



Mr David Kitto
Director
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

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Attention: Phillipa Duncan

Your Ref: MP/09_0093

Our Ref: 15SUT-3254

16 February 2016

Dear Mr Kitto,

RE: Section 75W request for modification to Approval Conditions – Sapphire wind farm

On behalf of SWF1 Operations Pty Ltd and CWP Renewables, Eco Logical Australia (ELA) is seeking a minor modification under Section 75W of the Environment Planning and Assessment Act 1979, to the approval for the Sapphire wind farm (Reference MP/09_0093).

The June 2013 approval for the project was to construct and operate a wind farm and associated infrastructure comprising up to 159 wind turbines in three clusters with a maximum generating capacity of approximately 238 to 425 megawatts between Glen Innes and Inverell. The dimensions of the wind turbines stated in the Environment Assessment Report (ELA 2011) included a maximum tip height of 157 m, a maximum rotor diameter of up to 126 m and a range of tower heights to suit.

In consultation with the Department of Planning and Environment (DPE) and Office of Environment and Heritage (OEH) in December 2015 and January 2016, the proponent has been advised to prepare a brief letter/report outlining the following:-

- the reasons and justification for the modification
- a demonstration that the impacts to biodiversity values are either the same or less than the approved project
- a recalculation of the offset requirements for the project using the Framework for Biodiversity Assessment (FBA) calculator, with Regent Honeyeater treated as a species credit (or a pro rata extrapolation of the existing BioBanking calculations to maintain consistency with the approved project subject to OEH consultation); and
- a statement committing to meet the offset requirement by securing and retiring the calculated number of biodiversity credits.

This letter addresses these requirements. A similar request to vary the EPBC Act approval has been submitted to the Department of the Environment (DotE).

Reason for modification request

As a result of changed market conditions, including revision of the Renewable Energy Target, and improvements in wind turbine technology since the original referral in 2011 and approval in 2014, the proponent would like modify the approval to reduce the overall number of wind turbines from up to 159 in three clusters to up to 109 in two clusters and increase the maximum tip height and rotor diameter from 157m and 126m respectively to up to 200m and 140m. A summary of changes to the project components is provided in **Table 1**. **Figure 1** shows the location of the 50 turbines to be removed from the project and **Figure 2** shows a comparison of the tower heights and rotor dimensions. The position of each of the 109 wind turbine locations remains as per the original environment assessment report (with micro siting of turbines permitted to avoid impacts to Hollow Bearing Trees), however the modification request also includes a reduction in the maximum width of the internal road network (from up to 12 m to up to 6 m).

Table 1: Summary of changes to Project Components

Project Aspect	Approved project	Proposed Modification	Comparison with Approved Project
Project Site Area of land within the cadastre boundaries of all properties subject to this proposal	14,189 ha	8,921 ha	Reduced by 5,268 ha
Study Area Area within the Project Site comprising a 200 m wide corridor within which the Development Footprint is contained	1,982 ha	1,480 ha	Reduced by 502 ha
Development Footprint Area of all <i>Permanent</i> and <i>Temporary</i> Project infrastructure including temporary disturbances within the Study Area	297 ha	136 ha	Reduced by 161 ha
Project Capacity	To be regulated by grid connection constraints	To be regulated by grid connection constraints	Seeks flexible rather than fixed capacity limit

Permanent Project Infrastructure	Approved project	Proposed Modification	Comparison with Approved Project
Wind turbine generators	Up to 159	Up to 109	Reduced by 50
Tower height	94 m	Up to 130 m	Increase of up to 36 m
Tip height	157 m	200 m	Increase of up to 43 m
Rotor diameter	126 m	140 m	Increase of 14 m
Tower height	101.5 m	137 m	Increase of 35.5 m
Swept area (per turbine)	12,470 m ²	15,396 m ²	Increase of 2,926 m ²
Swept Area (whole Project)	1,982,825 m ²	1,678,142 m ²	Reduced by 304,000 m ²
Hardstands (25 x 50 m)	1,250 m ²	1,250 m ²	No change
Footings ¹	400 m ²	625 m ²	Increase of 225 m ²
Road length	78 km	54 km	Reduced by 24 km
Road width	12 m	6 m	Reduced by 6 m
Overhead electrical reticulation and control cables ²	10 km	16.6 km	Increase of 6.6 km
Collector substation location options		2	Reduced from six options
Collector substation ³	2 ha	4 ha	Increase of 2 ha
Site office / Facilities buildings ⁴	3,000 m ²	400 m ²	Reduced by 2.6 ha

Permanent Project Infrastructure	Approved project	Proposed Modification	Comparison with Approved Project
Site compound ⁵	3 ha	3 ha	No change

Temporary Project Infrastructure	Approved project	Proposed Modification	Comparison with Approved Project
Earthworks alongside Permanent Infrastructure (cut and fill which also envelopes the following temporary infrastructure) ⁶	148 ha	75.5 ha	Reduced by 72.5 ha
Concrete batch plant options	7	6	Reduced by one option
Concrete batch plant	1.0 ha	0.5 ha per optional site	Reduced by 0.5 ha
Rock crushing facilities options	3	2	Reduced by one option
Rock crushing facilities	0.6 h per optional site	0.3 ha per optional site	Reduced by 0.3 ha
Construction compound (additional)	6 ha	3 ha	Reduced by 3 ha

¹ Included within permanent Development Footprint calculation and relates to the approximate area (per turbine) that will remain a permanent impact adjacent to the hardstand area. Temporary impacts associated with construction of the footings have been captured in the temporary earthworks area calculation.

² The estimated easement width is up to 45 m for the internal overhead transmission lines, though the actual impact area has been estimated to be 5 % (a 2.25 m corridor) of this total area given the low level of impacts associated with installing the power/transmission lines and the sparse vegetation cover along the selected routes. (Note the increase of 6 km is due to the inclusion of all preferred and alternate routes in the total figure whereas previously the Environmental Assessment only calculated the length based on the preferred easement route).

³ The increase is to accommodate a substation suitable of accommodating suitable equipment for multiple connections under the TransGrid Renewable Energy Hub proposal. Under a Project only connection the substation footprint would not alter from the previously approved area of 2 ha.

⁴ The site office and facilities buildings were previously considered a temporary impact. While there will be temporary site office and facility buildings, there is also a need for a permanent area to locate these facilities.

