

# GULLEN RANGE WIND FARM– MODIFICATION

## Turbine Locations

(MP 07\_0118 MOD 1)

### 1 BACKGROUND

New Gullen Range Wind Farm Pty Ltd (proponent), a subsidiary of Goldwind International, owns and operates the Gullen Range Wind Farm (project). The wind farm is located along a 25 km strip between Crookwell and Goulburn in the Southern Tablelands of NSW, within the Upper Lachlan Shire local government area (see Figure 1).

The project (MP 07\_0118) was approved by the Minister for Planning in 2009 and then by the Land and Environment Court in August 2010 following an appeal by both the proponent, J&A King and the Parkesbourne/Mummel Landscape Guardians. The project approval allows the proponent to construct and operate up to 73 turbines. The proponent started constructing the wind farm in late 2012, and all the turbines have now been installed. The project approval has not been modified to date.

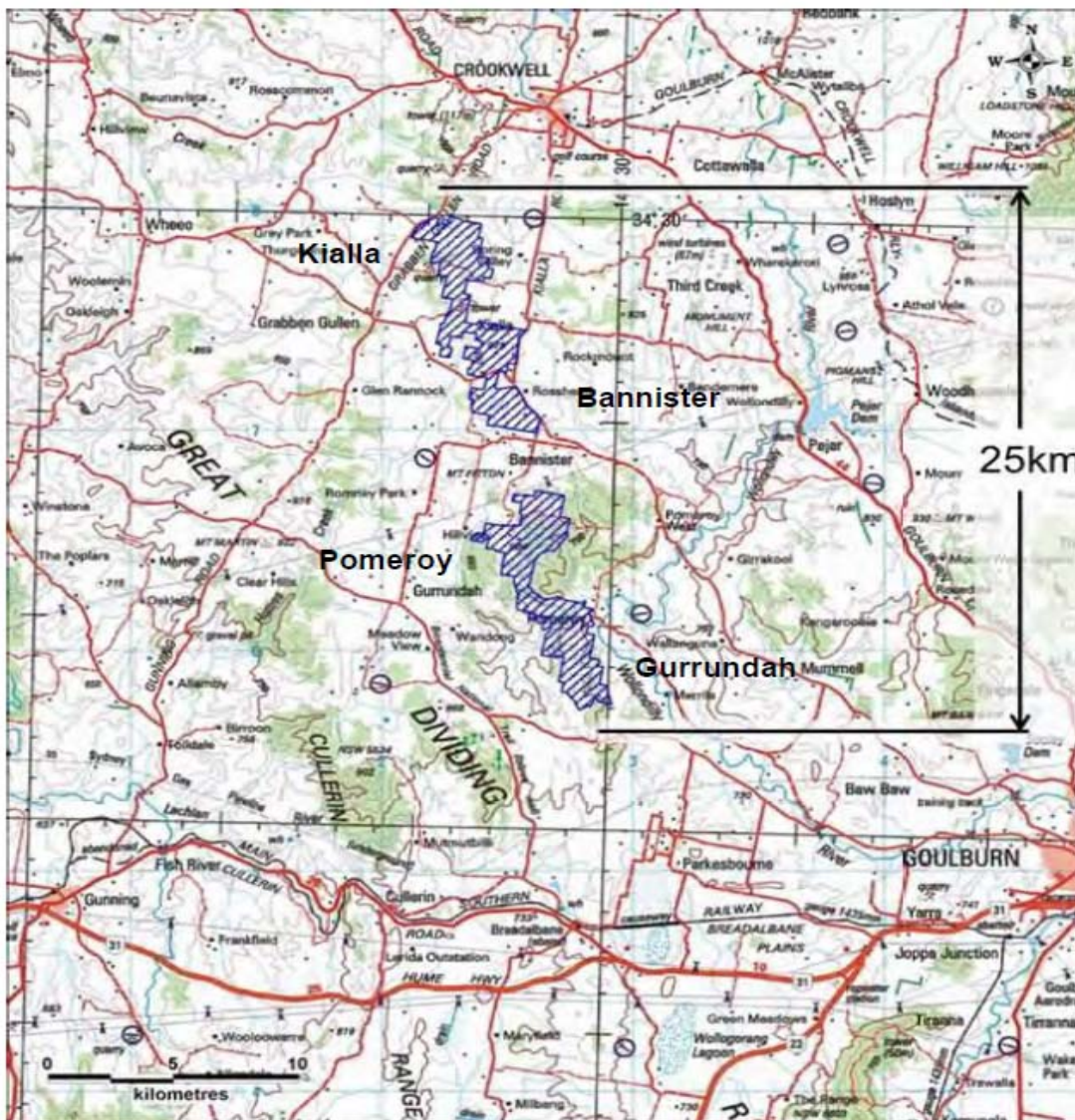


Figure 1: Location of the Gullen Range Wind Farm

### **1.1 Location of the Turbines**

During 2013, the Department received a number of complaints about the fact that several turbines had been moved from their approved locations.

