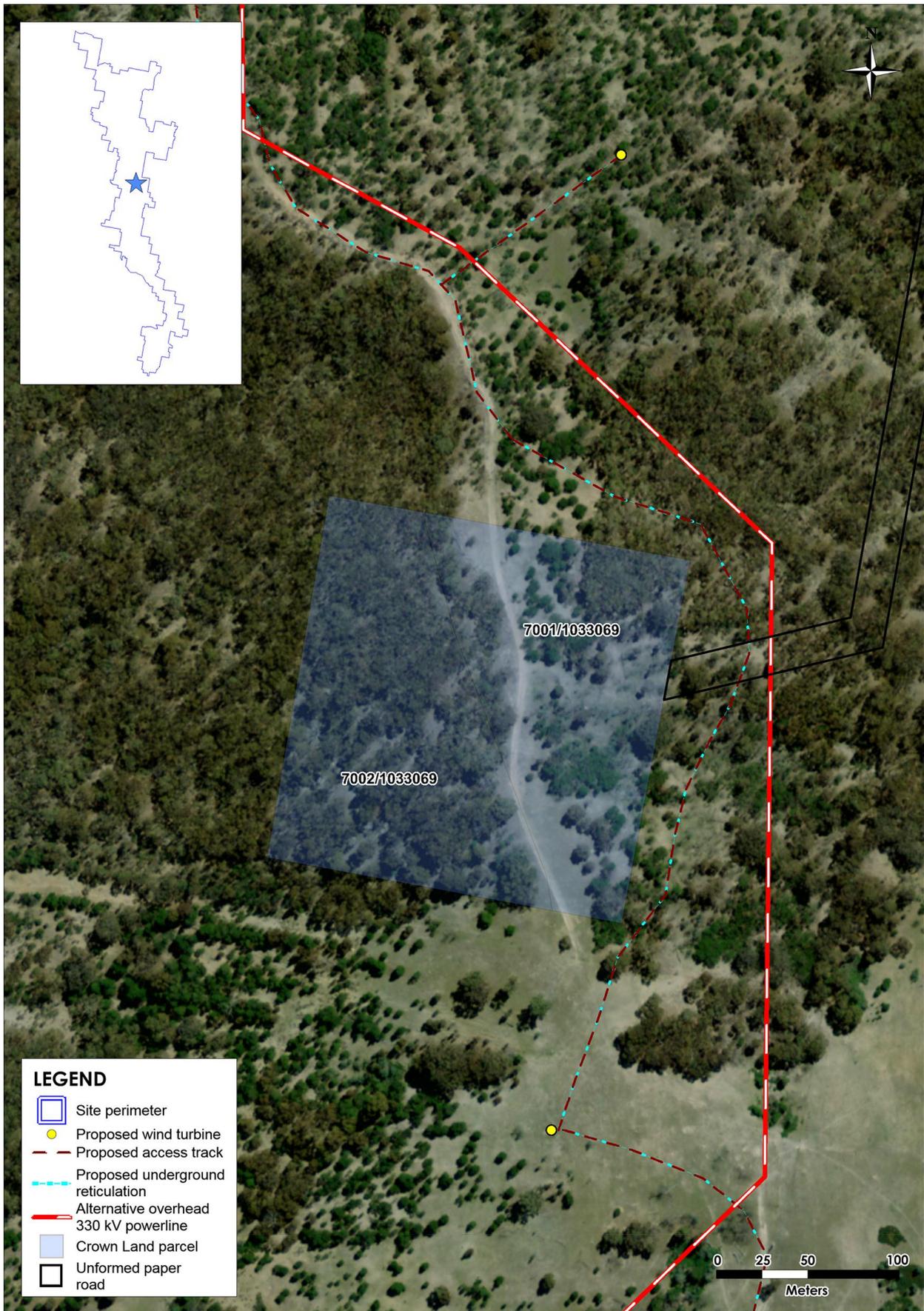


Figure 3-23 Crown Lands parcel located within the project boundary



Figure 3-24 Crown Lands parcel located within the project boundary

3.12 Local Government Areas

The proposed Rye Park Wind Farm is located across three LGAs; Boorowa Council, Upper Lachlan Shire Council and Yass Valley Council. The boundaries of the three LGAs can be seen in Figure 3-25, with the distribution of proposed wind turbines based on the revised layout summarised in Table 3-7. The final number of wind turbines in each LGA may be subject to change as micrositing of turbines may occur later in the development process.

Local Government planning instruments and policies are discussed further in Section 5.1.14

Table 3-7 Summary of the number of proposed wind turbines in each LGA

<i>Local Government Area</i>	<i>Proposed number of turbines</i>
Boorowa Council	73
Upper Lachlan Shire Council	25
Yass Valley Council	11
Total:	109

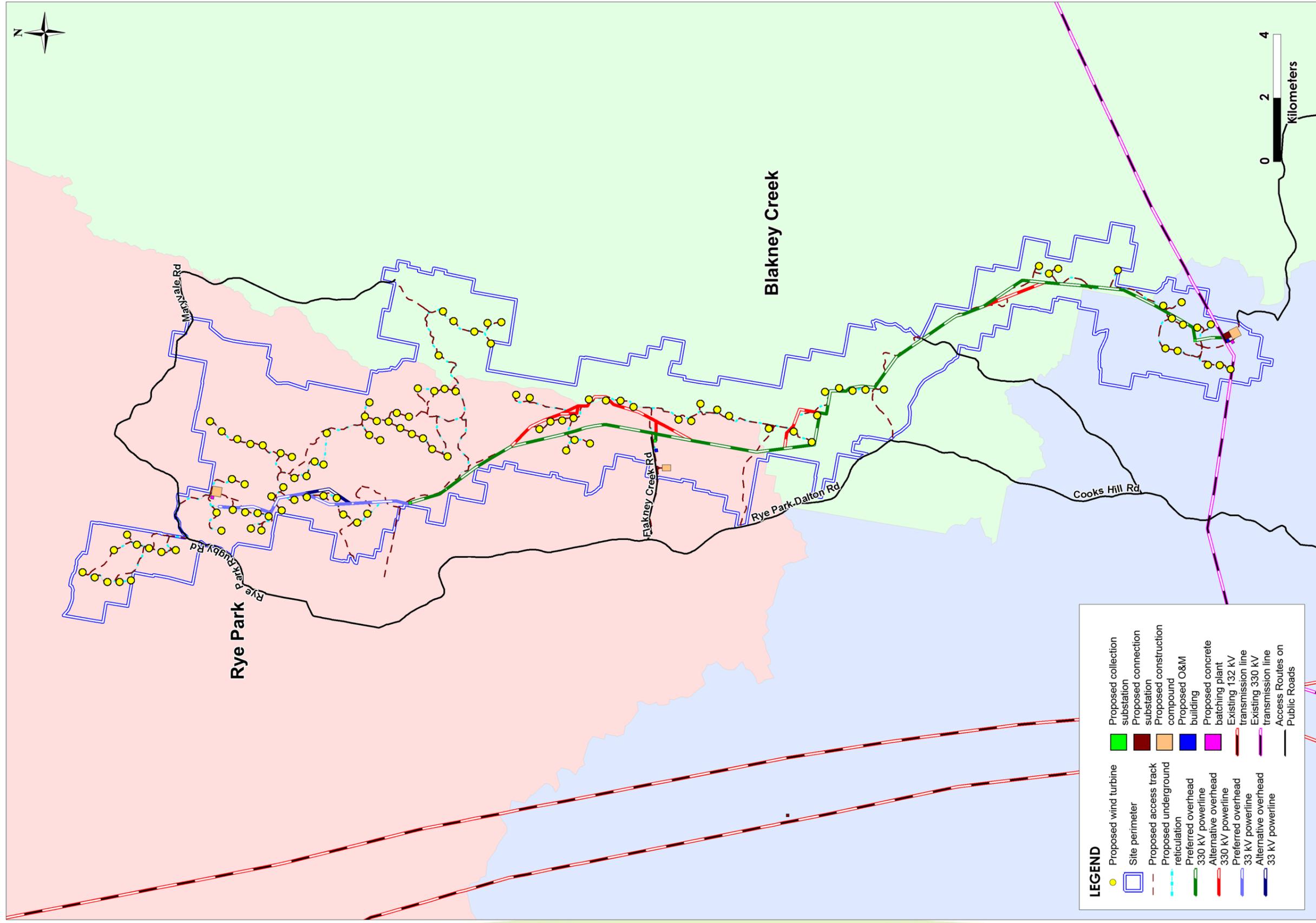


Figure 3-25 Distribution of wind farm infrastructure across the three LGA boundaries

4 PROJECT JUSTIFICATION

4.1 Project Benefits

The revised Rye Park Wind Farm proposal would provide the following primary benefits:

- In full operation, it would generate more than 1,028,000 MWh of electricity per year - sufficient for the average consumption of around 130,000 homes.
- It would improve the security of electricity supply through diversification of generation locations.
- It will save 800,000 tonnes carbon emissions per annum, equivalent of removing 260,000 cars off the roads per annum.
- It would contribute to the State and Federal Governments' target of providing 20% of consumed energy from renewable sources by 2020.
- It would contribute to the NSW Government's target of reducing greenhouse gas emissions by 60% by the year 2050.
- It will provide full time employment for up to 250 staff during construction and up to 12 ongoing regional jobs during its operational life.
- It will result in a direct injection of approximately \$2-\$3 million per annum to the local community through payments to landholders, permanent staff and community fund contributions

In addition to these primary benefits there are also secondary benefits and opportunities for improvement in infrastructure, tourism and ecology.

4.2 Meeting our changing electricity demand

Electricity Statement of Opportunities (ESOO) for the National Electricity Market released by AEMO in August 2015 uses information provided by industry to report on the adequacy of existing and committed electricity supply in the NEM to meet maximum demand and annual operational consumption forecasts over the period 2015–16 to 2024–25. The 2015 ESSO noted that, although there has been a slowing in growth in electricity demand, there has also been significant withdrawal of existing generation capacity. In particular, in New South Wales in the past year, the market has announced 2,315 MW of generation capacity withdrawal. This is in addition to 1,000 MW of withdrawal announced for this region before the 2014 ESSO publication. Assuming no market adjustments, these withdrawals may lead to a shortfall of generation capacity in NSW by 2022–23, under the medium demand scenario. The table below shows the lack of surplus capacity in NSW and SA with limited surplus capacity in VIC and TAS by 2023-24.

	Queensland	New South Wales	South Australia	Victoria	Tasmania
2014 ESSO surplus capacity – medium scenario	2,000	2,100	700	2,250	350
Plant capacity withdrawal announced since 2014	0	2,315	1,505	345	386 ⁶
Summer maximum demand increase – medium scenario	801	613	27	476	15
2015 ESSO surplus capacity – medium scenario*	450	N/A	N/A	100 ⁷	50

Figure 4-1 Surplus capacity changes (MW) by region since the 2014 ESSO projected to 2023–24

Electricity production from wind farms is variable. At any point in time a wind farm could be generating anywhere in the range of 0 to 100% of its power output, depending on the local wind speeds.

However, in the same way that the weather can be predicted hours to weeks in advance, the likely wind farm power output at any point in time can also be predicted with reasonable accuracy. In its role as electricity market operator, AEMO has established a Wind Energy Forecasting System to help it understand the likely wind farm production from minutes to days in advance. This system enables AEMO to reliably operate the electricity market taking into consideration the variability of all components including the constantly changing load, availability of and loading on transmission lines, plant outages at major power stations, and the changing output of wind farms.

In that context, while the output of wind farms is variable, it is also predictable and dependable. Significant wind monitoring has been carried out on the site to confirm the expected long term wind regime.

The energy produced from the wind farm would be 100% renewable energy and would be fed directly into the electricity grid and sold on the National Electricity Market (NEM).

4.3 Reducing greenhouse gas emissions

4.3.1 Context

There is scientific evidence that the earth's climate is changing. Observations have shown global increases in air and ocean temperatures, the widespread melting of snow and ice and rising sea levels (IPCC, 2008). It has further been observed that many of the world's natural systems are already being affected by the change of regional climates, in particular temperature increases (IPCC, 2008). Other indicators include altered rainfall patterns and more frequent or intense weather patterns such as heatwaves, drought, and storms. In Australia, this change in the climate is anticipated to have an impact on water supply and quality, ecosystems and conservation, agriculture and forestry, fisheries, settlements and industry and human health.

The drivers for climate change have been identified as being from both natural and anthropogenic forces, however a main contributor is the release of greenhouse gases GHG into the atmosphere (IPCC, 2008).

The Intergovernmental Panel for Climate Change (IPCC) has acknowledged that it is very likely that human greenhouse gas emissions have directly influenced global temperatures to increase, as well as lead to other climate impacts. As greenhouse gas emissions stay in the atmosphere for decades, a predicted warming of around 0.2°C per decade is already expected regardless of future emission levels. However, if greenhouse gas emissions continue to be emitted at their current rate then further and more extreme changes to the global climate system will be experienced. Therefore, a reduction in greenhouse gas emissions would reduce the rate and magnitude of climate change. The IPCC recognises that mitigation efforts over the next 20-30 years will be crucial to stabilising the amount of change (IPCC, 2008).

Referring to the Australian context, Department of Climate Change and Department of Sustainability, Environment, Water, Population and Communities reports show that greenhouse gas emissions from the stationary energy sector, is the largest and fastest growing area in terms of greenhouse gas emissions in Australia. The stationary energy sector accounted for 52% of total emissions in 2009 and within this sector, emissions from electricity generation contributed over 70%. Furthermore, stationary energy emissions between 1990 and 2009 energy have increased by 51% (DSEWPC, 2011).

Estimates of Australia's greenhouse gas emissions are produced by the Australian Department of Environment. NSW emissions in 2012/13 (the latest year of data) were 142 million tonnes CO₂e, with stationary energy (generating heat and electricity) the largest contributing sector. In the fossil fuel burning sectors, emissions have grown by 22% since 1990, including a 13% increase in emissions from electricity generation.

4.3.2 Options to Reduce our Emissions

The IPCC has identified key technologies and practices for the energy sector that are currently commercially available which could be used to mitigate the effects of Greenhouse Gas emissions. They include:

- ▶ improved supply and distribution efficiency (transmission and distribution of electricity);
- ▶ fuel switching from coal to gas;
- ▶ utilisation of nuclear power;
- ▶ utilisation of renewable heat and power (hydropower, solar, wind, geothermal and bioenergy);
- ▶ utilisation of combined heat and power technologies; and,
- ▶ early applications of carbon dioxide capture and storage (e.g. storage of removed CO₂ from natural gas).

In addition the IPCC has also identified policies, measures and instruments shown to be environmentally effective. These include:

- ▶ reduction of fossil fuel subsidies;
- ▶ an increase of taxes or carbon charges on fossil fuels;
- ▶ feed-in tariffs for renewable energy technologies;
- ▶ renewable energy obligations; and
- ▶ renewable energy producer subsidies.

NSW 2021: A plan to make NSW number one includes a target to minimise the impacts of climate change in local communities. The plan sets goals and targets that support practical action to tackle climate change. They include:

- ▶ 20% renewable energy by 2020
- ▶ help for businesses and households to realise annual energy savings of 16,000 gigawatt-hours by 2020 compared with 'business as usual' trends
- ▶ support for 220,000 low-income households to reduce their energy use by up to 20% by June 2014

4.3.3 Contributions to reducing greenhouse gas emissions

During its operational phase, the Rye Park Wind Farm would generate electricity without producing greenhouse gas emissions. In addition the wind farm would be displacing electricity produced by fossil fuel sources (coal and gas), and hence, would reduce the overall amount of GHG emissions produced by the stationary energy sector (electricity generation).

To estimate the potential GHG emissions savings that large scale wind farm developments would have in NSW, DECCW commissioned McLennan Magasanik Associates to conduct a study and subsequently developed a tool to calculate the expected savings from the wind farm based on its size and location. This tool can be accessed via the DECCW website at <http://www.environment.nsw.gov.au/ggescapp/>

The results of the study as they relate to the revised project showed the following:

- ▶ In NSW wind farms would initially almost exclusively displace fossil fuel generation from coal and, to a lesser extent, gas.
- ▶ A wind farm the size of Rye Park would save 800,000 tonnes of carbon emissions per year.
- ▶ The impact on the management of the network due to the variability of wind would be negligible and the emissions savings would greatly outweigh any such impact.

4.4 The role of renewable energy

4.4.1 Federal Renewable Energy Target

Australia's Renewable Energy Target (RET) is a Federal Government policy designed to ensure that at least 33,000 Gigawatt-hour (GWh) of Australia's electricity comes from renewable sources by 2020. The RET was reviewed by the Government and reduced in June 2015 from the previously legislated 41,000 GWh to 33,000 GWh.

The Rye Park Wind Farm would have a generation capacity of 327 MW (based on a 3.0 MW turbine) and would generate approximately 1,028 GWh each year. Accordingly, the project would contribute directly and significantly towards meeting the Federal Government's RET.

4.4.2 State Renewable Energy Targets

As noted in section 3.4.2, the *NSW 2021* plan includes a target of 20% renewable energy by 2020. The plan promotes the use of energy from renewable sources at least cost to the energy consumer and with maximum benefits to NSW. The Plan cites Bureau of Resources and Energy Economics statistics 2012 indicating that wind is presently the lowest cost renewable technology but for biogas (landfill), and that wind is predicted to be the least cost renewable source of electricity beyond 2030.

The proposed Rye Park Wind Farm supports the *NSW 2021* objective of 20% renewable energy by increasing the supply of electricity from wind, the most economical form of large-scale renewable energy.

4.5 Economic benefits

An Economic Assessment Report of Rye Park Wind Farm has been undertaken by Hudson Howells (see Appendix K for a complete copy of this assessment). This report outlines economic modelling for the project using a conservative scenario of impact. This economic assessment identified that the project will:

- ▶ generate \$163 million of value added in the State of NSW and \$45 million of value added to the ACT over the period of construction;
- ▶ support 1,411 person years of employment in NSW and 433 in ACT;
- ▶ generate \$49 million of value added in the region over the period of construction;
- ▶ support 437 person years of employment in the region;
- ▶ generate \$22 million of value added in Yass Valley, Upper Lachlan Shire and Boorowa LGAs; and
- ▶ support 186 person years of employment in the LGAs.

The report also noted that the evidence supports no overall long term negative impact on property values associated with wind farm developments.

4.6 Secondary benefits and opportunities

During the consultation process for the project, particularly Community Consultation Committee (CCC) meetings, the Proponent sought feedback on how best to establish a community enhancement fund for the project and to identify what type of local support is required from the project.

In general, the feedback received from this community consultation was:

"How best to establish a community fund"

- ▶ Councils prefer that if a community fund is established it is managed by them (local councils) via the setup of a committee under section 355 of the *Local Government Act 1993 (NSW)* (LG Act).

- ▶ The Community wants to have a say in where and how any community funds are managed and spent.
- ▶ Draft Wind Guidelines say community contributions may be required under the EP&A Act 1979 or through a voluntary planning agreement.
- ▶ Community funds where implemented for other projects have been considered through combinations of the above.

“Identify what type of local support is required from the project”

- ▶ Upgrade and improve local roads near the project.
- ▶ Improvements to the township of Rye Park and better local amenities.
- ▶ Better mobile phone and internet reception in town.
- ▶ Chance to reopen some businesses in town.
- ▶ Provide attraction to keep younger people and families in the local area through long term benefits and job creation.

In line with the feedback received, the Proponent proposes to implement Community Benefit Funds to be administered by a community representative committee under an appropriate governance structure. The principles of the Community Benefit Fund have been agreed with each of Boorowa Council, Upper Lachlan Shire Council and Yass Valley Council. It is proposed that separate funds would be provided for each local government area, based on \$2,500 per annum per turbine built within the local government area.

The proposed Community Benefit Funds would be established under a Voluntary Planning Agreement (VPA) which would be subject to community consultation. It has also been agreed to allocate at least 20% of the total amounts paid into the Community Benefit Funds for educational needs. The proponent is currently negotiating draft VPAs with each of the three local Councils. The remainder of the Community Benefit Funds will be available for community enhancement and benefit projects within the immediate vicinity of the wind farm.. Members of the local community will be able to apply for funds for community benefit and educational benefit projects.

In addition, the Proponent has offered neighbours living within 2 km of a constructed turbine a voluntary Neighbour Benefit Agreement which makes provision for the sharing of the economic benefits of the project with neighbouring landholders through annual benefit payments. The payments would be attached to each property and continue through any change in ownership, plus providing a permanent income for present or future owners of the properties affected, for the life of the wind farm.

5 PLANNING ASSESSMENT PROCESS

This section of the Response to Submissions provides an outline of the relevant statutory provisions for the planning assessment process at the State, Local and Commonwealth levels.

5.1 State Government Legislation and Policy

5.1.1 Environmental Planning and Assessment Act 1979

An application for project approval for the Rye Park Wind Farm under Part 3A of the EP&A Act was lodged with the DPE in January 2011. Director General's Requirements (DGR's) were issued to the Proponent on 14 February 2011 and 16 August 2011 to guide the work required in assessing the proposed wind farm.

While Part 3A of the EP&A Act was repealed in October 2011, the project continued to be a transitional Part 3A project after the repeal of Part 3A in accordance with Schedule 6A of the EP&A Act. Accordingly, an Environmental Assessment for the Rye Park Wind Farm, which addressed the issues raised in the DGRs, was submitted to the Department of Planning and Environment in early 2014.

The project was subsequently transitioned from being a transitional Part 3A project to being SSD under Part 4 of the EP&A Act by an order made on 21 March 2014. In accordance with Schedule 6A of the EP&A Act, actions taken in relation to the project under Part 3A of the EP&A Act were taken to be corresponding actions taken under Part 4 of the EP&A Act. In particular, the DPE advised the proponent by letter dated 18 March 2014 that *'the actions taken under Part 3A process to date, including the acceptance of the Environmental Assessment/Environmental Impact Statement for public exhibition have been accredited under the SSD process and are taken to have been completed.'*

Following the transition of the project into SSD, the EA was placed on public exhibition from 2 May 2014 until 4 July 2014.

As outlined at:

- section 5.1.6 below, an environment protection licence under the *Protection of the Environment Operations Act 1997 (NSW)* (POEO Act) is required for the project; and
- section 5.1.7 below, approval under section 138 of the *Roads Act 1993 (NSW)* (Roads Act) is also required for the project.

As a result, the project is integrated development under the EP&A Act.

Table 5-1 Consistency of the Project with the objectives of the EP&A Act

<i>Objective</i>	<i>Comment</i>
To encourage 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.	The project will develop the natural wind resource and conserve other resources such as soil, water and air. It will lead to a better environment by displacing greenhouse emissions and reducing the impacts of climate change and global warming. Sections 4.5 and 4.6 conclude that the project will have social and economic benefits.
To encourage the promotion and co-ordination of the orderly and economic use and development of land.	The project will promote the orderly and economic use of the land by adding a new use and development to the site that can coexist with the current agricultural use, in

<i>Objective</i>	<i>Comment</i>
	an orderly and managed manner.
To encourage the protection, provision and co-ordination of communication and utility services.	The project is a form of electricity generation and so will facilitate the supply of electricity utility services. The project will not adversely impact existing communication services – see section 8.2.
To encourage the provision of land for public purposes.	The project does not involve any change to the status of public land.
To encourage the provision and co-ordination of community services and facilities.	The project will contribute to Community Enhancement Funds to fund local projects.
To encourage 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.	Refer section 6.3
To encourage ecologically sustainable development.	A wind farm is inherently an ecologically sustainable development (ESD) as it contributes to a reduction of greenhouse emissions and addresses climate change. In consideration of the ESD principles, ‘Sustainable Use’ of the infrastructure, ‘Integration of Economic Development and Environmental Protection’, the project design and management has been guided by the ‘Precautionary Approach’ to avoid serious or irreversible damage to the environment where possible, and in any case minimise the local environmental impact.
To encourage the provision and maintenance of affordable housing.	No applicable.
To promote the sharing of the responsibility for environmental planning between the different levels of government in the State.	Both State and Local environmental planning instruments have been considered in the wind farm design and in the preparation of this report. In addition, consultation has occurred at both State and local government level.
To provide increased opportunity for public involvement and participation in environmental planning and assessment.	Refer section 7 for consultation details. The EA was placed on public exhibition from 2 May 2014 until 4 July 2014.

5.1.2 Draft NSW Planning Guidelines Wind Farms

The draft *NSW Planning Guidelines: Wind Farms* were exhibited from 23 December 2011 to 14 March 2012 and public comments on the draft guidelines were sought. The guidelines remain in draft form and, as at the date of this report, have not been finalised or adopted by the DPE. However, by letter dated 18 April 2012 the Director General provided a checklist relevant to applications (such as Rye Park Wind Farm) that had yet to be exhibited. The checklist is reproduced in Table 5-2, and cross-references to where the particular issues are dealt with in this report have been added.

Table 5-2 Key aspects of the ‘Draft NSW Planning Guidelines for Wind Farms’ relevant to applications yet to be exhibited

<i>Potential Issues for Consideration</i>	<i>Addressed In:</i>
Consultation	
Form a Community Consultation Committee	Section 7.2
Document the consultation process undertaken, including the stakeholders consulted.	Section 7.2

Potential Issues for Consideration	Addressed In:
Identify and tabulate the issues raised by the stakeholders during consultation. Describe how the issues raised have been addressed.	
Consult with all neighbours with dwellings within 2 km of a proposed wind turbine.	Section 7.2
Consider seeking an agreement with neighbours with dwellings within 2km of a proposed turbine.	Section 7.4
Landscape and Visual Amenity	
Provide photomontages from all non-host dwellings within 2km of a proposed wind turbine.	Section 6.1 and Appendix A
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 landscapes and views.	Section 6.1
Outline mitigation measures to avoid or manage impacts.	Section 6.1
Noise	
Undertake assessment based on separate daytime (7am to 10pm) and night time (10pm to 7am).	Section 6.2 and Appendix B
Predict noise levels at all dwellings within 2km of a proposed turbine.	Section 6.2
Consider special audible characteristics, including tonality, amplitude modulation, and low frequency noise (apply penalties where relevant)	Section 6.2
Outline measures to avoid, minimise, manage and monitor impacts.	Section 6.2
Health	
Consider and document health issues, focusing on neighbours with dwellings within 2km of a proposed wind turbine.	Sections 8.7
Ecological Issues	
Consider the impact on birds and bats, particularly migratory species and outline the proposed monitoring and mitigation strategy.	Section 6.3 and Appendix C
Aviation Safety	
Outline current agricultural aerial uses on neighbouring properties.	Section 8.1
Consider the potential for the proposed wind farm to impact on aviation safety associated with agricultural aerial uses consistent with the draft guidelines.	Section 8.1
Bushfire Hazard	
Consider bushfire issues consistent with the draft guidelines, including the risks that a wind farm will cause bushfire and any potential impacts on the aerial fighting of bushfires.	Section 8.5
Blade Throw	
Assess blade throw risks consistent with the draft guidelines.	Section 8.6
Outline measures to avoid, minimise, manage and monitor impacts.	Section 8.6
Economic Issues	
Consider whether the wind farm is consistent with the relevant local or regional land use planning strategies	Section 5.1.14
Consider the potential impact upon mining/petroleum leases and exploration licenses.	Section 7.3
Consider any potential impacts upon property values consistent with the draft guidelines, including properties within 2km.	Sections 8.8
Decommissioning	
Include a Decommissioning and Rehabilitation Plan in the EA, including proposed funding arrangements.	Appendix G
Confirm that the proponent not the landowner is responsible for decommissioning.	Appendix G
Monitoring and Compliance Program	

<i>Potential Issues for Consideration</i>	<i>Addressed In:</i>
Outline program to monitor the environmental performance to ensure compliance including mechanisms for reporting outcomes and procedures to rectifying non-compliance – including any provisions for independent reviews.	Statement of Commitments
Council Planning Controls	
Outline whether the proposal is consistent with any relevant provisions of the relevant council's Development Control Plan and list any variations	Section 5.1.14

5.1.3 State Environmental Planning Policies

The key State Environmental Planning Policies (SEPPs) which apply, or are otherwise potentially relevant, to the project are as follows:

- ▶ *State Environmental Planning Policy (Infrastructure) 2007;*
- ▶ *State Environmental Planning Policy (State and Regional Development) 2011;*
- ▶ *State Environmental Planning Policy (Rural Lands) 2008;*
- ▶ *State Environmental Planning Policy No. 44 – Koala Habitat Protection;*
- ▶ *State Environmental Planning Policy No. 33 Hazardous and Offensive Development;*
- ▶ *State Environmental Planning Policy No. 55 – Remediation of Land;* and
- ▶ *State Environmental Planning Policy No. 64 – Advertising and Signage.*

An overview of the application of each of these SEPPs to the project is contained in the report titled 'Consideration of Relevant Environmental Planning Instruments in relation to the Rye Park Wind Farm Project' prepared by BBC Consulting Planners and dated October 2015 (Planning Assessment Report) contained in Appendix L to this report. In particular, the Planning Assessment Report concludes that:

- the project is permissible with consent under *State Environmental Planning Policy (Infrastructure) 2007;*
- while the project was declared to by SSD in accordance with an order made under Schedule 6A of the EP&A Act, the effect of the *State Environmental Planning Policy (State and Regional Development) 2011* is that development control plans do not apply to SSD;
- the project is not characterised as a potentially hazardous development under *State Environmental Planning Policy No. 33 Hazardous and Offensive Development;* and
- the project site is not potential koala habitat or core koala habitat under *State Environmental Planning Policy No. 44 – Koala Habitat Protection.*

Please refer to the Planning Assessment Report for further details.

5.1.4 Protection of the Environment Operations Act 1997

The project is a scheduled activity under Schedule 1 of the *Protection of the Environment Operations Act 1997 (NSW)* (POEO Act) being 'electricity works (wind farms)'. Accordingly, the project will require an environment protection licence under the POEO Act.

5.1.5 Roads Act

The Roads Act provides certain rights with respect to public roads and the regulation of activities relating to public roads. The project would require upgrade works to various public roads as outlined in Section 6.5, Traffic and transport, enabling access to wind farm access roads for construction vehicles. Approvals will be required under section 138 of the Roads Act from the appropriate roads authorities for the proposed upgrade works on public roads, including Crown roads.

5.1.6 Crown Lands Act

As outlined above, consents will be applied for under section 138 of the Roads Act to authorise the carrying out of any works within the Crown road reserves.

Access rights, in the form of easements or licences, will also be obtained as required in relation to the Crown road reserves in accordance with the processes contained in the *Crown Lands Act 1989 (NSW)*.

5.1.7 Ecologically Sustainable Development

Ecologically sustainable development (ESD) involves the effective integration of social, economic and environmental considerations in decision-making processes. In 1992, the Commonwealth and all state and territory governments endorsed the *National Strategy for Ecologically Sustainable Development*.

For the purposes of the EP&A Act and other NSW legislation, the *Protection of the Environment Administration Act 1991 (NSW)* outline the following principles that can be used to achieve ESD:

- ▶ The precautionary principle: that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
 - Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
 - An assessment of the risk-weighted consequences of various options.
- ▶ Inter-generational equity: that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;
- ▶ Conservation of biological diversity and ecological integrity: that conservation of biological diversity and ecological integrity should be a fundamental consideration;
- ▶ Improved valuation, pricing and incentive mechanisms: that environmental factors should be included in the valuation of assets and services, such as:
 - Polluter pays: that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
 - The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste; and
 - Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The majority of the potential impacts of the Project are likely to be localised to the development area and would not diminish the options regarding land and resource uses and nature conservation available to future generations. Indeed, the climate change benefits of the project are likely to be of strong benefit to future generations.

The reversibility of the project has been specifically addressed by the detailed consideration given to decommissioning.

The impacts of the project on biodiversity have been assessed in detail in the attached ecological assessment (summarised in Section 6.3) and management strategies incorporated into the Draft Statement of Commitments.

The precautionary principle has been adopted in the assessment of impact. All potential impacts have been considered and mitigated where a risk is present. Where uncertainty exists, measures have been suggested to address the uncertainty.

Based on the social and environmental benefits accruing from the project at a local and broader level, and the assessed impacts on the environment and their ability to be managed, it is considered that the development would be ecologically sustainable within the context of the above ESD principles.

5.1.8 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974 (NSW)* (NPW Act) governs the establishment, preservation and management of national parks, historic sites and certain other areas. The NPW Act also provides the basis for the legal protection and management of threatened native flora and fauna and Aboriginal sites within NSW.

Projects approved as SSD under the EP&A Act do not require separate Aboriginal heritage impact permits under the NPW Act. The impacts of the project on Aboriginal heritage have been considered and assessed as part of the EA and this Report. Refer to section 6.4 for details.

5.1.9 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995 (NSW)* (TSC Act) provides for the conservation of threatened species, populations and ecological communities of animals and plants. It provides a framework for the assessment of any action that may impact on threatened species.

The Assessment of Significance (Seven Part Test) is a statutory mechanism under Section 5A of the EP&A Act, for assessing whether a proposed development activity may have a significant impact on threatened species, populations or ecological communities or their habitats.

The SEARs require an assessment of all project components on flora and fauna and their habitat “consistent with the Guidelines for Threatened Species Assessment (DEC, 2005)”. If the results of the test of significance concludes that there is likely to be a significant impact on a listed species, population or Endangered Ecological Community protected under the TSC Act then the Guidelines for Threatened Species Assessment (DEC, 2005) specify that a Species Impact Statement is required.

Refer to Appendix C – Biodiversity Assessment for confirmation that the Project is not likely to result in a significant impact on any fauna species listed under the TSC Act and, accordingly there is no requirement for a species impact statement to be prepared.

5.1.10 Water Management Act 2000 and Water Act 1912

Water in NSW is regulated by the *Water Management Act 2000 (NSW)* (WM Act) and *Water Act 1912 (NSW)* (Water Act). The WM Act applies to all water sources for which a water sharing plan has been gazetted and the Water Act applies to remaining water sources.

A controlled activity approval under the WMA is required for certain types of developments and activities that are carried out in or near a river, lake or estuary. However, controlled activity approvals are not required for projects which have received SSD consent under the EP&A Act.

The project will require water licences under the WM Act or Water Act if water from any onsite bore, dam or river (e.g. concrete batching plant, etc) is required during construction or operation.

5.1.11 Native Vegetation Act 2003

In accordance with the principles of ecologically sustainable development, the *Native Vegetation Conservation Act 2003 (NSW)* (NV Act) provides for the conservation of native vegetation through the prevention of inappropriate clearing and promotion of rehabilitation practices.

Projects which have received SSD consent under the EP&A Act do not require separate approval under the NV Act for the clearing of native vegetation.

See section 6.3 and the Biodiversity Assessment Addendum contained in Appendix C for further details of the vegetation impacts of the project.

5.1.12 Heritage Act 1977

The *Heritage Act 1977 (NSW)* (Heritage Act) provides for the protection of items of local, regional and State heritage significance.

No items of local, regional and State heritage significance protected by the Heritage Act will be impacted by the project. Please refer to section 6.4 for details.

5.1.13 Renewable Energy Precincts

The NSW Government has created five renewable energy precincts in areas where significant future renewable energy development is expected, especially wind farms. The precincts are each assigned a regional coordinator with the purpose of enabling local communities to have a voice and a stake in renewable energy development

The proposed wind farm is located within the South East renewable energy precinct.

5.1.14 Local Government Instruments and Policies

Local Environmental Plans

As outlined in section 3.13 above, the project site sites within three LGAs being Boorowa Council, Upper Lachlan Shire Council and Yass Valley Council. There are accordingly three Local Environmental Plans (LEPs) which apply to the project:

- ▶ *Boorowa Local Environmental Plan 2012;*
- ▶ *Upper Lachlan Local Environmental Plan 2010;* and
- ▶ *Yass Valley Local Environmental Plan 2013.*

The Planning Assessment Report contained in Appendix L to this report considers the application of each of these LEPs to the project. In particular, the Planning Assessment Report concludes that:

- the project is consistent with the relevant zoning objectives and permissible with consent under the *Boorowa Local Environmental Plan 2012;*
- the project is consistent with the relevant zoning objectives and permissible with consent under the *Upper Lachlan Local Environmental Plan 2010;* and
- the project is consistent with the relevant zoning objectives under the *Yass Valley Local Environmental Plan 2013* and, while not permissible with consent under this LEP, the project does not rely on the provisions of this LEP for permissibility.

Please refer to the Planning Assessment Report for further details.

Development Control Plans

Under the provisions of the *State Environmental Planning Policy (State and Regional Development) 2011*, development control plans (DCP) do not apply to SSD. However, in the interests of completeness, the Planning Assessment Report also considers the consistency of the project with the controls contained in each of:

- ▶ the *Boorowa Development Control Plan 2013;* and
- ▶ the *Upper Lachlan Development Control Plan 2010.*

As outlined in the Planning Assessment Report, there is currently no DCP which applies to that part of the wind farm site which is located within the Yass Valley Council LGA pending the adoption of the proposed draft *Comprehensive Yass Valley Development Control Plan 2014.*

Please refer to the Planning Assessment Report and section 6.1.10 of the EA for further details.

Upper Lachlan Economic Development Plan and Strategy

The Economic Development Plan and Strategy includes as a current strength of the Shire ‘potential to leverage off the wind farms for a potential renewable energy/clean energy hub or businesses attracted by this’ (ULSC, 2007).

Yass Valley Policy: Development on Elevated Land

The Yass Valley Policy on Development on Elevated Land (Yass Valley Council, DA-POL-5, 2012) requires visual impacts of development from public roads, public places and adjoining allotments to be considered in relation to bulk and scale, and impacts on the skyline or significant views. Please refer to Section 6.1 of this report for an updated visual impact assessment of the project.

5.2 Commonwealth Legislation

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

This *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for a Commonwealth assessment and approvals system for:

- ▶ actions that have a significant impact on ‘matters of national environmental significance’;
- ▶ actions that (indirectly or directly) have a significant environmental impact on Commonwealth land; and
- ▶ actions carried out by the Commonwealth Government.

A Proposal requires referral to the Commonwealth Environment Minister for decision as to whether it is a controlled action which requires approval under the EPBC Act if the action is likely to have a significant impact on a matter of national environmental significance. The matters of national significance includes:

- ▶ World heritage properties;
- ▶ National heritage places
- ▶ wetlands of international importance (Ramsar wetlands);
- ▶ Commonwealth listed threatened species and ecological communities;
- ▶ Commonwealth listed migratory species;
- ▶ nuclear actions;
- ▶ the Great Barrier Reef Marine Park;
- ▶ Commonwealth marine areas; and
- ▶ a water resource, in relation to coal seam gas and large mining development.

The project was referred to the Commonwealth Environment Minister under the EPBC Act in March 2014.

A determination was made, by a delegate of the Commonwealth Environment Minister, in April 2014 that the project was a controlled action which required approval under the EPBC Act owing to its potential impacts on Commonwealth listed threatened species and ecological communities. The determination required the project to be assessed under the EPBC Act based on the preliminary documentation. The Proponent is in the process of responding with additional information requested by the Commonwealth Department of the Environment to facilitate the assessment and determination of its application for approval under the EPBC Act.

6 UPDATED ENVIRONMENTAL ASSESSMENT

6.1 Visual

An updated Landscape and Visual Impact Assessment (revised LVIA) has been prepared by Green Bean Design landscape architects in relation to the project – refer Appendix A for the full revised LVIA. This section of the report summarises the results of the revised LVIA.

6.1.1 Assessment

The revised LVIA has determined that the landscape surrounding the project has an overall medium/medium to high sensitivity to change. The existing landscape character is reasonably typical of landscape character areas that are commonly found in the surrounding areas of the New South Wales Southern Tablelands and the NSW/ACT Border Region Renewable Energy Precinct.

As a landscape with an overall medium/medium to high sensitivity to change, some recognisable characteristics of the landscape character will be altered by the proposed project, and result in the introduction of visually prominent elements that will alter the perceived characteristics of the landscape; however, the degree of alteration may be partially mitigated by existing landscape elements and features within the landscape.

A total of 83 associated and non-associated residential dwellings have been identified within 3 km of the proposed Rye Park wind turbines.

Twenty five residential dwelling locations within the 3 km viewshed have been determined to have a very low to low visual impact, and twenty four with a moderate-low visual impact.

Fifteen residential dwellings within the 3 km viewshed have been determined to have a moderate visual impact (comprising seven associated and eight non associated residential dwellings), and fifteen a high-medium visual impact (comprising two associated and thirteen non associated residential dwellings).

Four residential dwellings locations would have a high visual impact (comprising two associated and two non-associated residential dwellings).

The revised LVIA assessed the potential visual impact associated with the proposed 330 kV and 33 kV overhead powerlines, substations and associated electrical infrastructure. The revised LVIA determined that the overall visual significance of these elements would be low due to their location relative to existing residential locations together with the screening influence of surrounding topography and vegetation.

Night time obstacle lighting, if implemented, would have the potential to create a visual impact on residential dwelling locations surrounding the Rye Park wind farm. The revised LVIA notes that night time lighting has been determined as not required for the Gullen Range wind farm, and that obstacle lighting has also been removed from the Cullerin wind farm adjoining the Hume Highway to the east of Yass. Although some mitigation measures are considered appropriate to minimise the visual effects for a number of the elements associated with the wind farm, it is acknowledged that the degree to which the wind turbines would be visually mitigated is limited by their scale and position within the landscape relative to surrounding receiver locations.

6.1.2 Cumulative visual impact

A cumulative assessment identified one proposed wind farm development (the Bango wind farm project) within the Rye Park wind farm 10 km viewshed. The revised LVIA determined that there would be some minor level of wind turbine intervisibility between the Rye Park wind farm and the Bango wind farm development with potential 'direct' and 'indirect' visibility within the Rye Park wind farm viewshed from residential dwellings, and 'sequential' views from some surrounding road corridors. The cumulative visual impact at nearly all residences is rated as Nil/Low with the cumulative visual impact at one residence (R284) rated as Low/Moderate.

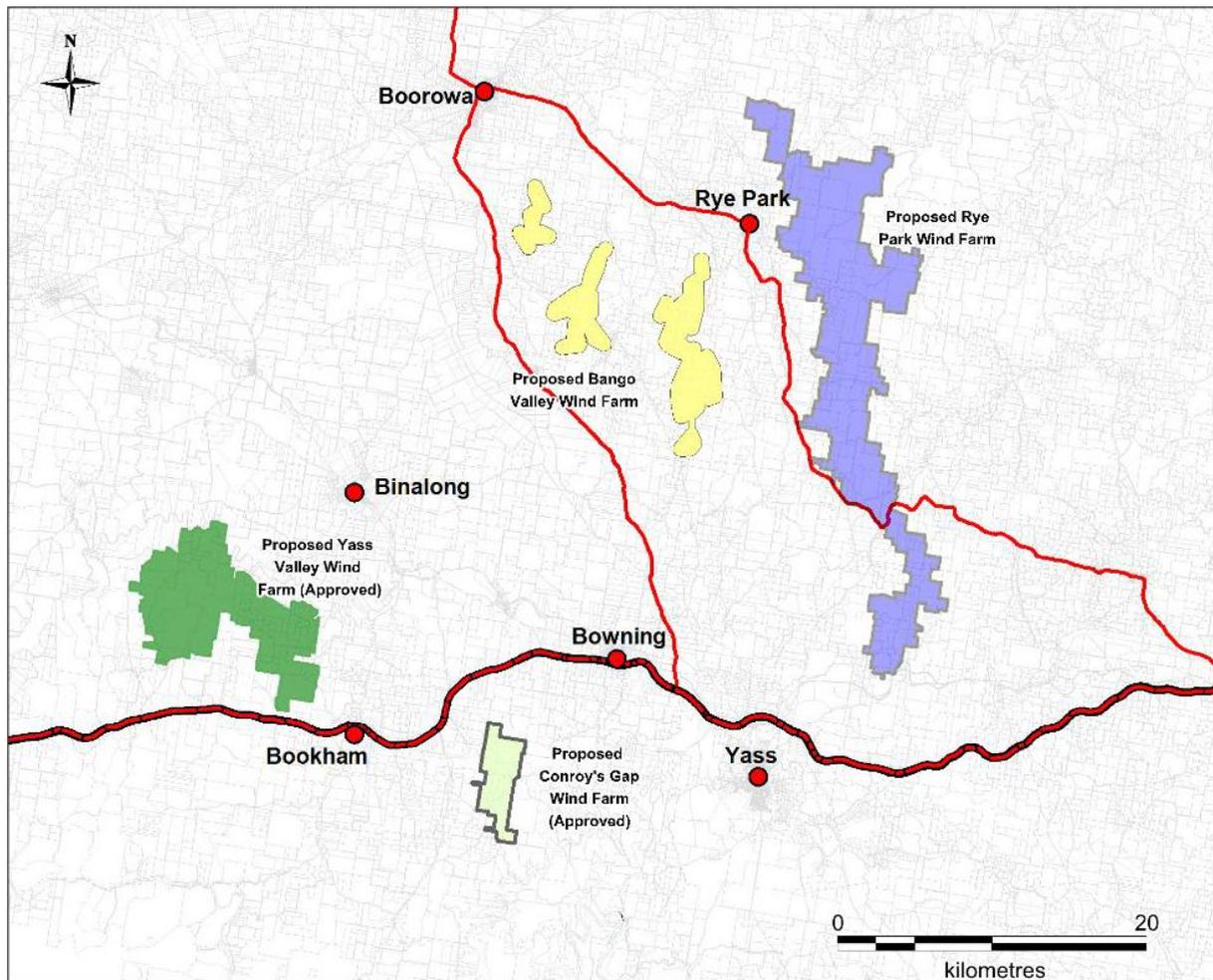


Figure 6-1 Proposed wind farms in the Yass region

6.1.3 Mitigation measures

In general mitigation measures would reduce the potential visual impact of the project in one of two ways:

- firstly, by reducing the visual prominence of the wind turbines and associated structures by minimising the visual contrast between the wind turbines and the landscape in which they are viewed; and
- secondly, by screening views toward the wind turbines from specific receiver locations.