⁵ The construction compound will consist of a fenced off area for the storage/lay-down of tools, vehicles, equipment, construction materials, turbine components. Following construction, one compound will be retained as a permanent area for the operational life of the wind farm for component storage and as an optional facility management building location.

⁶ Construction of the internal road and hardstand network will require earthworks that are beyond the limits of the permanent road impact within the Study area. This is required to level areas of steep gradient to a design suitable for safely transporting Project components into position. Detailed civil designs have been prepared for the Project that include impacts associated with permanent road, hardstand, footings and turning head areas in addition to the area considered the extent of the earthworks.

Changes to impact levels to biodiversity values, including listed ecological communities and threatened species.

The 2011 Environment Assessment report (ELA 2011) assessed and quantified impacts to native vegetation and threatened species habitat both in terms of direct impacts (permanent vegetation clearing for turbine hard stands and access roads and temporary impacts associated with road construction and turbine footing construction) and indirect impacts (potential bird and bat strike in the 'swept area' of turbines and displacement / avoidance of avifauna populations around turbines. These impacts were expressed as areas of vegetation/potential habitat in different broad condition states (i.e. intact woodland, scattered paddock trees over exotic pasture and derived native grasslands) impacted as well as the number of biodiversity credits calculated using v2.0 of the BioBanking Assessment Methodology (BBAM 2008).

The approved project would have resulted in up to 288.8 ha of impacts to five vegetation types including two TSC Act listed endangered ecological communities (EECs) ('*White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands*' and '*Ribbon Gum, Mountain Gum, Snow Gum Forest/Woodland of the New England Tablelands*'). The modified project will result in a significant reduction to the area to 126.22 ha of direct and indirect impacts to native vegetation including the two EECs which will be reduced from 45.5 ha to 12.0 ha and 240.9 to 114.22 ha respectively (**Table 2** and **Figure 3**).

Table 2: Comparison of impacts to native vegetation communities for approved project and proposed modification

Vegetation Type & BioMetric Condition	Condition / Structure	TSC Act Status	EA Report Impacts 159 turbine / 12m road	Proposed Modification (Up to 109 turbines), 6m road	Change compared to Approved Project
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Native Pasture	Native Pasture	EEC	10.6	1.3	9.3 ha reduction
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Paddock Trees	Paddock Trees	EEC	5.5	0	5.5 ha reduction
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Woodland	Woodland	EEC	1.5	0	1.5 ha reduction
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Moderate to Good, Native Pasture	Native Pasture	EEC	14.3	6.73	7.57 ha reduction
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Low	Paddock Trees	EEC	4.3	0.29	4.01 ha reduction
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Moderate to Good, Trees	Woodland	EEC	9.3	3.68	5.62 ha reduction
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Moderate to Good, Native Pasture	Native Pasture	EEC	89.9	47.34	42.54 ha reduction
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Low	Paddock Trees	EEC	50.5	22.4	28.1 ha reduction
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Moderate to Good, Trees	Woodland	EEC	100.5	44.48	56.02 ha reduction
Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion, Moderate to Good, Native Pasture	Native Pasture		1.3	0.49	0.81 ha reduction
Tenterfield Wollybutt - Silvertop Stringybark open forest	Woodland		1.1	0	1.1 ha reduction
Total Vegetation			288.8	126.22	162.58 ha reduction

Biodiversity Offset Requirements

Due to changes to the assessment methodology since the Environment Assessment Report was prepared in 2011 from the BBAM to the Framework for Biodiversity Assessment for Major Projects (the FBA was introduced in October 2014), the impacts of the proposed modification has been assessed using both a pro-rata extrapolation of the same credits required per hectare for each vegetation zone impacted as the 2011 assessment (as discussed with OEH North-east Branch) and by the Framework for Biodiversity Assessment (as requested by the NSW Department of Planning and Environment to meet NSW/C'wealth bilateral modification assessment requirements).

It is noted that BBAM 2008 and the FBA whilst using the same BioMetric Vegetation types and plot data result in different numbers of credits 'required' for impacts due to changes to a range of data sources used in the calculations (e.g. changes to the categorisation of certain threatened species as either ecosystem or species credit species, the introduction of threatened species and EEC multipliers, changes to vegetation type benchmarks, changes to landscape assessment methods etc) which result in different site value scores and thus numbers of credits required for impacts (The site value score is a condition score out of 100 for each vegetation zone). Further under the FBA, vegetation with a site value score less than 17/100 (i.e. vegetation in very poor condition) does not require an offset.

Ecosystem Credits

The approved project required **5,464** ecosystem credits for the 288 ha of impacts (ELA 2011). This is equivalent to an offset area of approximately 607 ha (based on the average BioBank site under BBAM 2008 generating around 9 credits per hectare) (**Table 3**). Using the same BBAM 2008 methodology and calculations, the proposed modification would require **2,410** ecosystem credits or approximately 268 ha of offset. If the FBA calculator is used, the number of ecosystem credits required is **2,108** (due to several vegetation zones having a site value score less than 17) with an approximate offset area of 211 ha (based on the average BioBank site under BBAM 2014 generating around 10 credits per hectare) (**Table 3** and Attachment A – FBA credit calculations).

Species Credits - Regent Honeyeater

The direct impacts to potential habitat for the Regent Honeyeater will reduce from 113.7 ha to 48.2 ha (**Table 4** and **Figure 4**). Indirect impacts to the Regent Honeyeater as a result of possible displacement or avoidance of areas around turbines has been calculated as per discussions with DotE (i.e. a 10% reduction in foraging activity within 500m of each turbine). The proposed modification will reduce this buffer area from 3,214 ha to 2,242 ha (**Figure 4**).

Additional indirect impacts may result as a consequence of blade strike as Regent Honeyeaters are either moving around within preferred foraging areas (considered low risk as their preferred foraging sites are areas of higher fertility woodland generally found in riparian areas) and moving between foraging areas which is thought to be undertaken at higher altitudes, likely along ridge lines where turbines are generally located and at night to avoid predators (Peter Christie and David Geering, pers. comm. to Robert Humphries, NSW Office of Environment and Heritage and experts in Regent Honeyeater ecology).