In March 2014, the proponent lodged a modification application (07\_0118 MOD1) to regularise any inconsistencies with the approved layout by seeking approval for the “as constructed” turbine layout.

After further investigations, the Department determined that 69 of the 73 turbines had been constructed in locations that differ from the grid co-ordinates identified in the project approval (see Figures 2 and 3 below).

The Department commissioned a surveyor to determine the extent of the differences, and found:

- 50 turbines had moved less than 50 metres;
- 14 turbines had moved between 50 and 100 metres; and
- 9 turbines had moved more than 100 metres, with the greatest movement being 187 metres (see Appendix F).

Some movement of turbines is permissible under the approval to allow for “micro-siting” during the final design of the wind farm. Based on the evidence at the time, the Department determined that the movement of 9 of these turbines was inconsistent with the project approval as they could materially increase the environmental impacts of the project. Note that these 9 turbines do not necessarily correspond with those that had moved more than 100 metres, as the key consideration applied by the Department was the potential for increased environmental impacts.

The Department completed its assessment of the merits of the application in July 2014 recommending that the application be approved, and referred it to the Planning Assessment Commission (PAC) for determination.

On 2 October 2014, the PAC refused the application saying the application was “inconsistent with the intent and spirit” of the draft wind farm guidelines, and would have significant visual impacts on non-associated residences that could not be mitigated.

### **1.2 Draft Order**

Following the PAC’s refusal, on 10 October 2014, the Department issued a draft order to the proponent, requiring the “relocation or removal” of 9 turbines.

Five of these turbines are located in the northern part of the site (i.e. BAN\_08, BAN\_09 and BAN\_12, BAN\_13 and BAN\_15), and were moved closer to non-associated residents (i.e. B12 and B29) and were considered to result in unacceptable visual impacts (see Figure 2).

The remaining 4 turbines (i.e. POM\_03, POM\_04, POM\_06, POM\_07) are located in the southern part of the site, and their movement was considered to increase the risk to known habitat for the Powerful Owl and Little Eagle which has increased the risk to biodiversity (see Figure 3).

On 31 October 2014, the proponent responded to the draft order, claiming that it had not breached the project approval and should therefore not be required to relocate or remove the turbines. It provided a range of additional information to address the Department’s concerns, and advised that it had either acquired or reached agreement with the landowners of the most significantly affected properties. It argued that these properties could therefore be considered “associated” residences for assessment purposes.

### **1.3 Court Proceedings**

The proponent sought a judicial review of the PAC’s refusal, and on 6 March 2015, the Land and Environment Court set aside the PAC’s decision, leaving the modification undetermined. On 16 March 2015, the application was referred back to the Department to re-assess the application, having regard to the additional information submitted by the proponent in response to the draft order and during the Court proceedings, additional expert evidence commissioned by the Department, and supplementary information provided by the proponent to the Department on 14 April 2015 (see Appendix G).