Prior to the commencement of construction the proponent will carry out further consultation with the owners of all non-associated dwellings within 4 kilometres of a wind turbine in relation to the provision of reasonable and feasible landscaping treatments to mitigate views of turbines from their dwelling.

6.1.4 Conclusion

The revised LVIA has determined that the Rye Park wind farm would have an overall medium visual significance on the majority of non-associated and associated residential dwellings within the projects 10 km viewshed. The Rye Park wind farm would have a slightly lower visual significance on views from surrounding road corridors and public spaces.

6.2 Noise

An experienced acoustic consultant, Sonus, was engaged to prepare an updated independent Environmental Noise Assessment for the project based on the 109 turbine layout presented in this Report. A full version of the updated Noise Assessment is included in Appendix B.

The updated Noise Assessment quantifies the operational noise impacts from turbines and substations, the construction noise impact and other potential noise related impacts such as traffic noise and vibration as required in the “Noise Impacts” section of the DGRs for the Rye Park Wind Farm.

The updated Noise Assessment concludes that all relevant Guidelines and standards are met and noise impacts are within the allowable limits, both for operation of turbines and substations and during construction.

6.2.1 Existing noise environment

In 2013, SLR Consulting produced an Environmental Noise Assessment for the project. This included capturing background noise measurements at a number of locations around the proposal. Sonus used this existing analysis, consistent with the South Australian Noise Guidelines and the DGRs, in specifying the background noise already present at surrounding dwellings. In all, 20 residential locations were used to monitor the existing background noise levels calculated using regression analysis as specified in the South Australian Environmental Noise Guideline Wind Farms 2003. The full background noise by location and wind speed is set out on page 8 of the updated Noise Assessment in Appendix B.

6.2.2 Operational noise

Turbines

The revised project layout consists of up to 109 turbines. Operational noise predictions have been carried out using a representative turbine for noise impacts, the Vestas V112 – 3.0 MW sound power levels and a hub height of 80m. Full octave band data has been used in the CONCAWE model which takes into account geometric spreading, topography, ground absorption, air absorption and weather conditions and is fully endorsed by the South Australian Noise Guidelines and more broadly accepted as an appropriate model. Full model parameters and assumptions are listed on page 16 of the updated Noise Assessment in Appendix B. It should be noted that in response to submissions from local government and the general public, that sound management mode has not been used in predicting noise levels.

The updated Noise Assessment demonstrates that the revised indicative project layout will comply with the established noise criteria contained in the *Wind Farm Environmental Noise Guideline Wind Farms* adopted by the South Australian Environmental Protection Authority in 2003 (South Australian Guidelines) and the World Health Organisation guidelines for all houses with an agreement.

Substations

Up to three collector substations are proposed as part of the Project. In addition, the connection substation may also include two large transformers. The transformers range in size from 80MVA to 210MVA and sound power levels for each location have been derived from Australian/New Zealand Standard AS/NS60076.10:2009 which includes octave sound power levels.

The predicted sound levels at nearby non-involved residences with three collector substations and the transformers at the connection substation are below 20 dB(A), and below criterion developed under the Industrial Noise Policy of 30 dB(A). The predicted sound levels at nearby involved residences range from 21 to 25 dB(A) which is well below the INP criteria of 30 dB(A).

Sonus concludes that since the criteria of 30 dB(A) is achieved at all residences, amenity will not be adversely impacted due to operational noise from the substations.

6.2.3 Other considerations

The DGRs require information relating to other considerations to be provided as summarised below. Full details can be found in the updated Noise Assessment in Appendix B.

Modulation

Amplitude modulation is a known characteristic of wind turbine noise and is taken into account in developing objective criteria for wind farm, including the South Australian Guidelines. In a limited number of cases overseas, “excessive” amplitude modulation has been observed, but due to the rarity, an assessment methodology is not well defined. If excessive amplitude modulation is found to be a feature of the turbine noise at the Rye Park Wind Farm, measures will be taken to correct the noise characteristic.

Van Den Berg Effect

Van Den Berg Effect describes “excessive” amplitude modulation mentioned above as well as a meteorological condition that produces high wind shear resulting in low wind speeds at ground level and higher wind speeds at turbine heights which can distort noise assessment when 10m wind speed measurements are used in deriving background noise criteria. In using hub height wind speeds in this assessment, the Van Den Berg Effect has been mitigated.

Additionally, as noted on page 21 of the updated Noise Assessment in Appendix B, the Land and Environment Court has heard evidence at both Taralga and Gullen Range Wind Farm hearings that suitable conditions for the effect are not likely to occur due to the elevated ridgelines at each site, which are similar to Rye Park. As a result no further assessment has been undertaken

Low frequency noise

Aerodynamic noise from wind turbines are dominated by mid-range frequencies. Low frequency noise produced by wind farms is not unique in overall level or content. Other sources well in excess of that around a wind farm can easily be measured and compliance with the South Australian Guidelines inherently provides an adequate level of protection of amenity from low frequency noise.

Infrasound

As with other sound, infrasound has a threshold of hearing. It is only above this level where the sound becomes audible. A large range of measurements from modern wind turbines indicates that at a distance of 200m, infrasound is in the order of 25dB which is below the recognised threshold of hearing of 85dB(G). The level of infrasound will further reduce with greater distance and be even further below hearing threshold at residences around the project. Additionally, infrasound levels measured around wind farms are no higher than other environments where people live, work and sleep and are of similar character to other infrasound noise sources such as industrial processes, vehicular movements, air conditioners, ventilation etc. For these reasons, no further assessment of infrasound has been undertaken.

Corona and Aeolian Noise

Power lines, either in operation or not, can create Corona and Aeolian Noise under very specific wind, temperature and humidity conditions. Typically this is not a problem over 100m from a power line. Mitigation measures are available if required.

Contingency Strategy

In the unlikely event of a commissioned turbine exceeding noise criteria during operation, opportunities exist, through turbine noise management modes for example, to implement lower noise modes or operational turbines. Notwithstanding that the predictions are based on conservative modelling assumptions including, among others, that no turbine has noise management mode activated to assess impact.

6.2.4 Construction noise

Construction noise will vary considerably throughout the construction period depending on work location, work type etc. A worst case prediction is presented in the updated Noise Assessment by assuming that all equipment is present together and operating simultaneously. Additionally, worst case propagation assumptions have been used.

Wind turbine Installation

Based on the predicted noise levels, it is expected that construction noise from the wind turbine installation will be greater than 40 dB(A) at a distance of 900m. The predicted noise levels are significantly less than the 75 dB(A) upper limit provided in the Interim Construction Noise Guideline (2009).

It is possible that a dwelling located between 900m and up to 2400m from a wind turbine may be defined as “noise affected” but not “highly noise affected” by the Interim Construction Noise Guideline (2009)..

Access Roads

Access to the wind turbine sites will be via a specifically constructed road network. The separation distance of the closest non-associated dwelling to a designated access road is approximately 250 m. The noise from typical road construction activity has been predicted to be 63 dB(A) at 250m.

Based on the above, it is possible that a dwelling located between 900 m and up to 2,400 m from an access road may be defined as “noise affected” but not “highly noise affected” during construction as defined by the ICN Guideline.

Batching Plant

The closest non-associated dwelling to a proposed batching yard is approximately 1,200 m away. The noise from typical batching plant machinery, such as cement trucks, loaders, and delivery trucks has been predicted to be 33 dB(A) at 1,200 m.

Noise Mitigation

Where residences are classed as “noise affected” by the Interim Construction Noise Guideline (2009), the developer is required to apply all feasible and reasonable work practices to minimise construction noise, and to inform the residents of the proposed construction work.

“Feasible and reasonable” noise control strategies to minimise noise during construction may include engineering measures such as the construction of temporary acoustic barriers, the use of proprietary enclosures around machines, the use of silencers, the substitution of alternative construction processes and the fitting of broadband reversing signals. It may also include administrative measures such as inspections, scheduling and providing training to establish a noise minimisation culture for the works. Such mitigation measures will be included in the Construction Management Plan once the final construction methods, timing, locations and equipment have been determined.

Construction Traffic

The day-time criterion provided by the Environmental Criteria for Road Traffic Noise (1999) is an equivalent (LAeq, 1hour) noise level of 55 dB(A) during any given hour. It is predicted that a distance of 10m from the road side the criterion can be achieved for 10 passenger vehicle movements and 3 heavy vehicle movements in one hour. The number of vehicle movements can double for every doubling of distance from the roadside and continue to achieve the 55 dB(A) criterion. That is, 20 passenger vehicles and 6 heavy vehicle movements could be accommodated in an hour at a dwelling that is 20m from the roadside. It is noted that care should be taken to avoid excessive acceleration of trucks and the use of truck engine brakes in close proximity to dwellings.

The Construction Management Plan will incorporate mitigation measures including communication with impacted residents, effective transport routing, informing drivers of any road restrictions, scheduling construction traffic and restricting construction traffic to within the operating hours for the construction site.

Construction Vibration

Typically, the distances required to achieve the construction vibration criteria provided in the Technical Guideline are in the order of 20 m. At a distance of 100 m, vibration from these activities is unlikely to be detectable to humans.

Based on the separation distances between the construction activities and the nearest dwellings being in excess of 100 m, vibration levels are expected to easily achieve the criteria.

6.2.5 Conclusion

Based on predictions, the noise from the proposed turbine layout will achieve the environmental noise criteria established in accordance with the South Australian Environmental Noise Guideline Wind Farms 2003 and the WHO Guidelines at all dwellings.

Construction noise impacts are considered to be acceptable and would be adequately addressed through the inclusion in the construction management plan of appropriate construction noise and vibration controls, developed to achieve the relevant DGRs for the adequate control of noise and vibration from general construction activity, transport and potential blasting activity.

Based on the above, the noise impacts arising from the construction and operation of the proposed Rye Park Wind Farm are considered to be acceptable.

6.3 Ecology

ngh Environmental have undertaken additional biodiversity investigations and prepared an updated Biodiversity Assessment to reflect the changes made to the project (Biodiversity Assessment Addendum).

The Biodiversity Assessment Addendum provides details of where impacts have been avoided and minimised through changes made to the indicative layout of the project, and provides a revised assessment of the potential impacts to biodiversity associated with these changes. It provides an update to the original Biodiversity Assessment completed by ngh Environmental in 2014 and is designed to be read in conjunction with the original assessment.

The Biodiversity Assessment Addendum has also taken into account the submissions received from the NSW Office of Environment and Heritage (OEH), local government following the exhibition of the EA.

A full version of the Biodiversity Assessment Addendum is included in Appendix C.

6.3.1 Additional investigations

Additional investigations undertaken to address the changes made to the project and respond to submissions received include:

- Habitat assessment for the Striped Legless Lizard and Golden Sun Moth (ngh Environmental September 2014)
- Targeted surveys for the Crimson Spider Orchid (ngh Environmental February 2015)
- Field validation of additional infrastructure areas
- Hollow-bearing Tree Survey and Assessment

A revised desktop assessment including searches of relevant state and Commonwealth threatened species databases was also undertaken to facilitate the revised impact assessment for the proposal.

Two additional threatened species have been identified as occurring within or in close proximity to the project site being the Southern Pygmy Perch and Yellow-spotted Bell Frog. Impacts to these species are considered to be manageable.

There is also potential for the Crimson Spider Orchid to occur within three areas of the project site. Further survey of these areas is required prior to the commencement of construction to determine the presence or absence of this species.

No other threatened species or Endangered Ecological Communities (EECs) additional to those previously identified in the original Biodiversity Assessment were considered to have the potential to occur at the development site.

6.3.2 Revised impact assessment

The primary impact types and the general nature of these impacts remain the same as identified in the original BA. Overall the estimated extent of vegetation clearing has increased slightly – 284.9 ha versus 235.9 ha originally estimated in the EA.

Table 6-1 Estimated permanent impact areas by vegetation condition

Vegetation types	Estimated permanent habitat loss within each condition class (ha)					Total of each vegetation type impacted (ha)
	Good	Moderate	Poor	Unknown	Total	
Acacia scrub	1.1	0.2	0	0	1.3	52.5
Argyle Apple Forest	0	0.4	0	0	0.4	58.6
Box-Gum Woodland	1.9	8.3	14.7	0	24.9	1,130.0
Brittle Gum Forest	0	0	2.8	0	2.8	165.7
Derived Grassland	0	3	22.3	0	25.3	1,357.7
Exotic pasture	0	0	0	15.8	15.8	1,015.9
Native pasture	1.8	18.9	50.8	0.1	71.6	3,875.7
Planted native vegetation	0	0	0	0.2	0.2	7.6
Scribbly Gum Forest	39.5	24.5	20.5	0.3	84.9	3,749.5
Sifton Bush Shrubland	14.4	14.4	0.4	0.4	29.6	2,027.9
					256.8	13,441.3

Table 6-2 Estimated TSC Act EEC permanent impact areas by condition class

EEC	Permanent habitat loss within each condition class (ha)			
	Good	Moderate	Poor	Unknown
Box-Gum Woodland and Derived Grassland	2	11	37	0
Total area within the site boundary	286	101	418	1,682

The results of Hollow-bearing Tree Survey and Assessment provided a more precise estimate of impacts on this important resource. The result was a reduction in the total number of hollow-bearing trees estimated to be impacted by the proposal. It was identified that the majority of hollows supported by hollow-bearing trees at the site were small to medium with proportionally few large hollows suitable for larger species such as cockatoos and owls.

The Biodiversity Assessment Addendum identified no change to the conclusions of the assessments of significance completed in the original Biodiversity Assessment. Significant impacts to threatened species and endangered ecological communities are considered unlikely.

6.3.3 Biodiversity offset strategy

The initial biodiversity offset strategy has been refined following extensive consultation with DPE and OEH. The updated offset strategy has used the NSW Framework for Biodiversity Assessment (FBA) to calculate the offset requirement and then demonstrate the adequacy of the proposed offsets. In lieu of actual plot data from the site, plot data was derived from benchmark data on the OEH vegetation data base. The median range of the

lower and upper benchmarks has been used unless otherwise justified. This approach is considered conservative, with the actual offsets required expected to be below those estimated in this offset strategy.

A summary of biodiversity offset requirements for the project are shown in the table below.

Table 6-3 Credit requirements and offset area required

Offset requirement	Ecosystem or Species	Credit requirement	Offset area required
EECs	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion , including derived grasslands	3,043 credits	327ha
Threatened species	Golden Sun Moth	5,154 credits	1,116 ha
Threatened species	Striped Legless Lizard	390 credits	163 ha
Threatened species	Superb Parrot	184 credits	170 ha
Other	Red Stringybark – Red Box – Long-leaved Box – Inland Scribbly Gum tussock grass – shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion	6,788 credits	730 ha
TOTAL:		15,559 credits	

Note that the area of land required is not cumulative and an offset area may concurrently satisfy ecosystem and threatened species requirements.

Table 6-4 Potential offset sites overview

Potential Site	Size (ha)	Vegetation	Threatened species	Landscape position / connectivity	Feasibility
1	578.3	Predominantly Blakely's Red Gum - Yellow Box grassy woodland and derived grassland.	Contains habitat for the Superb Parrot, Striped Legless Lizard and Golden Sun Moth	Provides a level of north-south connectivity for the north eastern area and appropriately minimises edge effects, consolidating existing remnant.	The Proponent is in commercial negotiations with the owners of the potential offset sites. If commercial agreement is reached, the lease agreements with involved landowners will contain specific provisions regarding the offsets.
2	167.7	Predominantly Scribbly Gum forest.		Provides a level of north-south connectivity.	
3	348.2	Predominantly Blakely's Red Gum - Yellow Box grassy woodland and derived grassland.	Contains habitat for the Superb Parrot, Striped Legless Lizard and Golden Sun Moth	Provides a level of south-west connectivity.	
4	64.2	Predominantly Scribbly Gum forest.		Provides a level of east-west connectivity.	
5	94.8	Predominantly Scribbly Gum forest.		Provides a level of north-south connectivity.	
6	127.8	Predominantly Scribbly Gum forest.		Provides a level of east-west connectivity.	
7	38.7	Predominantly Scribbly Gum forest.		Provides a level of east-west connectivity.	
Total:	1,419.7				

For biodiversity offset purposes, three theoretical precincts based on wind turbine locations have been defined to accommodate a staged project development being the Northern, Central and Southern stages (refer to mapping in Appendix C of the Offset Strategy contained in Appendix D of the Biodiversity Assessment Addendum). If the project were developed in stages, then the offset requirement for each stage would be delivered for the individual stage. For example, the construction of the Northern Precinct alone represents approximately one third of the offset requirement and so one third of the offsets required for the project as a whole would be delivered as part of that stage. See table on the following page for a theoretical breakdown of offset requirements for each of the three precincts.

If the Project is delivered in stages, then the offset requirements for each stage would be delivered and met separately as per the breakdown shown in Table 6-5 on the following page, depending on whether turbines are built in the precinct.

Table 6-5 Theoretical offset requirements by precinct

	Northern Precinct (ha)	Central Precinct (ha)	Southern Precinct (ha)
Box Gum Woodland	104	107	112
Scribbly Gum Forest	131	386	218
Striped Legless Lizard Habitat	76	52	34
Golden Sun Moth Habitat	524	145	435
Superb Parrot Habitat	11	127	32

Based on the investigations and assessment carried out on the project site, there is a high level of confidence that suitable offsets are available within the site boundaries. Considering all seven offset sites together, all entities can be fully offset. An implementation plan has been provided to ensure that that actual project impact areas are offset in accordance with OEH endorsed survey methods and tools.

6.3.4 Additional mitigation measures

Several additional mitigation measures are included as commitments to ensure that the impacts associated with the preferred project are managed appropriately. These include:

1. Prior to commencement of construction, verification of potential habitats for threatened flora in a new area of CEEC identified to the south-west of turbines 85 – 87.
2. Pre-construction, additional targeted surveys for the Crimson Spider Orchid
3. Pre-construction, consultation with NSW Fisheries with regard to the design of waterway crossings proposed along Blakney Creek and its tributaries.
4. Specific consideration to be included in the Construction Environmental Management Plan for the project to protect Blakney Creek and its tributaries from sedimentation and pollution.

As outlined above, a detailed offset package, including a plan of management (and demonstration that funding for management will be available to manage the site in accordance with the plan of management) would be finalised prior to impacts occurring.

6.4 Aboriginal and European Heritage

6.4.1 Overview

New South Wales Archaeology Pty Ltd conducted an Aboriginal cultural heritage assessment and European heritage assessment of the proposed Rye Park Wind Farm in 2012. This was documented in a final report in 2013 (Dibden 2013).

Changes have been made to the proposed layout as a result of detailed design and further consultation. The Proponent is now seeking Project Approval for the revised project from the NSW Department of Planning and Environment (DoP&E)

An addendum to the Aboriginal Cultural Heritage Assessment Report (refer Appendix D) documents the Aboriginal Cultural Heritage Assessment undertaken in respect of changes to the project layout. As with the original project layout, the revised layout does not impact on any items of European heritage.

6.4.2 Aboriginal consultation

The assessment has been conducted in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW DEC July 2005), the NSW Office of Environment and Heritage's *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW DECCW 2010a).

During the current assessment further consultation has been conducted with the Registered Aboriginal Parties. This ongoing Aboriginal community consultation was undertaken in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW DEC July 2005) and *OEH's Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW DECCW 2010b).

6.4.3 Results

The Addendum Aboriginal Cultural Heritage Report identifies and records Aboriginal cultural areas, objects or places, assess the archaeological potential of the proposal area and formulate management recommendations based on the results of the community consultation, background research, field survey and a significance assessment.

A new search of the NSW OEH Aboriginal Heritage Management Information System (AHIMS) has been conducted for this project (AHIMS Reference: 193956). Some 17 Aboriginal object sites are listed for the search area, the majority of which were recorded during the 2012 survey in the subject area. As a result of changes to the project layout, many of these are now outside the development footprint area.

A field survey for Aboriginal areas, objects and places has been conducted in order to assess new and previously unsurveyed. During the initial assessment, 13 Aboriginal object locales were recorded. In addition, three quartz outcrops were identified which may have been used as stone procurement areas by Aboriginal people. In the 2015 field survey, 20 Aboriginal object locales were recorded.

The recent survey has confirmed the conclusions reached during the original assessment. Generally, the high ridge crests on which turbines are proposed are of low archaeological sensitivity, potential and significance. However, some areas in which impacts would occur that are situated in valleys in close proximity to water courses are assessed to be of some greater archaeological and heritage value and significance.

6.4.4 Conclusions and recommendations

As a result of the assessment the following conclusions and recommendations are made:

- No further archaeological investigations are required in respect of the proposal. No areas were identified that could be characterised as places with a high probability of possessing subsurface Aboriginal objects with high potential conservation value. Accordingly, archaeological test excavation has not been undertaken in respect of the proposal as it could not be justified (cf. NSW DECCW 2010a: 24).
- Management and mitigation strategies are set out in Section 7. These strategies for should be used to formulate appropriate Statements of Commitment to condition Development Approval.
- A Cultural Heritage Management Plan should be developed for the appropriate management and mitigation of development impacts during any further planning and project construction. The development of an appropriate Cultural Heritage Management Plan should be undertaken by the project archaeologist in consultation with the proponent, registered Aboriginal parties and the NSW Office of Environment and Heritage.
- The Cultural Heritage Management Plan would be prepared to guide the process for the management and mitigation of impacts to Aboriginal cultural heritage and to set out procedures relating to the

conduct of additional archaeological assessment, if required, and the management of any further Aboriginal cultural heritage values which may be identified.

- Personnel involved in the construction and management phases of the project should be trained in procedures to implement recommendations relating to cultural heritage, as necessary.
- Cultural heritage should be included within any environmental audit of impacts proposed to be undertaken during the construction phase of the development.
- As noted in the original Aboriginal and European Heritage assessment report, it is unlikely that there will be any European Heritage sites within the proposed turbine envelopes and other areas of direct impacts.

6.5 Traffic and Transport

An updated assessment of the potential traffic and transport impacts as a result of the wind farm has been undertaken including:

- ▶ An access route survey by a wind turbine supplier and over-size transport contractor;
- ▶ A transport design assessment by specialist transport engineers; and
- ▶ A rationalisation and reduction of the number of access routes and access points to the wind farm site.

The key changes to the proposed access route to the wind farm site since the exhibition of the EA include:

- ▶ no over-dimensional or over-mass vehicles passing through the outskirts of Yass;
- ▶ no over-dimensional or over-mass vehicles on Cooks Hill Road; and
- ▶ no over-dimensional or over-mass vehicles for most of Blakney Creek Road.

The additional information has been incorporated into a revised Traffic and Transport Assessment report (refer Appendix E).

The primary traffic impacts are temporary impacts associated with the construction phase of the project. The expected duration of the construction phase is 18 to 24 months. During the subsequent operation of the wind farm facilities the traffic will be comparably minor, and will be travelling on a road network improved for the over-sized and over-weight construction traffic; and therefore able to accommodate for the traffic expected during the operation phase.

6.5.1 Traffic generation

Traffic to be generated as a result of the construction of the wind farm will consist of the following:

- ▶ Construction traffic for the road works, foundation works, turbine erection works, substation and collector station works, cabling and transmission line works.
- ▶ Delivery of local and imported Wind Turbine Materials including Tower Segments, Nacelle (Engine housings), Hub Units, Blades.
- ▶ Delivery of locally sourced road base materials for onsite access roads and council road modifications.
- ▶ Delivery of locally sourced sand and concrete materials for onsite batching for foundations of wind turbine units and minor buildings.
- ▶ Delivery of water for road works, concrete batching, and dust suppression practices.
- ▶ Delivery of building materials for all buildings and structures proposed on the site areas.

Road base and concrete batching materials

The vast majority of the truck traffic generated will be for the delivery of road base material and the sands, aggregates and cement required for the onsite batching of concrete. There are at least two commercial

quarries in the project vicinity that can accommodate the entire project. The first is Glenella Quarry in Cowra and the second Bogo Quarry in Bookham. Both are capable of providing RMS quality road base, sand and aggregate. Cement and steel is likely to be travelling from Port Kembla.

Construction traffic generation

Estimates of traffic generation include only trips that are expected to use council roads. A trip is defined as travel in a single direction. It is estimated that a total of 30,110 trips will be generated during construction including 15,055 trips to the site and 15,055 return trips from the site.

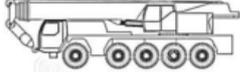
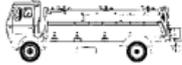
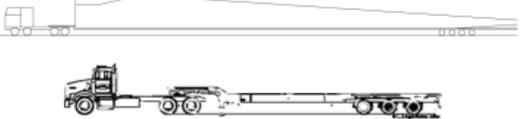
Vehicle	Estimated trips*	Typical Vehicle
Mobile crane	16	
20t Tanker	6,948	
Tanker (28t)	1,620	
Heavy Rigid Vehicle	520	
Six Axle Articulated	3,736	
32t truck and dog	15,270	
Low Loader	38	
Extendable Trailer / Dolly (various sizes)	1,962	
Total	30,110	

Table 6-6 Total transport task and typical vehicles

Item	Loads	Typical Vehicle	Total Trips	Assumptions	
Access Track Construction					
Delivery of Plant	18	Low Loader	36	Nominal	
Road Base	3,350	32t truck and dog	6,700	107,250t for 25km of road/access track + 10%	
Stabiliser	25	32t truck and dog	50	Allowance - one load per km	
Geofabric	25	Six Axle Articulated	50	Allowance - one load per km	
Fuel	90	20t Tanker	180	Nominal Allowance	
Foundation Preparation and Turbine Construction					
Turbine Parts	Tower sections	436	Extendable Trailer	872	Four sections per turbine
Nacelles (Generators)		109	Extendable Trailer	218	One per turbine
Blades		327	Extendable Trailer	654	Three per turbine
Hubs		109	Extendable Trailer	218	One per turbine
Cables/controllers		109	Six Axle Articulated	218	One load per turbine
Tools, misc goods for erection		109	Six Axle Articulated	218	One load per turbine
Plant and Equipment	Delivery of plant for civil work	80	Six Axle Articulated	160	Allowance of 20 items of plant per work face
Cranes - Crawler		40	Six Axle Articulated	80	Four work faces, each with one crane - 10 loads per crawler crane
Cranes - Mobile		8	Mobile crane	16	Four work faces, each with two mobile cranes
Equipment (Generators, lighting etc)		40	Six Axle Articulated	80	Allowance of 10 loads of equipment per work face
Fuel		104	20t Tanker	208	One truck fill per week
Site and Foundations	Slab	-	Concrete Truck	-	Sourced from batching plant
Walls		20	Six Axle Articulated	40	To be confirmed
Yard		20	Six Axle Articulated	40	To be confirmed
Fencing		4	Six Axle Articulated	8	Four work faces, each with one load of fencing
Concrete		-	Concrete Truck	-	Sourced internally from batching plant
Reinforcing Steel		450	Six Axle Articulated	900	5% of concrete; 181,000t concrete = 9,050t steel; 20t per truck
Batching Plant	Delivery of batching plant	9	Six Axle Articulated	18	Estimated from typical modular plant
Cement		810	Cement Tanker (28t)	1,620	22,700t (181,000 tonnes of concrete)
Sand and Aggregate		4,260	32t truck and dog	8,520	135,750t (181,000 tonnes of concrete)
Water		680	20t Tanker	1,360	13,600t (60% of cement mass)
Sub Station Transformer		1	Low Loader	2	
Switch Grid		20	Six Axle Articulated	40	Estimate to be confirmed
Fencing		10	Six Axle Articulated	20	
Power Transmission	Transmission Cables	50	Six Axle Articulated	100	10km, nominal 10 lines, 3km rolls, 2 rolls per vehicle
Transmission Pylons		500	Six Axle Articulated	1,000	To be confirmed - nominal 10 loads per pylon, pylons spaced at 200m
Support	Delivery of site offices	164	Six Axle Articulated	328	nominal 1.5 loads per turbine, assuming support office serves several turbines
Deliveries		130	Heavy Rigid Vehicle	260	One load every second week day, 24 month duration
Waste Disposal		130	Heavy Rigid Vehicle	260	One load every second week day, 24 month duration
Water		2,600	20t Tanker	5,200	10 loads per day for duration, road construction, dust suppression, concrete
Site Rehabilitation					
Delivery of plant for civil work		-	Low Loader	-	Re-used from construction
Equipment		109	Six Axle Articulated	218	One load per turbine
Seed/Plants		109	Six Axle Articulated	218	One load per turbine
Total		15,055		30,110	

Table 6-7 External project construction traffic generation

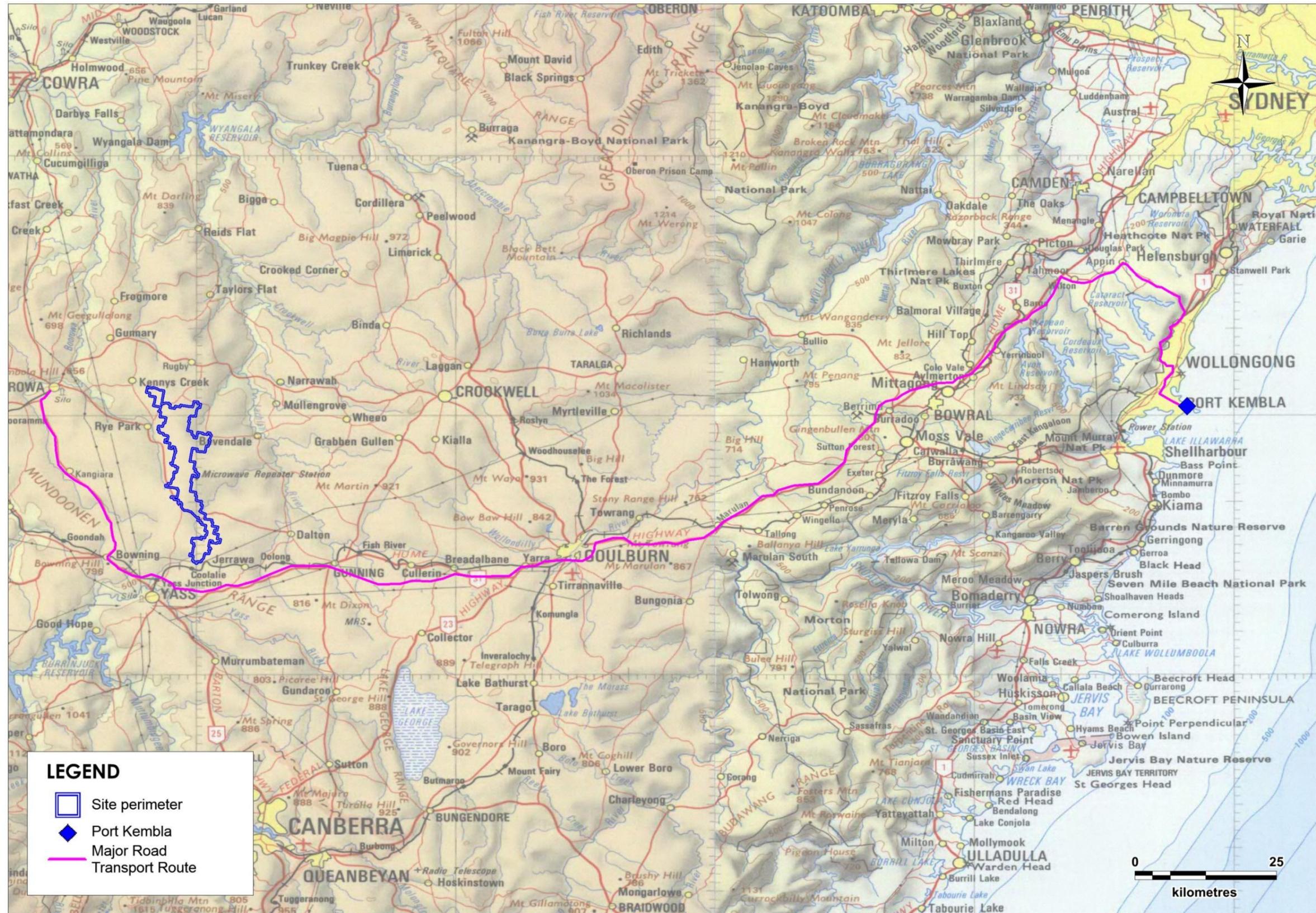


Figure 6-3 Access route from port to the project site

6.5.2 Access road upgrades

Some road upgrades will be required prior to the construction of the wind farm. The Proponent has held extensive consultation with the local road authorities as part of refining the proposed access routes and identifying where upgrade works may be required. Unless an alternative standard is agreed with Councils prior to construction and depending on the actual roads to be used for access and availability of local material from local quarries, the Proponent has agreed to the design standards to be implemented as outlined below.

- Unsealed roads to be sealed: 200 mm road base topped with double spray seal (14/7 double/double). 7.0 m seal and 8.5 m formation width (as per Upper Lachlan Shire Council recommendation).
- Unsealed Roads: Construction width minimum 6 metres wide, maximum 8 metres wide. Pavement minimum thickness 100 mm on existing sheeted road (as per Upper Lachlan Shire Council recommendation).

The Proponent will be responsible for maintenance of any upgraded unsealed roads during the wind farm construction period. Where the Proponent has sealed roads, the maintenance during construction and operation of the wind farm will be by the local road authority. The intention for the development is to provide the community with safe road network conditions during the construction period and to complete the project without damaging the existing road network.

Details of the existing condition of proposed access roads and drainage structures as well as the proposed upgrades are provided in section 6.4.4 of the Traffic and Transport assessment (Appendix E).

6.5.3 Conclusion

The operational phase of the wind farm will require low levels of vehicle access to the site via local roads and will have correspondingly little impact on local traffic.

During the construction phase there is potential for temporary impacts on the local traffic. The construction phase is expected to last for 18 – 24 months. In particular the delivery of the over-mass and oversize wind turbine equipment components may at times affect the flow of local traffic. Traffic management procedures will be implemented to ensure that the impacts of the oversize vehicles are minimised and safety and protection measures will be implemented to reduce the risks of accidents to an acceptable level.

The proposed access route to site via the Hume Highway, Yass Valley Way, Faulder Avenue, Cooks Hill Road and Rye Park Rugby Road, together with the mitigation measures proposed in this report will minimise the impact of traffic impacts during the construction phase and ensure that the road network can be maintained to a satisfactory standard. Considering the high quality of the access roads to the site and the mitigation proposed, likely traffic impacts are considered acceptable and manageable.

A Construction Traffic Management Plan would be developed and implemented in consultation with the RMS and Councils will ensure that any traffic and transport issues arising as a result of the construction of the project are appropriately addressed and have minimal impact on the local community and the local environment.

6.6 Water supply, water quality and hydrology

6.6.1 Catchment Management Regions

The Rye Park Wind Farm is located across two Catchment Management Authority (CMA) regions. The majority of the wind farm is located within the Lachlan CMA region, with a small portion of the south-west corner of the project located in the Murrumbidgee CMA region. Figure 6-4 highlights the location of the wind farm in relation to the surrounding CMA regions.

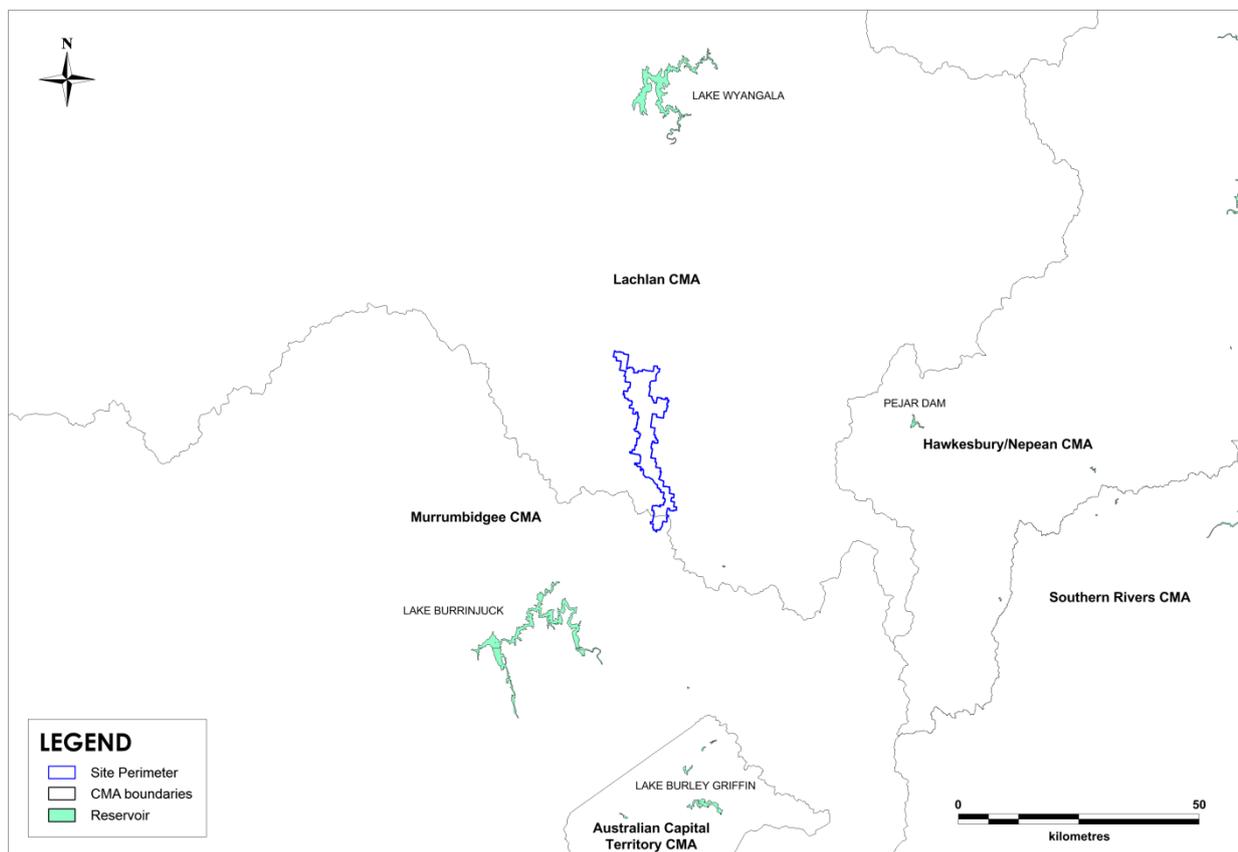


Figure 6-4 Surrounding Catchment Management Authority regions

6.6.2 Lachlan Catchment Management Authority

The Lachlan catchment covers an area of approximately 84,700 km² and has a population greater than 100,000 people and produces 14% of NSW agricultural production. The catchment encompasses 24 local government areas and is located in central western New South Wales, flanked by the Macquarie and Bogan catchments to the north and Darling to the west, Murrumbidgee to the south and the Sydney/Shoalhaven Basin to the east (LCMA, 2007).

The main dam regulating flows in the Lachlan River is Wyangala Dam, which has a capacity of 1,220,000 megalitres (ML) and is located at the junction of the Lachlan and Abercrombie Rivers. The Belubula River is regulated by Carcoar Dam, has a capacity 36,000 ML and is located about 10 km downstream of Blayney (LCMA, 2007).

6.6.3 Murrumbidgee Catchment Management Authority

The Murrumbidgee catchment has one of the most diverse climates in NSW, ranging from the alpine areas of Kosciuszko National Park and the Monaro plains, through to the rich grazing and grain belts of the South West

Slopes and Plains and the shrublands and grasslands of the semi-arid western Riverina. It covers an area of 84 000 km², the Murrumbidgee catchment is home to more than 500,000 people. Canberra and Wagga are both situated within the catchment (MCMA, 2012).

The closest major catchment to the proposed wind farm is Lake Burrinjuck, 50 km to the south-west of the project boundary. It has a catchment area of 12,953 km², a storage capacity of 1,028,000 ML and supplies water for towns, river flows, stock and domestic requirements, irrigated agriculture, industry, flood mitigation and environmental flows (State Water, 2009).

6.6.4 Regional Water Sources

The project is situated on the boarder of the Lachlan and Murrumbidgee Catchment areas, with the principle water courses being the Lachlan River 16 km to the east, Boorowa River 20 km to the west, the Yass River 10 km to the south and the Murrumbidgee River 50 km to the south-west.

Watercourses in the catchment area generally flow in a westerly direction until they form with the principle rivers in the catchment. In the western section of the catchments the Lachlan River and Murrumbidgee River combine and form part of the Murray Darling Basin.

The closest major reservoirs to the site are:

- | | |
|------------------|-------------------------|
| ▶ Burrinjuck Dam | 50 km to the south-west |
| ▶ Pejar Dam | 55 km to the east |
| ▶ Lake Wyangala | 60 km to the north |
| ▶ Cotter Dam | 60 km to the south |

Yass Dam, on the Yass River, supplies water to the town of Yass and the villages of Bowning and Binalong. The Murrumbateman bore supplies the village of Murrumbateman. All other areas of the Yass Valley LGA rely on onsite water collection and storage. Residents in non-urban zones are required to have tanks for rainwater collection as a condition of development consent; this is also to assist bushfire-fighting services.

The town of Rye Park is dependent on sourcing its own water through the use of their own tanks, as there is no town water supply from Yass or Boorowa. Additional water is also pumped from Pudman Creek for use in the town under domestic water licences.

6.6.5 Site Surface Water

The use of aerial photographs, topographical and surface water overlays for any creeks, watercourses and wetland areas were utilised to identify any significant watercourses, standing water bodies, lakes and wetland areas within the study area. No significant water bodies or wetlands have been identified within or near the wind farm site. Some small stock dams are interspersed across the site area.

The watercourses on site have been assessed based on their stream order. The order of streams was determined based on the Strahler method of stream ordering classification. This method of stream ordering involves labelling all upper tributaries as first order streams, which when two first order streams converge they combine to form a second order stream. Consequently where two second order streams converge they form a third order stream. When a stream of lower order joins a stream of higher order the downstream section of the stream will retain the order of the higher order upstream section (Yang and Kwan, 2001).