There are currently 17 wind farms operating within the Regent Honeyeater range in Victoria and NSW with a combined 583 turbines (**Figure 5**). A Bird and Bat Adaptive Monitoring Program will be implemented on an annual basis for five years and thereafter every two years throughout the operational phase of the wind farm consistent with the current NSW Approval conditions. The monitoring program will include a decision making framework with specifications to reduce any impacts to bird and bat populations and implement appropriate mitigations measures. Further, a contribution of \$250,000 is required to be made to an appropriate research institution to assist in building a body of knowledge regarding how the species interacts with wind farms.

In the absence of any current data regarding the potential for any increased risk from blade strike as a result of the modification during normal foraging activity, it is ELAs opinion that the risk is very low and certainly not higher

than the approved project. The clearing associated with the hard stands will not change at 1,250 m² and thus the turbines will not be any closer to retained vegetation. Further, the increase in the maximum tip height from 157 m to up to 200m and rotor diameter from 126 m up to 140 m will increase the distance from the ground and away from retained vegetation by at least 9 m and up to 29 m (depending on the final tower height) (**Figure 2**) i.e. at the lowest point, the tip of the rotors will now be between 40-60m above the ground, and from 20-40 m above the tree canopy instead of 31 m above the ground and only 10m above the tree canopy. Finally as a result of the reduction in the number of turbines, the combined 'swept area' of the wind farm will reduce by 15% (1.982M m² to 1.678M m²).

The potential for any increased risk from blade strike during long distance movement activity between foraging areas as a result of the maximum tip height increasing from the currently approved 157 m to up to 200 m (a 43 m or 25% increase) is less able to be assessed. ELA however considers the risk to be low because whilst the proposed wind farm is on the western side of the Great Dividing Range and in an area with suitable habitat, there are few records in or from the project area (the species was not recorded during the assessment period and has been assumed to be present based on suitable habitat), the wind farm is some distance from known, regularly frequented breeding sites in south east Queensland (150km to the north) and the Barrabra-Bundarra Region (100km to the south-west)(**Figure 5**) and the wind farm occupies a very small proportion (1,445 ha or 0.0024%) of the 'extent of occurrence' for the species which is stated as being 600,000 km² by the DotE listing advice, and 4.8% of the 'potential area of occupancy', which is stated as 300 km² by the DotE listing advice. Further, the likelihood of the species interacting with rotors within the wind farm during long distance movements when they are travelling above the canopy and possibly up to several hundred meters above the canopy is also a very small proportion of the available and likely used air space.

At the time of the NSW project approval, the Regent Honeyeater was classified as an ecosystem credit species and was predicted to be present based on vegetation types and geographic location. Its offset requirements would therefore have been met by the offset requirements for the same range of vegetation types that are classified as habitat. As a species credit species in the FBA with a Tg score of 0.125, it requires **3,708** credits for direct impacts to 48.16 ha of woodland habitat (an approximately 522 ha offset area at 7.1 credits generated per hectare of habitat). The FBA does not readily calculate indirect impacts for actions that do not result in changes to vegetation condition such as the effects of displacement or potential bird and bat strike. These matters will be addressed by the adaptive bird and bat monitoring program that will remain a condition of the project approval.

Summary of changes to biodiversity impacts

The request for variation to approval conditions will reduce the number of turbines from 159 to 109, reduce impacts to native vegetation from 288.8 ha to 126.22 ha, including a reduction to the two EECs '*White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands*' and '*Ribbon Gum, Mountain Gum, Snow Gum Forest/Woodland of the New England Tablelands*' from 45.5 ha to 12.0 ha and 240.9 to 114.22 ha respectively, reduce the area of potential habitat loss for the Regent Honeyeater from 113.7 ha to 48.2 ha, reduce the area of potential displacement of Regent Honeyeaters from suitable habitat around the wind farm from 3,214 ha to 2,242 ha, reduce the cumulative 'swept area' of turbine rotors from (and hence the risk of blade strike) 1.982M m² to 1.678M m² (15%) and increase the maximum tip height of rotor from 157 m to up to 200 m. In summary the modification will result in an overall reduction of direct and indirect impacts to biodiversity values in the project area.

Summary of requested changes to NSW Major Project Conditions of Approval

Condition	Proposed amended condition of approval	Reason
C1 The clearing of native vegetation will be limited to the minimum extent practicably required as detailed in the Construction Flora and Fauna Management Plan and no more than 288.8 ha.	C1 The clearing of native vegetation will be limited to the minimum extent practicably required as detailed in the Construction Flora and Fauna Management Plan and no more than 126.22 ha	Reduction of number of turbines from 159 to 109 and road widths of up to 12 m to up to 6 m.

Proponent Commitments

1. The proponent commits to construct the wind farm in a single stage of up to 109 turbines with offsets calculated on the basis of these 109 turbines. If fewer than 109 turbines are constructed, CWP Renewables will not seek a modification/variation to construct the remaining turbines at a later stage without a separate application and approvals process.
2. The calculated offsets for the project will be met by the purchase and retirement of the required number of biodiversity credits as stated above.

Robert Humphries

Robert Humphries

Eco Logical Australia

On behalf of CWP Renewables.

References

ELA (2011) Sapphire Wind Farm Part 3A Ecological Assessment. Prepared for Wind Prospect CWP by Eco Logical Australia Pty Ltd, 30 September 2011.