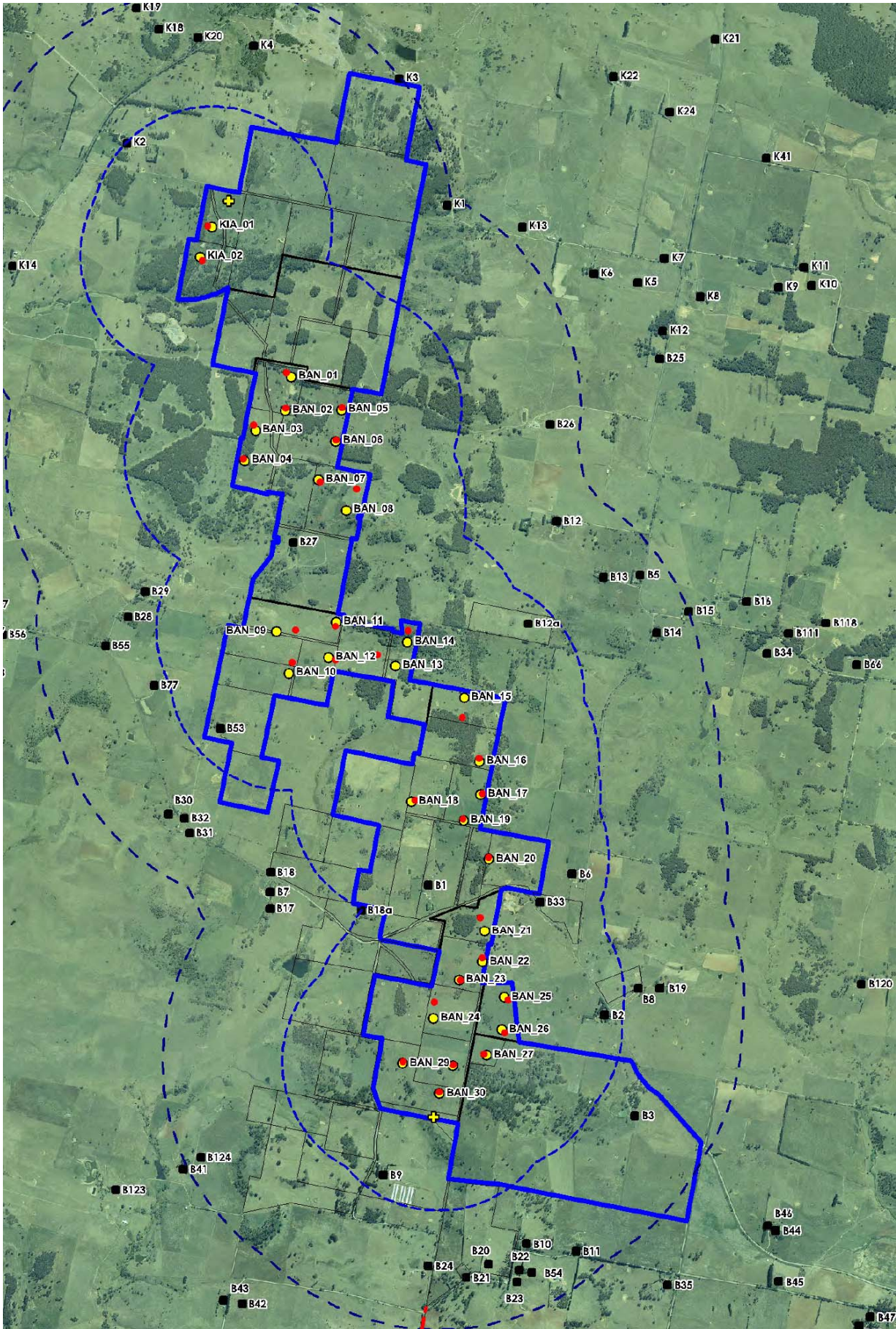


Figure 2: Location of the Gullen Range Wind Farm Project - Northern Turbines



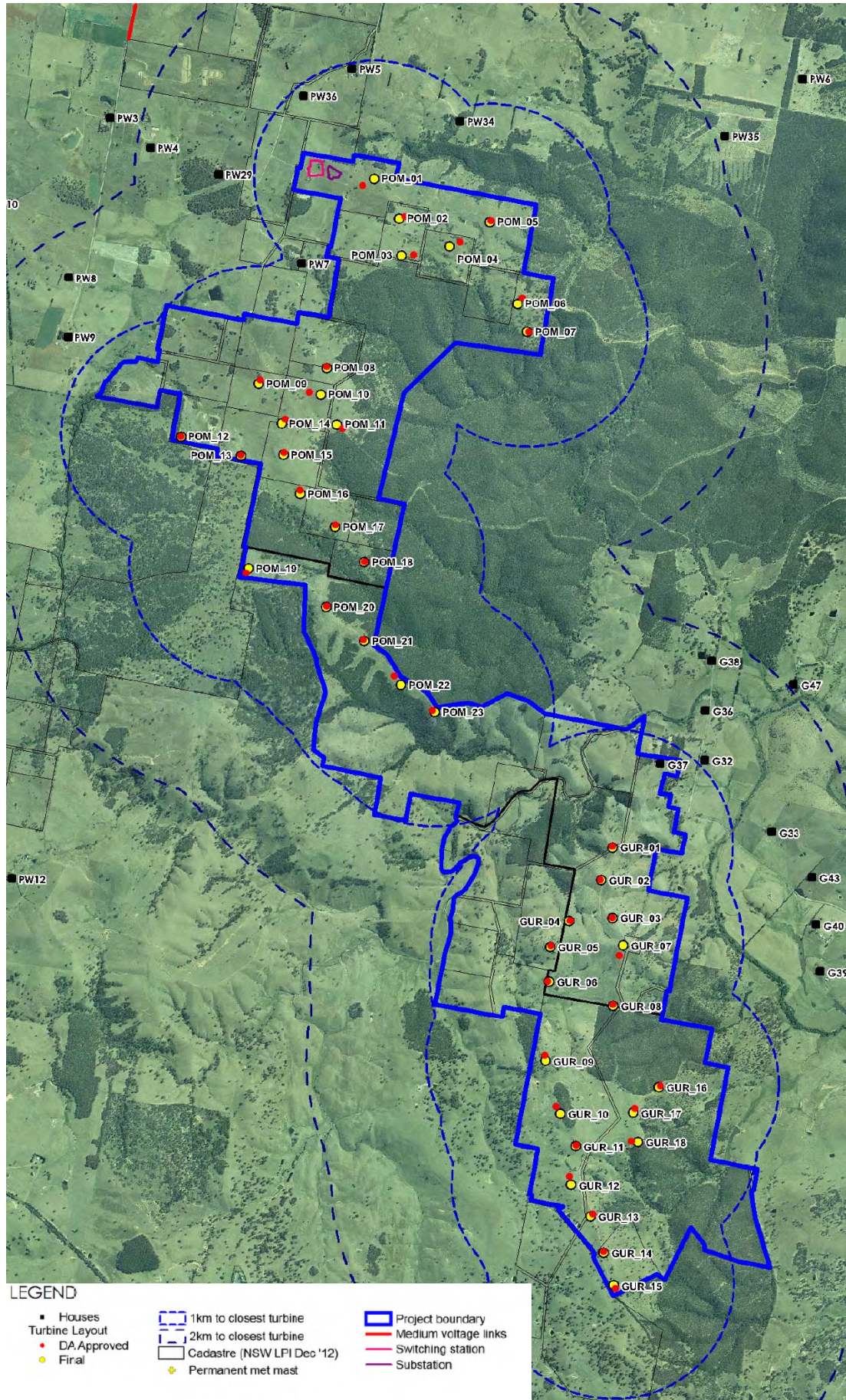


Figure 3: Location of the Gullen Range Wind Farm Project - Southern Turbines

## 1.4 Legal Advice

Following the Court proceedings, additional legal advice was sought by the Department regarding whether the draft order should be pursued (see Appendix N).

The legal advice noted that a number of matters have occurred since the Department issued the draft order, including:

- the Department has obtained independent advice concerning visual impact and ecology in relation to the relocation of the 9 turbines;
- key residences likely to experience additional visual impacts have either been acquired or the landowners have entered into an agreement with the proponent to accept the impacts of the project;
- the proponent has provided a detailed and lengthy submission in response to the draft order accompanied by a number of expert reports;
- the PAC's decision to refuse approval to modify the approval for the wind farm was set aside by the Land and Environment Court; and
- the proponent has submitted a considerable amount of material in further support of the modification application and the claim that the modified layout has not materially increased the environmental impacts of the project.

Having regard to the additional information, and subsequent events, that have addressed any potential increased visual and biodiversity impacts associated with the 9 relocated turbines, the legal advice concludes that there are no environmental impacts to which the Minister can point to justify the issue of an order. On this basis, the legal advice recommends that the Minister should not issue the order.

## 2 PROPOSED MODIFICATION

The proponent has lodged a modification application seeking approval for the “as constructed” locations for 69 out of the 73 approved turbines, and consequential changes to ancillary infrastructure such as access roads and cabling to the “as constructed” turbine locations.

The modification is described in full in the Environmental Assessment (EA), which is attached in Appendix C.

## 3 STATUTORY CONTEXT

### 3.1 Section 75 W

The Gullen Range Wind Farm was approved under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Although Part 3A was repealed on 11 October 2011, the project remains a ‘transitional Part 3A project’ under Schedule 6A of the EP&A Act, and hence any modification to this approval is to be made under the former Section 75W of the Act.