The site contains a number of watercourses which are predominantly first order streams with some second order streams. The turbines are generally located on the higher ground and the access tracks and underground cabling generally follow the higher ground locations. The layout of the wind turbines, the access tracks and underground cabling has been designed to avoid crossing known third order watercourses where possible on the site. However, there will be a requirement to upgrade an existing access track which crosses a third order stream (Blakney Creek) at the eastern boundary of the site, adjoining Blakney Creek North Road. This existing watercourse crossing will be upgraded and managed to be consistent with the 'Guidelines for Controlled Activities on Waterfront Land' as

specified by the NSW Office of Water¹. The NSW Office of Water has been consulted regarding the project. The watercourses through the site and the access track layout are illustrated in Figure 6-5.

The location of the substations and switchyard are also positioned away from any watercourses. Overhead powerlines are proposed to interconnect different segments of the project. The use of overhead powerlines will also be used to avoid the requirement to place underground cables through existing watercourses.

¹ Water NSW. Can be accessed via 'www.water.nsw.gov.au/M/ater.Licensing/Approvals/Controlled-activities/default.aspx'



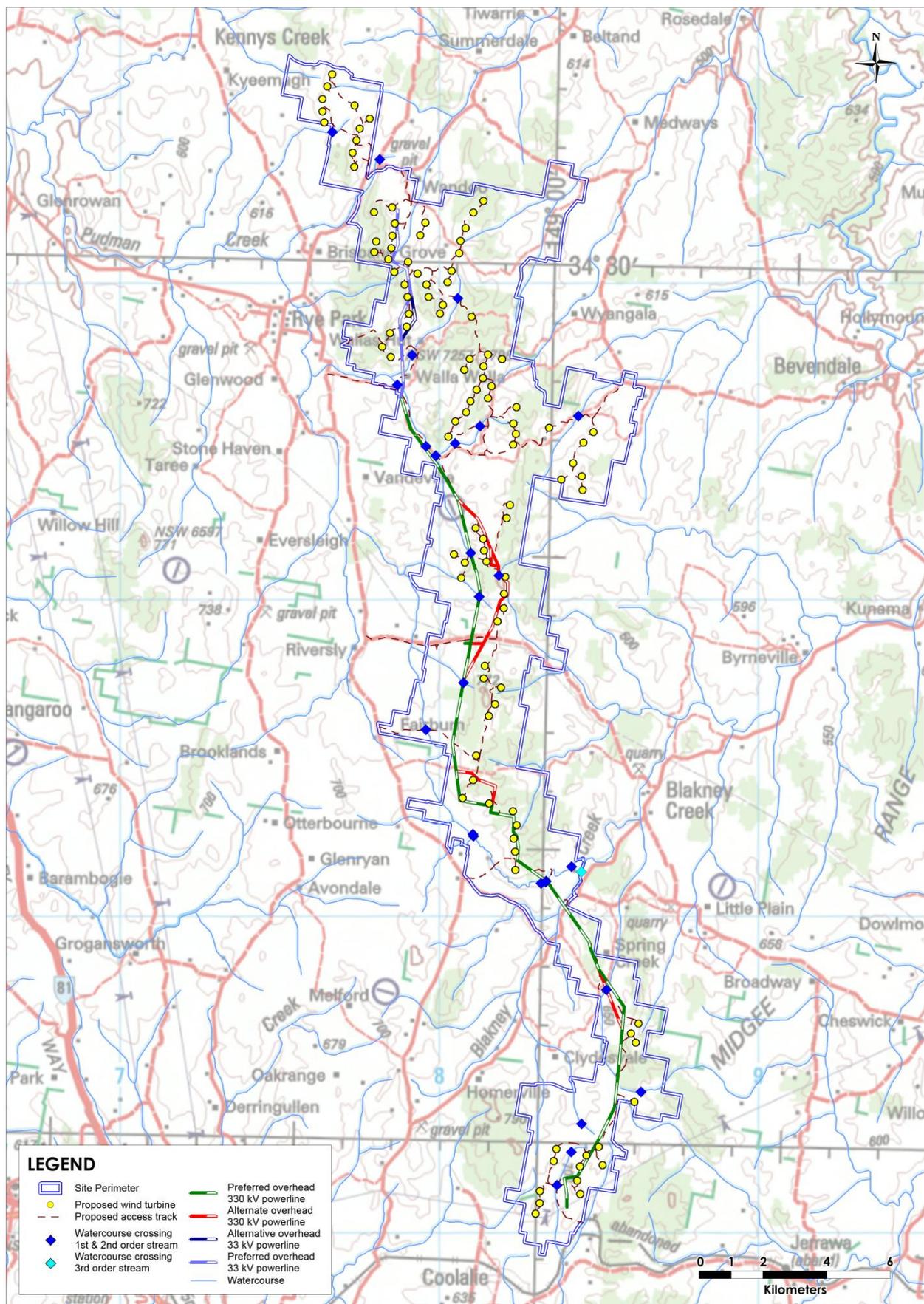


Figure 6-5 Watercourses and crossing locations within the site boundary

6.6.6 Groundwater

The Rye Park Wind Farm falls within the Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources which includes rules for protecting the environment, extractions, managing licence holders' water accounts, and water trading in the plan area. The project boundary falls within the Yass Catchment Groundwater Source.

Groundwater flow in Yass Valley Local Government Area is from local groundwater flow systems, mostly within Palaeozoic rocks or Mesozoic intrusives and intermediate flow systems within Precambrian rocks in sedimentary aquifers and some fractured rock aquifers (OCE, 2004).

The total licensed groundwater entitlement for the Yass catchment is 3,181 ML per year, of which 94.7% of this is to be used for irrigation purposes and 5.3% for town water supply purposes (DPI, 2010).

No impact on current groundwater levels or groundwater users is expected from the project primarily due to significant elevation differences between existing groundwater and proposed turbines regardless of whether a gravity type or rock anchor type foundation is used. For the purposes of this groundwater assessment a worst case scenario has been adopted using only rock anchor type foundations to 20 m deep. Suitable steps will be taken to ensure construction run-off and oil does not contaminate local groundwater, and local groundwater will not be used as a water supply source for the project. Water supply for project construction will be sourced from local water supply dams and transported to site.

An assessment of groundwater bores within 5 km of the project site indicates groundwater levels are generally located in lower lying country, not on the top of ridges where wind turbines are proposed. The only groundwater bore within the project site boundary is approximately 1.7km west of proposed turbine locations near dwelling R44 (Groundwater number GW058154). This groundwater bore has an elevation of 650 m above sea level, and the closest turbines have an elevation of 745m above sea level, an increase of nearly 100 m. This groundwater bore is 36.5 m deep, with water found at 16.7 m deep (NSW Government, National Resource Atlas 2013). As a wind turbine rock anchor type foundation is approximately 20m deep, there is no expected impact on this groundwater bore as there is more than 100 m elevation difference between the water level and the proposed turbine.

In total, there are 43 existing groundwater bores within 5 km of the Rye Park Wind Farm project. Of these 43 groundwater bores, the difference between the ground water level and the turbine elevation are all deeper than the 20 metres required for turbine rock anchor type foundations. The closest groundwater bore is not within the site boundary, is 1.45 km from the nearest turbine, and will not be impacted by the wind farm.

6.6.7 Construction and Operational Water Requirements

During the construction phase an estimated 900 ML of water will be required primarily for dust control as well as to supply the onsite concrete batching plants.

Water for the project is likely to be sourced primarily from Yass Dam and stored in onsite tanks. The proponent has discussed the proposed arrangements with Yass Valley Council and has written to Council seeking to progress the necessary arrangements to formalise the use of water during construction. Sourcing of water from Burrinjuck Dam is an alternative and will be progressed with the NSW Government, as the water managers, if required.

Once the wind farm is completed and operational it will require only a very small volume of water (less than 1 ML during operations). This water will be obtained through the use of onsite storage tanks collecting water runoff from any of the permanent structures and offsite sources if necessary. Groundwater on the project site will not be used as a source for construction or operational water requirements.

6.6.8 Assessment

Potential Impacts to Drainage and Hydrology

The construction, operation, maintenance and decommissioning of the project has the potential to impact on the current drainage and hydrological characteristics of the site by:

- ▶ installing access roads, on site buildings and other associated infrastructure;
- ▶ modifying the landscape with minor-medium earthworks and vegetation clearing;
- ▶ altering or disturbing existing watercourses and significant drainage paths if the layout design is amended to include construction in water course areas;
- ▶ the pollution of waters by accidental and uncontrolled spills and excavation works;
- ▶ sedimentation and erosional transport of pollutants, soils etc. to water courses in the area; and
- ▶ unnecessarily traversing or bounding watercourses with access tracks and powerlines in instances where these actions could be avoided.

Any potential impacts are predicted to be most significant during the construction and decommissioning phases, where heavy machinery and vehicles and excavation works are required, large areas of soil and cleared vegetation are exposed, materials are stockpiled and mechanical and construction fluids are stored onsite.

The installation of infrastructure such as foundations, onsite buildings, access tracks, and impermeable hard surfaces can alter and modify the pre-existing flow paths and dynamics of surface and ground water flows as well as impact on the areas general water quality through pollution and sedimentation.

Machinery and on-site storage of fluids and chemicals are another potential source of water pollution and contamination.

The sites altitude is at some of the highest elevations of the Great Dividing Range and forms the divide for water flowing north and east to the Lachlan and Murrumbidgee Catchments and west to the Murray Darling Basin. As the turbines will be located on the highest elevation points within the site area, with the foundations of the turbines only a few metres in depth and all access roads constructed on the surface, it is considered that the development will not encounter or impact on any groundwater reserves.

6.6.9 Mitigation

The following mitigating measures for minimising disturbance and impacts of the sites drainage and hydrology have either been applied during the design phase or will be applied during construction:

- ▶ Minimise the amount and degree to which the general topography and landscape is modified and disturbed by infrastructure and associated works through the design phase.

- ▶ Where practical upgrade existing access roads as opposed to constructing new access tracks.
- ▶ Where practical, restrict access tracks to follow the site’s ridge lines and natural contours while avoiding steep hill slopes and vegetated area.
- ▶ Prepare a Sediment/Erosion Control Plan to be incorporated into the CEMP. Soil and water management practices would be developed as set out in Soils and Construction Volume 1 (CSIRO, 2012).
- ▶ Infrastructure would not be sited within 40 metres of a major drainage line or water course, where practical.
- ▶ As soon as practical, stabilise exposed or clear areas to minimise erosion and sedimentation that can potentially pollute and block watercourses in the area.
- ▶ Design concrete batch plants to ensure concrete wash would not be subjected to uncontrolled release. Bund areas of the batching plant to contain peak rainfall events and remediate after the completion of the construction phase. Waste sludge would be recovered from the settling pond and used in the production of road base manufactured onsite. The waste material would be taken from the batching plant to be blended in the road base elsewhere onsite.
- ▶ A Spill Response Plan would be prepared as part of the Environmental Management Strategy.
- ▶ Stage excavation works to minimise the amount of exposed areas over time to allow for adequate rehabilitation and reduce the potential for erosion.
- ▶ Fuel and oils, materials and soil stockpiles must have designated areas away from any watercourses, with adequate sediment and contamination bunding controls installed to ensure or minimise the impacts of contamination of water sources in the area.
- ▶ Watercourse crossings would be designed to be consistent with the ‘Guidelines for Controlled Activities on Waterfront Land’ as specified by Water NSW². This includes but is not limited to:
 - Identify the full width of the riparian corridor and its functions in the design and construction of crossings,
 - Minimise the design and construction footprint and extent of proposed disturbances within the watercourse and riparian corridor,
 - Maintain existing or natural hydraulic, hydrologic, geomorphic and ecological functions of the watercourse,
 - Protect against scour, and,
 - Where possible stabilise and rehabilitate all disturbed areas including topsoiling, revegetation, mulching, weed control and maintenance to adequately restore the integrity of the riparian corridor.

The site plan for the wind turbines and associated infrastructure has been designed with particular emphasis on protecting existing streams and ephemeral watercourses. The layout avoids crossing or interfering with watercourses by any infrastructure. This is to avoid and minimise any adverse impacts to the areas drainage and hydrological regime.

6.7 Soils and landforms

The project boundary extends from the Rye Park-Dalton Road in the south to the Rye Park-Rugby Road in the north. The surrounding area of Boorowa Volcanics is characterised by undulating low hills and rocky rises on Silurian dacite, crystal tuff, andesite and minor sandstone. The general elevation is 550 to 650m, with peaks to

² Water NSW. Can be accessed via ‘www.water.nsw.gov.au/M/ater.Licensing/Approvals/Controlled-activities/default.aspx’

780m. The soil comprises red and yellow gradational earths, yellow structured loams and thin stony loams within rock outcrops (Mitchell, 2002).

6.7.1 Existing Environment

Geology

The highlands are part of the Lachlan fold belt that runs through the eastern States as a complex series of metamorphosed Ordovician to Devonian sandstones, shales and volcanic rocks intruded by numerous granite bodies and deformed by four episodes of folding, faulting and uplift. The general structural trend in this bioregion is north-south and the topography strongly reflects this. There are four centres of Tertiary basalt flows.

The oldest rocks are a small sliver of the Early Ordovician serpentinite running from Gundagai past Tumut into the lower Snowy Mountains. These unusual rocks were formed in deep marine conditions and were plastered against the edge of Australia when an area of sea floor and an island arc closed up. A similar sequence is found at Lucknow, about 9km south-east of Orange (OEH, 2011b).

The greatest proportion of the site geology is made up of Ordovician & Silurian sedimentary rocks in elevated locations, while Silurian volcanic rocks are found in smaller quantities in the low lying regions. These predominate geological features can be seen in

Figure 6-6 Geology of the local area (Source: Department of Primary Industries, March 2011)

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Soils

Soils vary across the bioregion in relation to altitude, temperature and rainfall: on the Palaeozoic slates, sandstones and volcanics, mottled red and yellow texture contrast soils, with red earths found; on the granites, shallow red earths occur on ridges, yellow texture contrast soils on all slopes and deep coarse sands in alluvium; on Tertiary basalts, shallow red-brown to black stony loams exist, with alluvial loams and black clays in swampy valley floors. Limited areas of shallow organic loams are present at high altitude on Canobolas. Some of the tertiary sands in the mid-Shoalhaven deep have been worked into low dunes under a past climate and now have deep siliceous sand or yellow earth profiles (OEH, 2011b).

Topography and Terrain

The South Eastern Highlands Bioregion covers the dissected ranges and plateaus of the Great Dividing Range that are topographically lower than the Australian Alps, which lie to the south-southwest. It extends to the Great Escarpment in the east and to the western slopes of the inland drainage basins.

The site varies from undulating hills with some areas of moderately steep slopes that extend down to small level valleys with numerous saddles and small knolls situated off the main ridgeline. As indicated in Figure 6-7, the site has higher elevations in the northern portion with spot heights in excess of 790 m and slightly decreases in elevation to the south.

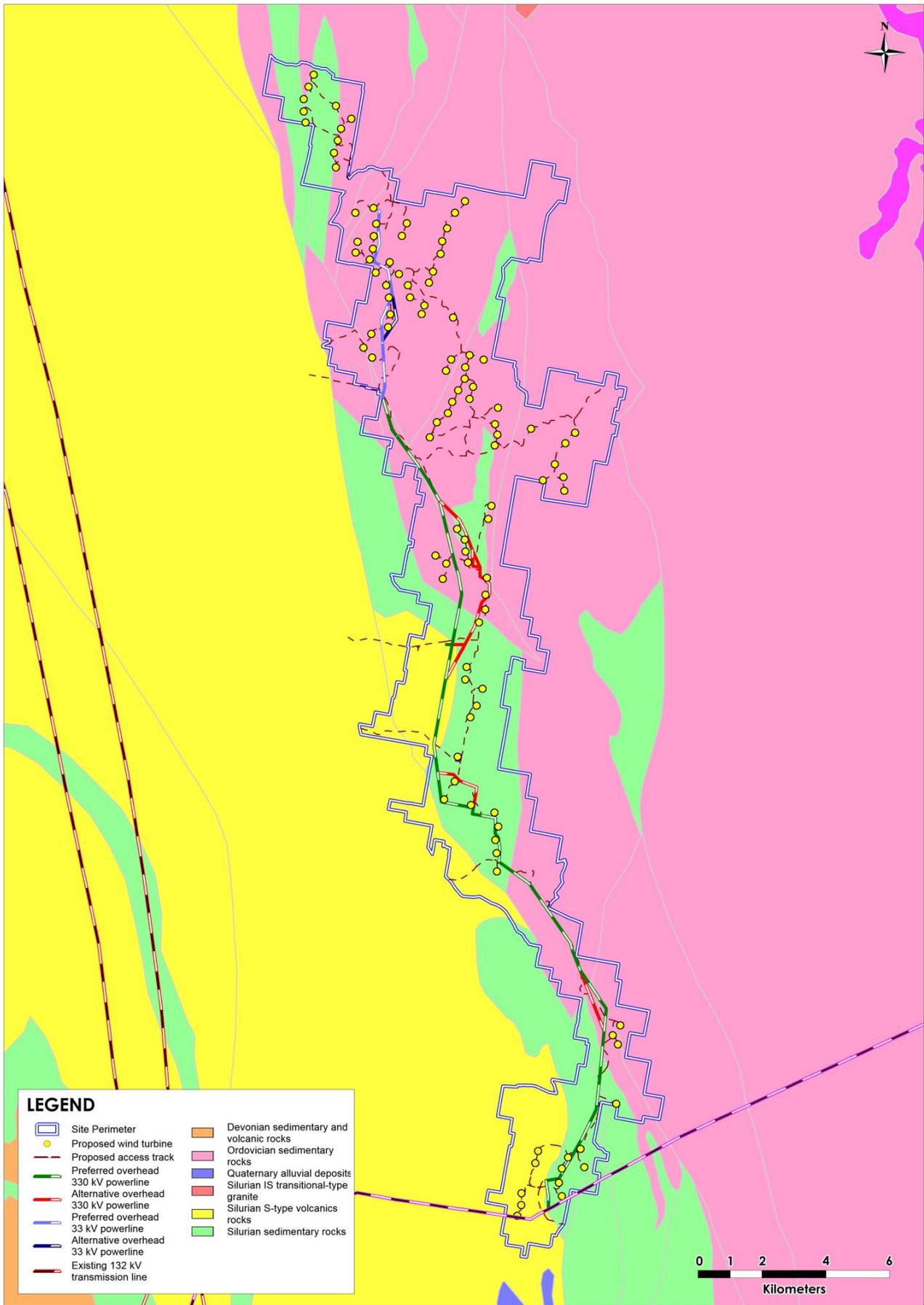


Figure 6-6 Geology of the local area (Source: Department of Primary Industries, March 2011)

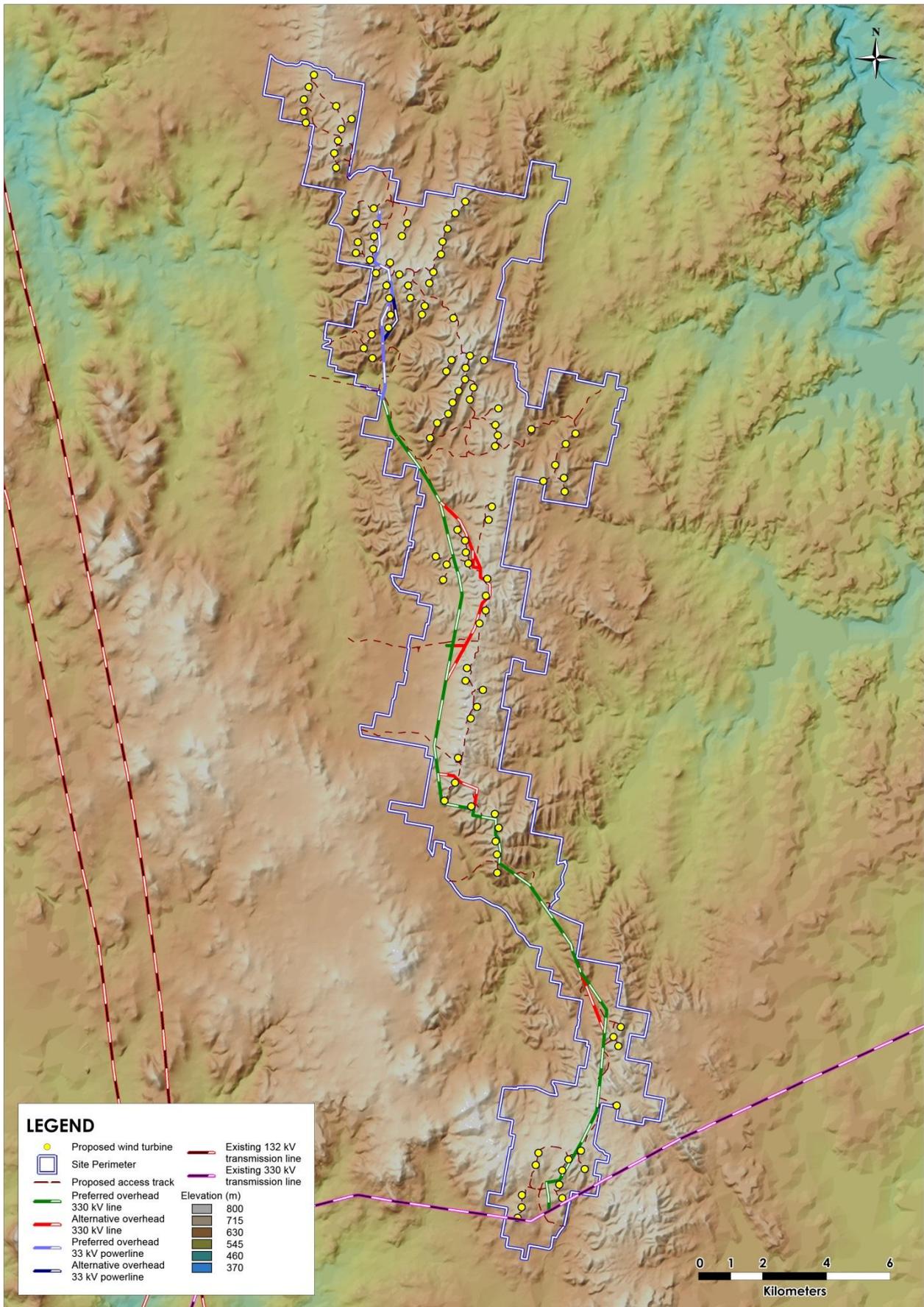


Figure 6-7 Digital Terrain Model of the Rye Park Wind Farm

6.7.2 Assessment

The construction, operation, maintenance and decommissioning of the wind farm has the potential to impact on the current soils and landform of the site. The construction phase and decommissioning phase will impact on the sites landform and soils through:

- ▶ vegetation clearing;
- ▶ excavation and heavy machinery works;
- ▶ grading/levelling;
- ▶ access road upgrades;
- ▶ possible trenching for powerlines;
- ▶ vehicle traffic and heavy machinery traffic;
- ▶ excavation for turbine foundation breakdown and site building removal;
- ▶ re-contouring the surface; and
- ▶ revegetation & rehabilitation works.

These works have the potential to alter and degrade the site's natural soils and landform through increasing the possibilities of:

- ▶ erosion and weathering processes;
- ▶ introducing and or spreading of weed species
- ▶ changing hydrology and drainage paths, which can potentially increase the area's chance of dry land salinity; and
- ▶ impact on the ground stability.

Areas at particular risk on the site are areas of steeper slopes and thinner soils. During the design phase, amendments to the infrastructure layout, and in particular access tracks, were made to reduce the overall environmental impact. This meant that access tracks predominantly followed the tops of ridgelines in order to prevent cutting into side slopes. For this reason the project is not expected to cause any significant environmental impacts on the site or its surrounding topography and terrain if standard procedures are undertaken to minimise excavation works and prevent erosion and sedimentation through adequate management and rehabilitation measures.

6.7.3 Mitigation

The extent of ground surface disturbance is expected to be relatively small compared to the total site area. The location of the turbines will be restricted to the ridgelines of the site, with ridges that are generally clear of vegetation.

The ridgelines are covered with varying densities of vegetation with the majority of more densely vegetated areas located along the sides of the ridges into the valleys. These slopes are at particular risk of erosion and will therefore be avoided where practical. The surrounding slopes will be largely unaffected by the project, except in the case where powerlines will be routed through them.

Nevertheless, areas will need to be protected by the installation and maintenance of standard erosion and sediment control measures and by minimising the amount of site excavations, land clearing, immediate stabilizing of exposed areas and restricting traffic to access tracks as much as possible. These measures are taken to avoid exacerbating erosion and weathering processes, changing hydrology and drainage paths of the site and contributing to soil and landform degradation.

At the conclusion of the construction period the disturbed areas of the site which are no longer required for operation would be rehabilitated to a level suitable for the ongoing agricultural use of the land. The topsoil removed for construction activities would be stockpiled and reused for the rehabilitation of the areas around the turbine foundations, lay down and hardstand areas and along the access tracks. The concrete batching plants and other areas disturbed by heavy machinery would be rehabilitated. Pasture grass seed will be used to reinstate the vegetation cover for disturbed areas. The verges of the access tracks would be rehabilitated with topsoil and seed.

The rehabilitation process will be carried out progressively as each section of turbines is established.

7 CONSULTATION

7.1 Government Agencies

The proponent has had a number of follow up discussions and meetings with the three local councils associated with the wind farm since the exhibition of the EA and will continue to engage with Boorowa Council, Upper Lachlan Shire Council and Yass Valley Council. The details of the meetings are listed in the Table 7-1.

Table 7-1 Meetings with council representatives

Date	Consultation Details
29 Jan 2015	Project update and meetings with council representatives
24 Mar 2015	Project update and meetings with council representatives
9 & 10 Jul 2015	Project update and meetings with council representatives
1 Sep 2015	Project update and meetings with council representatives
21 Sep 2015	Workshop and presentation to Mayor and Boorowa Councillors
23 Sep 2015	Workshop and presentation to Mayor and Yass Valley Councillors
24 Sep 2015	Workshop and presentation to Mayor and Upper Lachlan Shire Councillors
28 Oct 2015	Project update and meetings with council representatives
5 Feb 2016	Individual meetings with council representatives
7 Apr 2016	Joint meeting with council representatives – road use and proposed maintenance arrangements

The key issues that were discussed included potential traffic and transport impacts, upgrades to council roads and the proposed community and neighbour benefit scheme. Concerns relating to these key issues have been addressed as follows:

Traffic and transport impacts

As a result of consultation both the number of access routes and the number of access points to the wind farm site have been reduced. For further details please refer to the updated Traffic and Transport Assessment in Appendix E. The Statement of Commitments includes a commitment to prepare a detailed Traffic Management Plan in consultation with each of the Councils prior to the commencement of any construction. The Traffic Management Plan will include all relevant mitigation measures and safeguards to ensure that the traffic and transport impacts from the construction of the wind farm are minimised and managed appropriately.

Upgrades to Council roads

Following a number of meetings and discussions, the Proponent has negotiated with the councils on the extent of upgrades and standards which will be applied to each of the access roads which are planned to be used for the construction of the wind farm. The final road upgrade requirements will be agreed with the relevant council prior to construction under a deed of agreement.

Community benefit scheme

The Proponent has sought input and provided a draft of the proposed community benefit scheme to each of the councils prior to finalising the community benefit scheme that is currently being implemented for the project.

Consultation with Office of Environment and Heritage (OEH)

Following the exhibition of the EA the Proponent has had extensive correspondence and discussions with OEH including a site visit on 20 January 2016.

7.2 Community Consultation

Since the acquisition of the Rye Park Wind Farm project, Trustpower has reviewed the engagement undertaken by Epuron in previous phases of the project and developed a comprehensive community consultation process for current and future phases of the project. Please refer to Appendix J – Community and Stakeholder Engagement for further details of the community consultation process that has occurred to date.

The current consultation program has utilised a range of activities including one on one meetings, project newsletters, site visits, meetings with key stakeholders, an up to date project website, project fact sheets, ongoing Community Consultation Committee meetings and a community information day as detailed in Table 7-2.

Table 7-2 Community consultation activities since exhibition of EA

Description	Date	Distribution	Comments
Project website	Since November 2015	All stakeholders	www.ryeparkwf.com.au
Project newsletter 11	December 2014	All residents within 5 km and other stakeholders	
Project newsletter 12	August 2015	All residents within 5 km and other stakeholders	
Project Fact Sheet 2	August 2015	All residents within 5 km and other stakeholders	
CCC Meeting 8	10 March 2015	CCC members & invited observers	Minutes published on project website
CCC Meeting 9	26 August 2015		Minutes published on project website
CCC Meeting 10	14 October 2015		Minutes published on project website
Letter re Neighbour Agreements	26 August 2015		
Community Information Day	22 September 2015 1:00 PM to 7:00 PM	All stakeholders	Approximately 60 members of the community attended.
Media releases	Aug & Sep 2015	Yass Tribune, Boorowa News, Goulburn Post Town & Country Magazine, Canberra Times, Cowra Guardian, Goulburn Post,	
Radio interview with Trustpower Development Manager	Aug & Sep 2015	ABC Central West and Western Plains	

Description	Date	Distribution	Comments
Information Poster Booklet	October 2015	Project website	
Huffington Post online article	10 November 2015		
CCC Meeting 11	17 February 2016		Minutes published on project website

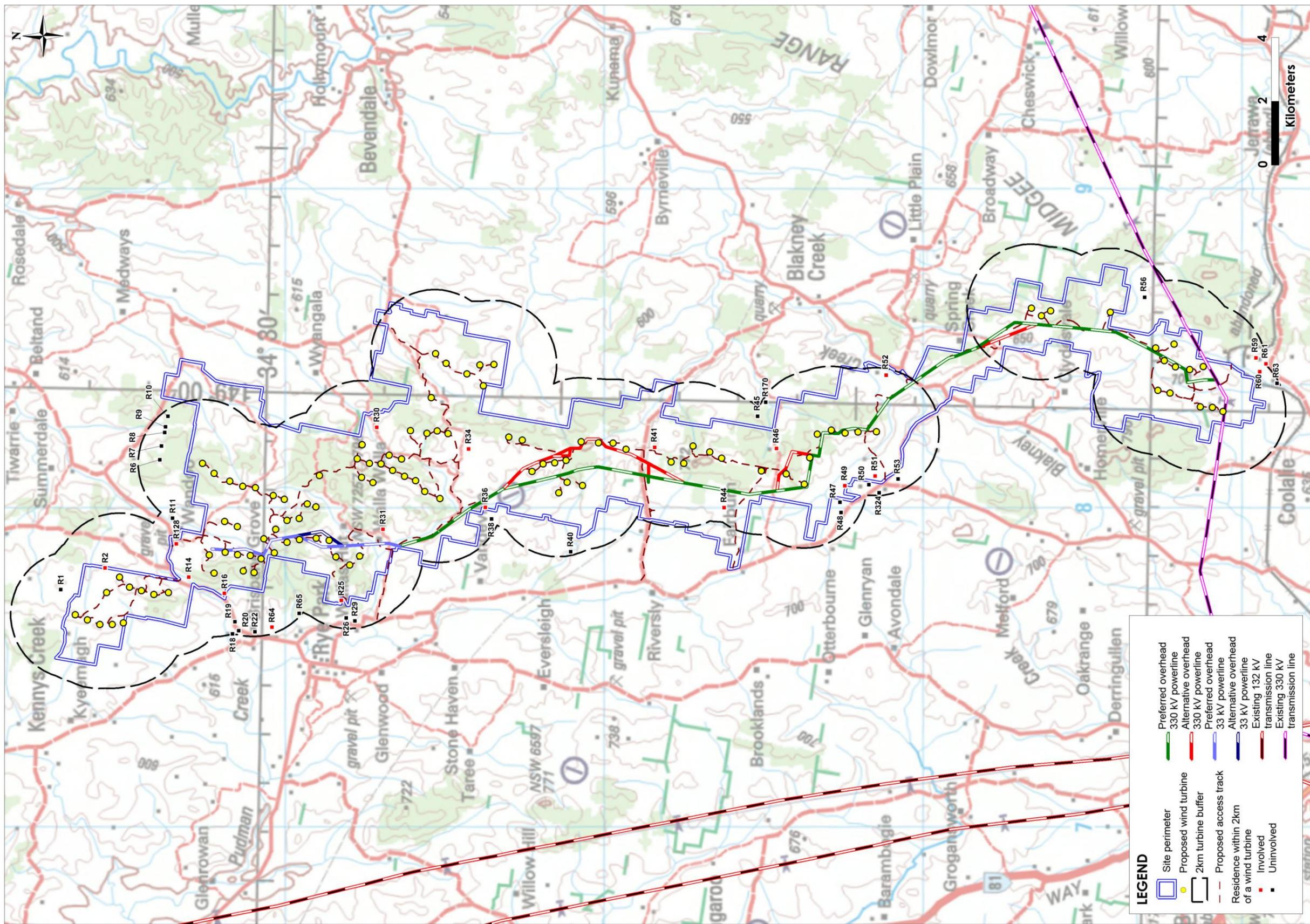


Figure 7-1 Involved and unininvolved residences within 2 km

The Proponent recognises that face to face meetings are critical to engagement within the community. Meetings were offered to all host landowners, adjoining landowners within 5 km, all local government bodies in the affected area and other relevant stakeholders.

Although the focus of the community consultation is on residences within 2 km of a proposed turbine, the Proponent has expanded the direct consultation effort to all residences located within 5 km of a turbine as outlined in the Table 7-3.

Table 7-3 Non-involved residences within 5 km

Distance to nearest turbine	Number of Non-Involved Residences	Cumulative Number of Non-Involved Residences
0 to 1 km	1	1
> 1 km to 2 km	24	25
> 2 km to 3 km	29	54
> 3 km to 4 km	94	148
> 4 km to 5 km	57	205

The principles outlined below have guided the project team to nurture stakeholder and community trust in the project:

- Engage early
- Be visible
- Be part of the community
- Do what we say we will do
- Be an effective communicator
- Behave appropriately
- Monitor continuously
- Be flexible and change the strategy if it's not working

Issues raised in the submissions following exhibition of the EA and raised during the consultation process have been considered in refining the project layout and preparing this report. Additional work and studies have been undertaken to address the further issues raised including:

- Refining the wind farm infrastructure layout, including reducing the number of proposed wind turbines by a total of 17 wind turbines
- Development and implementation of an extensive community and stakeholder engagement plan
- Further biodiversity and cultural heritage surveys
- A revised traffic & transport impact assessment including reduced impact on local roads
- Further refining the proposed community enhancement funds; and
- Offering neighbours living within 2 km of a constructed wind turbine a voluntary Neighbour Benefit Agreement.

The Proponent commits to ongoing consultation with key stakeholders and the local community to keep them informed of the project status and to engage with the relevant stakeholders and community on any construction impacts and management plans prior to construction commencement.

7.3 Mineral exploration title holders

The Proponent continued to consult with mineral exploration title holders as noted in the Table 7-4.

Table 7-4 List of mineral exploration title holders

Date	Exploration Licence	Licence Holder	Correspondence
14 Aug 2015	EL 6274	Strategic Metals Australia	Community newsletter
19 Aug 2015	EL 6274	Strategic Metals Australia	Newsletter 12
8 Sep 2015	EL 6274	Strategic Metals Australia	Community Information Day invite
19 Aug 2015	EL 8313	Ochre Resources Pty Ltd	Newsletter 12
8 Sep 2015	EL 8313	Ochre Resources Pty Ltd	Community Information Day invite
19 Aug 2015	EL 6873	Elephant Mines Pty Ltd	Newsletter 12
8 Sep 2015	EL 6873	Elephant Mines Pty Ltd	Community Information Day invite

No concerns or issues have been raised by any of the mineral exploration title holders.

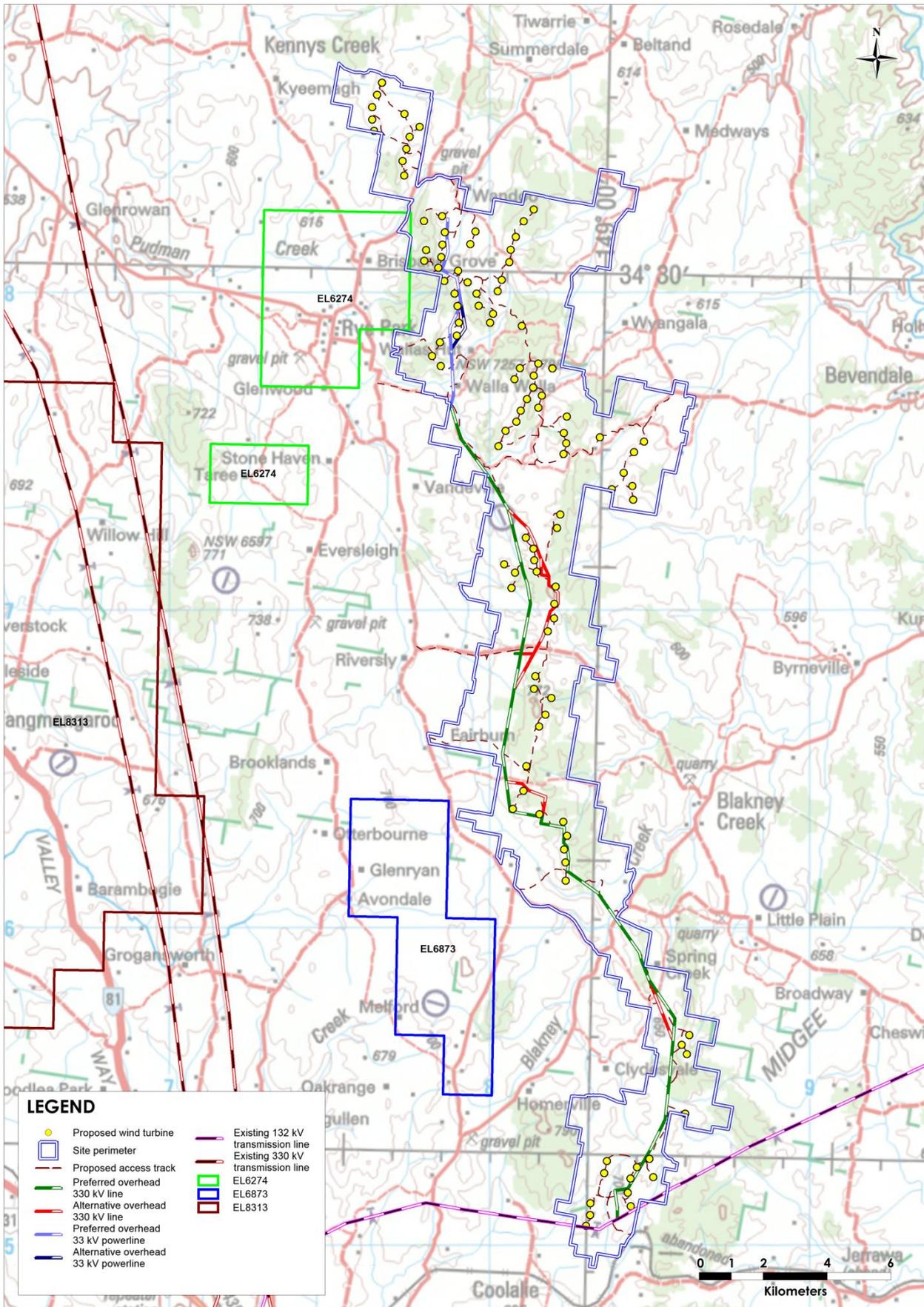


Figure 7-2 Current Mineral Exploration Licenses across the project site

7.4 Community Enhancement Fund

The Proponent has committed to establishing a fund to contribute to the social and economic wellbeing of the communities immediately surrounding the proposed wind farm. The contributions have been set at \$2,500 per wind turbine per annum, and will be payable upon the commissioning of each turbine. The principles of the Community Benefit Fund have been agreed with the local councils. It is proposed for separate funds in each council area, based on \$2,500 per annum per turbine built, to be administered through Section 355 Committees. The proposed scheme will be agreed and captured under a Voluntary Planning Agreement (VPA) which will be subject to community consultation. We have also agreed to allocate at least 20% of the total scheme for educational needs.

The remainder will be available for community enhancement and benefit projects within the immediate vicinity of the wind farm.

The Proponent is offering neighbours living within 2 km of a constructed wind turbine a Neighbour Benefit Agreement. The agreement is completely voluntary and offered to neighbours with an existing dwelling within 2 km of a wind turbine. For further details please refer to pro-forma agreement on the project website at http://www.trustpower.co.nz/~media/files/publications/308888173_1_rye%20park%20neighbouring%20deed%20august%202015.pdf

8 HAZARDS AND RISKS

8.1 Aviation

8.1.1 Background

Due to the height of the wind turbines, potential impacts to the safety of aviation activities have been assessed as follows:

- ▶ identifying nearby aerodromes and landing strips;
- ▶ consultation with aviation authorities and associations;
- ▶ assessing the risk to air navigation services and procedures; and
- ▶ assessing the risk to aerial agricultural activities.

The Ambidji Group was engaged to prepare an Aeronautical Impact Assessment as well as an Aeroplane Landing Area Assessment. Please refer to Appendix H and Appendix I for the full reports. A summary of the assessments and outcomes is outlined in the sections below.

8.1.2 Existing Environment

Aerodromes

The closest Civil Aviation Safety Authority (CASA) certified and registered aerodromes to the proposed wind farm site are Canberra and Goulburn airports, approximately 70 km to the south-southeast and 80 km to the east of the site respectively. Cowra and Young aerodromes are to the north west of the wind farm site.



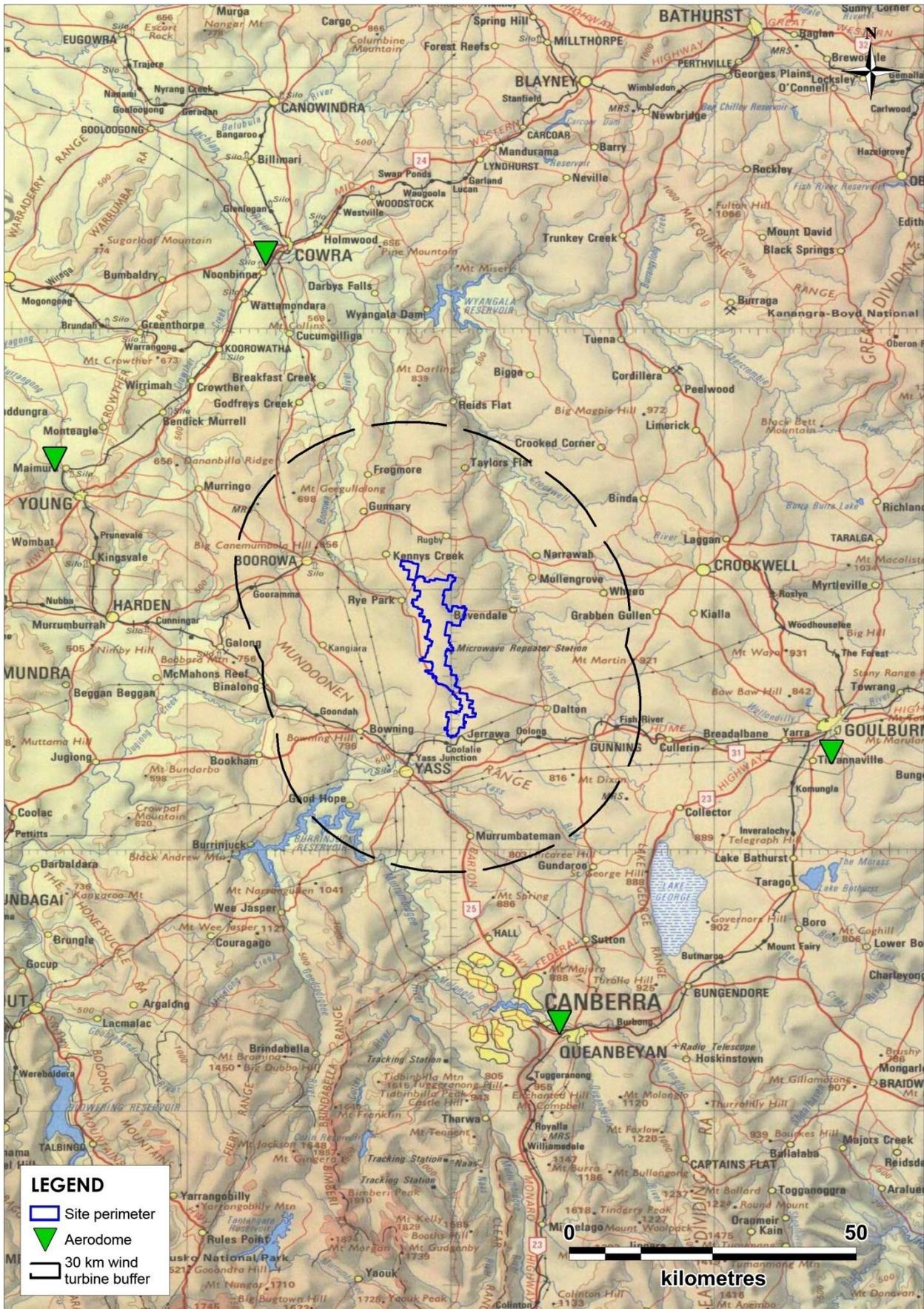


Figure 8-1 Aerodromes within vicinity of the proposed wind farm

Navigation Aids

There are two radio navigation aids in the vicinity of the wind farm located near Rugby and near Yass.