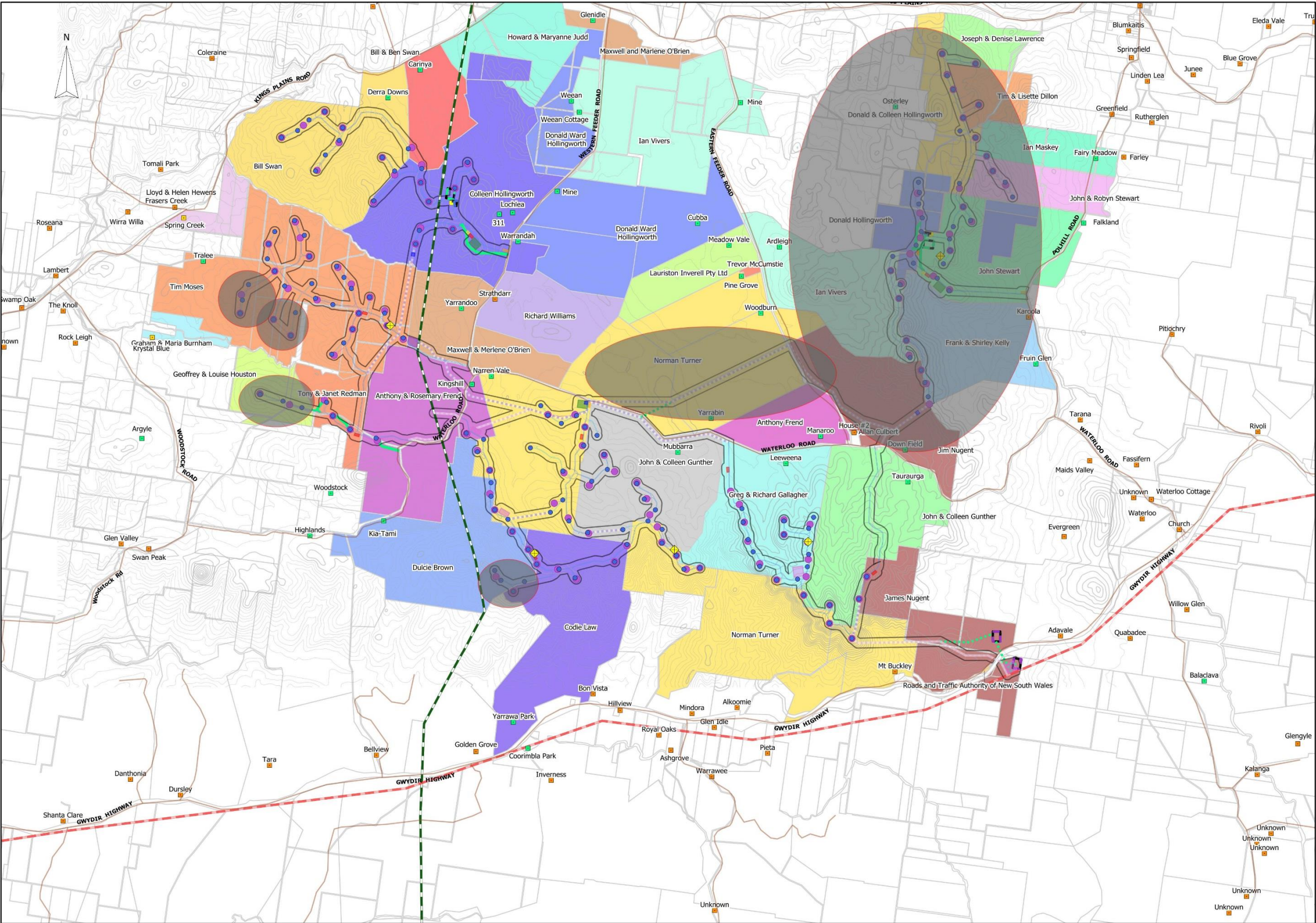


Figure 1: Approved Sapphire wind farm showing location of 50 turbines to be removed as part of the proposed modification (shaded)