Based on its assessment, the Department is satisfied that the application can be characterised as a modification to the existing approval (rather than a new project in its own right) as the proposal would:

- not alter the number of turbines;
- not alter the total electricity generation capacity of the project;
- not relocate any turbines outside the approved project boundary; and
- not significantly increase the environmental impacts of the project.

### 3.2 Approval Authority

Under the Minister for Planning's delegation of 14 September 2011, the modification application must be determined by the PAC. This is because the proponent has made a statement that it made a reportable political donation, and the Department received more than 25 submissions by way of objection during the exhibition of the application.



## 4 CONSULTATION

The Department publicly exhibited the application and accompanying Environmental Assessment (EA) from 3 April until 2 May 2014. The documents were also made available on the Department's website, the Department's Information Centre, and the offices of Upper Lachlan Shire Council and the Nature Conservation Council.

The Department received submissions from 5 government agencies and 76 submissions from the community. Full copies of all submissions are included in Appendix D.

**Upper Lachlan Shire Council (ULSC)** requested that the modification be put on hold while a range of matters associated with the compliance with the project approval were investigated, including matters relating to the relocation of the turbines and damage to the road network during the construction of the wind farm. The Department notes that the current modification application is seeking to regularise the "as constructed" turbine layout, and any other matters raised by Council about the compliance with the project approval will need to be addressed separately by the Department's compliance unit.

**Environment Protection Authority (EPA)** raised no concerns about the relocated turbines, and agreed that the predicted noise levels for the final turbine locations would be able to comply with applicable noise limits for all relevant wind speeds, and there would be no significant increase in noise impacts at nearby receivers.