Airtraffic Control Radars

There are two air traffic control radar systems operated by Airservices Australia located at Mt Majura and at Mt Bobbara. The Mt Majura radar system includes both a Primary Surveillance Radar (PSR) and Secondary Surveillance Radar (SSR) and is more than 54 km from the nearest wind turbine location. The Mt Bobbara radar system is a SSR only and is more than 33 km from the nearest wind turbine location.

Landing Strips

Seventeen private landing strips (known as Aircraft Landing Areas or ALAs) have been identified on private properties within 5km of the project. The majority of these landing strips are on properties associated with the project and are used infrequently for aerial agricultural operations. ALAs are not registered or regulated by CASA. Locations of the landing strips are shown in Table 8-1

Table 8-1 Location of existing landing strips

ALA No.	Location		Distance from nearest wind turbine (metres)
	Easting	Northing	
1	678,539	6,150,198	4,478
2	681,384	6,147,889	3,233
3	688,203	6,148,492	4,721
4	688,733	6,160,911	4,916
5	686,548	6,162,351	4,173
6	678,807	6,166,860	2,663
7	680,385	6,172,950	951
8	677,118	6,175,747	2,416
9	685,087	6,176,086	764
10	685,418	6,178,714	3,403
11	685,140	6,181,225	4,035
12	682,273	6,186,167	3,612
13	686,039	6,163,578	3,674
14	684,644	6,156,425	1,351
15	680,227	6,148,221	3,709
16	675,185	6,177,658	3,026
17	674,036	6,179,834	4,091

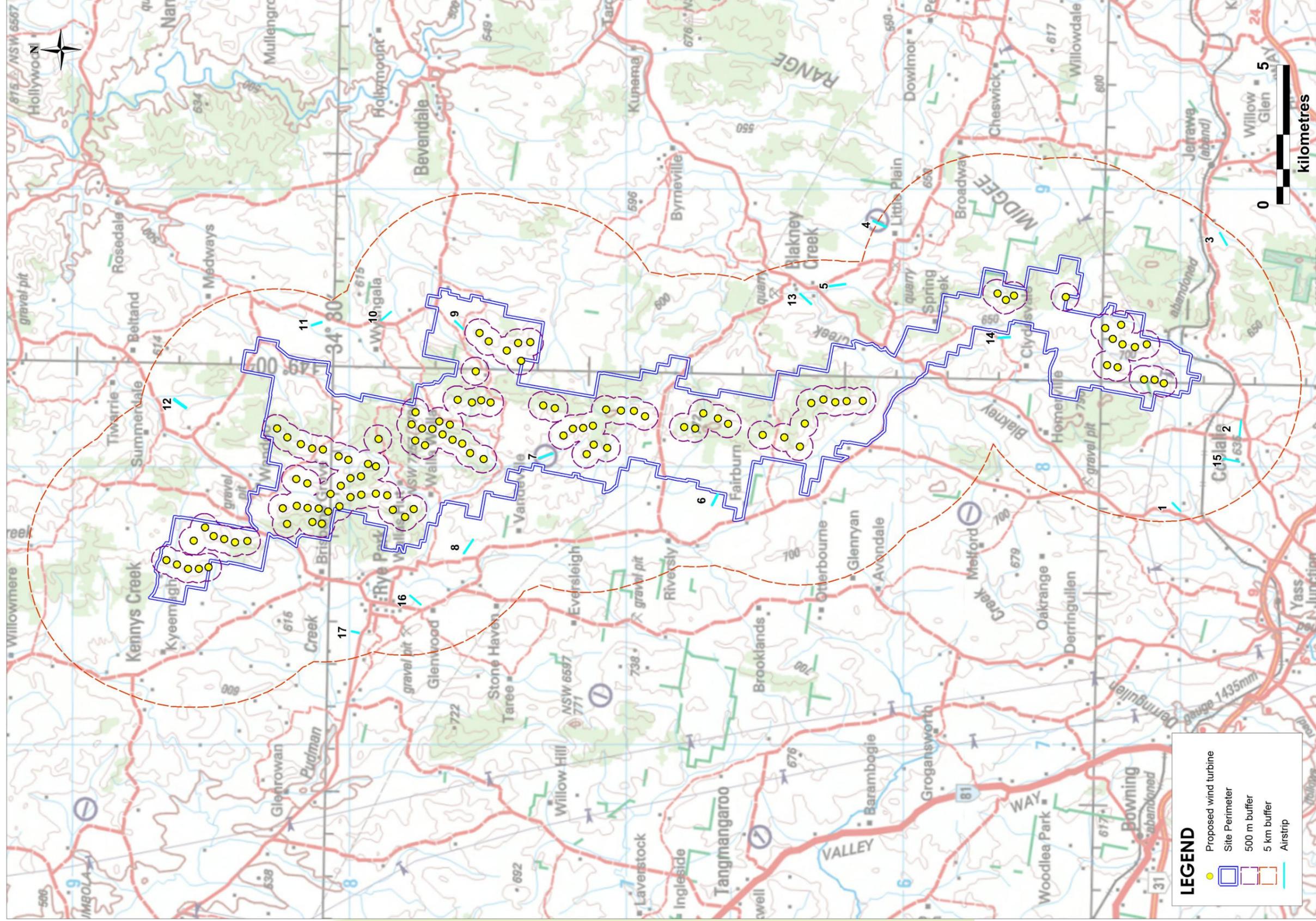


Figure 8-2 Airstrips within 5km of a turbine

8.1.1 Consultation

Yass Valley Council, Upper Lachlan Shire Council, Boorowa Council, CASA, Airservices Australia (ASA), the Aerial Agricultural Association of Australia (AAAA) and the Department of Defence have been consulted in relation to potential aviation impacts from the proposed wind farm. The consultation included written correspondence and follow up discussions as necessary. Please refer to Appendix H and Appendix I for further details.

8.1.2 Assessment

Aerodromes

The wind farm is more than 30 NM (56 km) from the nearest aerodrome and all the proposed wind turbine locations are further than 15 km away from any existing Obstacle Limitation Surface (OLS). As a result, no OLS or Procedures for Air Navigation Services – Aircraft Operations (PANS – OPS) surfaces are penetrated. There are no impacts that would affect operations at any of the four nearest aerodromes and no further assessment is required.

Procedures

A number of published air routes are in the vicinity of the proposed wind farm. The Lowest Safe Altitudes (LSALT) over the wind farm area is 4,600 ft to the west of 149 °E and 5,700 ft to the east of 149 °E. The highest wind turbine tips will be at 3,042 ft and when rounded up to 4,100 ft (including a 1,000 ft Minimum Obstacle Clearance) will be higher than the LSALT of 3,900 ft for four nearby routes.

Airservices have confirmed that this is not an issue and that it would require a notice period of two working days prior to the commencement of construction of the wind farm in order to raise the LSALT for the four impacted air routes.

Navigation Aids

The proposed wind farm will have no impacts on the non-direction beacon radio navigation aids at Rugby and Yass.

Air traffic Control Radars

As the Mt Bobbara SSR site is more than 16 km from the nearest wind turbine, no further assessment is required. The Mt Majura SSR is also more than 16 km from the nearest wind turbine and no further assessment is required.

Although the Mt Majura PSR is more than 15 km from the nearest wind turbine, it is likely to be within the line of sight of at least one or more wind turbines. As a result, a simple assessment is required. Preliminary analysis (Refer Appendix H) suggests that some detection of the wind farm is probable. The probability of the radar “seeing” some of the turbine and producing plots is medium, however the likelihood of these plots generating a false track to the radar controller is low.

Landing Strips and Aerial Agriculture

Aeroplane Landing Areas (ALAs) or private landing strips are not required to be registered with CASA. As a result not all ALA’s are shown on aeronautical charts or listed on any publically available databases. The ALAs, particularly grass landing strips located in paddocks, don’t always show up on aerial images or satellite based mapping services such as Google Earth. As a result, identifying ALAs with any confidence is extremely difficult.

The Proponent consulted with landowners and aerial agriculture operators in the vicinity of the wind farm and identified seventeen potential ALAs. The Ambidji Group was engaged to contact the owners and users of each of the identified ALAs and assess the potential impact of the wind farm on these ALAs. The majority of the ALAs are used infrequently (2 to 4 days/year) for aerial agricultural operations. Please refer to Appendix I for further details.

CASA guidelines for these landing strips are contained in their *Civil Aviation Advisory Publication 92-1 (1) - Guidelines for Aeroplane Landing Areas* (Madders and Whitfield, 2006). The publication contains physical characteristics that define the ‘surfaces’ which should be clear from obstacles around the runway approaches.

As the ALAs rely on visual rather than instruments based landing techniques, and as the turbines are highly visible, it is unlikely that the project would pose any additional hazard to users of these airstrips. It is expected that pilots will continue to use the local landing strips.

Only one landing area (ALA 7) could be considered to be adversely impact by the proposed wind farm. The owner of this ALA is involved with the wind farm and will benefit from the project by hosting wind farm infrastructure. The potential impact on ALA 7 can be addressed either by relocating the ALA or through the alternative use of one of the other nearby ALAs.

The Proponent acknowledges that the wind farm is likely to impact aerial agriculture in the area immediately adjacent to the turbine locations. Accordingly, should spaying or spreading of fertilisers be required in this vicinity, ground based methods will need to be considered and the landowner be compensated for any increase in costs as a result of the wind farm. Please refer to SoC 12 in section 10.

Lighting

Due to the significant physical separation between the wind farm and the closest airports, the fact that the overall wind turbine height will be below the lowest safe altitude for aviation and consideration of general community views on turbine obstacle lighting at night being visually intrusive, it is not considered appropriate to install obstacle lighting on turbines at the Rye Park Wind Farm site. The use of private landing strips is restricted to daytime operation and hence there would be no reason to install obstacle lighting for private aviation purposes.

Accordingly, the Proponent would only install obstacle lighting if required to do so by CASA, and to the extent required by CASA.

It should also be noted that the night time lighting installed on the Cullerin Wind Farm has been decommissioned by Origin Energy following a risk based aviation assessment. A number of recent wind farm developments in New South Wales have been approved without requirement for night time lighting, including the Gullen Range and Glen Innes wind farms.

8.1.3 Conclusions

The Aviation Impact Statement (Appendix H) confirmed that the proposed wind farm:

- Will not impact on the OLS and PANS-OPS surfaces of any registered or certified aerodrome;
- Will not impact on the performance of any navigation aids;
- Will not impact on the Mt Majura and Mt Bobbara SSR radars;
- Will not have any significant adverse impacts on the Mt Majura PSR radar; and
- Will have a minor impact on four published air routes, but Airservices have confirmed that this can be addressed through an administrative change to the Lowest Safe Altitudes for these routes prior to the commencement of construction.

The Aeroplane Landing Area Assessment (Appendix I) identified seventeen unregistered ALAs in the vicinity of the wind farm. The majority of the ALAs are used for 2 to 4 days per year. One of the landing areas (ALA 7) could be considered to be adversely impacted by the construction of the wind farm. If the wind farm is built, this ALA could be relocated or aerial agriculture services could be provided from one of the adjacent ALAs.

8.2 Telecommunications

8.2.1 Background

An updated Telecommunications Impact Assessment was carried out for the revised indicative project layout – refer Appendix F. The results of this assessment are summarised below.

The proposed wind turbines have the potential to cause a reduction in coverage to these communication technologies in some instances. The potential mechanisms that could cause interference include reflection and scattering, diffraction and near field effects.

8.2.2 Existing Environment

The assessment considered a number of telecommunication technologies that were identified as being in use within a 25 km radius of the site:

- ▶ TV and radio broadcasting,
- ▶ Mobile phone services provided by telecommunication companies,
- ▶ Radio communication systems, including point to point microwave links, licensed by the Australian Communications and Media Authority (ACMA),
- ▶ Other radio links including mobile radio, CB radio; and
- ▶ Aircraft navigation systems.

A number of television broadcasting and radio broadcasting services were identified in the area. The closest television transmitter is located about 40 km south east of Rye Park. Two point to point radio communications links cross the wind farm site as shown in Figure 8-3.

8.2.3 Consultation

Licence holders identified via the ACMA RADCOM database for services with a 25 km radius of proposed wind turbines were notified in writing of the proposed wind farm. No objections were raised. Please refer to Appendix F for further details.

8.2.4 Assessment

Television and radio broadcast services

The potential for wind turbines to interfere with analogue TV signals was assessed as part of the initial Telecommunications Impact Assessment. Since that time (2014) all TV signals have transitioned to digital signals which are less susceptible to ghosting or other impacts from wind turbines.

Nevertheless, the Proponent has committed to carrying out an audit of TV reception prior to commencement of construction and then again after construction has been completed to identify whether there is any impact at all to reception at residences located close to (within 5 km) the wind turbine locations. Please refer to SOC 13 in section 9.

Radio communications links

The fixed link microwave radio links are a point to point signal typically between two elevated topographical features. The transmission path may become affected if any part of a wind turbine is located within the 2nd Fresnel Zone between the sending and receiving antennae.

The Fresnel analysis confirmed that for the current 109 turbine layout proposed in this Report there are no wind turbines within the 2nd Fresnel Zone and hence no impact on any of the seven identified communication links.

Aircraft navigation systems

There are no known air navigation systems in the vicinity of the wind farm and Airservices Australia has no objection to the proposal.

8.2.5 Mitigation Measures

Television and radio broadcast services

A number of effective mitigation measures are available in the unlikely event that there is any deterioration of signal strength at any residences located within 5 km of the wind farm. These include modification to, or replacement of, receiving antenna and installation of an additional repeater transmitter. In the event that interference cannot be overcome by other means, other mitigation measures include negotiating an arrangement for the installation and maintenance of a satellite receiving antenna at the Proponent's cost.

Radio communications links

No mitigation required as there is no infringement of the 2nd Fresnel Zone for any of the communications links.

8.3 Electromagnetic fields

8.3.1 Background

Electromagnetic fields (EMF) (having both electric and magnetic components) are generated by all electrical devices including household appliances (televisions, lights, electric blankets etc.), powerlines, substations and wind turbines. Generally, scientific evidence does not firmly establish that exposure to 50 Hz electric and magnetic fields from these sources are a hazard to human health. Current science would suggest that if any risk exists, it is small (ARPANSA, 2011a).

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has produced fact sheets which state that studies to date have consistently shown that there is no evidence that exposure to low level electric fields (such as those found in the home or in most workplaces) are a health hazard. In the same text, it states the possibility remains that intense and prolonged exposure of magnetic fields may increase health risks (ARPANSA, 2011a).

In relation to EMF, the issues associated with wind farms are no different to the issues associated with the electricity industry in general and the use of industry best practice (and in particular the appropriate location of associated powerlines and related easements) should ensure EMF risk is adequately managed.

ARPANSA was formed in 1998 as a Federal Government agency charged with the responsibility of protecting the health and safety of people and the environment, from the harmful effects of ionising and non-ionising radiation. ARPANSA is currently developing guidelines on exposure limits to EMFs but in the meantime they still refer to the National Health and Medical Research Council Interim Guidelines (ARPANSA, 2011b).

The *National Health and Medical Research Council Interim Guidelines on Limits of Exposure to 50/60 Hz Electric and Magnetic Fields* recommend a limit for 24 hour exposure of 1000 mG for magnetic fields and 5 kV/m for continuous public exposure to electrical fields (NHMRC, 1989). These values are consistent with the 50 Hz values of the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998). They note that research suggests that health effects are associated with prolonged exposure; measurements at one point in time do not accurately reflect prolonged exposure levels. As an update in 2009, the ICNIRP stated that based on the latest scientific literature, these recommended limits above remain in place.

Electric fields can be reduced both by shielding and with distance from operating electrical equipment. Magnetic fields are reduced more effectively with distance from the equipment.

Potential for EMF impacts occurs only during the operational phase of the wind farm when electrical infrastructure is capable of generating electromagnetic fields. The electromagnetic fields produced by the wind farm infrastructure would vary at different locations onsite, as discussed below. No impact mitigation is considered to be required for the construction and decommissioning phases.

8.3.2 Assessment

Powerlines

The voltage of the underground and overhead powerline cables connecting turbines to the collection substations within the site would be either 22 kV or 33 kV. At the collection substations, the voltage would be stepped up to a maximum 330 kV, and transmitted on either 132kV or 330 kV overhead powerlines to a connection substation adjacent to the existing TransGrid transmission network.

The magnetic fields associated with a powerline at any moment in time depend on a range of factors, including the amount of current flowing in the line and the distance of the measurement point from the conductors. The electric field strength created by powerlines is dependent upon the height of the wires above the ground and their geometric arrangement. Table 8-2 shows maximum electrical and magnetic field strengths for the various types of powerlines expected to be used in the project (National Grid, 2011):

Table 8-2 Maximum electrical and magnetic field strength of various powerlines

<i>Voltage and Type</i>	<i>Maximum electrical field strength under powerline (or over cable) (kV/m)</i>	<i>Maximum magnetic field strength directly under line (over cable) (mG)</i>
33 kV overhead powerline	0.897	257
33 kV underground cable	--	10
330 kV overhead powerline	3.6	304

Note that underground cables do not produce any external electric fields.

All these values are well within the limits of 5 kV/m and 1000 mG recommended for 24 hour exposure mentioned previously (NHMRC, 1989). These values are maximum values and those measured in the project are expected to be less. Furthermore, the strength of both electric and magnetic fields falls away rapidly with distance from the line (National Grid, 2011)

Any power lines will be located and designed in accordance with the relevant guidelines and will be located well away from residences to minimise magnetic fields from any off-site powerlines.

Substations

Electricity substations are a source of electric fields, although those encountered at the boundary of substations are usually very weak due to effective screening. They are certainly no more than a few hundred volts per meter near the largest installations, well below the 5 kV/m limit.

Magnetic fields from substations occur at their maximum opposite feed pillars, transformers and switching units (Maslanyj, 1996). Fencing around the substations and the location of the substations and control buildings would ensure that the magnetic field exposure to receivers including the public, property owners and workers are well below the 1,000 mG levels determined to be the maximum to safeguard for public health.

Wind Turbines

The areas proposed for the installation of wind farm infrastructure with potential EMI would have limited public access. Access to these areas by the general public would be restricted, with periodic access by appropriately trained and qualified maintenance staff only. Property owners accessing the sites would have no reason to spend extended periods near the infrastructure, which is not located near frequent use areas such as sheds, yards and residences. Should property owners require access to control buildings or other wind farm infrastructure, they would be accompanied by an appropriately trained and qualified maintenance staff member.

A report investigated the expected magnetic field for proposed wind turbines for Windrush Energy in 2004 (Iravani et al., 2004). The study was based on research and measurements of an existing wind turbine. The measured flux density at the door of the existing turbine was 0.4 mG and the typical value around the wind turbine was 0.04 mG. The acceptable level as stated by the International Commission on Non-Ionizing Radiation Protection (at 60 Hz in this case) is 833 mG (ICNIRP, 1998). The results also concluded that no measurable magnetic field would be expected at a distance of eight metres from the 1,650 kW wind turbine, and hence the magnetic fields produced by generation of electricity from turbines would not pose a threat to public health.

8.3.3 Mitigation

Overhead powerlines and underground cables would generally be located as far as practical from residences and in accordance with the minimum distances set out the relevant powerline and easement guidelines.

8.4 Shadow flicker

8.4.1 Introduction

Due to their height, wind turbines can cast shadows on the areas around them. Coupled with this, the moving blades create moving shadows. When viewed from a stationary position, when the turbine is between the viewer and the sun, the moving shadows appear as a flicker giving rise to the phenomenon of 'shadow flicker'. This is similar to the strobe effect often experienced when driving through scattered trees on a rural highway.

For a particular position, shadow flicker will only occur during periods when the sun's rays pass directly through the swept area of the turbine blades to the viewpoint. The extent of the shadow flicker is dependent on the time of day, geographical location, meteorological conditions of the site and local vegetation.

There are a number of factors influencing the effect and duration of shadow flicker including:

- ▶ position of the sun in relation to the turbine;
- ▶ time of year (season) and time of day;
- ▶ turbine height and rotor diameter;
- ▶ viewer's distance from turbine;
- ▶ topography of the area;
- ▶ vegetation cover;
- ▶ weather patterns, number of cloudy days per year; and
- ▶ airborne particles, haze

The effect of 'chopping the light' attenuates with distance and is not considered by modellers of shadow flicker to be noticed beyond 500 – 1,000 m from a turbine (Osten and Pahlke, 1998).

In NSW there are currently no legislated guidelines on which to assess shadow flicker generated by wind turbines. The Victorian Planning Guidelines limit the duration of shadow flicker to a maximum of 30 hours per year (SEAV, 2003). The Planning South Australia Planning Bulletin "Wind Farms, Draft for Consultation" (2002) suggests that shadow flicker is insignificant once a separation of 500 m between the turbine and house is exceeded.

This assessment has taken a conservative approach and assessed the shadow flicker out to 2 km as suggested in the draft NSW Wind Farm planning guidelines. This is despite shadow flicker not being generally noticeable beyond a distance of 1,000 m.

The shadow flicker assessment has been updated using the revised turbine layout with the findings summarised in the sections below.

8.4.2 Background

Shadow flicker is usually an amenity issue rather than a health risk. Given it is a daytime event; it does not interrupt sleep patterns. However, two issues have been raised as potential health concerns in relation to shadow flicker:

Flicker vertigo

Flicker vertigo is an imbalance in brain cell activity caused by exposure to low frequency flickering or flashing of a light or sunlight seen through a rotating propeller (Rash, 2004). It can result in nausea, dizziness, headache, panic, confusion and – in rare cases – loss of consciousness. Flicker vertigo is usually associated with a light flashing sequence, or flicker frequency, of between approximately 4 hertz (cycles per second) and 20 Hz (NASA, 2001; Rash, 2004).

Photosensitive Epilepsy

Flicker from turbines that interrupt or reflect sunlight at frequencies greater than 3 Hz poses a potential risk of inducing photosensitive seizures. At 3 hertz and below the cumulative risk of inducing a seizure should be 1.7 per 100,000 of the photosensitive population. The risk is maintained over considerable distances from the turbine. It is therefore important to keep rotation speeds to a minimum, and in the case of turbines with three blades ensure that the maximum speed of rotation does not exceed 60 rpm, which is well above the normal practice for wind farms. The layout of wind farms should ensure that shadows cast by one turbine upon another should not be readily visible to the general public or fall upon nearby homes (Harding et al., 2008).

In both cases, the cause of the health effect is a flashing of light with the flash frequency in the range of 3 – 30 hertz. Therefore, wind turbines would only provide a health risk of the shadow flicker created was within this range.

8.4.3 Assessment

A detailed analysis of the potential for shadow flicker & blade glint to affect dwellings has been carried out by Epuron. Modelling of the shadow flicker was conducted using specialist industry software, assessing the largest turbine (maximum tip height) proposed for the project to represent the worst case impact scenario. The maximum number of annual hours at each of the nearby houses where shadow flicker may be experienced was calculated using this model.

The number of annual hours of shadow flicker at a given location can be calculated using simple geometrical models incorporating data such as the sun path, the topographic variation and wind turbine details such as rotor diameter and hub height. In such models, the wind turbine rotor is modelled as a disc and assumed to be in the worst case (i.e. perpendicular) to sun-turbine vector. Furthermore, the sun is assumed to be a point light source.

Shadow flicker calculated in this manner overestimates the number of annual hours of shadow flicker experienced at a specified location due to several reasons.

- ▶ The occurrence of cloud cover has the potential to significantly reduce the number of hours of shadow flicker.
- ▶ The probability of wind turbines consistently yawing to the ‘worst case’ scenario where the wind turbine is facing into or away from the sun- wind turbine vector is less than 1 (i.e. less than 100% of the time).
- ▶ The amount of aerosols in the atmosphere has the ability to influence shadows cast due to the following reasons:
 - Firstly, the distance from a wind turbine that a shadow can be cast is dependent on the degree to which direct sunlight is diffused, which is in turn dependent on the amount of dispersants (humidity, smoke and other aerosols) in the path between the light source (sun) and the receiver.
 - Secondly, the quantity of aerosols in the air is known to vary with time and it has the potential to vary the air density, thereby affecting the refraction of light. This in turn affects the intensity of direct light to cause shadows.
- ▶ The modelling of the wind turbine blades as discs to determine shadow path overestimates the shadow flicker effect.
- ▶ The blades are of non-uniform width with the thickest viewable blade width (maximum chord) occurring closer to the hub and the thinnest being located at the tip of the blade. As outlined above, the direct sunlight is diffused resulting in a maximum distance from the wind turbine that a shadow can be cast. This maximum distance is dependent on the human threshold which variation in light intensity can be perceived. When the blade tip causes shadow, the diffusion of direct sunlight means that the light variation threshold occurs closer to the wind turbine than when a shadow is caused by the maximum chord. That is, the maximum shadow length cast by the blade tip is less than by the maximum chord.
- ▶ Modelling the sun as a point light source rather than a disc has an effect similar to that described above.
 - Firstly, situations arise where the light rays from different portions of the sun disc superimpose around a shadow resulting in light intensity variations less than human perception.
 - Secondly, when the sun is positioned directly behind the wind turbine hub, there is no variation in light intensity at the receiver location and therefore no shadow flicker. However, when the sun is modelled as a point source, shadow flicker still arises.
- ▶ The presence of vegetation shields incidences of shadow flicker.
- ▶ Periods where the wind turbine is not in operation due to low winds, high winds or operational and maintenance reasons.

Taking the above issues into account, the modelling of shadow flicker has been conducted using simple geometric analysis. The wind turbine has been modelled assuming all wind turbines are disc objects positioned in the worst case with respect to shadow flicker. The sun has been assumed to be a point light source.

To carry out the shadow flicker assessment, the Victorian Planning Guidelines and the South Australian Planning Bulletin discussed earlier were used to determine the inputs to the model. They were:

- ▶ a maximum duration of shadow flicker at any residence of 30 hours per year; and
- ▶ a conservative assessment distance of 1.06 km (twice the distance suggested to be affected by shadow flicker).

An assessment out to 2 km has also been conducted to show the absolute theoretical worst case scenario, despite this distance from the turbines to the receiver to be much further than the distance that shadow flicker can be detected.

Therefore, the modelling conducted here represents a very conservative scenario and is intended to overestimate the actual annual hours of shadow flicker experienced at a location.

8.4.4 Actual Conditions at Rye Park

When the actual conditions of the Rye Park site are taken into consideration, the number of hours of shadow flicker should be reduced. The major consideration in this respect is the weather patterns and particularly the number of cloudy days experienced that result in no shadow flicker.

Based on 45 years (1965 – 2010) of daily weather observations in Yass (Yass Linton Hostel, Bureau of Meteorology), the nearest source of data, the average number of cloudy days experienced is 109.0 days/year. The average number of clear days experienced is 92.2 days /year. These are based on observations at 9am and 3pm each day. Accordingly based on 109.0 days/year of cloud the number of shadow flicker hours should be reduced by 29.8%. Further reductions for vegetation screening should be considered and applied where appropriate on a case by case basis.

Accordingly based on 132.2 days/year of cloud the number of shadow flicker hours should be reduced by 36.2%. Further reductions for vegetation screening should be considered and applied where appropriate on a case by case basis.

8.4.5 Results

The shadow flicker modelling has calculated the number of annual hours at each of the nearby houses and the results are presented in Table 8-3. The second column represents the theoretical maximum hours of shadow flicker out to 1.06 km, as discussed above. This approach is based upon the assumption that the wind turbine is yawed to the worst case position of facing into or away from the sun. Using onsite wind rose measurements, the probability of occurrence of various wind directions can be incorporated in the assessment to increase the accuracy. The results are shown in the third column. Additionally a reduction of the theoretical maximum number of hours can be assumed based on the long term observation of cloudy days shown in the fourth column.

Table 8-3 Result of shadow flicker assessment out to 1.06 km

<i>Residence ID</i>	<i>Theoretical maximum shadow flicker (hours/year)</i>	<i>Reduced due to turbine orientation (hours/year)</i>	<i>Reduced due to cloud cover (hours/year)</i>
R16	32	21	15
R14	0	0	0
R2	26	20	14
R13	0	0	0
R11	0	0	0
R32	0	0	0
R34	0	0	0
R41	0	0	0
R46	87	70	49
R30	65	47	33
R33	0	0	0
R35	0	0	0

The results of Table 8-3 are shown on a map at the end of this section in Figure 8-6. The results show compliance with the Victorian Guidelines of 30 hours/year at all nearby residences except R30 (minor exceedance) and R46. Dwellings R30 and R46 are associated with the project. Dwelling R46 is not anticipated to receive the calculated level of shadow flicker due to screening. This is based on extensive vegetation on the west of the property as seen in Figure 8-4. This vegetation is situated between the dwelling both of the turbines within 1 km of the dwelling, shown in in Figure 8-5.



Figure 8-4 Aerial imagery of dwelling R46



Figure 8-5 Proposed turbines relative to dwelling R46

The shadow flicker modelling has then been recalculated for a distance up to 2 km from the turbines. The number of annual hours at each of the nearby houses and the results are presented in Table 8-4. The second column represents the theoretical maximum hours of shadow flicker out to 2 km, as discussed above. This approach is based upon the assumption that the wind turbine is yawed to the worst case position of facing into or away from

the sun. Using onsite wind rose measurements, the probability of occurrence of various wind directions can be incorporated in the assessment to increase the accuracy. The results are shown in the third column. Additionally a reduction of the theoretical maximum number of hours can be assumed based on the long term observation of cloudy days shown in the fourth column.

Table 8-4 Result of shadow flicker assessment out to 2 km

<i>Residence ID</i>	<i>Theoretical maximum shadow flicker (hours/year)</i>	<i>Reduced due to turbine orientation (hours/year)</i>	<i>Reduced due to cloud cover (hours/year)</i>
R16	54	38	27
R14	0	0	0
R2	51	39	27
R13 / R128	13	10	7
R11	0	0	0
R32	0	0	0
R34	8	6	4
R41	0	0	0
R46	88	69	48
R30	128	99	69
R33	0	0	0
R35	0	0	0
R25	44	36	25
R31	33	24	17
R44	11	9	6
R49	25	18	13
R51	25	17	12
R52	10	8	6
R59	13	10	7
R64	9	7	5
R42	3	3	2
R18	17	13	9
R19	30	22	15
R20	15	12	8
R22	8	6	4
R26	13	11	8
R29	5	4	3
R45	1	1	1
R47	12	7	5
R48	10	5.9	4
R50	18	13.3	9

<i>Residence ID</i>	<i>Theoretical maximum shadow flicker (hours/year)</i>	<i>Reduced due to turbine orientation (hours/year)</i>	<i>Reduced due to cloud cover (hours/year)</i>
R53	8	5.6	4
R56	4	3	2
R324	4	3	2

The results show compliance with the Victorian Guidelines of 30 hours/year at all nearby residences except for two associated dwellings R46 and R30.

8.4.6 Health effects from shadow flicker

Flicker frequency of rotating propellers, including wind farm rotors, is derived by multiplying the hub rotation frequency by the number of blades. Based on the rotation speed of the 3 bladed wind turbines proposed for the project, the maximum shadow flicker frequency would be 1 cycle per second (1 Hz), well outside the frequency range associated with flicker vertigo or photosensitive epilepsy.

The operational wind turbines are not anticipated to produce a flicker frequency high enough to pose a health risk. Comparable turbines have been rated 0.45 to 0.95 Hz, significantly below critical levels of 3-30 Hz for public health. The project is therefore unlikely to represent a health risk to local residents in relation to flicker vertigo or photosensitive epilepsy.

This sentiment is also reflected in a recent public statement by the National Health and Medical Research Council titled 'Wind Turbines and Health' which has stated that the evidence on shadow flicker does not support a health concern (NHMRC, 2010).

8.4.7 Blade Glint

Blade glint occurs when sunlight is reflected off turbine blades. The concern is that this may affect some motorists or cause annoyance at dwellings.

Turbine manufacturers have acknowledged the possibility of blade glint and use a low reflectivity gel finish to reduce any reflectivity. The turbines proposed for this project would be finished in a matte, non-reflective finish to ensure blade glint impacts do not occur.

8.4.8 Conclusion

The worst case predicted shadow flicker at each dwelling within 1.06km of the proposed wind turbines is shown in Table 8-3. Additionally an assessment has been made on the level of conservatism associated with the worst case results by reduction in shadow flicker due to turbine orientation based on wind direction occurrences measured on site and cloud cover. The adjusted results are shown in the table and indicate that only two associated residences exceed the accepted limit of 30 hours per year.

8.4.9 Mitigation Measures

- ▶ If shadow flicker is found to be a nuisance at a particular residence at a known location a physical screen can be placed between the location and the wind turbines. Additional trees or other vegetation can be used to accomplish this.
- ▶ Shadow flicker effects on motorists would be monitored following commissioning and any remedial measures to address concerns would be developed in consultation with the RMS and the Department of Planning.

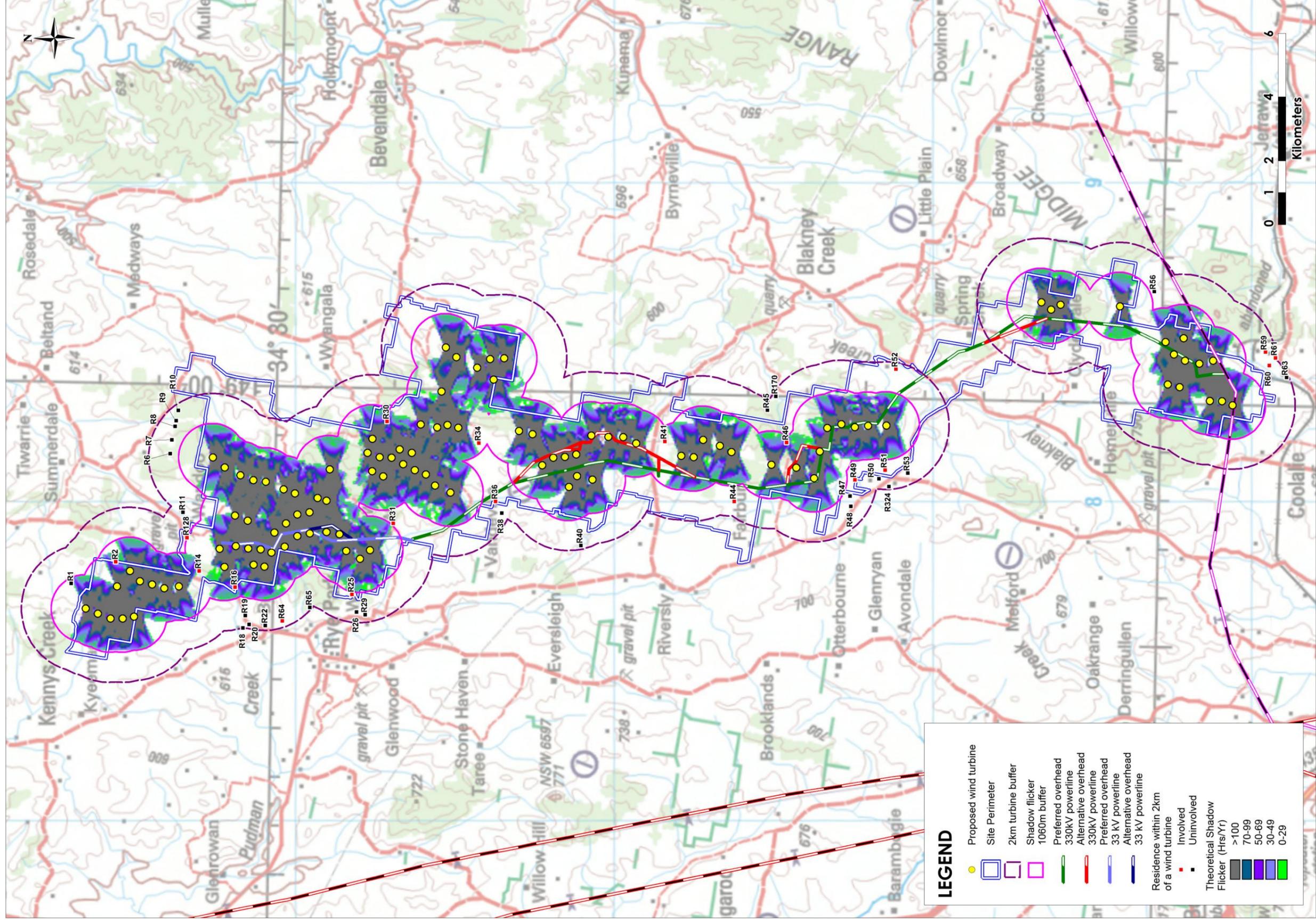


Figure 8-6 Areas potentially affected by shadow flicker

8.5 Fire and bush fire risks

The infrastructure for the project is predominately located in areas of pasture with patches of remnant Box Gum Woodlands also present. See the biodiversity information in Section 6.3 for further details. The majority of the site therefore presents a low fire risk since the fuel available in the cleared areas is generally low. In the areas where woodland exists, fire risk is greater. This fire risk profile within the site will be taken into account when preparing a Bushfire Management Plan for the site.

In an agricultural environment like that within which the Rye Park wind farm is proposed, a number of existing ignition sources exist. These include farm machinery and vehicles, hay storage, vehicles stopping in long grass on road verges, cigarette butts thrown from car windows and lightning strikes and provide a particular risk within the RFS defined fire season from 1st October to 31st March each year. Although the pasture that dominates the site is generally a low level of fuel source fire can spread quickly when dry and since the paddocks are relatively free from fire breaks. Fire fighting in some areas can be difficult due to topography and vegetation. The Rural Fire Service (RFS) is the primary resource available for bushfires but the NSW Fire brigade often provides support as required.

It can be seen in Figure 8-7 that a large part of the site is within a high risk fire area. It is therefore important that a Bushfire Management Plan be implemented prior to construction and in effect until after decommissioning.

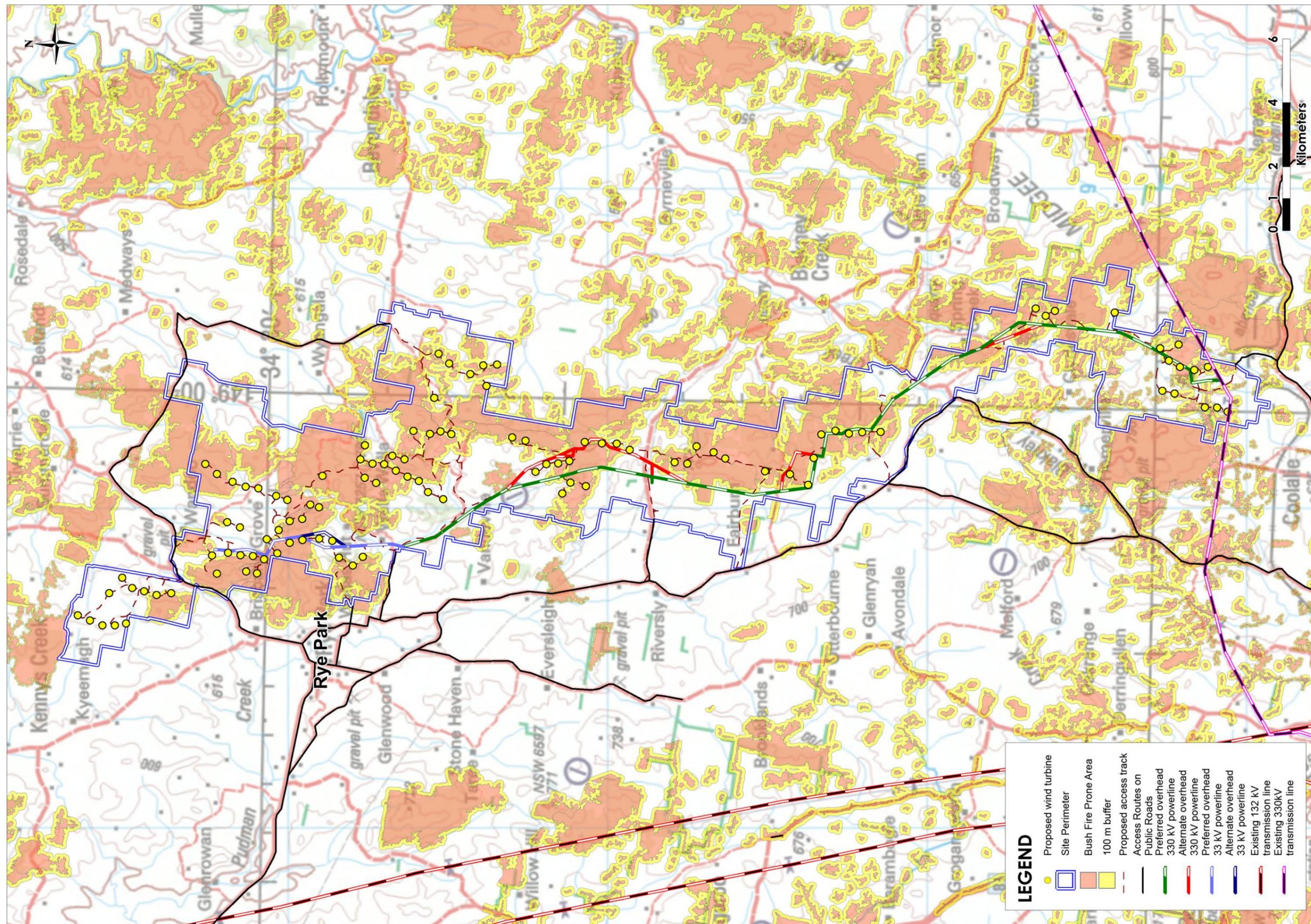


Figure 8-7 Bush fire prone areas near the Rye Park Wind Farm

8.5.1 Assessment of potential impacts

Construction and Decommissioning Activities

Flammable materials and ignition sources brought onto the site, such as machinery fuels, would increase the risk of fire during the construction period. Correct operation, handling and storage procedures would mitigate against the risk of ignition. Appropriate fire fighting equipment would need to be held on site when the fire danger is very high to extreme, and a minimum of one person on site would be trained in its use.

The RFS would need to be consulted in regard to the adequacy of bushfire prevention procedures to be implemented on site during construction, operation and decommissioning. These procedures would in particular cover hot-work procedures and response measures to control any incident.

Operational Activities

In addition to the pre-existing ignition sources, substations, powerlines, ancillary services and wind turbines which make up the wind farm do have potential to start and influence fires. This risk is largely driven by presence of electrical infrastructure and petrochemicals (such as lubricants). For the wind turbines themselves, the risk of fire can be associated with malfunctioning turbine bearings, inadequate crankcase lubrication, electrical distribution facilities, electrical shorting or arcing occurring in transmission and cable damage during rotation (AusWEA, 2001).