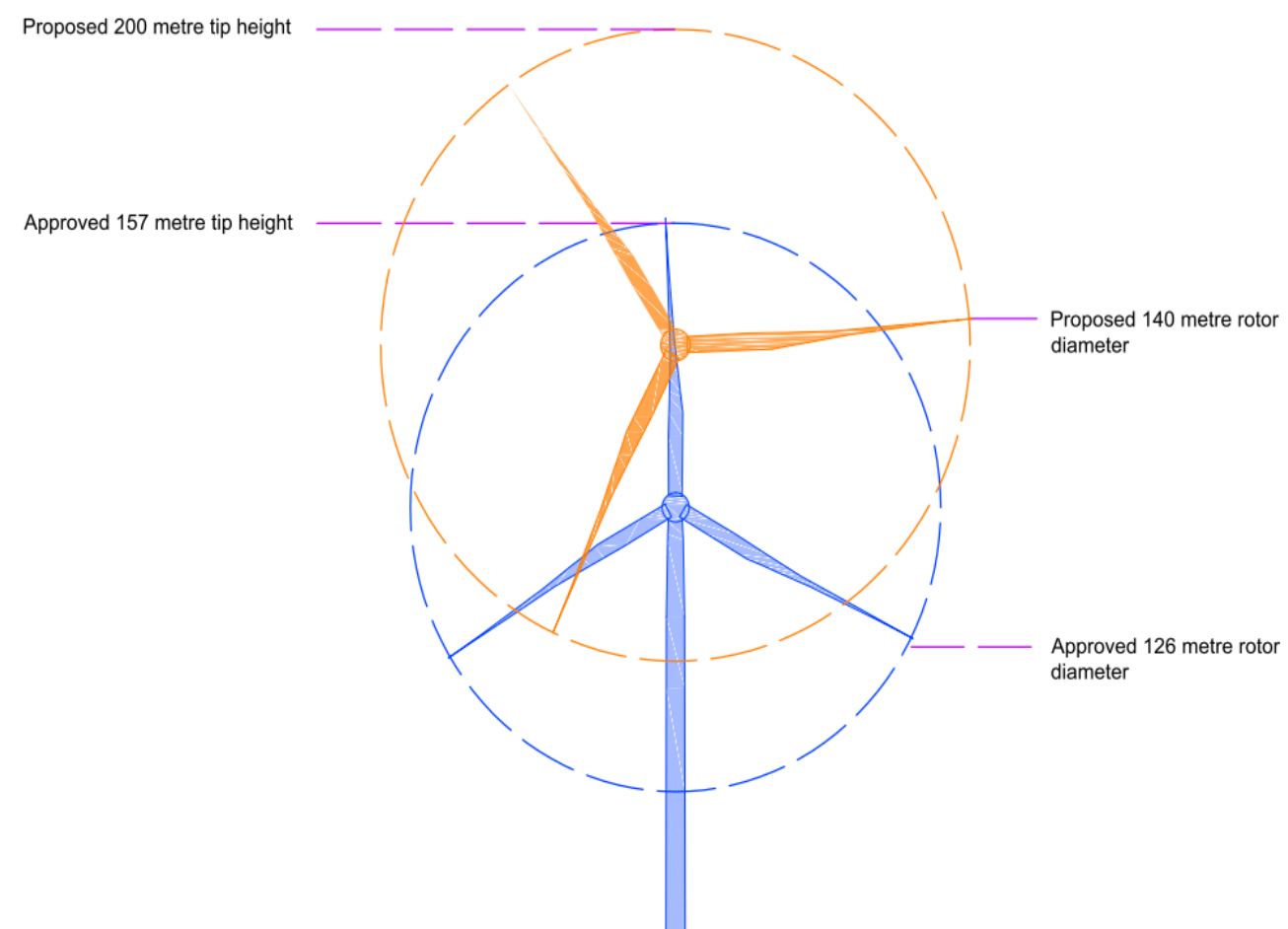


Figure 2: Comparison of approved tower/rotor and proposed tower/rotor dimensions

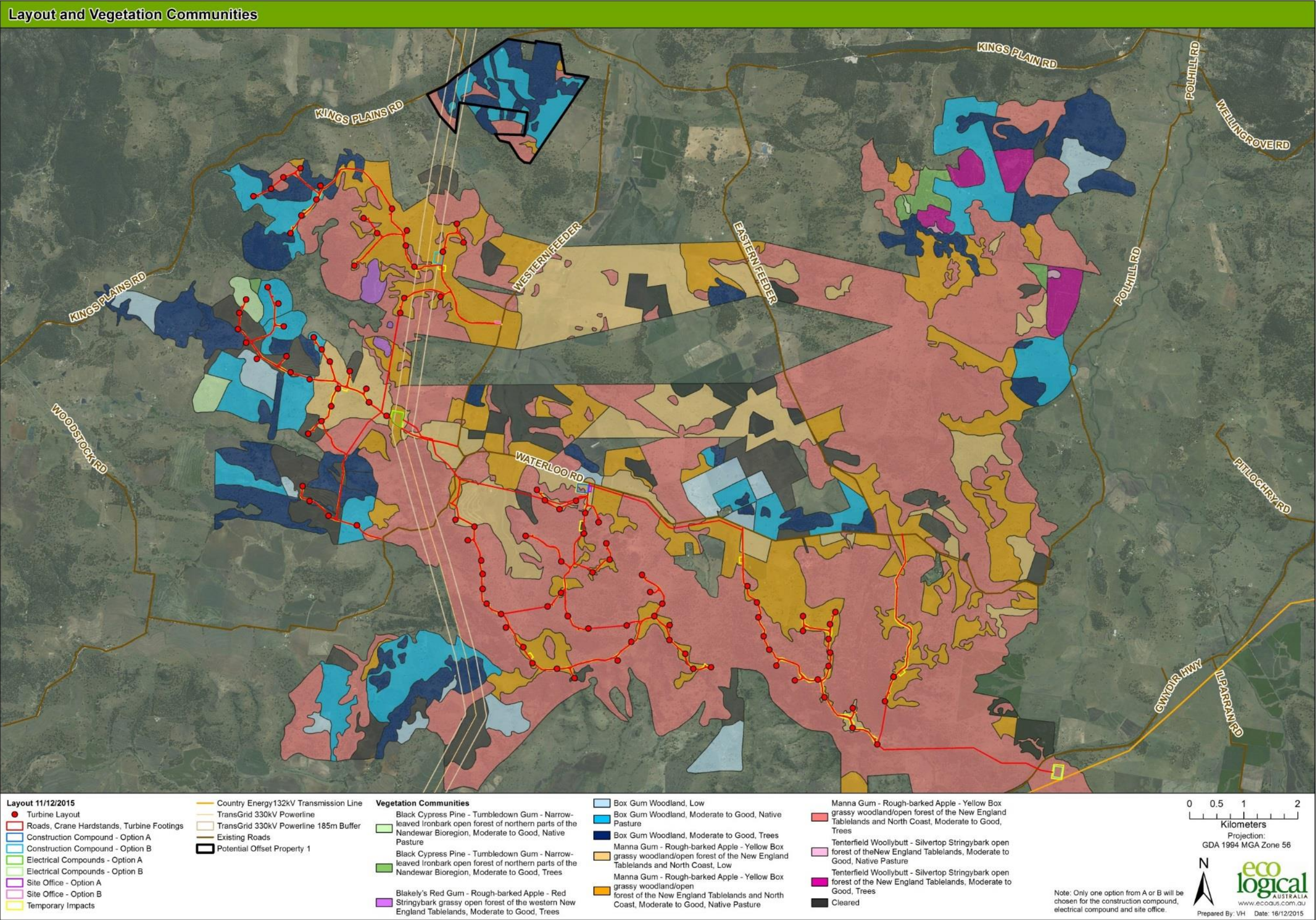


Figure 3: Mapped vegetation withy project area and proposed turbine, road and Grid connection