**Office of Environment and Heritage (OEH)** provided comments on biodiversity and Aboriginal heritage aspects of the project. Comments about Aboriginal heritage are not directly relevant to the current application as they relate to the Aboriginal Heritage Management Plan and the associated salvage program in 2012. In regard to biodiversity, OEH raised concerns about the fact that the relocated turbines (POM\_03, POM\_04, POM\_06 and POM\_07) may have been moved closer to known habitat for the Powerful Owl and the Little Eagle, and therefore increased the collision risks to these species. To address the increased risks, OEH recommended consideration of temporary suspension of operation of POM\_03 and POM\_04 during the fledging period for the Little Eagle, and an extension of the biodiversity offset area to include all known nesting sites for these species.

**Trade and Investment (T&I)** raised no specific concerns, but noted that the Crown road in close proximity to turbine GUR\_01 would need to be closed as a result of overhang of the turbine blades.

**Civil Aviation Safety Authority (CASA)** raised no concerns, and considers that the wind farm is consistent with Guideline D of the *National Airports Safeguarding Framework* (NASF).

A total of 76 submissions (including late submissions) were received from the general public. This included submissions from the following special interest groups:

- Boorowa District Landscape Guardians Inc;
- Crookwell District Landscape Guardians Inc; and
- Parkesbourne/Mummel Landscape Guardians Inc.

Of the 76 public submissions, 42 (63%) objected to the proposal, 10 (15%) supported the proposal, and the remainder did not object but raised concerns. Key issues raised in submission include visual impacts, noise impacts, loss of amenity, property devaluation, health and safety, proximity of turbines to residences, appropriate mitigation and compensation, and a request for a public inquiry.

Further analysis and detail about the issues raised in public submissions is provided in the Department's July 2014 assessment report.

The proponent has considered these submissions in its Response to Submissions report (RTS - see Appendix E).

## 4 ASSESSMENT

In assessing the merits of the proposal, the Department has considered:

- the EA and conditions of approval for the Gullen Range Wind Farm;
- submissions and response to submissions;
- the previous assessment report prepared by the Department in July 2014;
- additional information provided by the proponent in April 2015;
- relevant environmental planning instruments, policies and guidelines; and
- the requirements of the EP&A Act.

### 4.1 Scope of the Assessment

Although 69 of the 73 turbines changed location, the Department considers that 60 of the relocated turbines were constructed in locations in accordance with the project approval, as the movement is within the scope permissible, and the consequential environmental impacts are negligible and within the limits contemplated under the original assessment of the project.

However, the Department considered that the relocation of 9 turbines were not consistent with the project approval. In particular, the Department considered that:

- the horizontal and vertical extent of the relocation of turbines BAN\_08, BAN\_09, BAN\_12, BAN\_13 and BAN\_15 had a resulting increased visual impact on residences B12 and B29; and
- the horizontal extent of the relocation of turbines POM\_03, POM\_04, POM\_06 and POM\_07 had a potentially increased ecological impact.

On this basis, while the Department has considered the impacts of the modification as a whole, it has focused its assessment of the modification on the visual and biodiversity impacts associated with the relocations of these 9 turbines. A summary of the Department's assessment of other issues is provided in Section 4.4 below.

### 4.2 Visual Amenity

The EA includes a review of the original visual assessment to determine whether the change in turbine locations and reduced turbine height has changed the level of visual impact. This assessment indicates that 14 turbines have been constructed in closer proximity to non-associated residences.

The assessment found that due to the distance between the turbine and the receiver, the amended locations of the wind turbines do not cause a perceptible change in the level of visual impact and there would be no discernible difference to the viewer. As a result, the assessment concluded that the visual impact of the final layout is consistent with the level of visual impact anticipated by the initial visual assessment of the approved layout.

The Department has previously undertaken a detailed assessment of the potential visual impacts of the relocated turbines, including two site visits by Departmental officers in April and July 2014. Based on this assessment, the Department concluded that in most cases, turbines constructed in different locations to the approved layout have not caused significant differences to the visual impact predicted for the approved layout.

That being said, the Department acknowledges that it is possible to notice some subtle changes in the visual landscape where constructed turbines appear in slightly different positions, or in situations where the turbines are constructed in significantly closer locations relative to a viewpoint, the specific turbine may appear to be taller and closer to the viewer.

The Department notes that under the existing project approval, residences (within 3 km of the wind farm) would be able to access landscaping provisions to screen views of the turbines. With the implementation of the screening, the Department considers that any minor additional visual impacts would be effectively mitigated.

The Department considers that the relocated turbines have not materially increased visual impacts on local residents, except in two cases (i.e. residence B12 and B29).