Modern wind turbines are equipped with dedicated monitoring systems that are capable of preventing overheating through turbine shutdown. Other monitoring systems for events like electrical faults are used and fires caused from turbines is currently uncommon.

Wind turbines could influence the flow of a bushfire in their immediate vicinity, however, the RFS says *“Wind farms are not expected to adversely affect fire behaviour in their vicinity. Local wind speeds and direction are already highly variable across landscapes affected by turbulence from ridge lines, tall trees and buildings”*.

Lightning conductors are installed in turbines to ground lightning strikes in order to minimise risk of damage to the turbines and risk of ignition of a wildfire. Relatively minor damage to turbines may occur from lightning strike. At the existing Crookwell I site, a direct strike resulted in damage to one of the turbine blades, which was repaired onsite. No wildfire resulted. The risk of turbine ignition is considered to be low, based on the low likelihood of electrical failure or over-heating and a range of factors mitigating the fire hazard. The RFS says that *“Turbine towers are not expected to start fires by attracting lightning”*.

Electrical power generated by the turbines will need to be transmitted across the site. Underground cabling will be used where possible, which reduces the risk of fire. Where overhead powerlines and transmission lines are required, additional risk of fire will exist. Appropriate specification, easement clearing of vegetation and a strict maintenance routine will minimise the risk of fire being ignited from overhead electrical cabling.

The transformers located in the substation facilities would contain transformer oil for the purpose of cooling and insulation. These facilities would be bunded with a capacity exceeding the volume of the transformer oil to contain the oil in the event of a major leak or fire and would be regularly inspected and maintained to ensure leaks do not present a fire hazard, and to ensure the bunded area is clear (including removing any rainwater). Transformer oil would be changed regularly at appropriate intervals by qualified staff to minimise the potential for fire caused by contaminated oil. The oil would be removed from the site and disposed of appropriately.

The substations would be surrounded by a gravel and concrete area free of vegetation to prevent the spread of fire from the substation and reduce the impact of bushfire on the structure. The substation areas would also be surrounded by a security fence as a safety precaution to prevent trespassers and stock ingress. An asset protection zone would be maintained around the control room and substation buildings, compliant with the RFS Planning for Bushfire Protection guidelines. Workplace health and safety protocols would be developed to minimise the risk of fire for workers during construction and during maintenance in the control room and amenities.

The site access tracks are also likely to increase the ability of fire fighting services to access the wind farm area of the purpose of fire fighting. This will sometimes include previously inaccessible areas. The roads can also act as fire break within cleared paddocks and slow progress of grass or other fires. Crane hard standing areas can also provide refuge areas for crews.

Rural Fire Service Position

The Rural Fire Service is a member of the Australian Fire and Emergency Service Authorities Council. In October 2014, they published a document called “Wind Farms and Bushfire Operations: Position”. This report presents the RFS position on a range of issues in regards to Bushfires in close proximity to wind farms. Below is the stated position. The RFS do not consider that wind farm adversely impact their ability to fight bushfire in close proximity to a wind farms:

- ▶ *“The location and height of monitoring towers should be noted during aerial firefighting operations”.*
- ▶ *“Wind farms can interfere with local and regional radio transmissions by physical obstruction and radio frequency electromagnetic radiation. Any interference can be minimised or eliminated through appropriate turbine siting at the planning stage”.*
- ▶ *“Wind farms are an infrastructure development that must be considered in the preparation of Incident Action Plans for the suppression of bushfires in their vicinity. These considerations are routine and wind farms are not expected to present elevated risks to operations compared to other electrical infrastructure”.*
- ▶ *“Aerial fire fighting operations will treat the turbine towers similar to other tall obstacles. Pilots and Air Operations Managers will assess these risks as part of routine procedures. Risks due to wake turbulence and the moving blades should also be considered. Wind turbines are not expected to pose unacceptable risks”.*
- ▶ *“Wind farms are not expected to adversely affect fire behaviour in their vicinity. Local wind speeds and direction are already highly variable across landscapes affected by turbulence from ridge lines, tall trees and buildings”.*
- ▶ *“Turbine towers are not expected to start fires by attracting lightning”.*
- ▶ *“Turbines can malfunction and start fires within the unit. Automatic shutdown and isolation procedures are installed within the system. Although such fires may start a grass fire within the wind farm, planning for access and fire breaks can reduce the likelihood of the fire leaving the property. This risk from such fires is less than that of many other activities expected in these rural environments”.*
- ▶ *“Wind farms may operate on days of Total Fire Ban subject to relevant national, state and territory legislation”.*
- ▶ *“Liaison with wind farm operators and energy industry representatives during and after bushfires should aim to ensure minimal disruption to generation capacity and rapid resumption of essential services to the community”.*

8.5.2 Mitigation

A number of mitigation measures are proposed to reduce the fire risk to acceptable levels:

- ▶ Provide the as built locations of each wind turbine, met mast and ancillary infrastructure to the Rural Fire Service. This should include potential helicopter landing areas, on site fire fighting facilities and access protocols.
- ▶ Ensure that all project components on the site are designed, constructed and operated to minimise ignition risks, provide for asset protection consistent with relevant RFS design guidelines (NSW RFS, 2006; NSW RFS, 2010) and provide for necessary emergency management including appropriate fire-fighting equipment and water supplies on site to respond to a bush fire.
- ▶ Regularly consult with the local RFS to ensure familiarity with the project, including the construction timetable and the final location of the entire infrastructure on the site. The Proponent will comply with

any reasonable requests of the local RFS to reduce the risk of bushfire and to enable fast access in emergencies.

- ▶ Prepare a Bushfire Management Plan as part of the Construction Environmental Management plan. The RFS and NSW Fire Brigade would be consulted in regards to its adequacy to manage bushfire risks during construction, operation and decommissioning. As a minimum the plan would establish hot-work procedures, asset protection zones, safety, communication, site access and response protocols in the event of a fire originating in the wind farm infrastructure. All flammable materials and ignition sources brought onto the site, such as hydrocarbons, would be handled and stored as per manufacturer's instructions
- ▶ During the construction phase, appropriate fire fighting equipment would be held on site and training would be provided as necessary in its use. Fire extinguishers would be provided in site vehicles, construction compounds, O&M facilities and within the substations.
- ▶ Transformers in the substations would be banded with a capacity exceeding the volume of the transformer oil to contain the oil in the event of a major leak or fire. The facilities would be regularly inspected and maintained to ensure leaks do not present a fire hazard, and to ensure the banded area is clear (including removing any rainwater).
- ▶ Shut down of turbine components would commence if the components reach critical temperatures or if directed by the RFS in the case of a nearby wildfire being declared. Remote alarming and maintenance procedures would also minimise the risk. Overhead transmission easements would be periodically inspected to monitor regrowth of encroaching vegetation.

8.5.3 Summary

The proposal is located generally within pastures that have low fire risk. Ignition sources already exist in the area and a wind farm could contribute to additional sources. Mitigation measures have been proposed to reduce these risks to an acceptable level. Additionally, the RFS consider that wind farms do not provide an unacceptable risk to their ability to effectively fight bushfires in the area.

8.6 Blade throw

Blade throw refers to the event in which ice or a turbine blade itself becomes separated from the nacelle into the surrounding environment. On the occasions where part of the blade has become separated from the tower, the most common causes are lightning strikes, storms, material fatigue or poor operation and maintenance practices. Wind turbine manufacturers have been implementing new design features to reduce the risk of these events occurring even further. Some of these advances include increasing lightning protection along the blades to reduce the damage from strikes and developing better control systems to monitor any decrease in structural integrity and implement an automatic shutdown. Furthermore, modern turbines have an automatic braking system when wind speeds exceed a set value. For the case of the Vestas V112 used in this environmental assessment, the cut-out speed for high winds is 25 m/s (90 km/h).

Ice throw occurs when the surrounding environment drops below freezing temperature and ice develops on the turbine blade. The ice is then dislodged when the turbine blade begins to rotate or the surrounding temperature increases. Rye Park and the surrounding regions have been known to regularly have sub-zero nights throughout winter and therefore this must be considered as a low possibility for the winter months.

While there is a possibility of these events occurring, the likelihood of a landowner being near a turbine during storms or freezing conditions is considered low; however, land owners will be advised to avoid turbines during these conditions.

8.7 Human health

Some members of the public, have raised concerns about the potential impacts of wind turbine noise on human health. These concerns appear to relate to emissions from either low frequency noise or infrasound which is the two areas generally raised regarding potential health impacts from wind farm noise. Both these potential noise related impacts are addressed in further detail in Section 6.2 of this Report.

Other areas of concerns for human health related impacts from wind farms include electromagnetic radiation, shadow flicker and blade glint produced by wind turbines. While a range of effects such as annoyance, anxiety, hearing loss, and interference with sleep, speech and learning have been reported anecdotally, there is no published scientific evidence to support adverse effects of wind turbines on human health. There have been a number of studies into the perceived health impacts to humans from wind farms over the last few years and an outline of the key points from some of these studies include:

National Health and Medical Research Council

The National Health and Medical Research Council (NHMRC) is Australia's leading body for supporting health and medical research. One of its key objectives is to provide independent health advice to the Australian Community, health professionals and government. As mentioned above, there are been some concerns raised about the possibility of wind farms impacting human health. In response the NHMRC have performed a number of reviews on the topic.

In February 2015, NHMRC released its most recent systematic review of the available scientific evidence related to a link between wind turbine operation and human health. It identified 2850 potentially relevant sources in a review of the literature (both peer reviewed and otherwise) and 506 public submissions which was exhaustive at that time. 11 of these passed the eligibility criteria to demonstrate true rigour in their analysis and were used as direct evidence-base to make an evaluation of wind turbines impact on human health. In all 11 of these cases evidence was likely to have biases due to various factors including poor sample selection, lack of masking, no objective verification of health effects, poor control groups and inability to determine if health effects were present in advance of wind turbines being installed.

The review concluded that:

- ▶ *"the systematic review indicated that there was no consistent evidence that noise from wind turbines, whether estimated in models or using distance as a proxy, is associated with self-reported human health effects".*
- ▶ *"there was no consistent association between adverse health effects and estimated noise from wind turbines".*
- ▶ *"the evidence considered does not support the conclusion that wind turbines have direct adverse effects on human health, as the criteria for causation have not been fulfilled"*

Other areas, including shadow flicker and EMR, impact from wind turbines were also found to have limited evidence to link them to reduced human health.

The NHMRC also undertook a similar review in 2010. The conclusions were similar to the most recent review and note that:

- ▶ *"Based on current evidence, it can be concluded that wind turbines do not pose a threat to health if planning guidelines are followed".*

The NHMRC public statement accompanying the 2010 study also concluded that: It is recommended that relevant authorities take a precautionary approach and continue to monitor research outcomes. Complying with standards relating to wind turbine design, manufacture, and site evaluation will minimise any potential impacts of wind turbines on surrounding areas.

Environmental Protection Authority of South Australia

In January 2013, the South Australian Environmental Protection Authority (EPA) released findings of a study into the level of infrasound within typical environments in South Australia, with a particular focus on comparing wind farm environments to urban and rural environments away from wind farms.

The study concluded that the level of infrasound at houses near the wind turbines assessed is no greater than that experienced in other urban and rural environments, and that the contribution of wind turbines to the measured infrasound levels is insignificant in comparison with the background level of infrasound in the environment.

World Health Organisation

The World Health Organisation (WHO) has developed guideline exposure values for various types of community noise emissions. These noise values are designed to avoid long term deterioration in physical or psychological functioning. The guideline of most relevance to the potential impacts of wind farm noise is that for sleep disturbance. The WHO considers that night-time noise levels at the outside façade of a dwelling should not exceed 45dBA with open windows. The noise assessment (refer Appendix B) using different wind turbine models indicates that residences at the project would experience night time noise levels that are unlikely to exceed the WHO recommended levels.

NSW Parliament Inquiry

In 2009 the NSW Parliament conducted an inquiry into rural wind farms, which included consideration of the potential health impacts of wind farms. The inquiry report (New South Wales Parliament Legislative Council General Purpose Standing Committee No. 5, 2009) noted that "...the health effects associated with wind farm noise appear to be the most common concern..." and observed that "...it was clear that some people are significantly affected by their experience of wind farms, both existing and proposed". However, the inquiry report concluded that "...many purported impacts have created little more than unfounded fear in local communities, for example vibroacoustic disease, wind turbine safety, shadow flicker and 'Wind Turbine Syndrome'" and that "...the level of concern for many impacts is not supported by evidence" with "...such impacts being promoted to support arguments against wind power in general, rather than being used to highlight fundamental problems with wind farms." Notwithstanding that current research has been unable to establish a direct relationship between wind farm noise emissions and health, the NHMRC review (citing Chapman, 2010), note that:

"It has been suggested that if people are worried about their health they may become anxious, causing stress related illnesses. These are genuine health effects arising from their worry, which arises from the wind turbine, even though the turbine may not objectively be a risk to health."

Conclusion

These, and multiple other studies from independent health organisations around the world, have come to similar conclusions that there is no evidence to suggest a direct causal link between wind turbines and human health deterioration.

8.8 Property Prices

There is a view within some parts of the community that wind farms can adversely affect surrounding property values. Other than wider market conditions, there are a number of contributory factors potentially influencing differences between perceived and actual property values surrounding wind farms. These include its agricultural productivity, personal perceptions, location, allowable land uses, proximity to town centres, lifestyle circumstances and amenity considerations.

In 2014, a report called "Relationship Between Wind Turbines and Residential Property Values in Massachusetts" by the Carol Atkinson-Palombo (University of Connecticut) and Ben Hoen (Lawrence Berkley National Laboratory) analysed more than 122,000 home sales between 1998 and 2012 that occurred near current or future location of 41 turbines in densely populated areas of Massachusetts. This is one of the largest data sets analysed on the subject. The conclusion states:

- ▶ *"The results of this study do not support the claim that wind turbines affect nearby home prices".*
- ▶ *"The analysis also showed no unique impact on the rate of home sales near wind farms".*

A graphic in Figure 8-8 from the report illustrates the impact of wind turbines compared to other types of developments.

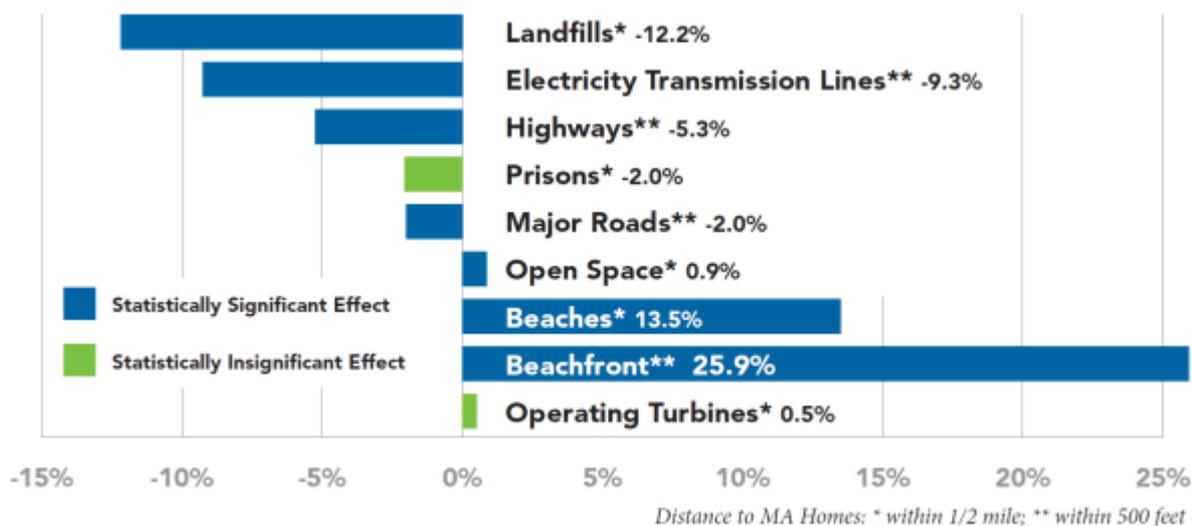


Figure 8-8 Effect of different infrastructure on property prices

In 2013, another study from the USA entitled “A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States” by Ben Hoen, Jason Brown, Thomas Jackson, Ryan Wisler, Mark Thayer and Peter Cappers was released. The analysis was based on over 50,000 home sales from 9 states within 10 miles of 67 current or existing wind facilities. Of these sales, 1,198 were with 1 mile of a turbine and 331 within half a mile of a turbine and data covered a period well before and after the construction of wind turbines. The report made the following conclusions:

- ▶ “Across all model specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post-announcement/pre-construction periods”.
- ▶ “Regardless of these potential maximum effects, the core results of our analysis consistently show no sizable statistically significant impact of wind turbines on nearby property values”.

In 2009, the NSW Valuer-General released the findings of a study into the potential impacts of wind farms on surrounding land values. The report, “Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia”, assessed eight wind farms located in NSW and Victoria and considered available market data mainly through the analysis of property sale transaction data. The findings of the study found that:

- ▶ Wind farms do not appear to have negatively affected surrounding property values in most cases. Forty (40) of the 45 sales investigated did not show any reductions in value. Five (5) properties were found to have lower than expected sale prices (based on a statistical analysis). While these small number of price reductions correlate with the construction of a wind farm further work is needed to confirm the extent to which these were due to the wind farm or if other factors may have been involved;
- ▶ Results also suggest that a property’s underlying land use may affect the property’s sensitivity to price impacts. No reductions in sale price were evident for rural properties or residential properties located in nearby townships with views of the wind farm;
- ▶ The results for rural residential properties (commonly known as 'lifestyle properties') were mixed and inconsistent; there were some possible reductions in sale prices identified in some locations alongside properties whose values appeared not to have been affected. Consequently, no firm conclusions can be drawn on lifestyle properties;
- ▶ Overall, the inconclusive nature of the results is consistent with other studies that have also considered the potential impact of wind farms on property values; and

- ▶ Further analysis (with additional data and expansion of the study area to other states) may yield more comprehensive results. Notwithstanding this, further studies are also likely to be limited by the availability of sales transaction data.

The Valuer-Generals study also considered previous studies which have analysed property sales transaction data relating to other local and international wind farms. The studies vary in size and methodology. While some studies have found slight negative impacts, the larger more comprehensive studies have generally found no statistical evidence of reductions in value associated with the development of a wind farm.

In 2007, a NSW Land and Environment Court decision found that property value impacts are not relevant considerations in the assessment of wind farms (or any other development). In *Taralga Landscape Guardians v. Minister for Planning and RES Southern Cross Pty Ltd*, in considering a request for compensation of nearby landowners in relation to a potential reduction in property value, Chief Justice Preston found that:

- ▶ *If the concept of blight and compensation, as pressed by the Guardians, were to be applied to this private property (a proposition which I reject) than any otherwise compliant private project which had some impact in lowering the amenity of another property (although not so great to warrant refusal on general planning grounds when tested against the criteria in S79C of the Act) would be exposed to such a claim.*
- ▶ *Creating such a right for compensation would strike at the basis of the conventional framework of land use planning but would also be contrary to the relevant objective of the Act, in S5(a)(ii) for "the promotion and co-ordination of the orderly and economic use and development of land.*

9 RESPONSE TO SUBMISSIONS

9.1 Exhibition of Environmental Assessment

The Environmental Assessment for the Rye Park Wind Farm was placed on public exhibition by the DPE from 2 May 2014 to 4 July 2014 at:

- Department of Planning and Environment: Information Centre, 23-33 Bridge St, Sydney and online.
- Boorowa Council: 6-8 Market Street, Boorowa.
- Boorowa Council Library: Corner Market and Pudman Streets, Boorowa.
- Yass Valley Council: 209 Comur Street, Yass.
- Yass Valley Council Library: Memorial Hall, Comur Street, Yass.
- Upper Lachlan Council: 123 Yass Street, Gunning.
- Upper Lachlan Council: 44 Spring Street, Crookwell.
- Nature Conservation Council: Level 2, 5 Wilson Street, Newtown.

Local residents were notified of the exhibition period through newspaper advertisements placed in the local papers by the Department of Planning and Environment. The proponent also sent a project newsletter to residents within 5 km of the project and those who had registered their interest in the project.

9.2 Submissions received

The Department of Planning and Environment received a total of 131 submissions - 12 were from government agencies and 119 were from members of the community. Of the 119 public submissions, 8 were in support of the project and 111 objected to the project. This Report provides considered responses to the issues raised in each of the submissions made.

The response to the public submissions has been addressed by listing each of the issues raised, rather than by repeating the response where the same issue has been raised in multiple submissions.

The response to the government agency submissions have been addressed individually to reflect the specific nature of the comments and queries raised by the particular government agencies.

The public submissions were received from various locations around New South Wales, Victoria and South Australia. Although the names and addresses were withheld for a number of submissions, the distance from the wind farm for each public submission which objected to the project was estimated in the following table.

Table 9-1 Location of public objectors

Distance from submitter address to nearest turbine	Proportion of objections to project
0 – 2 km	6%
2 – 5 km	50%
5 – 10 km	7%
> 10 km	37%

9.3 Response to public submissions

9.3.1 Strategic Justification

Issue	Response
Submissions 101691, 101697, 101737, 101725, 101571, 101239, 104519, 104501, 104060	
<p>There is no information given in the EA for the greenhouse gas emissions that will be made during the creation of the materials for the turbines and their associated machines, as well as the greenhouse gas emissions created during construction by the many vehicles that will be travelling the long distances to the site.</p> <p>There is no mention of the oxygen depletion caused by the removal of forest, plants and grasses along the ridgelines for both access roads and turbine sites.</p>	<p>As with any form of electricity generation, there is energy consumed in the creation of the materials and construction of the wind farm. This energy consumed is insignificant compared to the energy generated by the wind farm over its operational life. Several studies have looked at this question over the years and have concluded that wind energy has one of the shortest energy payback times of any energy technology. A wind power plant typically takes only a few (3 to 8 months depending on the average wind speed at its site) to “pay back” the energy consumed for its fabrication, installation, operation, and decommissioning. Carbon dioxide emissions are similarly “paid back” quickly with a significant net benefit over the life of the project.</p>
Submissions 101691, 101697, 101737, 101743, 100537, 101725, 104062, 104519, 104501, 100549, 101117, 101383, 104060, 104189	
<p>If the wind farm was situated closer to Sydney, Wollongong, Newcastle, or Canberra, there would be less need for infrastructural change, which would be a cost saving. If the turbines pose no threat to health and are not noisy and are visually appealing then there should be no reason why sites closer to freeways and cities could not be sought, rather than degrading a quiet, out of sight valley.</p>	<p>There are a number of considerations that are balanced when identifying a potential wind farm site. These include available wind resource, potential minimal impact on biodiversity and heritage etc., must be outside national parks, have relative closeness to electrical and other infrastructure, land owners that wish to host the project, ability to meet all relevant guidelines (including the SA EPA noise guidelines which are some of the most stringent in the world), limited impact on air safety and the other key impacts as assessed within this Report.</p> <p>The upland areas included within the site of the project have a balance of these requirements and is a suitable location for a wind farm.</p>
Submissions 104068, 104547, 101239, 100485, 104052, 101117, 101467, 104497	
<p>Wind turbines are not economic without government subsidies, are inefficient and require back up from coal and gas fired plant to be effective.</p>	<p>Electricity generated by wind turbines is currently the cheapest form of renewable energy. In many places around the world it is the cheapest form of new build electricity, including cheaper than gas or coal. The RET encourages renewable energy investment which assists in the required transition to a cleaner electricity sector.</p>
<p>104543. How long does it take for any savings from the manufacture and construction of these so called “green generators” to break even?</p>	<p>As stated above, energy payback is typically 3 – 8 months depending on the wind resource available. Wind Farms are often called green generators because they burn no fossil fuel and have no emissions.</p>
<p>101705. The proposal will contribute to the rapid escalation of consumer and business electricity prices that has occurred in NSW in the last 7 years, with Sydney consumer electricity prices exploding by 121% in that period.</p> <p>In addition to that, using outdated AEMO forecasts, the EA purports to show the project is needed because of near term NSW requirements for additional electricity</p>	<p>The generation of electricity accounts for about 19% of a typical consumer electricity bill in NSW (AEMO 2014). The Renewable Energy Target (RET) accounts for only 3% of a typical consumer electricity bill. The majority of the costs (52%) are network (poles & wires) which has also been the main driver for increased electricity prices in recent years.</p> <p>The Renewable Energy Target is the main driver for new build renewable energy generation and numerous new projects will be needed to meet the recently updated target of 33,000 GWh by 2020 so the justification for new wind farms remains. We have sufficient generating capacity to meet the load requirements but using the fossil fuel generators means we would go well</p>

Issue	Response
generation capacity.	over our emissions reduction target.
<p>101705. The various deficiencies in the EA, including;</p> <ul style="list-style-type: none"> • grossly misleading claims of economic benefit to the state; • a total failure to consider and evaluate alternative locations, • a fundamental failure in the consultation process including apparent departmental complicity in breaching the Wind Farm Guideline principles for selecting community representatives on the Community Consultative Committee without influence by the developer; • total misstatement of the health risks created by wind farms for some residents; • an approach to noise evaluation that has historically, repeatedly proved to make false Predictions; and, • a blatantly deficient assessment of increased bushfire hazard. 	<ul style="list-style-type: none"> • Please refer to updated assessment of economic benefits in section 4.5 supported by an independent economic impact assessment in Appendix K. • Please refer to section 3.2 of this report which describes the process used in selecting, reviewing and revising the location of the wind farm infrastructure • Please refer to section 7 of this report and Appendix J for details of additional community consultation carried out. • Please refer to section 8.7 of this report for updated assessment of potential health risks from wind turbines. The National Health and Medical Research Council and all State Government Health Departments that have investigated claims of health risks have found no evidence of harm from wind farms. • The noise assessments included in the EA and this report were prepared by independent experts in accordance with the DGRs. The predictions are made following the required process. • Please refer to section 8.5 of this report for an updated assessment of potential fire and bush fire risks imposed by the wind farm. Wind farms work with local firefighters to assist with access and fire management on the land on which the wind farm sits.
Submissions 104062, 101610	
<p>Why should those in the adjoining NSW country areas pay the price for this project? Why should our valuable grazing land, rare natural environment and quality of life suffer so that Canberran's can feel good when they turn on their air conditioners and heaters?</p>	<p>Major developments have occurred across Australia and in NSW for many years. These include road, rail, mining and other infrastructure that make our current lifestyles possible no matter where people live. Our standard of living has never been higher. Wind Farms are a more sustainable way to maintain the lives of all Australians in a manner that coexists with existing farms since wind farms use ~2% of the involved land on average. The level of impact of the proposed Rye Park Wind Farm to the natural environment is limited when compared to other major projects, and the biodiversity impacts will be fully offset in perpetuity. Wind farms are far less disruptive to grazing land and natural environments than other electricity sources such as coal fired generation and the coal mines which support it which currently powers all our lifestyles.</p>
<p>104519. How can Eyrone state greenhouse gas savings "will" be achieved when the Office of Environment and Heritage (OEH) states "As part of the Renewable Energy Precincts initiative the NSW Government has developed the NSW wind farm greenhouse gas savings tool allowing community and industry to easily calculate the "projected" greenhouse gas savings from new wind farms in different Precincts across NSW.</p>	<p>The NSW greenhouse gas savings tool is a standardised mechanism which is widely used to estimate the savings in greenhouse gas emissions that would result from the displacement of fossil fuel fired electricity generation by renewable energy generation. If the wind farm proceeds the GHG savings will be achieved.</p>
Submissions 101277, 104193, 104189	
<p>The double-standards of the ACT Government with its reverse auction for wind energy, while no wind farms are planned for the ACT, and how this weights the planning process in favour of the wind</p>	<p>This project is proposed within NSW and the Department and Planning and Environment in NSW is the consent authority. The reverse auction in the ACT has no impact on the planning process for the Rye Park Wind Farm. As stated above, the location of the project has been made by balancing wind resource available and other characteristics of the location and potential impacts. The</p>

Issue	Response
farm companies.	electricity system is a grid with generation from a number of locations serving the needs of homes and businesses connected all across the National Electricity Market network. Yass, Goulburn, the ACT, all get their power from the electricity grid which may be powered by sources which are not within their immediate area or region.
Submissions 104497, 101596	
There are alternate renewable energy options that don't take up as much land or scar our landscape such as solar panel farms, updating existing hydro, bio sources, self-sufficient households.	Many renewable energy technologies are available and it is highly likely that a mix of these technologies will be required to meet the requirements of the Renewable Energy Target. A resilient electricity network requires a diverse generation mix. Some of these other sources, such as hydro power, can have a significant impact on the environment, but they all have their place in the energy mix.
104060. The application say on page 16 that according to a document called 'NSW wind farm greenhouse gas savings tool' the Rye Park Wind Farm will reduce greenhouse gas emissions by around 1,153,000 tonnes CO2e per annum equivalent to taking 314,000 cars off our roads. This is an interesting value. There is also ambiguity in this value. It inadvertently avoids raising that point that in a real world the wind is not sufficient to generate electricity in excess of 50% of the time. It also omits the volume of electricity taken from the grid to enable operation of each wind turbine.	The NSW greenhouse gas savings tool is a standardised mechanism which is widely used to estimate the savings in greenhouse gas emissions that would result from the displacement of fossil fuel fired electricity generation by renewable energy generation. It includes a capacity factor in its calculation which acknowledges the intermittency of the wind.

9.3.2 Landscape and Visual

The landscape and visual impact issues have been addressed in section 6.1 of this report and supported by a specialist report Revised Landscape and Visual Impact Assessment contained in Appendix A. The assessment concluded that the Rye Park Wind Farm would have an overall low visual impact on the majority of non-associated residential and public view locations.

Issue	Response
Submissions 101691, 101697, 101523, 100948, 100366, 104066, 101660, 99000, 104543, 104163, 100434, 98430, 101571, 104064, 101638, 101642, 104519, 104060, 104499, 104199	
The proposed turbines will have a significant visual impact from my property and they will dominate the skyline and landscape.	The wind farm will have a visual impact on some residences that are located close to the proposed wind turbines. The Revised LVIA found that there are two non-associated residences within the 3 km viewshed that will have a high visual impact.
100278. Non-resident with property near Rye Park and understands there are turbines planned within 1.5km to 1.8km of property. Concerned there are 4 turbines that are too close to Rye Park village and houses to the east which will impact visual amenity and rural character.	The visual impact to residences in the Rye Park township has been assessed as Moderate to Low. The Proponent recognises that wind farms have a visual impact on the surrounding area due to their size and often prominent location on ridge tops. The Proponent also recognises that visual screening will not always be an effective measure to mitigate visual impacts however have committed to offer visual screening for dwellings located with 4 km of a wind turbine location where this will be effective.
Submissions 101598, 101725, 101757, 101624, 100582, 101117, 105102, 101596, 104060, 104495, 104199	

Issue	Response
<p>The Epuron provided photomontages are grossly inadequate and misleading in the perspective it provides. The images provided are not a realistic representation of the size of the future wind turbines and markedly minimises the visual impact the turbines will have on a residents outlook. No amount of screening will improve our outlook once the wind farm is constructed.</p>	<p>The photomontages have been prepared in accordance with best industry practice. Refer to section 11 in Appendix A for the methodology used in preparing the photomontages.</p>
Submissions 101598, 101757	
<p>Epuron has not made any consideration for smaller lifestyle properties such as ours which are surrounded by larger properties resulting in a more open outlook and consequent higher visual impact.</p>	<p>The visual impact assessment takes into account landscape values. The LVIA (Appendix A) considered a zone of visual influence of 10 km and assessed the visual impact on residences within 3 km of a wind turbine location.</p>
<p>101743 Epuron has been asked to for a photomontage to be taken from my property which will occur on Monday 7th July and will further respond once it is made available. The proposed turbines will have a significant visual impact from my property, dominating the skyline and landscape from all areas except the front paddock on the Western boundary.</p>	<p>A photomontage has been provided to the landowners of this residence (R50). The visual impact has been assessed as high. Elevated views extend toward wind turbines on ridgeline and low hills within central portion of the project area.</p>
Submissions 101689, 99199, 104543, 104199	
<p>The visual disturbance and landscape changes brought about by the proposed wind farm, due to the close proximity of my property I will be affected with shadow flicker and blade glint.</p>	<p>The updated shadow flicker assessment shows that although there may be some shadow flicker at certain times for some residences very close to the turbines, the shadow flicker will be within the limit of 30 hours/year for non-associated residences.</p>
Submissions 104545, 101596	
<p>We have not been offered montages, the outlook from the rear of our property is spectacular and we would dearly need to know if our rear boundary is affected by even the sighted capacity of these turbines. Maps are not clear enough to get a true indication of turbine sites.</p>	<p>Photomontages were offered to owners of all residences that are located within 2 km of a proposed wind turbine. Additional photomontages were also prepared in other instances where landowners specifically requested these. There are more than sufficient photomontages from viewpoints around the wind farm site as shown in the LVIA in Appendix 2. Although details were not provided in the submission it appears that these properties are further than 10 km from a wind turbine location.</p>
<p>104199. The visual pollution which these towers will exert on the local environment will be CATISTROPHIC, because of their closeness to the residential location of both communities at Rye Park and Blakney Creek.</p>	<p>The visual impact from this residence (R111 located 2.3 km from the nearest turbine) was assessed as moderate – low. Views towards wind turbines within the central and southern portion of the wind farm site will be partially screened by existing tree planting surrounding the dwelling.</p>

9.3.3 Noise

Operational noise issues have been addressed in section 6.2 of this report and supported by a specialist updated Environmental Noise Assessment report in Appendix B. The results of the assessment demonstrated compliance of the proposed turbine layout to the nominated criteria (Wind Farms Environmental Noise Guidelines, South Australian Environmental Protection Agency, 2003 (SA EPA Guidelines)).

Issue	Response
Submissions 101691, 101697, 101725, 104543, 101624, 100582, 101438, 101596, 104060, 104499	
The noise guidelines used in wind farm development do not require measurement of infrasound or for measuring noise of any type from inside a house, which I believe should be mandatory and maximum allowable levels determined.	The DGRs for the project required the use of the South Australian Guidelines from 2003 and the Environmental Noise Assessment carried out adheres to this standard. The full Environmental Noise Assessment is included in Appendix B and infrasound is discussed. It concludes that infrasound produced by modern turbines is well below the threshold of hearing. Additionally, measurements at modern turbines indicate that the levels of infrasound produced are no higher than and are of a similar character to levels that already exist where people commonly live, work and sleep, caused by air conditioners, vehicular movements, industrial processes, ventilation etc.
Submissions 101737, 101598, 101725, 101757, 101624, 101715, 101571, 104519, 104501, 101173, 105102, 101596, 104060, 104499	
The reality is that modelling by the developer cannot be proved until the wind farm is operational, by which time it becomes a costly exercise to either turn off or remove the offending turbines. In rural areas background noise at night is often below 20dBA.	<p>The South Australian Wind Farm Guidelines required for use in assessing potential noise impact in NSW have been specifically created for use at wind farms. The process has been developed over a number of years and takes into account the particular circumstances of wind farms and their surroundings.</p> <p>As Sonus have noted in their Environmental Noise Assessment (Appendix B), background noise and noise criteria have been defined using the required guidelines and predictions have been undertaken using a number of conservative assumptions showing full compliance.</p> <p>The proponent will be legally required to ensure the project complies with specified noise limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project.</p>
Submissions 101743, 104543, 104163, 98430, 104064, 101239, 100485, 101117	
I am concerned about the noise that the turbines will create despite assurances from Epuron that they are quiet. It is not possible to know the likely carry of noise across the valley until the turbines are in place, by which time it will be too late. But being close to the proposed turbines, I anticipate some disturbance due to the placement of bedrooms and living areas on the same side of the house, especially during the evenings when the countryside is naturally quieter.	<p>The noise models used in the Environmental noise assessment by Sonus (Appendix B) specifies CONCAWE as the noise propagation model used in the operational turbine predictions. This model is approved under the South Australian Guidelines from 2003 and is a conservative model. For example, it includes geometrical spreading, topography, ground absorption, air absorption and weather conditions. This takes into account such issues as noise carry over valleys etc.</p> <p>All dwellings are predicted to satisfy the derived criteria (or noise threshold set) at the exterior of the dwelling and any walls etc would be expected to further reduce the internal noise levels.</p>
Submissions 101757, 101596, 104199	
How are we to have quiet enjoyment of our home if the allowable background noise measurement exceeds requirements and	As stated in the Noise Assessment in Appendix B, all dwellings are predicted to satisfy the derived noise criteria. These sound levels have been predicted based on the actual recorded background noise levels at residences around

Issue	Response
<p>what actions will the proponent take to mitigate our degraded lifestyle when this occurs.</p>	<p>the wind farm site and are in accordance with the prescribed noise guidelines.</p> <p>The proponent will be legally required to ensure the project complies with specified noise limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project. It should be noted that the Noise Assessment in Appendix B predicts that no residence will exceed that allowable criteria. Should an exceedance be proved, mitigation could take a number of forms and include using lower turbine sound modes.</p>
<p>Submissions 101689, 99199, 99197</p>	
<p>According to your noise assessment prepared by SLR Consulting my property will be affected by noise pollution levels up to 35dBA. Concerned for impacts to quality of life and pollution created by the wind farm.</p>	<p>See the updated report by Sonus in Appendix B. The South Australian Noise Guidelines specify the noise criteria as 35dB(A) or background noise + 5dB(A), whichever is greater. Although it is understood the property currently has no dwelling, should one be built, at 35dB(A) this would fall within the noise guideline criteria.</p>
<p>Submissions 101691, 101697, 101737, 101598, 101743, 101725, 101664, 101624, 101571, 104519, 104501, 101596, 104060</p>	
<p>During construction it is anticipated that blasting will occur and the impact was assessed and found to be acceptable. Blasting may trigger an earthquake. I question how any blasting in a previously quiet rural setting can be acceptable.</p>	<p>Construction noise has been assessed based on the Interim Construction Noise (ICN) Guideline. This specifies noise limits allowable during construction. This conservative assessment (assumes all noise sources occur simultaneously) concludes that some houses 900 – 2,400 m from turbine and access tracks could be ‘noise effected’. Mitigation measures are suggested including scheduling and offsetting of noise sources, sensitive location of fixed noise sources (e.g. rock crushing etc.), enclose generators and compressors, use quieter alternatives where possible, site management, restrict noisier construction tasks to within daytime construction hours, management of vehicle movements and types in conjunction with community consultation.</p>
<p>Submissions 101691, 101697, 101737, 101598, 101743, 104519</p>	
<p>I also anticipate that noise of the turbines will be more apparent at night and this is not acceptable as the main bedroom of my home is on the side closest to the turbines.</p> <p>The allowable background noise measurement is too high at night and in rural areas background noise is often below 20dBA.</p>	<p>The noise generated by a wind turbine is proportional to the wind speed present at that turbine. Typically, when wind speeds are low (and background noise is correspondingly low) turbine noise is also low. The reverse is also true where the higher wind speeds contribute to higher background noise to mask the higher turbine sound. The noise criteria at each house have been derived based on the South Australian Noise Guidelines and by a correlation between the wind speed at turbine locations and actual recorded background noise at residences. This takes account of operational noise of the turbines over all wind speeds and the corresponding background noise at dwellings, as well as variations that may exist over different periods of the day and during any periods of low background noise (which tend to correspond to low turbine noise due to low wind speeds).</p>
<p>Submissions 101691, 101697, 101743, 100948</p>	
<p>Given the proximity of my house to the closest (8) turbines, Epuron cannot assure me that I won't be impacted by their noise as they have not yet decided on turbine size or design.</p>	<p>A , Vestas V112 3.0MW turbine model has been used for the purpose of the Environmental Noise assessment and this is considered to be a conservative approach by Sonus. The project will be legally required to comply with specified noise limits contained in the conditions of consent regardless of the turbine model ultimately selected.</p>
<p>Submissions 101737, 101598</p>	
<p>Have cumulative effects from nearby proposed wind farms such as Rugby and</p>	<p>According to the NSW Government's Major Projects Register, the Rugby Wind Farm proposal has been withdrawn.</p>

Issue	Response
Bango been taken into consideration.	A cumulative noise impact assessment has been included in Appendix B and concluded that the environmental noise assessment for the Rye Park Wind Farm will not be modified by the noise from the Bango Wind Farm.
101660. The EA says that construction noise will only be 40/45 dB. Night work will be 35 dBAa. That cannot be true.	<p>An assessment of construction noise has been conducted in Sonus's Environmental Noise Assessment (Appendix B). It is based on the ICN Guideline which specifies an upper limit of 75dB(A). 40dB(A) is the target limit. Predicted noise from construction activities indicate that some houses between 900 and 2400m from turbines may be 'noise effected'. These impacts are assumed to be worst case with all construction activities happening simultaneously and within construction hours.</p> <p>The Environmental Noise Assessment indicates a number of mitigation strategies including scheduling and offsetting of noise sources, sensitive location of fixed noise sources (e.g. rock crushing etc.), enclose generators and compressors, use quieter alternatives where possible, restrict noisier construction tasks to within daytime construction hours, site management, management of vehicle movements and types in conjunction with community consultation.</p> <p>Construction does create noise and the wind farm construction will abide by the required construction noise guidelines.</p>
101731. Under the current SA guidelines, disturbance and negative impacts are allowed to occur at a level which is unacceptable to residents. There is no consideration in the SA guidelines (and therefore NSW guidelines) for ILFN; quantifying the impacts on residents; noise monitoring inside dwellings; separating night from day measurements and the overuse of averaging in the analysis; all of which are known concerns in other jurisdictions.	<p>Compliance with the SA noise guidelines is required by the DGRs issued for the project.</p> <p>Sonus has provided information in the Environmental Noise Assessment (Appendix B) in relation to:</p> <ul style="list-style-type: none"> ▶ infrasound and low frequency noise. It concludes that infrasound produced by modern turbines is well below the threshold of hearing. Additionally, measurements at modern turbines indicate that the levels of infrasound produced are no higher than and of a similar character to levels that already exist where people commonly live, work and sleep and caused by air conditioners, vehicular movements, industrial processes, ventilation etc. ▶ quantifying the noise levels at dwellings surrounding the project and concluded that no dwelling exceeds the derived criteria (the noise threshold permitted)
Submissions 101571, 104199	
We have no doubt we will hear the turbines, and there will also be noise from powerlines and the 3 collection sub stations and are asking for reassurance that the project will meet the legislative requirements and we will not have our peace and quiet impacted.	The proponent will be legally required to ensure the project complies with specified noise limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project. As presented by Sonus in the Noise Assessment (Appendix B), all dwellings satisfy the criteria for operational turbines and substations.
104495. In the event of excessive noise complaints being received, the current authority (Local Council) is not equipped nor resourced to manage such complaints. The World Health Organisation (WHO) lists sleep deprivation as a major illness. It is the excessive Noise pollution from the proposed industrial development that may cause this deprivation.	<p>The proponent will be legally required to ensure the project complies with specified noise limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project. Compliance with the SSD consent will be regulated and enforced by the DPE. Compliance with the environment protection licence will be regulated and enforced by the EPA.</p> <p>The conditions of the SSD consent will also contain specific requirements relating to noise complaints.</p>

Issue	Response
The proponents confirmed (24 June 2014) that in the event of a noise complaint their process is to apply monitors over a three month period to assess the validity of the complaint. This is a major issue as this could result in the residents being required to accept the Noise pollution for a further period of (minimum) three months.	