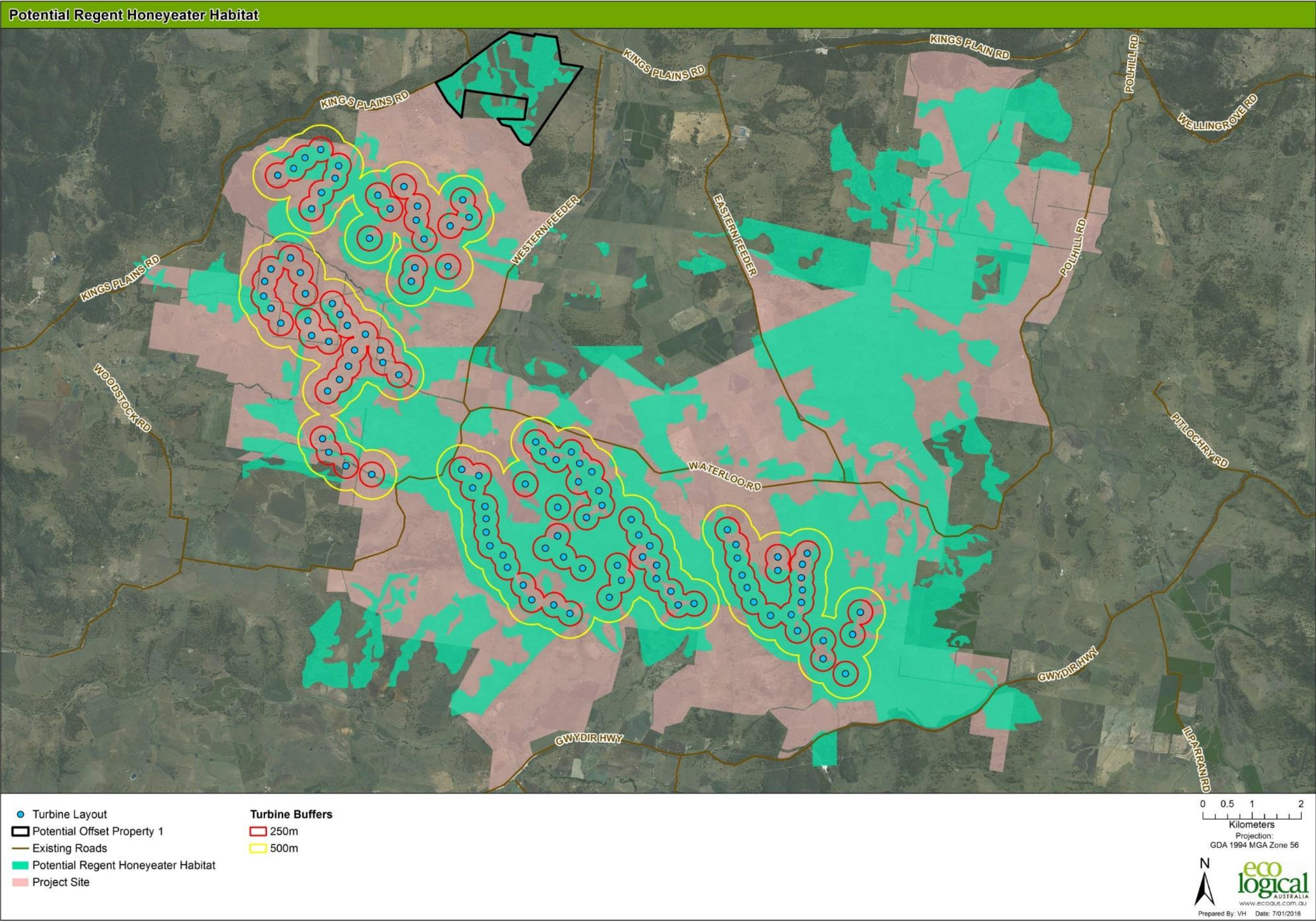


Figure 4: Impacts to potential Regent Honeyeater habitat and displacement buffers

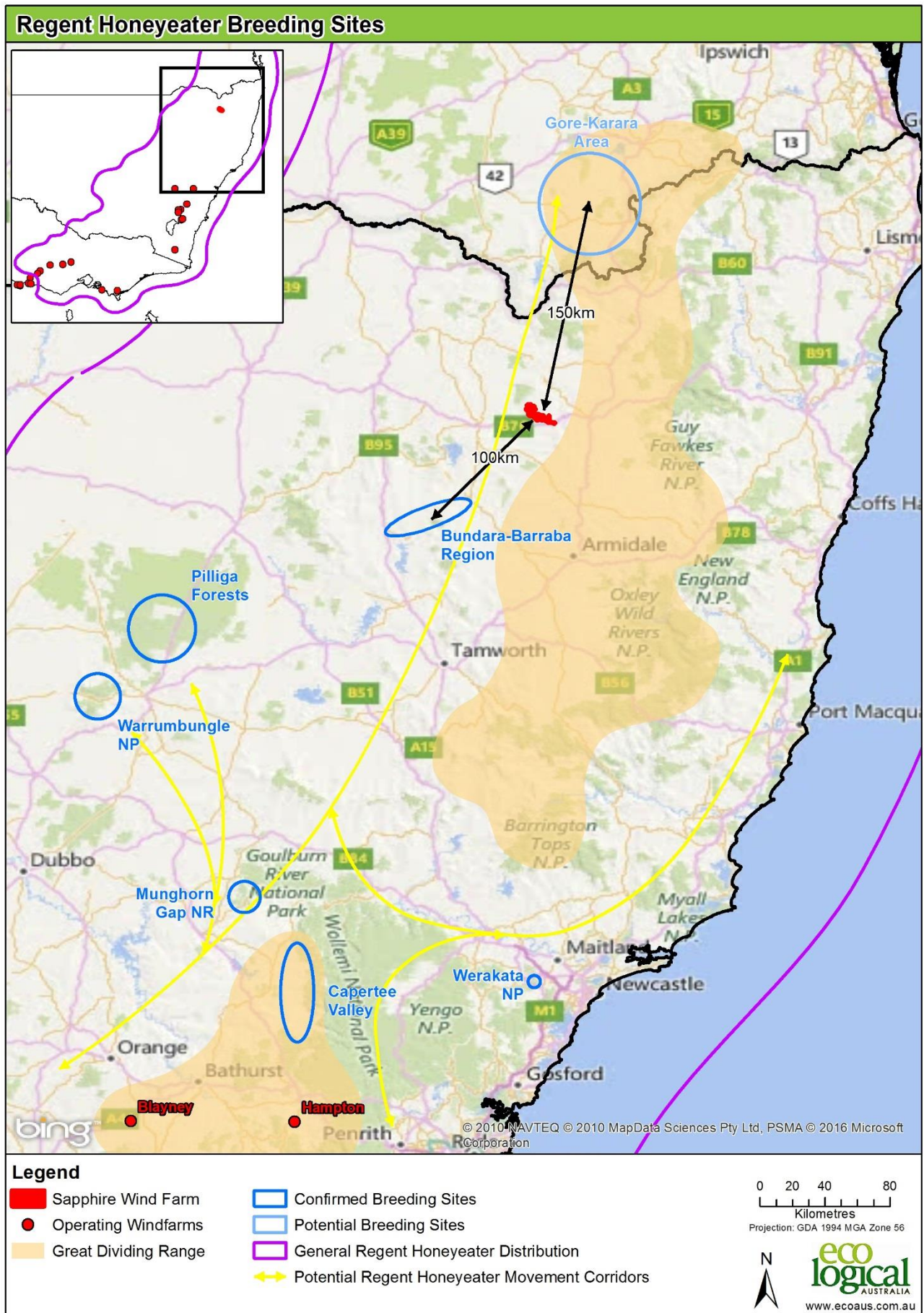


Figure 5: Regent Honeyeater range, breeding sites and possible movement corridors in Central to Northern NSW

Table 2: Summary of offset assessment guide calculations for proposed and potential offset sites.