B12 has 5 turbines between 1.6 km and 2 km from the residence of which two turbines have moved closer - BAN\_13 by 65 metres and BAN\_15 by 166 metres. Of the 9 turbines within 2 km of B29, 6 turbines have moved closer to the residence, of which 3 turbines have moved closer by more than 50 metres (i.e. BAN\_08 146 metres; BAN\_09, 162 metres; and BAN\_12, 64 metres).

To reduce visual impacts on these residences, the Department recommended in its July 2014 report that the 2 turbines that had moved more than 150 metres towards the residences be moved back to their approved locations (i.e. turbines BAN\_09 and BAN\_15). The Department also recommended that B29 be afforded voluntary acquisition rights under the project approval.

Importantly, however, since the Assessment Report (July 2014) was prepared, the proponent has advised that it has:

- acquired property B29; and
- reached a negotiated agreement with the owner of property B12 to accept the impacts of the wind farm “as constructed”.

Consequently, both properties can be considered to be “associated” with the project, and the measures previously recommended by the Department are no longer necessary.

The Department also notes that the proponent has made a commitment to undertake screening of the substation near property PW4 to minimise visual impacts from several areas within the property where the substation is visible. The Department has incorporated this commitment in the modified conditions.

Finally, the Department’s assessment report (July 2014) identified property PW34 as also having increased visual impacts. However, the company reached agreement with the owner of this property before the draft order was issued, and hence neither the draft order or this report specifically refer to this property as it is now considered to be “associated” with the project.

### 4.3 Biodiversity

The Draft Order considered that POM\_03, POM\_04, POM\_06, POM\_07 had moved to the extent that the turbines created increased risk to biodiversity, particularly in regard to the Powerful Owl and the Little Eagle. The location of these turbines with respect to ecological constraints is presented in Figure 4.

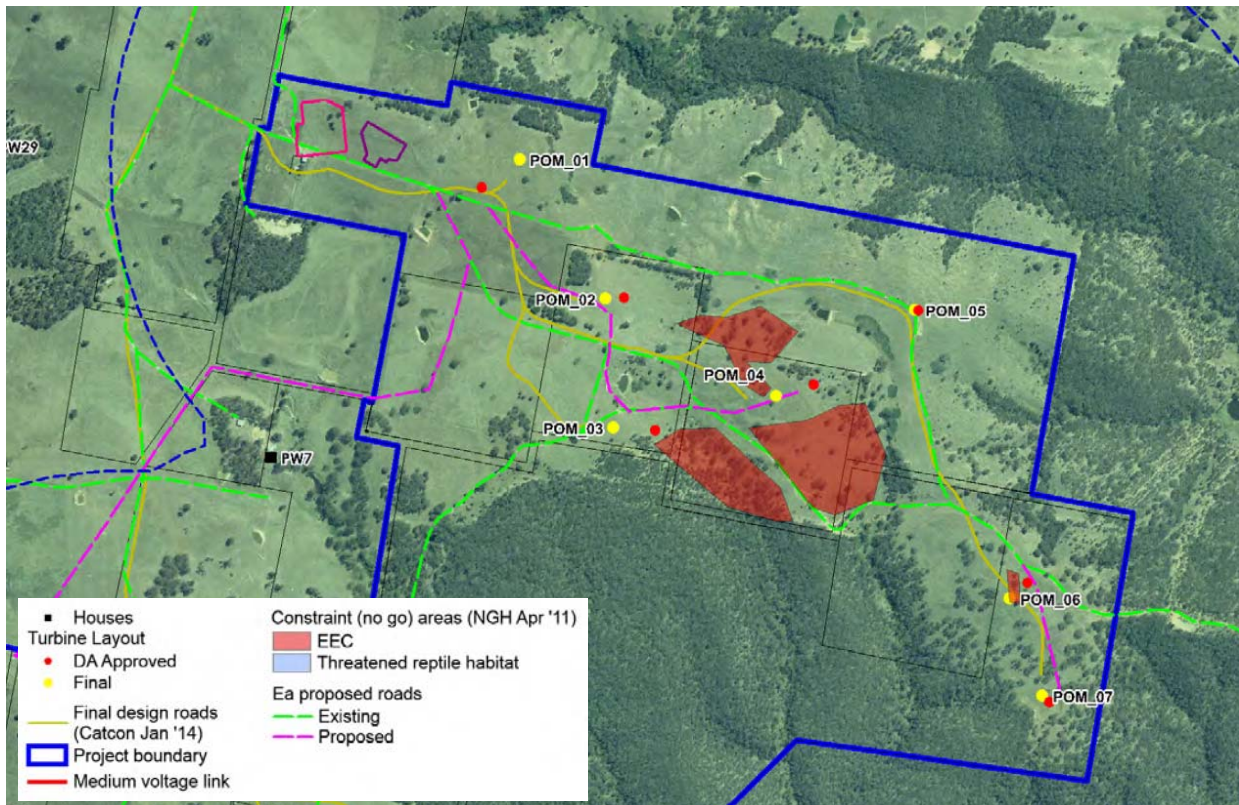


Figure 4: Location of the Northern Pomeroy Turbines



The increased risks to the Powerful Owl and the Little Eagle associated with the relocated turbines have now been considered in a range of reports over the last year, including:

- Little Eagle Review by NGH Environmental (August 2014 - see Appendix H);
- Powerful Owl and Little Eagle Survey by EcoFocus (October 2014 - see Appendix I);
- Expert Witness Report of Ian Smales (October 2014 - see Appendix J);
- Expert Witness Report of Brett Lane (October 2014 - see Appendix K); and
- Advice from the Department's independent ecological expert Dr Kevin Mills (October 2014 – see Appendix L).

All of these reports provide consistent conclusions – that the risk of collisions for key species of concern (i.e. Powerful Owl and Little Eagle) with the 4 relocated turbines has not materially increased. This includes the Department's independent expert (Dr Kevin Mills) who concluded that:

- in respect of turbines POM\_03, POM\_04 and POM\_07, the environmental and biodiversity outcome is better with the turbines relocated than it was as approved; and
- in relation to turbine POM\_06, the impact is the same in environmental and biodiversity terms.

Based on these reports, the Department notes that moving the turbines back to their approved locations has the potential to marginally increase the biodiversity risks.

The Department notes that OEH considered that the turbines POM\_03, POM\_04, POM\_06 and POM\_07 had moved closer to the known habitat for the Little Eagle. To address the increased risks, OEH recommended consideration of temporary suspension of operation of POM\_03 and POM\_04 during the fledging period for the Little Eagle.

The Department has considered the justification for a temporary suspension of operations to protect Little Eagle fledglings. The project approval already requires POM\_03, POM\_04, POM\_06 and POM\_07 turbines to be switched off from 30 November to 31 March each year to protect Powerful Owl fledglings. This period largely coincides with the fledging period for Little Eagles.

However, the evidence before the Department is that the risks to Powerful Owls are far more significant than any risk to Little Eagles in the area. For example, there have been 28 survey events between 2007 and 2015, with only one recording of the Little Eagle in 2007 at a location some kilometres to the south of these turbines. Compare this to the Powerful Owl which is known to have roosting sites in nearby bushland.

The Department also notes the Bird and Bat Adaptive Management Plan under the existing approval is designed to provide an evidence-based framework for adaptive management to minimise the risks to birds and bats. Under this plan, if the evidence is sufficient, there is flexibility for the Department to require additional mitigation of impacts on the Little Eagle, including temporary suspension of operations.

Given this, and the fact that the advice from a number of experts is that the relocated turbines would have no material effect on the risks to both species, the Department considers that there is little justification, at this stage, for imposing an additional suspension of turbine operations in this area to protect the Little Eagle.

Nonetheless, the Department has recommended that the Little Eagle be added to the list of "at risk" species in the Bird and Bat Adaptive Management Plan condition (see condition 3.1(d)). This requires monthly mortality assessments and periodic local population censuses and bird utilisation surveys to be undertaken for these species.

Finally, OEH has recommended that the proponent be required to update the mapping of the area of native vegetation impacted by the "as constructed" project, and revise the biodiversity offsets to compensate for any additional impacts. The Department agrees with this recommendation, and has incorporated a condition requiring the proponent to revise the Compensatory Habitat Package in consultation with OEH by the end of 2015.

#### 4.4 Other Issues

Table 3 summarises the Department's consideration of other issues associated with the proposed modification.