9.3.4 Biodiversity

Issue	Response
Submissions 101691, 101697	
<p>I have found frogs in our creek that are yet to be identified and am concerned that the development of this wind farm will have a detrimental impact on their habitat.</p> <p>Construction of the turbines will create runoff that contains soil and seed from the hosts land. The wind farm will impact on sensitive areas that are host to the Superb Parrot, Wedge-Tail Eagle, Pygmy Perch, Yass Daisy to name only four significant fauna and flora of the area.</p> <p>Construction and land clearing will negatively impact on all birdlife, along with the four threatened flora species and the three species of threatened microbats.</p>	<p>The Yellow-spotted Bell Frog was identified as occurring within close proximity to the project site but impacts to this species are considered to be manageable.</p> <p>A CEMP including an Erosion and Sediment Control Plan will be developed to ensure all issues with the potential to occur have management protocols in place prior to the commencement of any construction.</p> <p>The Biodiversity Assessment Addendum (refer Appendix C) assessed the impacts on fauna and floras species including potential impacts on the Superb Parrot, Wedge-Tail Eagle, Pygmy Perch, Yass Daisy and microbats.</p> <p>Major projects must identify, avoid, minimize, mitigate and offset impacts and this project will follow those requirements.</p>
Submissions 101395, 104495, 104199	
<p>The environmental impact study by NGH Environment Pty Ltd done for Epuron of the proposed wind turbine area is disputable. It is in contradiction to publications by National Parks and Wildlife “The Native Vegetation of Boorowa Shire Sept 2002 and “State of the Environment report 2004”. Which outline thoroughly the extensive species in the region their status and the extreme importance of maintaining remnant woodlands and road verges. I bring into question the validity of work done by NGH and claim Epuron has not conducted a thorough and extensive environmental impact study in the area and of the extended consequences of the destruction of the ecosystem caused by extensive clearing of land for turbines and access roads.</p>	<p>The biodiversity assessments for the project have been carried out in accordance with the requirements set out in the DGRs. Over the extensive period of the project assessment the Proponent and ngh Environment have consulted extensively with OEH and have expanded the extent of the assessment and methodologies employed to accommodate the additional requirements and feedback provided by OEH.</p>
Submissions 100511, 100300, 100948, 104068, 101624, 104163, 101399, 100434, 100584, 101628, 104555, 101662, 104064, 104547, 101239, 101638, 101642, 100485, 104062, 104052, 101397, 101117, 101383, 101465, 101467, 105102	
<p>Concern for inadequate information in the EA for species and their habitat including the Southern Pygmy Perch, Superb Parrot, Swift Parrot, Wedge Tailed Eagle, Scarlet Robin, Eastern Bent Wing Bat and Box Gum Woodland.</p>	<p>The biodiversity assessments have been carried out in accordance with the DGRs issued by DPE and in accordance with current best practice. The assessments include consideration of a number of fauna species and their habitat including the Southern Pygmy Perch, Superb Parrot, Swift Parrot, Wedge Tailed Eagle, Scarlet</p>

Issue	Response
	Robin, Eastern Bent Wing Bat and Box Gum Woodland. See Appendix C for more details.
Submissions 101737, 101598, 104545, 101725, 101757, 101571, 104501, 101596, 104060	
The application identified eleven vegetation types, four threatened flora species and one EEC were identified with potential for impact, nine species of threatened birds and three species of threatened microbats were recorded during the surveys, along with the 99 different species of bird identified. Isn't this significant enough to warrant ceasing all development of the project.	The biodiversity assessment concluded that significant impacts to threatened species and endangered ecological communities are considered unlikely. Mitigation measures have been recommended including the provision of biodiversity offsets where residual impacts can't be avoided.
101743. Construction of the turbines will lead to runoff containing soil and seed from the hosts land. This may make its way into our creek and decrease the flow of the creek, due to increased sediment as well as potentially introducing weeds downstream. Currently there are very few weeds on my property, which was one of its attractions for purchase to raise our cattle.	An Environment Management Strategy including an Erosion and Sediment Control Plan will be developed to ensure all issues with the potential to occur have management protocols in place prior to the commencement of any construction.
100948. An independent environmental assessment of effects on threatened, endangered and migratory birds must be conducted for this development as required under Commonwealth legislation.	The biodiversity assessment included an assessment on threatened and endangered migratory birds. The project has also been referred under, and is being assessed in accordance with, the Commonwealth EPBC Act.
100948. The EA states that the endangered Rosenberg's goanna was not recorded when environmental surveys were conducted however there is an established local population of these goannas in the Muntoonen Range woodland which is directly threatened by the development.	The project will not have any impact on goannas with the Muntoonen Nature Reserve which is located well outside the project site.
101475. Land clearing for the wind turbines will result in weed disturbance, Scotch thistles and blackberries are the only noxious weeds noted in the EA (page 187). It fails to identify serrated tussock, St Johns Wort, and Paddison's Curse all of which are declared in NSW under the Noxious Weeds Act 1993 and are rife on some of the proposed host's properties.	Serrated Tussock and St John's Wort were identified during the additional site surveys and the Biodiversity Addendum (Appendix C) has been updated to include this information. Patterson's Curse is listed as Noxious in NSW but not within the Booroowa local control area. The Environment Management Strategy will include a Weed Management Plan to appropriately manage the initial earthworks and clearing activities to prevent the spread of weeds across the site.
101725. The DA for the Rugby Wind Farm has been submitted to your department, and the company doing the Koala Spot assessment found Koala, which states on Page 60 of the BL & A survey that koala 'occurs in the area'. Page 150, Annexe D – impact assessment states that koala was found on the southern side of the Rugby Rd. This would place the Koala on the northern end of the Rye Park Wind Farm development. This is an extremely significant finding. I have heard stories for of there being koala in the area and this has to be investigated further. This would be an isolated colony that would be genetically significant in the saving of koala Australia wide.	Potential impact to Koalas was assessed as part of the original biodiversity assessment and the potential for impact to Koalas is considered to be low as good condition woodland areas have been largely avoided. The planning application for the adjacent Rugby Wind Farm has been withdrawn.
100584. I would have thought that a thorough EA would have included at least, results from a 12 month survey of all birds and animals in the area as a proposal like this	The requirements for the biodiversity assessment including the relevant guidelines for assessing the potential impact on threatened and migratory species were set out in the DGRs.

Issue	Response
<p>one will have a massive impact on all wildlife in the area, some positive perhaps, but more being detrimental.</p> <p>My question is, how can a conclusive and precise environmental study be done at just one time of the year? As this gives no indication as to what goes on for the other 9 months.</p>	<p>Feedback and additional requirements from OEH have been incorporated into the amended biodiversity assessment. Surveys have been carried out in accordance with these requirements.</p>
<p>101662. I know of 24 species of native orchid in the Rye Park area and more in the Bango Nature Reserve (National Parks and Wildlife Service) which is planned to have two wind turbines on its border. I believe I have found so far two endangered orchids of significance in this area, Prassophyllum Petilum (The Tarango Leek Orchid) and Caladenia Concolor (The Crimson Spider Orchid).</p>	<p>Targeted surveys for the Crimson Spider Orchid were carried out in early 2015. Additional orchid surveys are planned prior to the commencement of construction. The timing for additional surveys on site will depend on when the known population of the species in the Bango Nature Reserve are flowering.</p>
<p>101397. Access to Mt Hume (E 8120 N 77540) section is off Maryvale road, a dirt road of 4m to 5m in width, with large old growth gum trees on both sides and below is home to orchids. Bearded orchids, Sun orchids, Greenhoods and Donkey orchids to name some (see photos).</p> <p>Access roads off Maryvale road start at E866616 N7670 at an elevation of 560m to T48 at an elevation of 760m. Gradients are from 1:10, to 1:4, Access roads to sites would need considerable cement trucks, cranes, semi-trailers to every turbine site. Erosion again is a major concern.</p>	<p>The impact from all infrastructure for the wind farm including access tracks for construction and installation of the wind turbine components has been considered as part of the biodiversity assessment. The proposed access track routes have been inspected and selected to minimise disturbance to the land.</p>
<p>104185. Clearing of native vegetation in the ridgelines where the proposed wind farms will be located. There are state regulations that apply to all land holders that limit the clearing of mature vegetation in country with huge fines payable. The proposed sites include virgin vegetation that has been untouched as long as local records exist. The native ecosystems that exist in this area cannot be destroyed without having an effect on the local environment. The impact of clearing such ground in our location would also have a devastating effect with erosion of our slate soils, not basalt as stated in the proposal. Such erosion and the sediment which will be moved as a result will have a major impact on the water ways below.</p>	<p>The project area is characterised by cleared farmland, mostly derived from Box Gum Woodland on the lower slopes and flats with Inland Scribbly Gum Dry Forest vegetation on the steeper sheltered slopes. The location for wind farm infrastructure has been refined to minimise the impact on native vegetation. Where the impacts can't be avoided, the residual impacts will be offset. All clearing will be legally authorised in accordance with legislative requirements.</p>

9.3.5 Aboriginal and European heritage

Issue	Response
<p>Submissions 101737, 104545, 101725, 104501, 104060, 104495, 104199</p>	
<p>Full consideration needs to be given to the local aboriginal communities as well as the history of European settlers.</p>	<p>The Heritage Assessment (Appendix D to the EA) considers both the Aboriginal heritage and European heritage impacts.</p>
<p>104559. After discussions with the local Aboriginal Onerwal and Ngunawal committee members, I have</p>	<p>The Aboriginal consultation process was undertaken strictly in accordance with the relevant NSW OEH guidelines for Aboriginal</p>

Issue	Response
<p>found that Epuron's consultation process has not been undertaken in accordance with the guidelines. I request that as you are in position of responsibility for the engineering, investment and planning decisions for this project, that you force Epuron to undertake the Aboriginal Cultural Heritage Assessment Report process again given the significant evidence I have attached as proof that their claim of only low density distribution of stone artefacts is definitely not the case and has been misleading. The attached photos are only a small sample of artefacts that are held by residents in the proposed Rye Park wind project area that have been found, some of which come from hill top sites proposed to have a wind turbine erected and the others are photographic evidence of an aboriginal camp.</p>	<p>consultation, as outlined in detail in Section 3 (page 67 – 68) of the Heritage Assessment (Appendix D to the EA). The assertion that the consultation process was not undertaken in accordance with the guidelines is incorrect.</p> <p>Five Aboriginal groups registered an interest in the process of community consultation and all were invited to contribute to the methodology for the assessment and to provide cultural knowledge in regard to the area. Two contributions relating to cultural information were received and documented in the report.</p> <p>Given the extensive and effective survey coverage, the paucity of stone artefacts found during the survey was assessed to be an accurate reflection of the artefactual status of the project area and contained very low density artefact distribution.</p>
Submissions 101660, 104519, 104501, 104495, 104199	
<p>No contact has been made with local aboriginal groups, yet Epuron say they tried to make contact with no response. Rye Park Guardians have contacted some of the local groups easily and none of them know anything about the project. So how did they try and make contact.</p>	<p>The Aboriginal consultation process was undertaken strictly in accordance with the relevant NSW OEH guidelines for Aboriginal consultation, as outlined in detail in Section 3 (page 67 – 68) of the Heritage Assessment (Appendix D to the EA). Five Aboriginal groups registered an interest in the process of community consultation and all were invited to contribute to the methodology for the assessment and to provide cultural knowledge in regard to the area. Two contributions relating to cultural information were received and documented in the report.</p>
Submissions 101660, 101630, 101628	
<p>There has been no due diligence on Native Title issues under the Act (Cth) 1992 and or Common Law Native Title, as required by law.</p>	<p>Consideration of Native Title is a land ownership issue rather than a planning consideration and will be considered as required by legal obligations in connection with any agreements entered into in relation to crown land, such as crown road reserves.</p>
<p>104555. I believe that the community consultation process was not conducted in a broad and robust manner. The archaeologist engaged has made no attempt to become aware of the family/clan groups on the ground in the region, As evidenced by only two submissions from Aboriginal organisations one of which represents a separate Aboriginal Nation. I am a member of Ngunnawal Aboriginal Corporation (NAC) and Buranya Aboriginal Corporation (BAC) and neither of the companies where not contacted in relation to this report. I do not believe one notice in the local newspaper (Yass Tribune) would qualify as sufficient notice to register interest in the assessment.</p>	<p>The Aboriginal consultation process was undertaken strictly in accordance with the relevant NSW OEH guidelines for Aboriginal consultation, as outlined in detail in Section 3 (page 67 – 68) of the Heritage Assessment (Appendix D to the EA). The assertion that the consultation process was not undertaken in accordance with the guidelines is incorrect.</p> <p>Five Aboriginal groups registered an interest in the process of community consultation and all were invited to contribute to the methodology for the assessment and to provide cultural knowledge in regard to the area. Two contributions relating to cultural information were received and documented in the report.</p> <p>A letter of advice was sent to the Onerwal Local Aboriginal Land Council (OLALC) asking for the names and contact details for any Aboriginal people who may have an interest in the area. No response was received.</p>
Submissions 104064, 105102	
<p>'Everton' was staffed when owned by the Hume family by local aborigines under the leadership of 'Queen Caroline', the respected housekeeper, who supplied stockmen for the station and girls for household duties from her numerous descendants. They all lived on a</p>	<p>The history of this property was discussed in considerable and sufficient detail in the historical overview of the Rye Park area (refer pages 88 – 90 of Appendix D to the EA). Given that the property is situated well outside any area which will be impacted by the project, further consideration of potential heritage impacts</p>

Issue	Response
<p>newly gazetted Reserve. The Epuron report Aboriginal Cultural and Heritage Assessment Report totally ignores the continuous living history of Queen Caroline's peoples. Her great, great granddaughter today still owns the land, it is within 2kms of a planned turbine, and no contact has been made to Mrs Elma Pearsall by either Epuron or representatives on the Aboriginal Cultural Heritage assessment team.</p>	<p>on 'Everton' are not required.</p>
<p>104495. The report, although only consulting with two (2) organisations, which in themselves have questionable native authority with the proposed region, concluded "The archaeological status of the three SPAs [stone procurement areas] is uncertain, and accordingly, their cultural and archaeological values are unknown".</p> <p>Yet despite the "unknown" finding their recommendation and Epuron's position is - "The L3 recorded Aboriginal object locales are assessed to be representative of a very low density distribution of stone artefacts. The cultural and archaeological heritage significance of these locales is assessed to be low. Accordingly, unmitigated impact is considered to be appropriate.</p> <p>A management strategy of impact avoidance is not warranted, except in respect of the three quartz outcrops. It is recommended also, that the three European heritage items are avoided during construction.</p> <p>There are no identified Aboriginal archaeological and cultural constraints relating to the proposal."</p>	<p>Five Aboriginal groups registered an interest in the process of community consultation and all were invited to contribute to the methodology for the assessment and to provide cultural knowledge in regard to the area. Two contributions relating to cultural information were received and documented in the report.</p> <p>The heritage field survey is considered comprehensive. 13 stone artefact locales comprised of 20 stone artefacts were recorded. In addition 3 possible Stone Procurement Areas were found, however their artefactual status was not confirmed. The 13 artefact locales are mostly single stone artefacts (small flakes). Given that in one single stone knapping event in excess of 200 – 300 flake and heritage items would be produced, 20 artefacts cannot be considered extraordinary.</p> <p>The heritage assessment included a number of recommended mitigation measures including that:</p> <ul style="list-style-type: none"> ▶ Additional archaeological assessment is conducted in any areas that may not have surveyed to date (eg to accommodate any micro-siting of infrastructure prior to construction) ▶ A Cultural Heritage Management Plan be developed in consultation with an archaeologist ▶ Personnel involved in the construction and management phases of the project should be trained in procedures to implement recommendations relating to cultural heritage, as necessary.

9.3.6 Traffic and Transport

Issue	Response
<p>Submissions 101697, 101743</p>	
<p>The developer has plans for an access road, opposite Cooks Hill Road onto the wind farm. This access road travels along my Eastern boundary and will be less than 200 metres from the Eastern side of my house and farm buildings. I am totally opposed to the use of this road for any access to the Wind Farm.</p>	<p>The access road in question has been removed from the proposal and relocated 500m from submitters house following detailed site investigation.</p>
<p>Submissions 101622, 101173</p>	
<p>The primary routes outlined in the EA will pose major obstacles, particularly the underpass on Cooks Hill Rd under the Hume Highway given that the bridge has a clearance of 5.3m. Many if not all of the large loads will be forced onto the secondary route of the Lachlan Valley</p>	<p>The revised access route to site avoids the underpass on Cooks Hill Road under the Hume Highway as an access road for over dimensional and over mass construction traffic – refer section 6.5 and Appendix E for more details. All bridges and crossings have been inspected by a civil engineer and a report prepared and</p>

Issue	Response
<p>Way through Boorowa. Any over mass loads would be required to use the secondary route through Boorowa as the rail crossing bridge on Cooks Hill Rd may not be of engineering standard to carry up to 80 tonne.</p> <p>The end of Cooks Hill Rd and sections of the Rye Park Dalton Rd in the Upper Lachlan LGA are unsealed and must undergo a study in the same manner as Coolalie Rd.</p> <p>The Rye Park Dalton Rd has a low level crossing over Flakeney Creek and a bridge over Pudman Creek. Both would need to be inspected by engineers prior to over mass loads using this route.</p> <p>The secondary route of the southern section passes through residential areas of Yass. This would mean disruption to local residents particularly for any night oversize deliveries. Coolalie Rd has a bridge over the Hume Highway which could require consultation with engineers if over mass loads are to enter the development via this route.</p>	<p>presented in Appendix E.</p>
<p>Submissions 101691, 101697, 101743</p>	
<p>I want to know how the company will stop dust from the roadway settling on my rooves and then contaminating the water on my property which is used for drinking, bathing, cooking and for stock, which is a source of my income.</p>	<p>An Air Quality Management Plan including dust control measures will be incorporated as part of the CEMP. The regular watering of all unsealed roads used during the construction phase will be an important measure to control dust.</p> <p>The road upgrade agreement with the councils also includes some sections of council roads to be sealed if they are to be used for over-mass and over-dimensional traffic. This will also further minimise dust generation.</p> <p>The Proponent will also further commit to engage with the local residents and effected community prior to construction commencement on how best to communicate construction traffic activities and input into traffic safety and management plans prior to approval with the relevant authorities.</p>
<p>Submissions 101691, 101697, 101743, 101475, 104052</p>	
<p>I have concerns about the ongoing noise from construction vehicles for 6 days of the week for the 18-24 month period of construction and have great concerns the destabilising impact on my home through vibration from construction vehicles.</p>	<p>The potential noise from construction activities including from all construction vehicles accessing the site has been assessed as part of this Report. The proponent will be legally required to ensure the project complies with specified noise and vibration limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project.</p> <p>The proponent will also further commit to engage with the local residents and effected community prior to construction commencement on how best to communicate construction traffic activities and input into traffic safety and management plans prior to approval with the relevant authorities.</p>
<p>Submissions 101691, 101697, 101743, 104066, 104068, 101608, 101575</p>	
<p>Increased traffic on the road will also increase the likelihood of accidents. As a rural road, the local School bus picks up and drops off students at times similar to the start and finish of the works on the Epuron site. It is</p>	<p>A detailed Traffic Management Plan will be developed in consultation with affected residents, the road authorities (RMS & councils) and the selected transport contractor to ensure that the timing for oversize and overmass deliveries are scheduled to</p>

Issue	Response
a concern that childrens lives will be at risk due to the heavier volume of traffic created by the Wind Farm traffic.	minimise the impacts on existing road users. School bus routes and timings will be a factor considered in the traffic management plan.
Submissions 101691, 101697, 101743, 100511, 104161, 101660, 104543, 101624, 101715, 104064, 101438, 101467, 104495, 104499	
I believe that all roads will deteriorate quickly and that it will be unsafe for local road users. The unsealed sections of Cooks Hill Road and Rye Park Road will also deteriorate significantly and make it more difficult for local road users, increasing wear and tear on vehicles, for which we will carry the financial burden.	Local roads that will be used as the access route to the wind farm site will be upgraded and maintained to the standards that have been agreed with the councils. Refer Appendix E for further details.
Submissions 101691, 101697, 101743	
With vehicle movements there is the great potential for spreading of weeds and soil viruses both onto and off site, along access tracks and along all road ways used by the construction traffic.	The CEMP will include a Weed Management Plan to appropriately manage the initial earthworks and clearing activities to prevent the spread of weeds across the site. This will include regular inspections and cleaning of construction of machinery to be used for the initial land clearing activities.
Submissions 100300, 104161, 101624, 101547, 101549, 104062, 104185	
Will residents be able to travel on local access roads during normal construction hours. There are concerns roads will be barricaded often to stop local traffic passing.	Yes. There will be a Traffic Management Plan which considers the needs of all road users. There may be some inconvenience during the short period of delivery of large turbine parts but any short term issues will be made known to the community through the traffic consultation plan and impacts managed appropriately.
Submissions 101624, 104501, 104497, 101596, 104060	
Access roads are noted as needing to be 5 – 6 metres wide, wider on bends. Some of the roads on the access route are only about 4 metres wide, which means all the old trees and remnant vegetation along these roads will need to be cleared to make way for the trucks and machinery.	The assessment of the impact on vegetation clearing required for widening roads has been included in the Biodiversity Addendum attached to this Report (Appendix C).
101701. Traffic volume study on Blakney Creek Rd South. This light traffic and narrow road needs to be ruled out of use for this project or upgraded to handle the impact of large numbers of semi-trailers and damage they will cause.	Please refer to updated Traffic Impact Assessment (Appendix E) for the updated access routes and updated estimates of construction traffic numbers.
101701. There is no agreed access for this project from Dalton Rd at or near the “Spring Creek” property entrance or from Blakney Creek Rd from my property.	Access to this property is from the south via Jerrawa Road as agreed with this landowner.

9.3.7 Community Consultation

Issue	Response
Submissions 101691, 101697, 100948, 104545, 101660, 101664, 101624, 100434, 100555, 101662, 101239, 100543, 101638, 101642, 104062, 104519, 101666, 104187, 101173, 101465, 104185, 105102, 104495, 104499, 104199	
Epuron claim to have consulted	Please refer to section 7.2 and Appendix J for details of additional community

Issue	Response
with the community and stakeholders through a variety of means including newsletters and letters to identified residents within 5kms of the proposed site but I have either never heard from them or only very recently come across information from a neighbour.	consultation carried out since the exhibition of the EA.
Submissions 101691, 101697, 101571, 101608, 100539, 101438, 104199	
I have not had any formal communication with Epuron until my attendance at a recent open day at the Rye Park Hall when representatives from the company were unable to answer all my questions. I don't believe this to be a satisfactory consultation process.	Please refer to section 7.2 and Appendix J for details of additional community consultation carried out since the exhibition of the EA.
Submissions 101737, 101725, 101571, 104064, 104519, 104501, 104193, 104497, 101596	
The information day held by Epuron in Rye Park on Wednesday 21 st May, during business hours, was not advertised in Boorowa or Rye Park, and only a few select people were invited. It was also held after the application was submitted to the Department of Planning.	The initial information was advertised in the Yass Tribune as well as by mail to residents in the vicinity of the proposed wind farm. Additional information days were held on 24 June 2014 and 22 September 2015. The purpose of the first two open days was to discuss the project with the community in a timeframe which would enable individuals to make submission if they wished. Further consultation is to ensure that community members get to know the personnel and are able to ask any questions emerging.
Submissions 100300, 101475, 101660, 104068, 100996, 100499, 101630, 98430, 101628, 99197, 101610, 100549, 101277, 104060, 104191, 104495	
The "consultation" process by Epuron has been secretive and divisive and has polarised the Rye Park community. Potential hosts have been provided with information under confidentiality clauses. The consultation process appears to only involve certain landholders within 2 km of the proposed site rather than the population that will be effected by this project. Some of these landowners are not even residents of the area.	As set out in section 7.2 of the EA the approach to project consultation was to use a variety of communication channels to ensure the community and other stakeholders are fully informed and aware of the proposal. These included the project website, project newsletters, newspaper articles, radio interviews, public information days, establishment of a community consultation committee, phone calls and meetings with landowners within 2 km of a proposed wind turbine. Commercial discussions and negotiations with host landowners are not part of the broader community consultation process.
100300. No community newsletters of any kind from Epuron to provide updates of the project have been received by us or any of our neighbours. There was no notification of the two 'Community Open House' days held in Rye Park as stated in the EA. We are only 3.5	The initial focus was on making contact with all residents living within 2 km of a proposed turbine as well as any other people who registered an interest in the project. The mailing list has been expanded to include all residents within 5 km.

Issue	Response
km from the proposed turbines according to Epuron's maps.	
100300. The Community Consultative Committee set up in June 2012 has been described as "a waste of time" by one of the invited council attendees and has had on average only 7 attendees (range 5 to 11) not 8-10 as stated (page 118). This includes the 6th meeting on 30/09/13 when 9 "members" attended, of which 3 represented proponents, 4 the involved landowners and there were no council representation (Minutes of Meeting, Rye Park Wind Farm, Community Consultative Committee).	<p>The Community Consultation Committee has been established and operated in accordance with the guidelines which form part of the draft NSW Planning Guideline: Wind Farms issued by DPE.</p> <p>A number of additional CCC meetings have been held since the exhibition of the EA. The meetings have been productive and further CCC meetings will be held.</p>
Submissions 101737, 101660, 101725, 101624, 104519, 104501, 101596, 104060	
How much will be available in the community enhancement fund. Trustpower has been heard to say that the amount of money expected in the community fund (\$130,000 pa) will not be viable. It will also be shared between 3 local councils, Boorowa, Upper Lachlan and Yass.	The total value of the Community Enhancement Fund is \$2,500 per turbine per year. This is likely to be distributed on a pro rata basis relevant to the council area in which the turbines are located. Please refer to section 7.4 for further details.
Submissions 101737, 101660, 101571, 104519, 104501, 101596, 104060	
There will be no local jobs long term from the project operations and the construction phase will not use local people or companies.	The project is expected to support a total of over 470 sustained jobs in NSW and 144 in the ACT over a three year construction period. This includes an estimated 62 direct jobs in the local area during construction and 12 jobs in the region once the wind farm is in operation. It is our experience on other projects that the main focus for construction and ongoing employment is to source suitably skilled local individuals and that many of the ongoing jobs are filled with people living in the local area that have been appropriately trained.
Submissions 101737, 104501, 101467, 101596, 104060	
Families will suffer increased insurance costs or become uninsurable if turbines are within 1 km of homes or boundaries.	This allegation is not supported. There is no evidence that neighbouring properties will incur any increase in insurance costs as a result of the wind farm.
Submissions 100300, 104559, 101725, 104543, 100555, 101608, 101547, 101549, 100539, 104519, 104501, 104193, 104497, 101596, 104060	
Wind farm proponents' survey propaganda purporting that surveys show that the majority of rural landowners are in favour of wind farms are blatantly misleading. It is well know that the lead-up questions to a survey will	<p>The independent surveys referenced in the EA and this Report are publically available. See https://www.environment.nsw.gov.au/resources/households/WindEnergyfactsheet.pdf</p>

Issue	Response
sway the answers. The whole of the survey should be produced rather than simple figures.	
Submissions 101691, 101697, 101743, 101410	
Having recently purchased my property I was surprised that I had not been informed of the proposed wind farm through the searches at Council. I was more surprised by the lack of information that had been given to the local community in general and I had seen nothing about it in the local paper before this time.	The EA documents are publically available at the council offices as well as on the project website and DPE website. Please refer to section 7.2 and Appendix J for details of additional community consultation carried out since the exhibition of the EA.
Submissions 101410, 104064	
According to Epuron's categories of Key Stakeholders we are classified as "Nearby Neighbours (2-5km from Windfarm)". This is confirmed by their diagram of the 5km footprint contained in the EA. However, we have never been contacted, approached or consulted with in any way.	The initial focus was on making contact with all residents living within 2 km of a proposed turbine, as well as any other people who registered an interest in the project. The mailing list has now been expanded to include all residents within 5 km.
101410. I had no knowledge of a Community Consultation Committee on which I would have been keen to sit.	Invitations to register interest in being part of the Community Consultation Committee were sent as part of the project newsletter in April 2012 to everyone on the project mailing list at the time. As the project has progressed, new applications for membership have been received and accepted, and new members have joined the CCC.
104543. The proposed wind farm is located within 1.4 km of my home and as the property owner, I had not provided any written or verbal consent for this project. We have had to chase Epuron to find out what was being proposed for the rumoured wind farm. Nor were we contacted by the NSW Department of Planning, or any other Government Departments – State or Commonwealth, or the Boorowa or Yass Shire Councils. I note that my property is not shown on EA Figure 1-2 Rye Park Wind Farm turbine layout & site boundary, nor on any other map that I have seen.	The landowner was contacted by the Proponent's project manager and subsequent meetings were held with maps and other information provided to the landowner. The turbine location initially proposed closest to this residence has now been deleted from the project.
104163. In our view, the processes that Epuron have engaged to consult with the community have been inadequate. Firstly, we, as	The consultation strategy was outlined in section 7 and attachments 6 and 7 of the EA. Please refer to section 7.2 and Appendix J of this Report for details of additional community consultation carried out since the exhibition of the EA.

Issue	Response
<p>unaffected landowners and significantly potentially impacted community members, have only been contacted about the proposal on an adhoc basis with no apparent strategy in mind. At all times we have requested to be kept in the loop about progress of the application and any community meetings or consultation that might occur. The majority of the time, we found out about opportunities for consultation through other community members, not from Epuron, despite our numerous requests.</p>	
<p>104163. As part of our correspondence with Epuron we have been consistently stating the benefits of compensation arrangements for non-involved landowners.</p>	<p>Refer to section 7.4 and the project website for details of the voluntary Neighbour Benefit Agreement that is now being offered to non-involved landowners with dwellings within 2 km of turbines.</p>
<p>Submissions 101608, 104497</p>	
<p>In June 2014 we attended a public meeting held in Rye Park Hall with 112 other residents of the area. A survey of these residents recorded 91% did not want a wind farm in Rye Park. It's a shame that Epuron did not accept their invitation to attend or they would have experienced this for themselves.</p>	<p>We appreciate that not everyone in the community will support a development of this nature. We have made concerted efforts to reach out to all the immediate neighbouring and most impacted members of the community to ensure they have access to factual information on the development and wind farms in general. It is our experience through this consultation process that the majority of the individuals consulted are not opposed to the project.</p> <p>We have also offered voluntary neighbour agreements to address concerns raised that immediate neighbours do not get any direct financial benefits from the project.</p>
<p>101610. I have never been asked my opinion on the Rye Park Wind Farm Project Application or been able to participate in any survey involving the project. I was never asked to participate in the 'Community Attitudes to Wind Farms NSW' page 18 that was done in 2010 and strongly believe that statistics stating that 85% of the population support wind turbines in NSW and 79% support a wind farm being built within 10km of their residence are inaccurate.</p>	<p>Noted. See above.</p>
<p>104193. The information I have seen involving the proposed site of the Rye Park Wind Turbines is regularly changed, and difficult to understand. The site of the turbines has changed on numerous maps over the years and people that were getting original turbines</p>	<p>Details of the project including wind turbine locations are regularly updated on the project website and in the project newsletters.</p> <p>Please refer to section 7.2 and Appendix J of this Report for details of additional community consultation carried out since the exhibition of the EA.</p>

Issue	Response
<p>such as local member of the Boorowa Council Andrew Southwell are no longer getting turbines. This confusion and lack of communication from Epuron has also contributed to the divide within the Rye Park Community.</p>	
<p>104193. When will we be informed of the exact size of the turbines, the exact location and the exact infrastructure needed to support these turbines? This information has not been provided to me by Epuron despite accessing the limited resources they have provided to me.</p>	<p>The expected wind turbine dimensions, including the maximum tip height, were nominated in section 3.3 of the EA and in section 3.4 of this Report. They will up to 157 m in height to the tip of the blade.</p> <p>The exact turbine will not be known until the project is approved and a competitive tender process is completed to find the most viable wind farm which considers the output each particular turbine could warrant on the site with the known wind resource.</p>
<p>104495. The Chair of their, and it is "their", Community Consultation Committee himself acknowledges that the proponent "stacked" the membership with the complete intention being to "tick the box" for your purposes.</p>	<p>The Community Consultation Committee has been established and operated in accordance with the guidelines which form part of the draft NSW Planning Guideline: Wind Farms issued by DPE.</p>

9.3.8 Property Value

Issue	Response
<p>Submissions 101691, 101697, 101743, 100300, 100541, 101377, 101660, 101703, 101624, 101547, 101549, 104052, 100549, 101465, 101467, 105102, 101737 101598, 101689, 101389, 101523, 100948, 104161, 101725, 101757, 101695, 101664, 99199, 104543, 104163, 100434, 98430, 100555, 104064, 104547, 101638, 100582, 100485, 99197, 101575, 104062, 104519, 101117, 101383, 104185, 104060, 104499</p>	
<p>I have been told to expect at least a 40% decrease in the value of my property. This will have a significant impact on my livelihood should I need to sell in the foreseeable future.</p> <p>I am concerned many people will have large negative impacts on their property values due to proximity to wind farms and this will affect their livelihood and may even cause banks to reassess their finance/solvency.</p>	<p>Concerns about property price impact are dealt with in section 8.8. Studies have been carried out both in Australia and overseas. These have included studies of over 120,000 home sales over a ~20 year period before and after wind farms were installed. This has included over 1200 sales within 1 mile and over 300 sales within half a mile of a wind farm. Consistently, no statistical change in prices attributable to wind farms is observable.</p>
<p>Submissions 101691, 101697, 101743</p>	
<p>I have concerns that the Wind Farm will diminish my opportunity to subdivide the land as Council has indicated to others in the Rye Park Road valley that further residential development applications may be refused due to the wind farm. My question is – if the turbines are safe, why would further housing be declined?</p>	<p>Local councils have a planning process for subdivision. A number of requirements and criteria must be met in order to have a subdivision approved and these vary depending on individual council requirements. Information on subdivision requirements applying to your property can be obtained from your local council.</p>

9.3.9 Draft NSW Planning Guidelines: Wind Farms

Issue	Response
Submissions 101687, 101737, 101624, 100582, 104501, 101438	
101687. The setback distances recommended in the NSW Draft Wind Farm Guidelines should be considered. The Guidelines specify that turbines cannot be less than 2km from a non-host unless an acceptable "gateway" process has been negotiated.	The NSW Wind Farm Guidelines remain draft format and the gateway process is not in operation. The planning approach for the project has been guided by the Director Generals Requirements.
Submissions 100300, 101624	
The NSW Draft Planning Guidelines: Wind Farms December 2011 stated that "neighbours along transport routes" should be consulted (page 10). According to this, as we live on the Rye Park-Dalton Road, we should have been notified.	We are pleased when community members attend the open days put on to provide information to the community. The respondent contact details have now been included in the contact database and the respondent has been notified. A final Traffic Management Plan will be compiled in consultation with Councils and local community prior to construction commencement.
Submissions 100537, 104545, 101573, 101725, 100996, 100499, 104519, 100547, 105102, 101596, 104060	
The application fails to comply with the Guidelines as they are only in draft format and the developer does not have to adhere to them.	The project complies with the draft guidelines to the extent required in accordance with guidance provided by the DPE.

9.3.10 Planning Process

Issue	Response
Submissions 101689, 99199, 100434, 98430, 99197	
I intended to apply for planning permission in the further to build a dwelling. As I am within 2 km radius of a turbine and in the restricted zone a Development Application is unlikely to be approved, and further more I would have concerns for investing any more capital in our property if this proposed project goes ahead. This stops my future plans. With my property affected by visual and noise pollution and my right to a building permit in question my land value will be greatly affected by this proposal.	Local councils have a planning process for new dwellings. A number of requirements and criteria must be met in order to have a subdivision approved and these vary depending on individual Council requirements. Information on dwelling requirements applying to your property can be obtained from your local council.
Submissions 100300, 101596, 104060	
Epuron has stated in the current EA that "the project does not comply with set-back distances suggested in the DCP.	DCPs do not apply to SSD. Nonetheless, the provisions of the DCP have been considered for information purposes.
99000. An exclusion zone should be setup around centres of population (villages) so that no turbines are sited closer than 5km to the nearest town house.	The proposal for changing the legal requirements is noted.
Submissions 100547, 101277	
I object to the Rye Park Wind Farm, as I think current	As an SSD project the Rye Park Wind Farm is subject to rigorous

Issue	Response
<p>policy and legislation need to fairly set in place before going ahead with more wind farms in NSW. As it stands currently wind farm companies do not have strict guideline to adhere to and follow. While properties hosting the wind farm do benefit financially, there is no protection for surrounding properties that are affected by the wind farms in both financial terms and quality of living.</p>	<p>assessment requirements under the EP&A Act which must be carried out in accordance with the guidelines specified in the DGRs. Further, the Proponent has also offered voluntary neighbour agreements to address a concerns raised that immediate neighbours do not get any direct financial benefits from the project.</p>
<p>Submissions 101737, 101725, 101624, 101571, 101642, 104519, 104501, 104497, 105102, 101596, 101596, 104060, 104060</p>	
<p>No consideration is being given by Epuron for the Bango and Rugby wind farms as they are in the planning stage and not yet approved.</p>	<p>Cumulative visual impact and noise impact with the proposed Bango Wind Farm has been considered as part of the assessments for the Rye Park Wind Farm. The Rugby wind farm is noted as having been withdrawn on the planning website.</p>

9.3.11 Human Health

Issue	Response
<p>Submissions 101687, 101735, 101743, 100948, 101475, 101525, 101703, 104543, 101624, 101630, 98430, 101628, 101715, 104064, 104547, 101547, 101549, 99197, 101575, 104062, 104052, 104519, 101596, 104199</p>	
<p>There is an accumulating body of evidence that turbines are producing adverse health effects for many residents living within the vicinity of wind farms. The issues revolve around effects of audible noise, vibration and flicker, and the effects of low frequency noise and infrasound. Other effects include sleep disturbance, annoyance and poor quality of life.</p>	<p>Section 8.7 of the Report provides more detail. Reports from National independent bodies such as AMA and NHMRC have looked at the scientific evidence around wind farms impacting human health. Each of these reviews, and a number of other similar independent medical organisations around the globe, have come to the conclusions that there is no causal link between wind farms and risk to health.</p>
<p>Submissions 101691, 101697, 101525, 99199, 100499, 104519, 104185, 104199</p>	
<p>Whilst Epuron say that there are no proven health impacts, they cannot guarantee that for everyone in every situation. I have asked what guarantees or compensation they are prepared to offer to people who do suffer from health issues once the turbines are in place, for which they had no answer. The stress and anxiety that this process has created on landowners who are not hosts is already apparent.</p>	<p>As stated in section 8.7 of the Report, no causal link has been demonstrated between wind farms and adverse human health as assessed by independent health organisations such as NHMRC in Australia and others around the world.</p> <p>It is widely agreed that stress and anxiety from many life events, including as a result of fear of illness, has the ability to make people sick.</p> <p>In the Nov 2014 judgement of the Environment Resources and Development Court of South Australia witness Professor Wittert referred to a study which looked at all 51 Australian wind farms with a total of 1634 turbines. Professor Wittert said that the methodology in the study was robust.[94] The study found that 33 out of 51, or 64.7%, including 18 with a turbine size of more than 1MW, have never been subject to noise or health complaints. These 33 wind farms have an estimated 21,633 residents within 5 kms and have a combined total operating history of 267 years. Across Australia, 1 in 254 residents appears to have complained, with no complaints from Western Australia or Tasmania. 94% of those complaining live near 6 wind farms which have been targeted by anti-wind farm groups.</p>
<p>Submissions 101693, 104499</p>	
<p>I am not convinced there are no health implications and</p>	<p>Noted. Turbine dimensions are specified in Section 8.7 and the</p>

Issue	Response
<p>as Epuron have yet to decide on the design and size of the turbines, I do not believe that there will be no future impact.</p>	<p>final turbine model or models will be decided once the project is approved. A number of considerations will be used in this selection process including but not exclusively meeting noise requirements, being within approved dimensions, having a generator size within the planning approval, commercial implications etc. potential impacts are specified within the Report. Whichever turbine model is selected it will be compliant with the noise and planning requirements.</p>
<p>Submissions 101743, 101703, 99199, 100434, 98430, 99197, 104062, 101117, 101467</p>	
<p>Questions still remain as to the health impacts on livestock. As we are cattle breeders, we are concerned that the wind farm would have a similar impact on breeding of not only our cattle, but other livestock including horses, on our land.</p>	<p>Livestock are known to cluster together and preferentially rest in the shade provided by wind turbine towers on hot days. There is no scientific evidence of harm or any other issue affecting livestock related to wind farms.</p>
<p>104161. We are extremely concerned about the impact the proposed power lines will have on our health and the health of our children and those who visit us. We would never, by choice, buy a property with high voltage power lines on it and we do not feel it is in any way reasonable to have them close to our house.</p>	<p>High voltage powerlines have been part of our landscape for many years. There are limits that have been placed on the impact that these can have on people. Further discussion is contained in Section 8.7 of the Report. The design of the wind farm is such that the separation between dwellings and high voltage powerlines is conservative and in line with distances which have been in use for some decades.</p>
<p>Submissions 104064, 104199</p>	
<p>Rye Park school children and Pre School (operating 2 days per week) will be subjected to the influence of 26 turbines within 5kms. No studies have been released or assessed on effects on school populations.</p>	<p>NHMRC review of available evidence in 2015, as detailed in section 8.7 of the Report, is valid for all humans. It has found that there is no causal link between wind turbines and adverse impact on human health.</p>
<p>104497. Residents of the areas of Collector, Bowning-Bookham and Gunning voiced their concerns about their existing wind farms they have reported noise pollution, sleep deprivation, infrasound illness, ground vibrations playing havoc with gas mains, erosion from earthworks and decrease in animal fertility. These concerns should be investigated by the government or independent research before anymore wind farms are constructed. EPURON have given out fact sheets that state there is no evidence of health risks, can they give a written guarantee?</p>	<p>Noted that the submitter feels more research into these areas is required. See the reference to the South Australian ERD court decision above. As stated in section 8.7 of the Report, no causal link has been demonstrated between wind farms and adverse human health.</p>

9.3.12 Water

Issue	Response
<p>Submissions 100300, 101571, 101397, 105102, 101596</p>	
<p>In the EA there has been no impact study on the effect of water erosion causing increased sediment and the resultant increased salinity in the any of the creeks and the damage that can be done to the aquatic creatures in this water system. The endangered Southern Pygmy Perch live in the Blakney Creek and were reintroduced into the Pudman Creek, 200m downstream from its confluence with the Flakney Creek, a number of years</p>	<p>Section 15.4 of the EA provided an assessment of the potential impacts of construction activities on drainage and creeks, including on the risks of sedimentation and transport of pollutants to water courses in the area. A number of mitigation measures for minimising the disturbance and impacts were identified in section 15.5 of the EA.</p>

Issue	Response
ago.	
Submissions 101660, 104543, 101571, 101596	
Where do they think they are going to get the water from? There isn't enough water in the summer to support the towns and maintenance grading of the roads!	A number of potential water sources for the construction activities were identified in section 15.3 of the EA. These included the Yass Dam and Burrinjuck Dam. The estimated volume of water required is relatively small compared to the capacity available from these potential water sources.
Submissions 100543, 101666, 104187	
<p>On page 265 of the EA section 15.4 The site... forms the divide for water flowing east to the coast and west to the Murray – Darling Basin, with the foundations of the turbines only a few metres in depth... there will be little threat to groundwater resources at lower elevations.</p> <p>On page 102 section 6.1.8 The proposed Rye Park windfarm falls across the border of the Lachlan and Murrumbidgee Catchments. These two statements contradict each other – the second one is factual and the first is incorrect. Does the proponent know which ridgeline they are referring to? The water flows east then north to the Lachlan and west to the Murrumbidgee River catchment – none flows east to the coast.</p>	This issue has been addressed in section 5.6.8 of this Report.
Submissions 105102, 104060	
It is of concern that the project could have a large impact on water quality in the area given the scale of the constructions. Foundations will be drilled and blasted deep into the hills, large areas of land cleared and the construction of tracks in steep landscape subject to erosion. This is all likely to cause a reduction in the quality of runoff water and lead to the contamination of underground water supplies. This water feeds into creeks on our property which provide water for our livestock. Any contamination would have a significant impact on the operation of our farm.	Appropriate construction methodologies will be used and implemented strictly in accordance with control measures outlined in a CEMP to be prepared and approved prior the commencement of any construction activities. The CEMP will include an Erosion and Sediment Control Plan.