				Approved Impacts & Offset Requirements						Modification Impacts	Modification Offset Requirements - BBAM v2.0		Modification Offset Requirements - FBA				EPBC Act offset required (Approval 2011/5854)
BioMetric Vegetation Type and Condition	Condition / Structure	TSC Act Status	EPBC Status	Approved Impacts 159 turbine / 12m road	SV Scores (BBAM v2.0)	Credits / ha	No. Credits	Offset area required (ha)	EPBC Act offset required (Approval 2011/5854)	Proposed Modification Impacts	Pro-rata Credits required	Offset area required (ha)	Site Value Scores FBA	Area	No. Credits required	Offset area required (ha)	
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Native Pasture	Native Pasture	EEC	EPBC	10.6	13.02	14.43	153	17	1.9*159 = 296.84	1.3	19	2	13.02	1.3	0	0.00	1.9*109 turbines = 207.1 ha
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Paddock Trees	Paddock Trees	EEC		5.5	5.2	3.27	18	2		0	0	0	0	0	0	0.00	
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good, Woodland	Woodland	EEC		1.5	50.8	33.33	47	5		0	0	0	0	0	0	0.00	
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Moderate to Good, Native Pasture	Native Pasture	EEC	EPBC	14.3	20.83	15.80	226	25		6.73	106	12	18.75	6.73	122	12.20	
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Low	Paddock Trees	EEC		4.3	10.41	7.67	33	4		0.29	2	0	10.42	0.29	0	0.00	
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions, Moderate to Good, Trees	Woodland	EEC	EPBC	9.3	52.6	26.34	245	27		3.68	97	11	54.17	3.68	127	12.70	
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Moderate to Good, Native Pasture	Native Pasture	EEC		89.9	29.01	13.56	1,219	135		47.34	642	71	16.67	47.76	0	0.00	
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Low	Paddock Trees	EEC		50.5	13.58	11.66	589	65		22.4	261	29	11.46	21.99	0	0.00	
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Moderate to Good, Trees	Woodland	EEC		100.5	70.98	28.64	2,878	320		44.48	1,274	142	59.9	44.48	1,846	184.60	
Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion, Moderate to Good, Native Pasture	Native Pasture			1.3	32.81	17.69	23	3		0.49	9	1	30.73	0.49	13	1.30	
Tenterfield Wollybutt - Silvertop Stringybark open forest	Woodland			1.1	32.81	30.00	33	4		0	0	0	0	0	0	0.00	
Total Vegetation				288.8		18.40	5,464	607	297	126.22	2,410	268		126.72	2,108	210.80	207
Cleared				9						9.82							
Development Footprint				297.8						136.04							

Vegetation zones with a sv score < 17, do not require an offset in the FBA

Table 4: Comparison of impact and offset calculations.

Species	Impacts	Potential habitat (ha)	Tg Score*	Credits/ha habitat	No. Credits	Est. Offset Area (ha)	EPBC Act offset required (Approval 2011/5854)	Potential Habitat (ha)	Credits Required	T.S. Offset Multiplier	Credits/ha habitat	Est. Offset Area (ha)	EPBC Act Offset Requirements (ha)
Regent Honeyeater	Direct Impacts	113.7	0.125	6	8,755	1,459	6.5 x 159 = 1,033.5	48.16	3,708	7.70	7.1	522.25	6.5 x 109 = 708.5

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 5/02/2016

Time: 4:03:04PM

Calculator version: v4.0

Major Project details

Proposal ID: 0092/2016/2406MP

Proposal name: Sapphire Wind Indicative Assessment v2

Proposal address: Kings Plains Road Sapphire NSW 2360

Proponent name: CWP Renewables Pty Ltd

Proponent address: Level 6, Suite A, 41-45 Hunter Street Newcastle NSW 2300

Proponent phone: 40134640

Assessor name: Jennie Powell

Assessor address: Level 6, 299 Sussex Street SYDNEY NSW 2000

Assessor phone: 02 8536 8656

Assessor accreditation: 0092

Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion	0.49	13.00
Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	1.30	0.00
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion	114.23	1,846.00
White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	10.70	249.70
Total	126.72	2,109

Credit profiles

1. Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion, (BR153)

Number of ecosystem credits created

1,846

IBRA sub-region

Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion, (BR153)</p> <p>Black Sallee grassy woodland of the New England Tableland Bioregion, (BR112)</p> <p>Snow Gum - Black Sallee grassy woodland of the New England Tableland Bioregion, (BR218)</p> <p>Snow Gum - New England Peppermint grassy open forest of the New England Tableland Bioregion, (BR220)</p> <p>Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion, (BR269)</p> <p>Candlebark - Ribbon Gum grassy woodland of the New England Tableland Bioregion, (BR279)</p> <p>New England Peppermint grassy woodland on sedimentary or basaltic substrates of the New England Tableland Bioregion, (BR319)</p> <p>Ribbon Gum - Mountain Gum - Snow Gum grassy open forest or woodland of the New England Tableland Bioregion, (BR329)</p> <p>Mountain Gum - Ribbon Gum open forest of drainage lines of the southern New England Tableland Bioregion, (BR307)</p>	<p>Glen Innes-Guyra Basalts</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

2. Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion, (BR153)

Number of ecosystem credits created

0

IBRA sub-region

Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Black Sallee grassy woodland of the New England Tableland Bioregion, (BR112)</p> <p>Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion, (BR153)</p> <p>Snow Gum - Black Sallee grassy woodland of the New England Tableland Bioregion, (BR218)</p> <p>Snow Gum - New England Peppermint grassy open forest of the New England Tableland Bioregion, (BR220)</p> <p>Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion, (BR269)</p> <p>Candlebark - Ribbon Gum grassy woodland of the New England Tableland Bioregion, (BR279)</p> <p>New England Peppermint grassy woodland on sedimentary or basaltic substrates of the New England Tableland Bioregion, (BR319)</p> <p>Ribbon Gum - Mountain Gum - Snow Gum grassy open forest or woodland of the New England Tableland Bioregion, (BR329)</p> <p>Mountain Gum - Ribbon Gum open forest of drainage lines of the southern New England Tableland Bioregion, (BR307)</p>	<p>Glen Innes-Guyra Basalts</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