9.3.13 Fire and Bushfire

Issue	Response
Submissions 100511, 100300, 104161, 101475, 104066, 101573, 101660, 101664, 99199, 101630, 101715, 101547, 101549, 101438, 105102, 104499, 104199	
We are concerned for the increased risk to people, livestock, and property through bushfire due to hazardous material from wind turbines.	<p>Further detail on fire hazards and mitigation of hazardous materials can be seen in Section 8.5 of the Report. Hazardous material such as lubricants and oils are required for operation of modern wind turbines. Turbines are equipped with control systems that are designed to limit overheating and shut turbines down in the event of a fire.</p> <p>Bundling will also be provided around the substations along with regular maintenance to ensure that the bunding is fully functional in the case of oil leaks.</p>

Issue	Response
	A bushfire Management Plan will be implemented in consultation with relevant personnel.
Submissions 100511, 100300, 104161, 101475, 104066, 101573, 101660, 101703, 101725, 101664, 99000, 101624, 104163, 100434, 101630, 98430, 101628, 101715, 104064, 104547, 101642, 101547, 101549, 100485, 99197, 104062, 104052, 104591, 101465, 101467, 104497, 101596, 104191, 104495, 104499	
We are concerned that any fire in the vicinity of the wind farm will reduce the ability for the fire to be fought using water bombing aircraft.	<p>In Section 8.5 of the Report, the position of the RFS on fighting bushfires in the vicinity of wind farm is presented. It states that:</p> <p><i>“Aerial fire fighting operations will treat the turbine towers similar to other tall obstacles. Pilots and Air Operations Managers will assess these risks as part of routine procedures. Risks due to wake turbulence and the moving blades should also be considered. Wind turbines are not expected to pose unacceptable risks”.</i></p> <p><i>The new access roads to the wind turbines will provide better access to the ridges and may, as in other wind farms, provide ground breaks.</i></p>
101573. Noting that the EA claims RFS did not respond to Epuron's request for comment, I hope that the RFS has now lodged a comment as a result of this exhibition.	As stated in Section 8.5 of the Report, In October 2014, the RFS, through membership of the Australian Fire and Emergency Service Authorities Council released a position statement about bushfire fighting in the vicinity of wind farms. It should be noted that the position statement believes that wind farms and fire fighting in close proximity to wind farms does not provide an unacceptable risk to either ground or aerial based fire fighting.
Submissions 101624, 104499	
The EA identifies the “potential for the wind turbines, substations, control buildings and power lines to start or influence the spread of fire” (page 250). It goes on to state that the “local presence of RFS equipment and personnel would assist detection, response time and control” (page 250). This contradicts the statement that “any fire at the wind farm would come under the management of the NSW Fire Brigade supported by the RFS” due to the hazardous materials used and stored at the sites (page 249).	The RFS and NSW Fire Brigade would work in tandem and be fully informed and consulted about the sites bushfire management plan. This would include provisions for dealing with flammable substances like diesel fuel, lubricants and oils as well as grass and other bushfires that are already present in the area.
<p>104495. As the proposal sits within a declared Fire Prone zone, the proponent should be required to comply with all planning requirements for any development within such a declared zone.</p> <p>The intending purchaser of this development (Trust Power - who have signed a purchase agreement with Epuron) confirmed on 24 June 2014 at the Public Open display held at Rye Park Hall, that in the event of turbine is alight, there is no external method of extinguishing the blaze. The combination of height, oils and a potentially spinning blade ensures external firefighting methods are redundant.</p> <p>Whilst the likelihood of the actual turbine causing a fire is deemed minimal, the impact of them catching alight, either during a fire or as a result of mechanical failure, the impact is extremely high</p>	Further details are in Section 8.5 of the Report. Modern turbines are equipped with control systems that are designed to optimise system performance. This includes managing fire risk through detecting things like overheating. The systems can shut down the turbine to prevent overheating and action can also be taken to shut down the turbine should there be a mechanical failure that causes a fire. Details will also be included in a Bushfire Management Plan.
104499. During the construction phase, appropriate fire	Section 8.5 of the Report describes the potential risk that the wind

Issue	Response
fighting equipment would be held on site when the fire danger is very high to catastrophic, and training would be provided as necessary in its use. Fire extinguishers would be stored onsite in the control building and within any substations. Please explain in detail as to what they refers to so I can at least rest easy knowing we are in competent hands.	farm presents in terms of fire. This is highest during construction and decommissioning since diesel fuel, lubricants and oils will be stored on site and the chance of ignition is higher simple because there is more activity on site. It would therefore form part of the Bushfire Management Plan that fire fighting facilities be held on site during high fire danger periods during construction and decommissioning. It would also be a requirement that trained personnel be on site to operate such fire fighting equipment. RFS would be consulted in creating the bushfire management plan.

9.3.14 Aviation

Issue	Response
Submissions 101691, 101697, 101660, 101610	
With an aviation ban of 5 kilometres from each turbine, (Yass Tribune, July 2 2014) my concern is that in the event of a bush fire, water bombing would not occur which is necessary for the safely of ground crew firefighting. The local Rural Fire Service have indicated that they will not provide ground crews without aerial support. How can Epuron ensure safety of livestock, property and residents if a bush or grass fire occurs near their turbines?	There is no ban on any aviation within 5 km of a wind turbine. The RFS have noted that <i>“Aerial fire fighting operations will treat the turbine towers similar to other tall obstacles. Pilots and Air Operations Managers will assess these risks as part of routine procedures. Risks due to wake turbulence and the moving blades should also be considered. Wind turbines are not expected to pose unacceptable risks”</i> . The wind farm access tracks will provide the RFS with much easier access to many areas for fire fighting than is current available in the area.
Submissions 101660, 101695, 104191, 104199	
Air strips. No fly zones around the towers and setbacks for safety for the planes. We have an air strip with in 2kms and have been told we will not be able to use it. In the EA it says that it will be safe to spray weeds 500m from the tower, Yet when I talked to my pilot he will not fly with in 5km as he deems it unsafe with all the wind turbulence. 15 km min from a strip.	An assessment on the potential impact on unregistered Aircraft Landing Areas or ALAs (refer Appendix I) in the vicinity of the wind farm found that only 1 of the 17 airstrips would be affected by the wind farm. This particular ALA is only used about 4 times a year and is located on an involved landowner’s property The Proponent has committed to reimbursing any landowner in the event that they incur any additional costs for aerial agricultural operations on their land as a direct result of the wind farm – see SoC 12.
Submissions 101660, 100485, 101610, 104193	
In the event of an emergency or accident how is the South Care Rescue Helicopter going to come into our area	There are no specific restrictions on the operation of fixed wing or rotary wind aircraft, such as helicopters, in the vicinity of the wind farm.
104543. Wind farms and their supporting infrastructure are a hazard to air navigation. I assemble ultralight aircraft and intend to be flying into an airstrip on my farm, or into the airstrip next door, the proposed wind farm will be a massive hazard to my operations.	Refer to Aircraft Landing Area Assessment report included in Appendix I to this Report.
Submissions 104497, 101438	
104497. Risk to light aircraft. Light aircraft are used in rural areas to spray crops. Can a farmer have the turbines shut down when aircraft are required for	The Proponent has committed to reimbursing any landowner in the event that they incur any additional costs for aerial agricultural operations on their land as a direct result of the wind farm – see

Issue	Response
spreading fertiliser or fighting fires?	SoC 12.
101701. My airstrip on my property is not shown on the airstrip map and the impact of not being allowed to use it.	ALA 14 is now shown on the updated map of airstrips – see section 8.1 Use of this airstrip will not be prohibited.

9.3.15 Telecommunications

Issue	Response
Submissions 100511, 100300, 101660, 101547, 101549, 104199	
The area is dependent on radio or satellite transmission for most means of communication such as internet, television and community CB radio. An aerial for 3G phone reception has recently been installed. The possibility that all communication systems could be non-operative puts the lives of people at risk as they would not be able to monitor any level of risk for bushfires or the like or call for assistance if an accident were to occur.	As noted in the Telecommunications Impact Assessment (Appendix F) mobile phone VHF radio and TV signals are unlikely to be affected by the wind farm as there are no broadcast towers within 500 m of any proposed wind turbine.
104543. The wind turbine and feeder cable structures could have an "adverse physical or electromagnetic interference effect upon navigable airspace or air navigation. What about interference to Digital TV, Mobile Phone and Radio communications, health of people, animals and crops?	As with any electrical devise or infrastructure there will be associated electromagnetic fields, however there is not expected to be any interference with existing navigation aids, communication technologies or any impact on human or animal health. Please refer to 8.3 for further details.

9.3.16 Construction

Issue	Response
Submissions 101660, 104199	
Where is all the concrete and road base material etc coming from? How much extra traffic will there be importing all of this material?	There are at least two commercial quarries in the vicinity that could potentially supply construction materials for the project. The Glenella Quarry located in Cowra is about 100 km to the north of the site and the Bogo Quarry is located in Bookham about 70 km to the south west. The delivery of construction materials has been included in the estimates of construction traffic – refer Traffic & Transport Assessment (Appendix E).
Submissions 100543, 101666	
The resources required to construct this wind farm have been grossly under estimated in the EA because of this fragility of the soils and rock formations. The EA claims the turbines will require 16 X 16 X 2 metre deep foundations which is appropriate in the best conditions ie basalt rock. The foundations may have to be 20 metres deep or more. This means the estimate in the EA of the concrete needed for the wind turbine foundations is most likely grossly inadequate/inaccurate. They may require 2, 3 or 400 000 tonnes of concrete instead of the 110 000 tonnes estimated – they may require more.	Wind turbine gravity style foundations are typically 2 m deep rather than 20 m deep. If rock anchor style foundations are able to be used, then the volume of concrete required for each foundation is significantly less.
101608. It is of serious concern that Epuron has based	Wind turbine technology is continuing to evolve with larger rotor

Issue	Response
<p>their EA on 3MW turbines for this project. 3MW turbines as described in the EA, are the largest ever built in Australia, and as there has been no research or studies done on this size of turbine, how can any assessments be made. Such assessments are not based on precedents, studies or fact. These so called assessments are Epuron’s assumptions.</p>	<p>sizes and larger generator capacities being used. Details of the wind turbines under consideration for this project are outlined in section 3.4 and these turbine parameters have been used in the environmental assessments included as part of this Report. In addition, the statement that 3MW wind turbines “are the largest built ever in Australia” is incorrect. The Proponent built and owns the Snowtown Wind Farm in South Australia, which has 3.2MW wind turbines and operates in accordance with all legal requirements.</p>

9.3.17 Land and Environmental Management

Issue	Response
<p>Submissions 101737, 101624, 104519</p>	
<p>Cutting properties into smaller portions will certainly impact on the productivity of local farms. Those with smaller properties neighbouring turbines will also be impacted because their animals will not utilise the part of the farm closest to the noise and traffic. Water courses will be disrupted with the strong possibility that storms will cause erosion, which will cause muddiness in dams and streams. New drainage systems may even divert water from existing catchments and stock water dams for filling.</p> <p>Massive amounts of water will be needed, placing greater burden on already stretched water supplies in the area. Have permissions been sought and water licences been granted for getting water from Burrinjuck Dam. The application also mentions getting water from the Yass reservoir but have not yet got permission for this. How can it be considered to use an already stretched town water supply for a private development of this magnitude.</p>	<p>As outlined in section 6.6 of the Report some wind farm construction activities will have a potential impact on water courses and erosion on the land, but the assessment concluded that these risks are able to be managed through appropriate mitigation and control measures. The Environment Management Strategy will include an Erosion and Sediment Control Plan.</p> <p>The amount of water required for the construction of the wind farm is relatively small in relation to the capacity of the Yass Dam and Burrinjuck Dam which have been identified as potential water sources.</p>
<p>Submissions 101737, 101598, 104545, 101725, 101571, 101547, 101549, 104519, 104501, 104199</p>	
<p>The application plays down the impact the project will have on land management. 5 – 6 metre wide access roads, a hectare of land dug up for the construction of each turbine, the destructive access to the tops of the hills, the huge amount of drainage systems that will need to be put in place to decrease the impact of erosion.</p>	<p>The wind farm infrastructure takes up a very small (around 1%) of the wind farm site and is not expected to have any significant impact on normal farming operations. It is recognised that appropriate drainage structures will need to be designed and installed to minimise erosion.</p>
<p>Submissions 101737, 101598, 104545, 101757, 101610, 104501, 104193, 101596, 104060</p>	
<p>Epuron have not done adequate planning to ensure the project will be compliant. Plans not included in the application are Traffic and Transport, Erosion and Sediment Control, Landscape Management, Soil and Water. Chemical and Fuel Storage, Fire Management, Rail Safety Management, Waste Generation and Disposal etc.</p>	<p>Detailed construction management plans will be included in the CEMP which is required to be developed in conjunction with the relevant authorities and approved by DPE prior to the commencement of construction.</p>
<p>Submissions 101737, 101598, 104545, 101757</p>	

Issue	Response
<p>Concerns about the environment have not been fully addressed as the model of turbine has not been decided nor have the exact location of these turbines.</p>	<p>The turbine model to be used on the wind farm will be selected as part of the commercial tender process prior to commencement of construction. The assessments in the EA and this Report have been based on the worst case turbine parameters to ensure that the selected turbine model will meet the relevant requirements. Micro-siting of wind turbine locations after approval has been assessed as part of this project. Micro-siting is a usual practice and enables the layout to accommodate the characteristics of the final turbine model and any particular site conditions uncovered during the detailed design phase.</p>
<p>Submissions 101664, 101547, 101549, 104199</p>	
<p>Disruption of water—courses and other land management issues should be taken into consideration, as should the Impact on local wildlife. To utilize very rare, high rainfall, Rich basalt country for wind farms is unacceptable.</p>	<p>The assessments completed (refer section 6.6 in the Report) and comments from authorities (eg NSW Office of Water) have confirmed that the impacts to water courses will be minor and will be able to be properly managed with appropriate conditions.</p>
<p>104191. Land clearing for the wind turbines will result in weed disturbance. The spread of serrated tussock is not addressed in the weed control. It is declared in NSW under the Noxious Weeds Act 1993. It has not currently invaded my property but is rife on my neighbouring proposed host's property. Scotch thistles and blackberries are the only noxious weeds noted in the EA (page 187). What will be done to prevent the spread of this highly invasive tussock-forming grass which is a serious weed in Australia (NSW Dept of Primary Industries)?</p>	<p>The Environment Management Plan will incorporate a Weed and Pest Management Plan which will include requirements such as inspections and cleaning of plant and vehicles to ensure that the initial clearing activities do not cause the spread of weeds and other pests.</p>

9.3.18 Soil and Landform

Issue	Response
<p>Submissions 104541, 100543, 101642, 101666, 104187, 101465</p>	
<p>The soils where turbine development will occur are not red and loamy or well grassed as described in the EA and are very prone to erosion.</p>	<p>Detailed geotechnical testing will be carried out at each turbine location prior to the commencement of construction to ensure that the appropriate construction methodologies and erosion and sediment control measures are used.</p>
<p>Submissions 100300, 100948, 101475, 104543, 104064, 100543, 101642, 100539, 104062, 101666, 104187, 101465, 104191</p>	
<p>The ridgelines where turbines are proposed are not predominantly basalt rock as described in the EA but is sedimentary (mainly Ordovician) and is very prone to erosion.</p>	<p>As described in the EA and section 5.7.1 of this Report, the geology of the ridgelines are predominantly sedimentary rock. The contradictory reference basalt rock has been removed.</p>
<p>Submissions 100300, 100948, 101475, 104559, 101660, 101725, 104543, 100584, 100543, 100485, 100539, 101575, 101397, 101666, 104187, 101438, 101465</p>	
<p>The construction of turbine foundations, access roads and land clearing will cause erosion, weed growth and the formation of gully's from water run-off. Sediment-laden runoff from road surfaces, and their associated ditch systems, can be a major source of water pollution</p>	<p>An Erosion and Sediment Control Plan will be incorporated in the Environment Management Strategy which will be used to ensure that the appropriate construction methods and control measures are applied to ensure that excessive erosion does not occur.</p>

Issue	Response
and turbidity."	
100300. It is identified in the EA that the footings and hardstand will be 25m x 60m per turbine (page 64). It is not however stated the depth required for these structures. Bearing in mind the fragility of the rock type and risk of erosion this is surely relevant.	Gravity style wind turbine foundations are typically about 2 m deep. The hardstand area adjacent to the wind turbine location is formed using compacted road base material to provide a stable area for the installation cranes to operate.

9.3.19 Hazards and Risks

Issue	Response
100300. The EA fails to cite the specifications for the electrical energy dispersal for the turbines and the power structures or address the health and safety implications for humans and stock. Electrical energy must be dispersed into the ground using a system of metal strapping and earth rods to reduce the conductivity to less than 5 ohms. This can run to hundreds of metres especially on rocky ground with shallow top and subsoil as is the case in this area.	Details of the wind farm electrical infrastructure including transformers, underground and overhead powerlines and substations are included in section 3.5. The electrical installation includes earthing systems to ensure the safe operation of the wind farm during normal operation and fault conditions. There are no implications for the health and safety of persons or animals.
Submissions 100300, 101575, 104199	
Even though it is not identified in the EA, the fact that it is stated that there must be a 60m easement along the powerline corridor indicates that the lines must be 330Kv lines. These lines must have an aerial earth-wire for each pole that is grounded at each structure. These 330Kv lines must cross over the top of the Moomba to Sydney underground natural gas pipeline between turbines RYP_83 and RYP-143. With the need to ground powerlines in close proximity to this gas pipeline there is real potential for a massive explosion if there is any fault in the shielding of this pipeline. A lightning strike would be even worse. The gas company is already investigating problems with the pipeline at the Cullerin Wind Farm near Gunning.	<p>The new powerlines and other electrical infrastructure associated with the wind farm will be designed in accordance with the relevant criteria and code requirements to ensure no interference with existing infrastructure, including the existing gas main which crosses the wind farm site.</p> <p>The existing gas pipeline is also legally required to be maintained in accordance with the relevant Australian standards for pipelines.</p>
<p>100366 Potential for EMF impacts occurs only during the operational phase of the wind farm when electrical infrastructure is capable of generating electromagnetic fields. As the wind farm plans 82 turbines within 10km of my residence, I am deeply concerned as to the impact that this will have on not only my ongoing health but also of that of my family and friends.</p> <p>101660. Will electromagnetic fields be unsafe to livestock?</p> <p>101399 and 100434 I am concerned about the health issues caused by the noise, vibrations, ultrasound emissions and, electricity leakages of the wind turbines. I have a pacemaker and am concerned the electromagnetic fields could affect people and animals.</p>	The potential impacts of EMF from the wind farm have been assessed in section 8.3 of this Report and conclude that there would be no unacceptable impacts.
Submissions 101660, 99197	
Shadow flicker and blade glint causes health problems	The potential impacts from shadow flicker and blade glint have

Issue	Response
yet they are still putting the towers close enough to homes it will affect people.	been assessed in section 8.4 of this Report. The assessment concluded that there would be no unacceptable impacts.
Submissions 101660, 104199	
Blade Throw. Vestas turbine manual recommends a 400m exclusion zone around these turbines. How big of a piece of ice will come off turbines when there is a frosty night/morning. How many stock or people are in danger?	Blade throw has been assessed in section 8.6 of this Report and is considered to be a very unlikely event.
104543. When preparing to build our home we were advised that this area had a fault line passing through the area going to Dalton. At times we get to feel slight tremors, to prevent/minimise any problems with slab cracking we used a waffle pod foundation when we built our home. There does not appear to be any coverage of soil stability checks or anything else on this subject in the EA.	A number of options exist for turbine and other wind farm infrastructure foundations. The exact design will be decided after the project has a planning approval and during the detailed design process. During this process a full consideration of ground conditions including soils types etc. is undertaken for each piece of infrastructure.
101701. Legal liability of any fire and or catastrophic event resulting from the turbines and or powerlines and or acts of employees/contractors on site.	The legal liability as a result of any fire or other catastrophic event resulting from the wind farm is the same as for any other adjoining property owner or occupier. The risk of a bushfire caused by the wind farm was assessed in section 8.5 of this Report. The assessment found no unacceptable impacts.
104199. Safety concerns about the polluting effects of the vast quantities of oil and other hazardous materials housed in wind turbines should an accident or failures occur.	Failure of modern wind turbines is uncommon. Regular preventative maintenance is undertaken with the view to prevent failure. Additionally, a significant number of sensors are used within the turbine to detect possible failure in advance. These control systems can stop turbine operation in the event of component overheating for example as well as other contributing factors to failure.

9.3.20 Wind Farm Layout

Issue	Response
101697. On Pg 40, our house is indicated by a black dot, as an “other building” rather than a red dot, indicating a residence. This is an indicator of the inaccuracies of the EA and lack of consultation between Epuron and the previous owners to recognise this is a private residence, within 2 kms of some 7 turbines. It also raises questions about whether my property has been included in other data throughout the EA and its accuracy.	The mapping in this Report has been updated based on feedback received from ongoing consultation and the exhibition of the EA. Residence R50 is now correctly shown as a non-associated residence and has been correctly included in the relevant assessments including visual impact and operational noise.
101693. The planned access road, 120m to the east of my residence will have a negative impact on my land and stock.	No contact details or address was provided with the submission and no record of the property owner was found in the vicinity of the wind farm.
101660. What amendments have been made to the wind farm layout to accommodate the installation and environmental impact of the wind farms construction?	Details of the amendments to the wind farm layout since the exhibition of the EA are explained in section 3.2 of this Report.
104495. In the event that the turbines proposed to the South East of the development were removed, the impact of nearby residents would be greatly reduced. It	The Report has considered the potential impacts to all residences located within the vicinity of the wind farm. Changes have been made to the wind farm layout since the exhibition of the EA

Issue	Response
is this South East portion of the development that is of highest density or residential inhabitants which causes the majority of concerns raised above.	including reducing the number of wind turbines from 126 to 109.

9.3.21 General

Issue	Response
Submissions 101693, 100559, 101695, 101664, 101662, 100561, 101638, 101161, 104521, 101277, 101465	
Generally opposed to the construction of the wind farm for issues including environmental, visual, noise, health and due to concerns for lack of consultation and proximity of turbines to nearby uninvolved houses.	The potential environmental impact of the wind farm has been assessed in accordance with the requirements set out in the Director General’s Requirements.
100557. Objects to the placing of wind turbines near residences other than those hosting turbines as they are obtrusive and interfere with people’s right to live peacefully where they have chosen to.	The potential impacts of the wind farm, including visual impact, on neighbouring residences has been assessed and found to be acceptable.
100557. Wind farms are not viable without government subsidies.	Wind farms do not receive any government subsidies. The Renewable Energy Target provides an obligation for electricity retailers to supply a certain portion of the energy from renewable sources.
Submissions 101737, 101725, 101608, 101547, 101549, 104062, 101610	
They do not even know which model turbine they are using. Turbine locations will not be finalised until the geotechnical assessment has been completed.	The Report in section 3.4 has specified the turbine envelope and this describes that maximum dimensions for which approval sought. Turbine locations have been determined through significant design work including with detailed digital terrain information and ground-truthing by civil engineers. Should the proposal be approved a turbine corridor and infrastructure corridor will be used to allow micro-siting of turbines and associated infrastructure within surveyed areas. Further detail on micro-siting can be seen in Section 3.9 of this Report.
Submissions 100541, 101725, 99000, 100543, 101608, 101547, 101549, 101610, 101666, 104187, 101117, 101465, 104199	
Epuron’s process in producing maps for this development needs to be reviewed and made consistent as the maps they have supplied in their application are misleading and don’t give a true reflection of the number of Rye Park residents that this massive project will effect. For example why is my house is not included in the 2km development perimeter.	Residence R99 is located 3.2 km from the nearest wind turbine location. Updated maps have been included in this Report incorporating all feedback received from individual submissions and as a result of ongoing consultation.
Submissions 101660, 99199, 100434, 98430, 100485, 99197, 101117, 101383, 104497, 101701, 104495, 104199	
Who is responsible for decommissioning the wind farm and who pays the cost.	The Proponent is responsible for decommissioning the wind farm and pays for all associated costs at the end of the life of the wind farm. See Appendix G for further details.
101660. Will the turbine concrete footings be removed during decommissioning.	Typical decommission is to remove all above ground components and reinstate the surface (such as tracks etc). Typically, turbine foundations are left in place. To remove concrete footing would create a great deal of land disturbance, with its effects

Issue	Response
	outweighing the effects of leaving the concrete footings in-situ.
Submissions 99000, 101117	
99000. How will turbine blades be disposed of when decommissioned.	Turbine blades are typically made of composite materials. They can be removed from site using a truck (in the same way they were installed) and disposed of properly in a licenced facility. Materials are such that they can often be recycled.
101660. Ground Vibration. No mention of the main gas pipe line running through the middle of the site which will be affected. Main gas line Moomba to Sydney 34. Has APA been contacted. What about the natural fault lines? The extra weight of all the infrastructure and the vibration from the blades will have to affect them. I couldn't find anything about this problem.	A wind farm powerline will cross the gas pipeline and will be designed to ensure there are no adverse impacts or risks to the pipeline. The wind farm will not have any impact on natural fault lines.
Submissions 101737, 101598, 101725	
How can Epuron justify building wind turbines to save the earth when they are destroying this unique part of the environment.	Although the wind farm will have some environmental impacts these will be more than offset by the positive environmental benefits. Refer section 4 for further details.
101664. Energy generated by local wind farms is not for local consumption but is destined for Canberra as the ACT government does not permit wind farms in the territory.	<p>Power from the wind farm will flow into the National Electricity Marlet (NEM) which links South Australia, Victoria, Tasmania, New South Wales, The ACT and Queensland. The power can be used by any electrical user connected to this network.</p> <p>Wind Farms need to be located where the wind resource is located in much the same way as a mine is located where the ore is. To this end, the ACT does not have sites with a sufficient resource for construction of a wind farm.</p>
Submissions 104543, 105102	
Epuron has not fully carried out significant wind monitoring over the site to confirm an expected long term wind regime, the few wind measuring points are not fully representative of the whole site.	6 met masts have been installed on the site. This is in line with industry standards and provides an excellent indication of the wind resource available. Industry standard wind flow models can and are used to make accurate assessments of future energy production. Monitoring, like that already carried out, is used industry wide to form the basis of wind farm bank finance.
100584. On reading the EA I noticed that a specific size was not mentioned for the turbines.	The exact turbine model is not yet finalised. The dimensions are, however, set out in section 3.4 and include a maximum tip height of 157m
Submissions 100543, 101666, 104187	
As can be seen from the various photographs included in the DA the Rye Park to Blakney Creek – Yass corridor has sparse tree cover. The DA says 300 hectares of the site will be used for the wind farm infrastructure and also says 114 hectares of trees and other habitat will be removed – is it 114 hectares or 300 hectares?	Updated estimates of impact areas from the wind farm infrastructure are included in section 3.9 of this Report. All impacts will be offset as set out in the biodiversity offset strategy – see Appendix C.
Submissions 100543, 101666, 104187	
Section 14.4.4 page 244 The heading reads - Actual	This was a typo which has been corrected in the Report.

Issue	Response
conditions at Rye Park, and then the text reads When the actual conditions of the Liverpool Plains site are taken into consideration. The Liverpool Plains are a long way from Rye Park.	
Submissions 100543, 101666, 104187	
The proponent claims there will be 300 jobs and later claims 500 jobs- how many jobs?	An independent economic assessment estimated that the project would provide 470 jobs in NSW and 144 in ACT during the construction period. See Appendix K for further details.
101343. Please consider the Wind Turbine Turbulence and how that affects living conditions of surrounding families.	Turbulence (variability in wind speed and direction) is a natural phenomenon which occurs downwind of all natural and manmade obstacles and doesn't have any impact on people living in the vicinity of wind turbines.
Submissions 101610, 104193	
The basic infrastructure within the Rye Park Community very basic and limited with many dirt roads, unpassable roads, no mobile phone reception due to lack of service, no television reception due the new digital television implementation, and very limited waste management facilities and water and sewerage facilities. The lack of infrastructure will not support the large machinery and trucks, equipment and increase in the overall population of the Rye Park Community and Epuron have not outlined how they will address these issues.	The proposal includes road upgrades that will be required to transport construction materials to and from the site. This should significantly benefit the road quality in the area despite increased traffic during construction. Other systems for waste disposal have been provided for within the Report.
101596. The developers have produced "Neighbour Agreements" for residents to sign making the land virtually impossible to on-sell when they are in close proximity to and surrounded by wind turbines. It will greatly reduce the competition by purchasers, resulting in lower values. Will councils suffer rate decreases because of lower land values over large council areas, particularly when there are several proposals in place alongside each other? Will residents be able to renew mortgages with lending institutions, or get loans for improvements when properties and earning abilities are negatively impacted?	Section 8.8 of the Report discussed house prices and wind turbines. A number of studies have been undertaken both in Australia and overseas. The largest study was completed in the USA in 2014 and analysed over 120, 000 home sales over more than a decade before and after wind farms were constructed. It found that there was no statistical reduction in house prices as a result of wind turbine proximity. Given these conclusions, the presence of the wind farm alone would be unlikely to contribute to difficulty in getting loans or renewing mortgages.
Submissions 101701, 104060, 104199	
Are all issues agreed or clarified with this project transfer to any new entity.	Trustpower is the proponent of the project and intends to build the wind farm if the market conditions are favourable to do so. In the event of the project passing to a new owner, all planning conditions and commitments also pass with the project.
104495. The submitted EIS by Epuron contains multiple errors and deceitful practices, Namely the incorrect representation of Homes, not receptor locations as they are often referred to by Epuron but homes that families actually live in, The omission of the multiple Homes is significant as the overall impact of this proposed industrial development is greatly increased with their inclusion, it is no wonder Epuron has deliberately left	Additional effort has been made to correctly identify all residences located within the vicinity of the wind farm. Feedback from the community through submissions and other correspondence has been used to update the location of all residences used for the assessments in this Report.

Issue	Response
them out.	

9.3.22 Supportive Submissions

Issue	Overview of Submission
101461. Supports this project.	<ul style="list-style-type: none"> ➤ Project will provide immediate and long term benefits for the local community and Australia as a whole. ➤ Wind farm would provide additional funding to get farm improvements back on track by allowing additional funds to be spent on fencing, pasture and soil improvement, weed control and land degradation control. ➤ Wind farms and agricultural production have shown that they can co-exist and the additional income will provide real and direct benefits to the surrounding community.
101138. Supports this project.	<ul style="list-style-type: none"> ➤ Project will bring positive benefits to the district and the state. ➤ There is a large silent majority that are in support of the wind farm or have no strong view against its construction.
100475. Supports this project.	<ul style="list-style-type: none"> ➤ As a person with Grandchildren I am hoping for a better environment for them in the future. So, harnessing power from wind has to be better than the current situation.
101483. Supports this project.	<ul style="list-style-type: none"> ➤ I support the Rye Park wind farm. It will provide many benefits for the local community.
100509. Supports this project.	<ul style="list-style-type: none"> ➤ Clean energy must supplant fossil fuel power generation entirely in our lifetime ➤ Turbine power generation has/is shown as an efficient means of power generation. ➤ The ongoing financial input for an up to 60 year time span for the Rye Park landowner hosts will inevitably benefit the larger community of the Yass-Boorowa-Rye Park area. ➤ The argument of medical risks to the surrounding community from the Farm is not a sustainable concept. ➤ The turbines to me are objects of grace, symmetry, to be admired, not denigrated, but that's just me.
101007. Supports this project.	<ul style="list-style-type: none"> ➤ I have no objections to the wind farm in this area after checking out several other wind farms within 200 km for noise, health, and the overall look of them etc.

9.4 Issues raised in government agency submissions

9.4.1 Upper Lachlan Shire Council (101403)

Issue	Response
The current layout is indicative only and subject to detailed design and Epuron seeks consent to micro site turbines anywhere within the assessed project corridor up to 100m.	This is normal practice with wind farm developments to enable the project to accommodate the final turbine model or models selected for the project at the time of construction. Please refer to section 3.3 for further details on the Turbine Corridor, Infrastructure Corridor and micrositing defined for the project.
Council is unclear on number of turbines within LGA. Council has requested a map on several occasions to no avail. Council has thus mapped it themselves and estimates 42-46 turbines in the LGA	Yass Valley Council: 11 turbines Upper Lachlan Shire Council: 25 turbines Boorowa Council: 73 turbines Total: 109 turbines Note that there are 6 turbine locations that are located close to the ULSC/YVC boundary.
Flawed map in EIS and cannot be relied upon to provide finalised detailed responses	Updated maps have been provided in this Report.
Inadequate response to relevant statutory provisions and relevant development control plans	As the project is SSD, the DCP does not apply to it. Nevertheless, consideration of the requirements of the DCPs is set out in section 6.1.10 of the EA.
Upper Lachlan Development Control Plan 2010	
Development should be sited and carried out to minimise impacts on or restriction to grazing, farming and forestry practices. Only reference in EIS is 500m aerial spraying restriction which council deems unreasonable imposition on landowners with no mitigation measures provided	The Statement of Commitments the following mitigation measure: <i>If aerial agriculture activities are demonstrated to be materially disruptive on any property immediately adjacent to the site, due to the operation of turbines, the Proponent would consult with the affected landowner and implement appropriate mitigation measures where necessary taking into consideration the history of aerial agriculture activities. This could include funding the cost difference between the current aerial agricultural activities and a reasonable alternative method.</i>
Must assess visual impact on project including an assessment of scenic value. Must consult with council and community on appropriate visual impact measures. Recommend to commit to commitments of Clause 9.4 in EIS compared to lower standard Statement of Commitments Section 17 of the EIS.	The Landscape and Visual Impact Assessment (LVIA) included as part of the EA and this Report was prepared in accordance with the requirements and relevant guidelines set out in the DGRs. The Statement of Commitments has been amended to be consistent with the commitments in the Report and LVIA.
Error on page 149 of EIS regarding local government area name	Noted and corrected in the Report
Council concerned about need for Sound Management Mode. Shouldn't be approved if required.	The wind turbine layout has been amended so that all 109 turbines comply with the noise guidelines without the need to any Sound Management Mode measures to achieve compliance.
Mapping does not provide any certainty to the compliance of non-compliance of DPC criteria 'Turbine locations shall not surround a non-related property. Turbines shall be located with the specified setbacks from property boundaries to minimise the visual impact of the development on adjacent and nearby non-related property. Cumulative impacts, having regard to existing	As the project is SSD, the DCP does not apply to it. Nevertheless, consideration of the requirements of the DCPs is set out in section 6.1.10 of the EA.

Issue	Response
turbines and turbines approved but yet to be constructed should be assessed.	
Council recommends that turbines within 2 km of existing dwelling be deleted if no agreements in place with uninvolved landowners as per Draft NSW Wind Farm Planning Guidelines	As outlined above, the gateway process proposed in the draft guidelines is not in effect and does not apply to the project.
Turbines within a distance two times the height of the turbine (including tip of blade) from a formed public road be deleted. Proponent has not been able to indicate which roads are proposed to be utilised as well as disregard for ULDCP 2010 under Table 6-4 – Clause 6.1.10 of the EIS. This is inadequate and unprepared in this respect for the EIS.	No wind turbine is closer than 314 m from a formed public road. Please refer to 5.1.3 for details of where the proposal does and doesn't comply with the LEPS. The closest turbine is number 16 which is 480 m from a formed public road.
Mapping doesn't provide certainty whether compliance is met with the item 'turbines shall not be located within a distance two times the height of the turbine including the tip of the blade from non-related property boundary'. See Table 6-4 Clause 6.1.10 of the EIS inadequate answer. Council recommends these turbines to be deleted.	As the project is SSD, the DCP does not apply to it. Nevertheless, consideration of the requirements of the DCPs is set out in section 6.1.10 of the EA.
Regarding noise and shadow flicker legal commitment should be given to the mitigation measure Clause 14.4.8.1 of the EIS. Regarding communication legal commitment should be given to the mitigation measures outline in Clause 14.2.5 of the EIS.	All conditions in any planning approval and all commitments in the Report, including the Statement of Commitments, are legally binding obligations on the Proponent.
Council requires significant rationalisation of the proposed routes and significant upgrading works carried out on its road network to ensure that the proposed activities do not create unsafe conditions on its road network. Alternative the proponent could upgrade all the roads mentioned at its full cost.	The Proponent has actively engaged with all three local councils regarding the proposed upgrades to the local road network. In-principle agreements have been reached on details of the road standards and road segments which require upgrades.
Council considers that the TMP must be prepared prior to consent being granted to ensure adequate due diligence for subsequent purchasers	The TMP will be prepared prior to construction in consultation with the councils and RMS, together with the selected transport contractor to ensure that the appropriate control measures and management practices are adopted.
Council requires more info on cables used to connect turbines to each other and to the State Electricity Grid. Concern is these are usually a separate contract which leads to subsequent road safety reduction due to normal due diligence process not being carried out in the planning phase for these works. These works create a significant amount of heavy and over dimension traffic and more frequent access to and from the local network	Updated details for the wind farm electrical infrastructure and connection to the electricity grid are included in section 3.5 of this Report. The details include descriptions and maps of the underground cabling, overhead powerlines, wind farm collection substations and connection substations which will connect the wind farm to TransGrid's existing transmission network. Details of the access routes required for construction of the powerlines and substations are included in the traffic and transport section 6.5
Traffic is based on single direction only, should be based on both direction. True traffic figures are double those shown in documents, this is important regarding its potential to affect road safety.	The updated Traffic & Transport Assessment (Appendix E) uses traffic volume estimates based on both (load to site and return trip) directions of travel.
Non adequate data to support traffic data calculation. Data required: Supply and delivery of gravels and road building materials. The location of likely sources should	The updated Traffic & Transport Assessment (Appendix E) includes details on the likely source and delivery route for

Issue	Response
<p>also be provided. Supply and delivery of concrete (batched on site or off-site). The location of likely suppliers. The supply and delivery of reinforcing steel. The likely routes to be used by construction staff when travelling to and from the site. The supply and delivery of materials (poles, wires, concrete) proposed to be used in the construction of the interconnecting power line and transport methods used. Council will not accept the laser car profilimeter method of assessing the condition of the existing pavements as it is mostly suited to assessment of average condition of a long length of road network. Not particularly useful in determining how much damage has occurred to a pavement due to particular type of usage and it overlooks small defects. Inappropriate for gravel roads due to changing nature of surface. Council prefers to negotiate a suit of works prior to commencing that will provide a better outcome for all concerned.</p>	<p>construction materials.</p> <p>The Proponent has reached in-principle agreements with the councils on details of the road standards and road segments which require upgrades.</p>
<p>Council recommends the extinguishing rights of carriageway that were created to enable maintenance of turbines within 6 months of turbine ceasing to operate and land made good unless otherwise agreed with landowner</p>	<p>While the intent of this recommendation is understood, it may not be practical due to the obligations the wind farm company has with the landowners involved who may want to retain the access roads. Further, internal access tracks or roads within the wind farm site will be required to enable decommissioning at the end of the wind farm life. This process may not be completed within 6 months of the turbines ceasing to operate.</p>
<p>Details of the proposed connection to the electricity reticulation network shall be included as part of the development application EA and information regarding agreement with TransGrid</p>	<p>The connection of the wind farm to the existing TransGrid transmission lines is included in the scope of the project and the planning application – refer section 3.5</p>
<p>Clause 3.17 of the community enhancement program in the DPC not addressed. Council shall require the imposition of a condition that states: in consultation with council prepare a community enhancement program funded by a minimum rate of \$2,500 per constructed turbine per annum indexed to CPI for Sydney (Housing) commencing at the September 2010 quarter</p>	<p>Council was consulted as part of developing the current Neighbour Benefit Scheme and associated Community Benefit Fund. Please refer to section 7.4 for further details.</p>
<p>Non-compliant with provisions of Clause 9.5 and 3.17 of the Upper Lachlan Development Control Plan 2010.</p>	<p>As the project is SSD, the DCP does not apply to it. Nevertheless, consideration of the requirements of the DCPs is set out in section 6.1.10 of the EA.</p>

9.4.2 Boorowa Council (101672)

Issue	Response
<p>Failure to adequately consult with Council.</p>	<p>The Proponent has consulted extensively with Boorowa Council since exhibition of the EA. Refer to section 7.1 for further details.</p>
<p>Concerns about community consultation.</p>	<p>The Proponent has continued to carry out extensive community consultation since the exhibition of the EA. Refer section 7.2 for further details.</p>
<p>Request for a s94A Development Contribution at 1% of development cost plus a Community Enhancement Fund</p>	<p>Refer to section 7.4 for details of the voluntary Community Enhancement Fund and Neighbour Benefit Scheme that was</p>

Issue	Response
of \$3,600 per turbine per year paid to council.	discussed with the Council.
Proponent has not adequately considered how road impacts will be managed during and following construction. Inadequate consultation with council regarding road impacts.	The Proponent has actively engaged with all three local councils regarding the proposed upgrades to the local road network. In-principle agreements have been reached on details of the road standards and road segments which require upgrades.
Noise impacts and Council’s ability to deal with noise complaints.	The proponent will be legally required to ensure the project complies with specified noise limits which will be contained in the conditions of any SSD consent and environment protection licence issued for the project. Compliance with the SSD consent will be regulated and enforced by the DPE. Compliance with the environment protection licence will be regulated and enforced by the EPA. The Noise Impact Assessment (Appendix B) confirms that the noise associated with the construction and operation of the wind farm will comply with the relevant guidelines.
Decommissioning Plan – further detail requested pre-approval such as where waste will be disposed of.	Refer updated draft Decommissioning and Rehabilitation Plan (Appendix G).
Disposal of construction waste to be detailed	Construction waste details and methods of disposal will be incorporated in the CEMP which will be prepared prior to the commencement of construction as actual waste generated will be dependent on the detailed construction design and construction methodologies used.
Impact on property values to be addressed by DPE in its assessment	Refer updated assessment in section 8.8
The approach to managing fire risks is a matter for the Department to consider in consultation with the NSW RFS.	Refer section 8.5 for details of consultation with NSW RFS and the recommended approach for managing fire risk.

9.4.3 Yass Valley Council (104169)

Issue	Response
Yass Local Environmental Plan 1987 no longer applied and should be updated with the site area as zoned RU1 Primary Production in accordance with the Yass Valley Local Environmental Plan 2013	Section 5.1.14 in the Report has been updated to address the Yass Valley Local Environment Plan 2013
Absence of Construction Environmental Management Plan and Operational Environment Management Plan is concerning. Some of the information that these documents will address are addressed in the EIS but in insufficient detail upon which to base comment. Council would like these issues addressed in greater detail prior to any development approval to make a more complete assessment of the impact.	A CEMP and OEMP are not required to be completed prior to the assessment and determination of the planning application, however these plans are usually a condition of approval and are required to be submitted and approved by DPE prior to the commencement of construction.
Community enhancement fund should be addressed prior to development approval with an agreed upon contribution imposed as a condition of any such approval. Council notes no fund is proposed to be established only 6 months prior to commencement of operations. Conroy’s Gap WF sets a clear precedent for any future wind farm approval in the Yass Valley LGA.	Council was consulted as part of developing the current Neighbour Benefit Scheme and associated Community Benefit Fund. Please refer to section 7.4 for further details.