3. White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (BR240)

Number of ecosystem credits created

250

IBRA sub-region

Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (BR240)</p> <p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (BR141)</p> <p>Grey Box - Blakely's Red Gum - Yellow Box grassy open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR144)</p> <p>White Cypress Pine - Silver-leaved Ironbark grassy woodland of the Nandewar Bioregion, (BR244)</p> <p>Carbeen - White Box +/- Silver-leaved Ironbark grassy tall woodland on basalt hills, Brigalow Belt South Bioregion, (BR280)</p> <p>Silver-leaved Ironbark grassy tall woodland on clay-loam soils on plains in the Brigalow Belt South Bioregion, (BR350)</p> <p>Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR296)</p> <p>White Box - White Cypress Pine - Silver-leaved Ironbark grassy woodland on mainly clay loam soils on hills mainly in the Nandewar Bioregion, (BR388)</p> <p>White Box grassy woodland on the Inverell basalts mainly in the Nandewar Bioregion, (BR391)</p>	<p>Glen Innes-Guyra Basalts</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

4. White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (BR240)

Number of ecosystem credits created

0

IBRA sub-region

Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (BR141)</p> <p>Grey Box - Blakely's Red Gum - Yellow Box grassy open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR144)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (BR240)</p> <p>White Cypress Pine - Silver-leaved Ironbark grassy woodland of the Nandewar Bioregion, (BR244)</p> <p>Carbeen - White Box +/- Silver-leaved Ironbark grassy tall woodland on basalt hills, Brigalow Belt South Bioregion, (BR280)</p> <p>Silver-leaved Ironbark grassy tall woodland on clay-loam soils on plains in the Brigalow Belt South Bioregion, (BR350)</p> <p>Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR296)</p> <p>White Box - White Cypress Pine - Silver-leaved Ironbark grassy woodland on mainly clay loam soils on hills mainly in the Nandewar Bioregion, (BR388)</p> <p>White Box grassy woodland on the Inverell basalts mainly in the Nandewar Bioregion, (BR391)</p>	<p>Glen Innes-Guyra Basalts</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

5. Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion, (BR272)

Number of ecosystem credits created	0
IBRA sub-region	Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion, (BR272)</p> <p>Broad-leaved Stringybark - Blakely's Red Gum grassy woodlands of the New England Tableland Bioregion, (BR121)</p> <p>Rough-barked Apple - Cabbage Gum grassy woodland of the New England Tableland Bioregion, (BR334)</p> <p>Ribbon Gum - Rough-barked Apple - Yellow Box grassy woodland of the New England Tableland Bioregion and NSW North Coast Bioregion, (BR330)</p>	<p>Glen Innes-Guyra Basalts</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

6. Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion, (BR110)

Number of ecosystem credits created

13

IBRA sub-region

Glen Innes-Guyra Basalts

Offset options - Plant Community types	Offset options - IBRA sub-regions

Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion, (BR110)

Black Cypress Pine - Tumbledown Red Gum - Caley's Ironbark shrubby open forest of the Nandewar Bioregion, (BR111)

Caleys Ironbark - Orange Gum - Black Cypress Pine shrubby open forest on acid volcanics of the northern New England Tableland Bioregion, (BR125)

New England Blackbutt - Youman's Stringybark grassy open forest of the western New England Tableland Bioregion, (BR172)

Rough-barked Apple - Red Stringybark shrubby open forest of the western New England Tableland Bioregion, (BR197)

Rough-barked Apple - Silvertop Stringybark - Red Stringybark grassy open forest of south western New England Tableland Bioregion, (BR198)

Youman's Stringybark - New England Blackbutt - Narrow-leaved Black Peppermint - Eucalyptus subtilior open forest of the New England Tableland Bioregion, (BR255)

Black Cypress Pine - Orange Gum - Tumbledown Red Gum shrubby woodland on granites of the Nandewar Bioregion and New England Tableland Bioregion, (BR263)

Black Cypress Pine - Orange Gum heath shrubland or woodland on granite outcrops of the New England Tableland Bioregion, (BR264)

Black Cypress Pine - Rough-barked Apple - stringybark shrubby open forest of the Nandewar Bioregion and western New England Tableland Bioregion, (BR266)

Black Cypress Pine - Tumbledown Red Gum - Narrow-leaved Ironbark - Stringybark She Oak open forest on acid volcanics of the western New England Tableland Bioregion, (BR267)

Blakely's Red Gum - Stringybark - Rough-barked Apple open forest of the Nandewar Bioregion and western New England Tableland Bioregion, (BR270)

McKies Stringybark - Western New England Blackbutt - Rough-barked Apple open forest of the New England Tableland Bioregion, (BR299)

Mugga Ironbark - Blakely's Red Gum open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR311)

Orange Gum - Black Cypress Pine shrubby open forest on acid volcanics of the north western New England Tableland Bioregion, (BR322)

Orange Gum - Caleys Ironbark - Red Stringybark open forest of the southern Nandewar Bioregion and New England Tableland Bioregion, (BR323)

Rough-barked Apple - Blakely's Red Gum open forest of the Nandewar Bioregion and western New England Tableland Bioregion, (BR333)

Orange Gum - Caleys Ironbark - stringybark - Tenterfield Woollybutt shrubby open forest of the Horton River area of the Nandewar Bioregion, (BR324)

Orange Gum - Caleys Ironbark - stringybark shrubby open forest of the northern New England Tableland Bioregion, (BR325)

Western New England Blackbutt - stringybark open forest of the Nandewar Bioregion and New England Tableland Bioregion, (BR382)

Mugga Ironbark open forest of the New England Tableland Bioregion, (BR312)

Glen Innes-Guyra Basalts

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Tumbledown Red Gum - Black Cypress Pine - Caleys Ironbark shrubby open forest of the Nandewar Bioregion and western New England Tableland Bioregion, (BR366)

Tumbledown Red Gum - Black Cypress Pine shrubby open forest on rhyolite geology of the Nandewar Bioregion and north west New England Tableland Bioregion, (BR367)

Tumbledown Red Gum - Caleys Ironbark shrubby open forest on Rock of Gibraltar in the northern Nandewar Bioregion, (BR368)

Western New England Blackbutt - Narrow-leaved Ironbark - Stringybark She Oak open forest of the western New England Tableland Bioregion, (BR379)

Summary of species credits required

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Regent Honeyeater	Anthochaera phrygia	48.16	3,708
Border Thick-tailed Gecko	Underwoodisaurus sphyrurus	10.74	140