Issue	Response
<p>Community Enhancement Fund should be commensurate with the number of turbines and MW to fund local community infrastructure and services. Council requires condition of approval to be \$2,500 per year paid to the relevant Council increased with CPI. Council with consultation with CCC would determine which projects to be funded with the fund. Council would be custodians of the funds and distribute with council accounting regulations</p>	
<p>Supplementary DGR's 16 August 2011 issued due to perceived lack of genuine community consultation prior to that date. Important that all key stakeholders continue to be communicated with through the construction and life and any submission received during public exhibition period for EIS be considered in DA determination</p>	<p>Please refer to section 7 and Appendix J for details of the community consultation carried out since the exhibition of the EA as well as the planned ongoing consultation strategy.</p>
<p>Proponent has failed to confirm whether agreements between uninvolved landowners that have existing dwellings located within 2km of a proposed turbine have consented according to draft NSW Wind Farm Guidelines. Until such verification Council strongly recommends turbines within 2 km of an existing dwelling shall be deleted.</p>	<p>As outlined above, the gateway process proposed in the draft guidelines is not in effect and does not apply to the project.</p>
<p>Council requests that the mitigation measures listed in section 9.4 of the EIS be imposed as conditions on any development approval.</p>	<p>These mitigation measures in relation to visual impact are included in the Statement of Commitments.</p>
<p>Detailed construction noise management plan to be imposed as condition on any development approval</p>	<p>A construction noise management plan will be included as part of the CEMP prior to the commencement of construction.</p>
<p>Fire management mitigation measures listed in section 14.5.4 as minimum to be imposed as condition. Council is supportive of the preparation of a bushfire management plan in consultation with the NSW Rural Fire Services</p>	<p>Noted.</p>
<p>Traffic and transport assessment is grossly inadequate in assessing the capacity of the proposed access road in identifying likely impacts to council's road network. No assessment against Council's road standards and council's engineering staff have not been involved in any discussion with respect to use of Council roads.</p>	<p>Please refer to the revised Traffic and Transport Assessment (Appendix E). The Proponent has engaged with Council and has in-principle agreement on the standards to be applied and details of local roads to be upgraded for use as access routes to the wind farm site.</p>
<p>Assessment calculates traffic on a single direction basis only. Standard traffic engineering practice is to refer to traffic both to and from the site. As a result this increase in traffic volume has significant bearing in the assessing the suitability and impacts on council's road assets and safety considerations.</p>	<p>The revised Traffic and Transport Assessment has assessed traffic movements in both directions – see Appendix E.</p>
<p>Internal electricity cable network construction traffic has not been considered.</p>	<p>The revised Traffic and Transport Assessment has assessed traffic movements associated with the installation of underground and overhead powerlines within the wind farm site as well as the construction of the collection and connection substations.</p>
<p>Non adequate data to support traffic data calculation.</p>	<p>Additional details of the calculations used to estimate traffic</p>

Issue	Response
<p>Data required: Supply and delivery of gravels and road building materials. The location of likely sources should also be provided. Supply and delivery of concrete (batched on site or off-site). The location of likely suppliers. The supply and delivery of reinforcing steel. The likely routes to be used by construction staff when travelling to and from the site. The supply and delivery of materials (poles, wires, concrete) proposed to be used in the construction of the interconnecting power line and transport methods used.</p> <p>No detail on expected traffic volumes for vehicle types for each specific access route (secondary and primary). Without data detailing proposed vehicle movement it is not possible to adequately assess the impacts of the project.</p>	<p>volumes is included in the revised Traffic and Transport Assessment, including the expected source and delivery routes for all construction materials.</p>
<p>Specific concern is the proposed use of residential streets for movement of heavy vehicles and oversized loads to the site e.g. the proposed route directly passes the site of a child care centre as well as numerous residential properties and council has concerns regarding road safety along this route. Assessment doesn't adequately identify the risks nor does it provide sufficient information to make an assessment of potential impacts.</p>	<p>The preferred access routes for oversize and overmass vehicles has been refined following further consultation with all three councils. All vehicles using public roads will need to comply with the relevant regulations and agreed traffic management measures to ensure that the safety of the community and other road users isn't compromised.</p>
<p>No specific assessment of suitability i.e. width, alignment, structural capacity of proposed route. Local roads are lightly constructed pavement and narrow with poor vertical and horizontal alignment and not considered suitable for proponents intended use particularly for frequent heavy loads. Significant upgrading works are considered necessary to ensure unsafe conditions are not created and community not left with unfair burden of deteriorated road network.</p>	<p>A preliminary assessment of the suitability of the proposed access routes has been carried out by specialist traffic engineers. A route survey was also carried out by a turbine supplier together with an oversize load transport contractor. The assessments included identifying any issues at particular intersections and the minor upgrades that may be required on certain sections of local roads – refer revised Traffic and Transport Assessment in Appendix E for further details.</p>
<p>Vegetation along the routes is also likely to need significant remediation works to ensure large loads are able to safely utilise the routes.</p>	<p>Where vegetation clearance or tree trimming will be required on the proposed access routes this has been included in the biodiversity impact assessment.</p>
<p>Particular concern is a small bridge on Cooks Hill Road. It will require full structural analysis and may need to be upgraded by proponent. Also other sections of road which are already poor and will need to be upgraded to ensure the continued safety of road users.</p>	<p>The revised site access route no longer uses this section of Cooks Hill Road.</p>
<p>Traffic management plan must be prepared prior to consent being granted to ensure all issues can be adequately addresses early in the process creating certainty for all parties. Council considers that the TMP must be prepared prior to consent being granted to ensure adequate due diligence for subsequent purchasers</p>	<p>The revised Traffic and Transport Assessment has been developed following extensive consultation with all three councils to address the concerns about the use and upgrades required to the local road network. The Traffic Management Plan will be developed in consultation with the councils, RMS and the selected transport contractor prior to the commencement of construction.</p>
<p>Council will not accept the laser car profilimeter method of assessing the condition of the existing pavements as it is mostly suited to assessment of average condition of a long length of road network. Not particularly useful in</p>	<p>The Proponent has actively engaged with all three local councils regarding the proposed upgrades to the local road network. In-principle agreements have been reached on details of the road standards and road segments which require upgrades.</p>

Issue	Response
determining how much damage has occurred to a pavement due to particular type of usage and it overlooks small defects. Inappropriate for gravel roads due to changing nature of surface. Council prefers to negotiate a suit of works prior to commencing that will provide a better outcome for all concerned	
Council requests that a condition to obtain extraction licence from the NSW Office of Water be imposed on any development approval	Any water extracted from underground or surface water sources will need to meet the NSW Office of Water regulations and licence requirements.
Council requests that mitigation measures listed in section 15.5 of the EIS be imposed as a condition on any development approval	The proposed mitigation measures in relation site drainage and hydrology are included in the Statement of Commitments (SoC 60 to 65).
Council believes DPE and OEH should review the biodiversity assessment in regards to significantly affect threatened species identified in the EIS, particularly that a species impact statement is unnecessary.	The biodiversity assessment has been prepared in accordance with the requirements set out in the DGRs. Following feedback and consultation with OEH, a number of additional studies have been incorporated into the biodiversity addendum report – refer Appendix C for further details.
Council recommends that DPE, NSW OEH and South East Local Land Services undertake a detailed assessment of proposed clearing of 66 ha of Box-Gum Woodland and grassland prior to issuing development approval	The biodiversity assessment has been updated to incorporate the updated impact areas from the revised wind turbine and related infrastructure layout presented in the Report.
Council recommends that DPE require further assessment to be undertaken in relation to the impact of the proposal on the Golden Sun Moth, Striped Legless Lizard, Superb Parrot and Painted Honeyeater prior to issuing any development approval.	Additional studies requested by OEH, including for Golden Sun Moth, Striped Legless Lizard and Superb Parrot have been incorporated into the biodiversity addendum report (Appendix C)
Council satisfied with Aboriginal and European Heritage assessment but recommendation made in section 12.4 of the EIS should be imposed as conditions on any development approval	The recommend measures for managing heritage impacts are included in the Statement of Commitments (SoC 40 to 46).
Council requests condition to be imposed that any development approval includes a decommissioning and rehabilitation management plan prior to decommissioning the infrastructure. This should include a detailed flora and fauna management plan.	A draft Decommissioning and Rehabilitation Plan was included as part of the EA and is also included in Appendix G of the Report.

9.4.4 NSW Trade and Investment – Minerals Resources Branch (104054)

Comments	Response
The Proponent is encouraged to continue to liaise with holders of mineral exploration licenses to ensure that no potentially prospective areas will be compromised by the project.	Refer updated map in section Figure 7-2 which shows the location of current mineral exploration licence areas relative to the wind farm. Details of current correspondence with the mineral licence holders are also listed.
Petroleum Special Prospecting Application 60 held by a NSW Aboriginal Land Council exists over a broad regional area that includes the wind farm site.	This licence area is included in the updated map in section 6.3.

9.4.5 NSW Trade and Investment - Crown Lands (104056)

Comment	Response
<p>A number of the proposed turbines sites are located close to Crown roads. The proposed location cannot impact on road usage or it could be considered a breach of Section 5 (1) of the Roads Act 1993. In those circumstances there are two options:</p> <ul style="list-style-type: none"> • Relocate the turbine such that the structure and blade overhang do not encroach on the road reserve; or • Arrange for the adjoining landowners to close and purchase the roads if it is no longer required for access. 	<p>The closest turbine is more than 350 m from a from a formed Crown road. For the current revised project layout there are no turbines on or overhanging unformed Crown roads. Refer section 3.11 for more details.</p>
<p>If there are any subsequent changes to turbine locations, Crown Lands should be advised.</p>	<p>Noted</p>
<p>Turbine RYP16 close to Lot 7001 DP 1026328. This is subject to Aboriginal Land Claim 9395. Ensure no infrastructure encroaches on reserve. Similarly for turbine RYP 48 on Lot 7301 DP 1147658 and Hume Trig.</p>	<p>There is no infrastructure located on or over the Crown lots or trig reserves. Refer section 3.11 for more details.</p>
<p>Ensure no encroachment of work compounds on nearby Crown roads and impact its use for access.</p>	<p>Noted</p>
<p>The overhead transmission line crossing Blakney Creek and passing through Lot 7002 DP 84687 is subject to ALC 10992. This will need to be determined by the Minister and any appeal period expires before this lot can be considered. The proponent should relocate the transmission line.</p>	<p>The proposed transmission line has been relocated to avoid Lot 7002/84687.</p>
<p>Both overhead transmission lines traverse Crown roads and waterways and provisions need to be made to authorise these crossings</p>	<p>Prior to the commence of construction a licence will be obtained from Crown Lands for all powerlines or access tracks which cross or encroach on formed and unformed Crown roads.</p>
<p>A proposed access track through Lot 7001 DP 1026213. This Lot is reserved for Trig purposes (Blakney Trig) but is subject of ALC 9319. Until this claim is determined and any appeal period expires, consideration should be given to relocating the access track away from this Lot. In addition, the proponent should consider the consent requirements of Survey Infrastructure & Geodesy Section of Land and Property at Bathurst.</p>	<p>The access track has been relocated away from Lot 7001 DP 1026213.</p>
<p>Proposed access tracks would travel down the affected Crown roads for distances for varying distances. Given policies on construction of Crown roads, the proponent should approach the local Council and seek their concurrence to the transfer of the roads in question to that Council's control, together with any conditions of consent.</p>	<p>Prior to the commence of construction a licence will be obtained from Crown Lands for all powerlines or access tracks which cross or encroach on formed and unformed Crown roads.</p>

9.4.6 Department of Primary Industries (104416)

Comments	Response
<u>NSW Office of Water</u>	
Any proposal to install or utilise new pumping works at Yass Dam and any proposal to source water from Burrinjuck Dam to be discussed with NSW office of Water prior to commencement.	Noted
Water crossings must be in line with Guidelines for Controlled Activities on Waterfront Land. Statement of Commitment related to hydrology to be consistent with “Guidelines for Controlled Activities on Waterfront Land (2012)”.	Noted
Consult with Office of Water in regards to the development of the CEMP and associated Soil and Water Management Plan	Noted
<u>Fisheries NSW</u>	
The wind farm lies within catchment which supports Southern Pygmy Perch (endangered under Part 7A of Fisheries management Act 1994). The upper Lachlan River is known habitat for Macquarie Perch which is listed as endangered under the FM Act and endangered under EPBC Act. The EIS has not considered the potential for impacts on these species.	The Biodiversity Assessment Addendum (Appendix C) has considered the potential impacts to the Southern Pygmy Perch and Macquarie Perch.
<p>Potential for indirect water quality impacts upon downstream aquatic environments associated with earthworks during construction, particularly tracks and underground cabling installation.</p> <p>Fisheries NSW requests the following conditions of consent:</p> <ul style="list-style-type: none"> • Draft Erosion and Sediment Control Plan (ESCP) to be provided to Fisheries NSW for comment • Proponent must engage an independent and suitably qualified person to carry out periodic audits after commencement of construction to verify implementation of ESCP. • Proponent must provide copies of each audit report to Fisheries NSW 	Noted
No concerns on 1 st and 2 nd order waterway crossings. Waterway crossings should be appropriately designed, sized and sited to minimise risk to erosion and sediment generation	Noted
Request condition of consent that the Proponent must consult with Fisheries NSW in relation to the design of the proposed upgraded waterway crossing of Blakney Creek (3 rd order watercourse). The intent is to provide or limit fish passage and to ensure that the introduced predator Redfin does not further invade Blakney Creek.	Noted

9.4.7 Office of Environment & Heritage – Biodiversity (104529)

Issue	Response
<u>Constraints analysis</u>	
The proposal continues to include a 45m wide transmission line easement through High Constraint, Critically Endangered Box-Gum Woodland Ecological Community.	The transmission line has been relocated to minimise the impact on Box-Gum Woodland, however there remains some impact which will be offset.
The high constraint Superb Parrot nest tree buffer west of WTG 143 has a road and underground cable running through it. Other hollow-bearing trees that may be potential Superb Parrot nest trees should be preserved within buffer and construction should be excluded.	Turbine 143 has been relocated 35 m so that the road and underground powerline avoid the nest tree buffer.
There are road and cables going through high constraint Golden Sun Moth areas northwest of turbine 73, west of turbine 98 and 99, and south of turbine 47.	Turbines 73, 98, 99 and 47 have been relocated to reduce the impact on the GSM area by the associated roads and underground powerlines.
The high constraint area for Striped Legless Lizard at turbine 27 is impacted by construction of turbines and tracks.	Turbine 27 has been deleted to avoid the potential impact on Striped Legless Lizard habitat
If construction to be undertaken in high constraint areas, offset for loss to be calculated at a higher ration than for mod or low constraint	Noted
High constraint mapping within large contiguous woodland and forest blocks should consider the edge effects from widening of roads and also indirect impacts of close proximity to turbines from noise and disturbance. The distance of disturbance impacts should be at least 100 m.	<p>Most tracks near areas of large contiguous woodland already exist and do not need substantial widening. The greatest impact is where new tracks diverge from the main track to turbine locations. These impacts cannot be reduced any further without removing the wind turbines.</p> <p>Buffer distances to wind turbine locations were discussed with OEH during a site visit in February 2014 and in the absence of any other research-based guidelines it was decided to apply the formula presented by Natural England (2012) which resulted in applying a buffer distance of 70 m.</p>
<p>Construction of turbine 102, 103 and 104 and the creation of new easements through remnant forest/woodland will inflict edge effects such as weed invasion and provision of suitable habitat for the aggressive Noisy Miner.</p> <p>Consider edge effects on woodland birds and threatened species in moderate constraint woodland near WTGS 102, 103 and 104</p>	Turbines 102, 103 and 104 have been relocated to reduce the impact and edge effects on areas of remnant forest/woodland.
<u>Hollow Bearing Trees (HBT)</u>	
OEH has concerns about the methodology used to estimate numbers of HBT and the potentially very large impact that the removal of over 1,000 HBT could have on the hollow-dependant fauna in this over-cleared landscape.	Please refer to Appendix C for details of the revised methodology and additional HBT survey work completed.
The project design must demonstrate that high conservation biodiversity features, such as large HBT in	See results of revised HBT assessment in Appendix 3 which demonstrates the reduced impact on large HBTs from the refined

Issue	Response
an over-cleared landscape have been avoided where possible.	infrastructure layout.
OEH advised that offset ratios for HBT that represent suitable potential habitat for threatened species range from of 5:1 to over 10:1.	Offsets for impacts on HBTs has been included in the updated Biodiversity Offset Strategy – see Appendix 3.
OEH seeks clarification on the number of plots surveyed to date for HBT	34 Patches were surveyed across the site. Please refer to section 3.5 of the Biodiversity Addendum (Appendix 3) for more details of the HBT methodology.
The proposal continues to include several turbines within High Constraint, Critically Endangered Ecological Ecosystem (CEEC). OEH reiterates previous advice that turbine 110 should be removed and turbines 106, 107 and 109 should be removed or seasonally shutdown to avoid the breeding season of the Superb Parrot and Painted Honeyeater.	Turbines 106, 107, 109 and 110 have been deleted to reduce the impact on CEEC and avoid potential impacts to the Superb Parrot and Painted Honeyeater.
OEH considers that turbine 104 should be removed to avoid impacts to hollow-dwelling fauna that would occupy this remnant high conservation value area.	Turbine 104 has been relocated to reduce the potential impact on hollow-dwelling fauna in the adjacent area.
<u>Box Gum Woodland EEC</u>	
<p>All BGW EEC to be classified as Moderate to Good and mapped with one of following descriptions:</p> <ul style="list-style-type: none"> • BGW with native understory and intact overstorey, • BGW with intact overstorey and non-native groundcover and • BGW as native ground cover without overstorey 	Noted. Please refer to section 4.6 of the Biodiversity Addendum (Appendix 3) for more details of the revised vegetation classification and condition.
<p>Inconsistent figures for hectares of EEC to be impacted – 40 ha of NSW BGW EEC, 12 of which are CEEC (P188 and 196 of EA, p84 of BA)</p> <p>OR 31 ha of BGW EEC (Table 7.3 [p85 of BA], Table 11.5 [p195 of EA] and Section 7.5.6 [KTP p106 BA])</p>	Updated impact areas have been included in the Biodiversity Addendum (Appendix 3)
<u>Impact Assessment</u>	
Collision risk re Wedge-tailed Eagles [n=6] per annum significant – analysis required regarding impact of this rate of eagle deaths on the local and regional ecology.	Refer section 4.7 of the Biodiversity Addendum (Appendix 3) for updated assessment.
Wedge-tailed Eagle nests to be buffered by 200m.	The closest turbine in now more than 500 m way from Wedge-tailed Eagle nests
<p>Identify trees which constitute potential nesting habitat for Superb Parrot. Any loss of trees with hollows >5cm to be quantified and offset at recommended species-specific ratio.</p> <p>Superb Parrot test of significance – cannot be substantiated as nest trees may be cleared outside of surveys in restricted focal areas.</p>	Refer to section 4.1 of the Biodiversity Addendum (Appendix 3) for updated assessment of potential impacts on the Superb Parrot.

Issue	Response
<u>Avoidance, Mitigation and Offset</u>	
<p>All surveys and finalisation of layout to be completed prior to approval.</p> <p>OEH does not support micro-siting post-approval</p> <p>OEH does not support post approval survey and identification of suitable offset sites.</p>	<p>The nature of wind farms means that some micro-siting will be required within the defined turbine and infrastructure corridors.</p>
<p>Section 8 (p110, BA) does not demonstrate that feasible alternatives were considered to siting of infrastructure with significant biodiversity impacts.</p>	<p>Refer to section 3.2 for details of changes made to the siting of infrastructure since the exhibition of the EA to further reduce significant biodiversity impacts.</p>
<u>Adequacy of surveys</u>	
<p>Further information required on timing and species targeted in threatened flora surveys undertaken.eg Crimson Spider Orchid targeted systematic survey in appropriate season required in all areas of woodland and grassland potentially impacted.</p>	<p>Refer section 3 of the Biodiversity Assessment Addendum (Appendix C) for further information on the additional studies undertaken.</p>
<u>Consistency with DGRs</u>	
<p>Surveys only done in moderate or good condition BGW and derived grassland not all woodland and grassland</p>	<p>Refer to section 4.6.2 of the Biodiversity Assessment Addendum (Appendix C) for further information.</p>
<p>Targeted searches only done for Hoary Sunray, Yass Daisy and Tarengo Leek Orchid. OEH consider DGRs list five subject species and a further seven species</p>	<p>Refer to section 3.6 of the Biodiversity Assessment Addendum (Appendix C) for further information on updated desktop assessment including relevant searches of state and Commonwealth threatened species databases.</p>
<p>Further assessment required for Striped Legless Lizard and Golden Sun Moth to meet DGRs. Site visit held to advise the methodology but information on additional survey work has not been provided.</p>	<p>Refer to section 3.1 of the Biodiversity Assessment Addendum (Appendix C) for additional Striped Legless Lizard and Golden Sun Moth habitat studies.</p>

9.4.8 Office of Environment & Heritage – Aboriginal Cultural Heritage (104529)

Comment	Response
<p>OEH recommends that if all required archaeological assessment investigations cannot be undertaken prior to the final approval of the proposed project design that a development condition must be included indicating that all available management measures, including changing the project layout and avoiding any significant areas, will be undertaken if any areas of significant Aboriginal objects or archaeological deposits are subsequently located during additional archaeological surveys and assessments.</p>	<p>Noted and accepted.</p> <p>As well as being part of the conditions of approval, this recommendation has been included in the Statement of Commitments and will be included in the Aboriginal Cultural Heritage Management Plan that would be prepared prior to construction.</p>
<p>Whilst the thirteen Aboriginal sites located with the Project area have been assessed as of low significance OEH advocates for the avoidance of all impacts where</p>	<p>The heritage assessment clearly indicates that undetected Aboriginal artefacts would occur in the proposed development area. For example, some artefacts will be present under grassed</p>

possible.	surfaces and, where soils are sufficiently deep, buried within the soil profile. It has been predicted with a high level of certainty that any additional artefacts would be distributed at very low densities. Even in the event of avoiding the 13 known artefact locales, it is almost certainly the case that impacts would occur to unknown artefacts. Moving the location of infrastructure to avoid the 13 know sites of very low significance is not justified.
The management of Aboriginal sites must be clearly documented within an Aboriginal Heritage Management Plan.	Noted and accepted.

9.4.9 Civil Aviation Safety Authority (104531)

Comments	Response
The Proponent should describe how the 500m buffer zone for aerial agriculture will be promulgated and implemented.	The 500 m buffer zone mentioned in the EA is a suggested buffer distance from wind turbine locations to accommodate a safe turning distance for aerial agricultural aircraft. The responsibility for deciding where aerial agricultural operations can safely be carried out in the vicinity of the wind farm rests with the pilot.
CASA seeks a more detailed analysis of the basis for the risk assessment which determined that obstacle lighting is not considered necessary.	The risk assessment was conducted in accordance with ASNZS ISO 31000-2009 Risk Management and sought to establish the risk to aviation activity in the area of the proposed wind farm through interviews with key aviation stakeholders. The assessment is in accordance with NASF Guideline D paragraph 33 and 34; with a finding that the proposed wind farm is NOT a hazard to aircraft safety.
The wind farm should be marked on appropriate aeronautical charts.	CASA Civil Aviation Safety Regulation 139.365 requires the notification to CASA of the intent to construct a building or structure which will be more than 110 m above ground level. The Proponent will provide CASA with the final coordinates and maximum heights for each wind turbine and wind monitoring mast prior to the commencement of construction. See SoC 11.

9.4.10 Roads and Maritime Services (104533)

Roads and Maritime Services raise no objection to the development as proposed, subject to the following comments being included as conditions in the development consent.

Comment and suggested conditions of consent	Response
A Traffic Management Plan shall be prepared in consultation with relevant road authorities (RMS and Council) to outline measures to manage traffic related issues associated with the delivery and construction of the turbines or ancillary structures, construction materials, machinery and personnel involved in the construction and decommissioning process.	Noted. See SoC 14
The detailed traffic and transport planning for the project is required to involve the appointed transport contractor to determine the final details of haulage, including exact transport routes, road-specific mitigation measures and haulage timing.	Noted
The Proponent must engage an appropriately qualified person to prepare a Road Dilapidation Report for all road routes to be used in consultation with the relevant road authorities prior to commencement of construction and again after construction complete.	Noted
A full and independent risk analysis and inspection of the transport route will be required to	Noted

be undertaken by an appropriately qualified person and a copy provided to the relevant road authority	
Prior to the commencement of construction, the Proponent must undertake all works to upgrade any road, its associated road reserve and any public infrastructure in that road reserve, to a standard suitable for use by heavy vehicles to meet any reasonable requirements that may be specified by the relevant road authority.	Noted
Any disturbances to the road infrastructure within the road reserve of a classified road are to be reinstated to pre-existing or better condition.	Noted
No external lighting at night of any infrastructure associate with the project that may cause distraction to road users is permitted other than low intensity security lighting.	Noted
Vegetation must be cleared and maintained for the duration of construction to provide safe intersection sight distance in accordance with Austroads Guide to Road Design at intersections and proposed access points on private property in all directions.	Noted
Any specific details for construction of, access to and signage associated for any proposed viewing areas along the classified road network are to be developed to the satisfaction of RMS.	No public viewing areas are proposed.
All works associated with the project shall be at no cost to RMS.	Noted

9.4.11 NSW EPA (104535)

Comment	Response
Large scale wind farms that have a capacity for generating more than 30 MW of electricity will require an Environmental Protection Licence under the POEO Act for both the construction and operational phases.	Noted
Noise	
EPA recommends that the proponent provides additional information that demonstrates that Sound Power Levels of the proposed mobile rock crushers. These should be included in the modelling of predicted construction noise levels at receivers.	The predicted noise from mobile crushing and screening plant is 52 dB(A) at a distance of 900 m. Please see table 10 of the revised Noise Impact Assessment (Appendix B).
A detailed construction noise management plan should be developed prior to construction	The construction noise management plan will form part of the Environment Management Strategy to be developed prior to the commencement of construction. See SoC 5.
All construction activities should take place during standard construction hours. EPA requests the Proponent provide additional information / justification in relation to any expected need to undertake work outside the standard hours and demonstrate that the INCG criteria can be met or a noise agreement can be reached with impacted receivers.	The vast majority of construction activities will take place during standard construction hours. As outlined in the EA, there are a small number of activities unique to the installation of wind turbines that may need to be carried out outside of normal construction hours. For example, the installation of tower sections or lifting of turbine rotors that can only be carried out during periods of low wind speeds.
The proponent should clarify whether the transportation of water will also occur at night in coincide with the operation of the concrete batching plants. This should be clarified by the proponent.	The transport of water and operation of concrete batching plants will be carried out during standard construction hours.
To ensure the NIA accurately reflects the noise	It is predicted that a distance of 10 m from the roadside the

Comment	Response
<p>generated by traffic movements along the transport route at sensitive receivers, EPA recommends the proponent provides additional information that demonstrates an assessment in accordance with the RNP confirms the assertions above.</p> <p>The additional information should include a noise contour map that clearly defines all transport routes and identifies all sensitive receivers in order to demonstrate via noise prediction modelling compliance with the 55 dB(A) LAeq guideline.</p>	<p>criterion can be achieved for 10 passenger vehicle movements and 3 heavy vehicle movements in one hour. The number of vehicle movements can double for ever doubling of distance from the roadside and continue to achieve the 55 dB(A) criterion.</p> <p>A number of mitigation measures have been proposed for dealing with temporary construction traffic noise. Refer to the revised Noise Impact Assessment (Appendix B) for further details.</p>
<p>We note that it is usual for conditions of approval to require an on-ground compliance assessment performed once the constructed wind turbines commence operation</p>	<p>Noted. All conditions of approval will be complied with. See SoC 6.</p>
<p>The proponent must demonstrate compliance with the noise criteria established for the project. Where compliance cannot be demonstrated the wind turbine should be removed or relocated to achieve the relevant criteria at all receptor locations. Alternatively, the proponent may seek to negotiate a noise agreement with affected receivers. (EPA doesn't want sound management mode)</p> <p>The EPA recommends a revised NIA be undertaken for the proposal following final turbine model, layout and hub height selection demonstrating that noise criteria will not be exceeded.</p>	<p>Refer revised Noise Impact Assessment (Appendix B) attached to this Report which demonstrates full compliance of the current 109 turbine layout without the need for any sector management or sound management modes.</p>
<p><u>Air Quality</u></p>	
<p>EPA recommends the proponent prepare an Air Quality Management Plan to be incorporated into the CEMP to manage dust impacts as per SoC 82.</p>	<p>Noted</p>
<p><u>Soil and water</u></p>	
<p>EPA requests the proponent prepare a Sediment and Erosion Control Plan to be incorporated into the CEMP to manage soil and water impacts as per SoC 61</p>	<p>Noted</p>
<p><u>Waste and contamination</u></p>	
<p>The EA does not provide details in relation to waste management and disposal including :</p> <ul style="list-style-type: none"> • Volumes and types of surplus fill and other material • The management strategy for any contaminated spoil or materials <p>EPA requests the proponent refine the wording in SoC 67</p>	<p>The further details on waste management including volumes and types of surplus fill and strategy for any contaminated spoil or materials will be incorporated into the Environmental Management Strategy. Refer updated wording in SoC 22.</p>

9.4.12 Department of Defence (104539)

Department of Defence does not object to the proposal and provide the following comments.

Comment	Response
As constructed details of the wind farm to be provided to RAAF Aeronautical Information Service (AIS) for charting, using the Vertical Obstruction Report Form at www.raafais.gov.au/obstr_form.htm	Noted.
Defence requests that the Wind Farm should be lit in accordance with CASA regulation 139 and CASA Manual of Standards 139. If LED obstruction lighting is applied the frequency range of the emitted LED light is to fall within the wavelength range of 655 to 930 nanometres to enable the lighting to be visible to persons using night vision devices.	The Proponent has corresponded with CASA and the independent Aviation Impact Assessment (Appendix H) confirmed that obstacle lighting is not considered necessary for the Rye Park Wind Farm.
Department of Defence to be consulted should there be any subsequent modification to the design, scale, location or intensity of the wind farm.	Noted. Final details of wind turbine and wind monitoring masts locations and heights will be provided to the Department of Defence prior to construction. See SoC 11.

9.4.13 Airservices Australia (104634)

Comment	Response
If the proponent wishes to proceed with the wind farm to a height of 927 m (3,042 ft) AHD, a NOTAM will be required from Airservices to permanently raise all of the above affected air routes LSALT to 4,000 ft. Airservices require at least 2 business days to issue the relevant NOTAM prior to commencing construction.	This airspace procedures requirement is noted.
The wind farm will not affect Canberra Air Traffic Control Centre (RTCC) and does not fall within 30 NM of any aerodrome that has existing instrument procedures.	Noted
This wind farm to a maximum height of 927m will not impact the performance of Precision/Non-Precision Nav Aids, HF/VHF Comms, A-SMGCS, Radar, PRM, ADS-B, WAM or Satellite/Links	Noted

10 STATEMENT OF COMMITMENTS

Although Statement of Commitments are not specifically required to be provided by the Proponent for State Significant Development projects, they have been included in this Report to demonstrate to all stakeholders how the Proponent will implement measures for environmental mitigation, management and monitoring for the project. In general, these issues will be incorporated and addressed in an Environmental Management Strategy which will provide a framework for environmental management of the development.



SoC	Issue	Impact	Objective	Mitigation tasks	Project phase	Auditing
1	General	Revisions to approved development	No material increase in impact	Ensure that any minor changes, including micro-siting within the Turbine Corridors and Infrastructure Corridors, to the proposed development do not create any material increase in overall environmental impacts as assessed.	Design	DPE
2	General	All environmental impacts	Mitigate impact	Implement an Environment Management Strategy prior to the commencement of construction in accordance with the Best Practice Guidelines for Wind Energy Projects (Auswind, 2006).	Construction	DPE
3	Visual	Deterioration of visual amenity	Mitigate impact	Following the commencement of construction, the Proponent will implement visual impact mitigation measures within 12 months of receiving a written request from any non-associated residence that is located within 4 km of any wind turbine.	Post Construction	DPE
4	Visual	Shadow Flicker	Mitigate impact	The Proponent will ensure that shadow flicker associated with wind turbines does not exceed 30 hours per year at any non-associated residence.	Operation	DPE
5	Noise	Construction noise	Minimise Impact	The Proponent will implement all reasonable and feasible measures to minimise construction noise, including any associated traffic noise. Noise generated by construction or decommissioning activities will be managed in accordance with the best practice requirements outlined in <i>the Interim Construction Noise Guideline</i> (DECC 2009).	Construction	Environment Management Strategy
6	Noise	Operational noise	Compliance	The Proponent will ensure that the noise generated by the operation of wind turbines does not exceed the relevant criteria measured in accordance with the relevant requirements of the South Australian EPA's <i>Wind Farms – Environmental Noise Guidelines 2009</i> for any non-associated residence. Within 3 months of the commencement of operation the Proponent will undertake noise monitoring and provide a report of the results to DPE and EPA.	Operation	EPA

<i>SoC</i>	<i>Issue</i>	<i>Impact</i>	<i>Objective</i>	<i>Mitigation tasks</i>	<i>Project phase</i>	<i>Auditing</i>
7	Ecology	Biodiversity impacts	Minimise impact	Prior to the commencement of construction the Proponent will prepare a Biodiversity Management Plan in consultation with OEH. The plan will include measures to minimise the amount of clearing required for the development, protecting vegetation and fauna habitat outside the disturbance area, minimising impacts on tree hollows, controlling weeds, controlling erosion, bushfire management and a bird and bat adaptive management plan.	Construction	OEH
8	Ecology	Native vegetation and habitat	Offset	The Proponent will provide appropriate biodiversity offsets in accordance with the Biodiversity Offset Strategy.	Operation	OEH
9	Heritage	Aboriginal and historic heritage items	Minimise impacts	Prior to the commencement of construction, the Proponent will prepare a Heritage Management Plan in consultation with OEH and Aboriginal stakeholders which outlines measures to minimize and manage any impacts to any Aboriginal heritage items within the project disturbance area.	Detailed design	OEH
11	Aircraft Hazards	Potential hazard	Minimise Impact	Liaise with all relevant authorities (CASA, Airservices, and Department of Defense) and supply location and height details once the final locations of the wind turbines and wind monitoring masts have been determined and before construction commences.	Detailed design	Environment Management Strategy
12	Aircraft Hazards	Potential hazard	Minimise Impact	Consult with the landowners and appropriate licensed contractors to discuss alternate measures for aerial spreading in areas affected by the turbines. The Proponent has also committed to reimbursing any landowner in the event that they incur any additional costs for aerial agricultural operations on their land as a direct result of the wind farm.	Operation	Environment Management Strategy
13	Telecommunication	Deterioration of signal strength	Avoid impact	The Proponent will make good any disruption to radio or telecommunication services in the area caused by the construction of the wind farm.	Operation	Environment Management Strategy
14	Traffic	Safety and asset protection	Minimise impact	The Proponent would develop and implement a Traffic Management Plan in consultation with RMS and Councils to facilitate appropriate management of potential traffic impacts.	Detailed design	Environment Management Strategy

<i>SoC</i>	<i>Issue</i>	<i>Impact</i>	<i>Objective</i>	<i>Mitigation tasks</i>	<i>Project phase</i>	<i>Auditing</i>
15	Traffic	Safety and asset protection	Minimise impact	Prior to the commencement of construction the Proponent will carry out any necessary upgrades to the local roads to be used during construction in consultation with the roads authority.	Construction	Environment Management Strategy
16	Traffic	Safety and asset protection	Minimise impact	The Proponent will prepare a pre-dilapidation survey of the transport route prior to construction and a post-dilapidation survey after construction and will make good any project-related damage as soon as practicable.	Construction	Environment Management Strategy
17	Bushfire	Bushfire risk	Minimise Impact	Prepare a Bushfire Management Plan as part of the Environment Management Strategy in consultation with the Rural Fire Service and NSW Fire Brigade in order to manage bushfire risks during construction, operation and decommissioning.	Construction Operation	Environment Management Strategy
18	Hydrology	Deterioration of water quality	Minimise Impact	The Proponent will ensure that the construction, operation and decommissioning of the development does not cause any water pollution.	Construction Operation	Environment Management Strategy
19	Economic	Effect on local community	Maximise positive impacts	Liaise with local industry representatives to maximise the use of local contractors and suppliers in the construction and operation phases of the project.	Detailed design Construction	Project website
20	Economic	Community fund	Maximise local benefits	The Proponent will establish a community benefit fund and offer voluntary neighbour benefit agreements as outlined in this Report	Operation	Project website
21	Health and Safety	Safety of persons	Minimise Impact	The Proponent will prepare and implement a Safety Management System to address safety during the construction and operation phases.	Construction Operation	Environment Management Strategy
22	Resources	Waste generation	Minimise waste	The Proponent will prepare a Waste Management Plan and implement all reasonable and feasible measures to minimise waste generated by the development and maximise recycling of materials	Construction Operation	Environment Management Strategy
23	Community Consultation	Project Information	Community liaison	Continue with the Community Consultation Committee as required during various stages of the project life cycle.	Construction Operation	Environment Management Strategy

11 CONCLUSION

This Response to Submissions Report has investigated and assessed the likely impacts that would result from the construction and operation of the proposed Rye Park Wind Farm, a project capable of generating around 327 MW of renewable energy.

The project has been revised in response to community feedback from consultation efforts and the environmental constraints identified during the assessment process. This report has demonstrated how the feedback and constraints were applied to the design of the wind farm to arrive at the revised project layout. It has also outlined the measures that will be taken to avoid and, if necessary, address the environmental risks and issues that have been identified for the construction, operation and decommissioning stages. These measures are supported by a Statement of Commitments.

The Proponent has prepared updated studies by independent consultants on the key issues of:

- ▶ Landscape and Visual Impact Assessment;
- ▶ Operational and Construction Noise;
- ▶ Biodiversity (Flora and Fauna); and
- ▶ Indigenous Heritage (Archaeology).

Additional studies were conducted in relation to communications, traffic and transport, aviation, existing landscape and community issues such as economic, health and safety and community benefits.

A strategic justification for the project outlined the following benefits at the local, regional and global scales:

- ▶ In full operation, it would generate more than 1,028,000 MWh of electricity per year - sufficient for the average consumption of around 130,000 homes.
- ▶ It would improve the security of electricity supply through diversification of generation locations.
- ▶ It would save 800,000 tonnes carbon emissions per annum, equivalent to removing 260,000 cars off the road.
- ▶ It would contribute to the State and Federal Governments' target of providing 33,000 GWh from renewable sources by 2020.
- ▶ It would contribute to the NSW Government's target of reducing greenhouse gas emissions by 60% by the year 2050.
- ▶ It will provide full time employment for up to 250 staff during construction and up to 12 ongoing regional jobs during its operational life.
- ▶ It will result in a direct injection of approximately \$2-\$3m per annum to the local community through payments to landholders, permanent staff and community fund contributions.

The conclusion of the individual key issue assessments is that the proposed Rye Park Wind Farm can be constructed with minimal impact to the existing environment.

The success of the project in meeting the environmental requirements of "maintain or improve" relies on the effective implementation of an Environmental Management Strategy for effective environmental management of the development. The Proponent is committed to ensuring the measures developed in these plans are best practice to ensure the best possible outcome for the Rye Park Wind Farm as well as the local and wider communities.

12 GLOSSARY & ACRONYMS

<i>Abbreviation</i>	<i>Description</i>
AA	Airservices Australia
ABARE	Australia Bureau of Resource Economics
ABS	Australian Bureau of Statistics
ACMA	Australian Communications and Media Authority
AEMO	Australian Energy Market Operator
ALA	Aircraft Landing Area
An	Annum
APZ	Asset Protection Zone (for bushfire compliance)
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ARTC	Australian Rail Track Corporation
AusWEA	Australian Wind Energy Association (previously Auswind)
BA	Biodiversity Assessment
CANRI	Community Access to Natural Resource Information
CAP	Catchment Action Plan
CASA	Civil Aviation Safety Authority
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Authority
CMP	Construction Management Plan
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
dB(A)	Decibels (A weighted)
DCP	Development Control Plan
DEC	NSW Department of Environment and Conservation (now OEH)
DECC	NSW Department of Environment and Climate Change (now OEH)
DECCW	NSW Department of Environment, Climate Change and Water (now OEH)
DEH	Commonwealth Department of Environment and Heritage, now the Department for Environment and Water Resources
DEUS	NSW Department of Energy Utilities and Sustainability (now OEH)
DEWR	Commonwealth Department for Environment and Water Resources, formerly the Department of Environment and Heritage
DGRs	NSW Department of Planning and Infrastructure's Director General's Requirements.
DPE	NSW Department of Planning and Environment
DPI	Department of Primary Industries
EA	Environmental Assessment report (2014)

<i>Abbreviation</i>	<i>Description</i>
EEC	Endangered Ecological Community
EMF	Electromagnetic fields
EMP	Environmental Management Plan
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
ESD	Ecologically Sustainable Development
FM Act	Fisheries Management Act
GBDLA	Green Bean Design Landscape Architects
GHG	Greenhouse Gas
GWh	gigawatt-hour
ha	hectare (unit of area 100m x 100m)
HBT	Hollow-bearing tree
HF	High Frequency
ICN Guideline	DECC Interim Construction Noise Guideline 2009
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram
kL	Kilolitres
km	kilometre
kV	kilovolt
LAeq	Equivalent Sound Power (A weighted)
LALC	Local Aboriginal Land Council
LCA	Landscape Character Area
LEP	Local Environmental Plan
LGA	Local Government Area
LSALT	Lowest Safe Altitudes
LVIA	Landscape and Visual Impact Assessment
m	meter
m/s	meters per second
mG	milligauss
ML	Megalitres
MRET	Mandatory Renewable Energy Target
MTOW	Maximum Take-off Weight
MW	megawatt
MWh	megawatt-hour
NEM	National Electricity Market
NES	National Environmental Significance

<i>Abbreviation</i>	<i>Description</i>
NPI	National Pollutant Inventory
NRET	NSW Renewable Energy Target
OEH	Office of Environment and Heritage
OEM	Original Equipment Manufacturer
OEMP	Operational Environmental Management Plan
OLS	Obstacle Limitation Surface
PEA	Preliminary Environmental Assessment
POEO Act	Protection of the Environment Operations Act 1997
Proponent	Rye Park Renewable Energy Pty Ltd
Report	This Response to Submissions report
REP	Regional Environmental Plan
RET	Renewable Energy Target
RFS	Rural Fire Service
RMS	Roads and Maritime Service
SA EPA Guidelines	South Australian Environment Protection Authority Environmental Noise Guidelines: Wind Farms (2003)
SIS	Species Impact Statement
SEPP	State Environmental Planning Policy
SKM	Sinclair Knight Merz
SoC	Statement of Commitments
tCO ₂ e	Tonne of carbon dioxide equivalent
TMP	Traffic Management Plan
TSC Act	Threatened Species Conservation Act 1995
TVI	Television Interference
V	volt
VHF	Very High Frequency
W	watt
WHO	World Health Organisation
WTG	Wind Turbine Generator

13 PREPARATION OF REPORT

This Response to Submissions Report was prepared by Epuron on behalf of the Proponent, Rye Park Renewable Energy Pty Ltd. Specific sections were summarised from specialist consultants' reports as detailed in the table below.

<i>Section</i>	<i>Description</i>	<i>Author</i>
5.5	Traffic and Transport	Cardno Pty Ltd ZEM Energy Pty Ltd
9	Visual Assessment	Andrew Homewood Green Bean Design Landscape Architects
10	Operational and Construction Noise	Chris Turnbull Sonus Pty Ltd
11	Ecology	Nick Graham-Higgs ngh Environmental Pty Ltd
12	Aboriginal and European Heritage	Julie Dibden NSW Archaeology Pty Ltd

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Attachment 1 – Involved Land Parcels



Attachment 2 – Residence Coordinates



Attachment 3 - Turbine Coordinates



Attachment 4 – Wind Monitoring Masts



Attachment 5 – Turbine Corridor & Infrastructure Corridor Maps



Attachment 6 – Maps of Infrastructure Changes



Appendix A – Landscape and Visual Impact Assessment



Appendix B – Noise Impact Assessment



Appendix C – Biodiversity Addendum



Appendix D – Heritage Assessment Addendum



Appendix E – Traffic & Transport Assessment



Appendix F – Telecommunications Impact Assessment



Appendix G – Draft Decommissioning & Rehabilitation Plan



Appendix H – Aviation Impact Assessment



Appendix I – Aircraft Landing Areas Assessment



Appendix J – Community and Stakeholder Engagement



Appendix K – Economic Impact Assessment



Appendix L – Planning Assessment Report