**Table 3: Assessment of Other Issues**

<b>Issue</b>	<b>Impact and Consideration</b>	<b>Recommendation</b>
<i>Noise</i>	<ul style="list-style-type: none"> <li>The EA includes a revised Noise Impact Assessment for the final turbine models and locations selected which concludes that the predicted noise from the “as constructed” project achieves the relevant noise limits at all assessed receivers.</li> <li>Both the Department and the EPA consider that the original and revised Noise Impact Assessments were conducted in accordance with the South Australia's <i>Environmental Noise Guidelines: Wind Farms</i> (2003), which is the accepted methodology for assessing wind farm noise at non-associated residences in NSW.</li> <li>The Department also commissioned an independent noise assessment by Wilkinson Murray, including independent noise modelling of the approved and proposed turbine layouts. The predicted difference in noise levels were either the same or within 0.1 dB (see Appendix M).</li> <li>On this basis, Wilkinson Murray concluded that the proposed relocation of the turbines has not resulted in a noticeable increase in noise impacts and that the project (as modified) would be able to meet the noise limits in the project approval.</li> <li>The Department accepts this conclusion.</li> </ul>	The Department has made some minor amendments to the conditions to provide flexibility in regard to noise monitoring methodologies provided the EPA agrees.
<i>Shadow Flicker</i>	<ul style="list-style-type: none"> <li>The Department considers that shadow flicker is a consideration in terms of amenity and possible annoyance. The modified project includes the relocation of a number of turbines, some of which have moved closer to non-associated residences.</li> <li>The proponent prepared a shadow flicker assessment of the revised turbine locations, which the Department notes is based on using conservative modelling assumptions for a theoretical worst case scenario.</li> <li>The assessment concludes that there have been marginal increases or decreases in calculated shadow flicker for some non-associated residences. Predicted increases range from 1 hr/year to 3 hrs/year.</li> <li>The Department notes the theoretical maximum shadow flicker exceeds 30 hrs/year for the modified layout for one non-associated residence (i.e. B19 with 37 hrs/year predicted).</li> <li>However, once this prediction is adjusted for turbine orientation and cloud cover, the predicted shadow flicker reduces to 20 hrs/year.</li> <li>The Department acknowledges that there are a number of assumptions in calculating the theoretical maximum shadow flicker and the maximum theoretical levels predicted are probably unlikely to occur.</li> <li>Irrespective, the project approval requires the proponent to ensure that any non-associated residence does not experience shadow flicker more than 30 hrs/year, and the Department is generally satisfied the proponent would be able to comply with this limit.</li> </ul>	No additional conditions or amendments necessary.
<i>Health</i>	<ul style="list-style-type: none"> <li>The proponent assessed the variations to turbine locations in terms of noise, shadow flicker and electromagnetic radiation and concluded there were negligible differences between the approved layout and the relocated turbine layout.</li> <li>The proponent also summarised literature from the National Health and Medical Research Council (NHMRC) and the Australian Medical Association (AMA) regarding possible human health effects from wind farms. This literature indicates that there appears not to be a strong link between the operation of wind farms and human health effects.</li> <li>The Department acknowledges the community's concern regarding potential health effects emanating from wind farms. However, the Department is guided by the literature reviews undertaken by the</li> </ul>	No additional conditions or amendments necessary.



<b>Issue</b>	<b>Impact and Consideration</b>	<b>Recommendation</b>
	<p>NHMRC which uses a robust evidence-based approach, supported by NSW Health, regarding human health effects from wind farms.</p> <ul style="list-style-type: none"> <li>Given the above, the Department is satisfied that the project would comply with applicable criteria, and the risk of any residual health effects from the wind farm (as modified) is minimal.</li> </ul>	
<i>Air Safety</i>	<ul style="list-style-type: none"> <li>An assessment of the impacts of the relocated turbines on Crookwell and Ashwell aerodromes was undertaken by the proponent.</li> <li>The Crookwell aerodrome is located approximately 4 km south of Crookwell, and is utilised by emergency services to fight bushfires and provide training, as well as functioning as an emergency medical evacuation site.</li> <li>The proponent's assessment concluded that the closest relocated turbine to the Crookwell aerodrome (KIA_01), was approximately 32 metres closer to the aerodrome, and resulted in no increase on aviation impacts.</li> <li>The Ashwell airstrip is utilised as a private airstrip, and the closest relocated turbine (i.e. POM_19) has moved 40 metres further away from the airstrip, and resulted in no increase on aviation impacts.</li> <li>The constructed turbines have also been constructed to a maximum height of either 126 m or 130m, which is shorter than the maximum approved height of 135 m.</li> <li>Given the above, the Department is satisfied that the impacts on air safety, including the Crookwell aerodrome and Ashwell airstrip, of the modified project have been satisfactorily addressed, and considers that the modified project would not result in any increased risks to aviation.</li> </ul>	No additional conditions or amendments necessary.
<i>Aboriginal Heritage</i>	<ul style="list-style-type: none"> <li>The proponent's archaeologist prepared a desktop assessment of the impacts of the relocated turbines on Aboriginal cultural heritage.</li> <li>This assessment included a search of the Aboriginal Heritage Management System (AHIMS) database and consideration of the salvage surveys conducted in 2012 to identify whether any Aboriginal sites occurred within the relocated locations of the turbines.</li> <li>No Aboriginal sites have been recorded within the relocated turbine layout, and no sites were found within the turbine locations during the salvage program, which included the "as constructed" turbine locations.</li> <li>OEH raised a number of issues about the Aboriginal Heritage Management Plan and the salvage program undertaken in 2012.</li> <li>However, the Department notes that these matters are not directly relevant to the proposed modification, and will be addressed separately.</li> <li>Based on the assessment in the EA, the Department is satisfied that the changes to the "as constructed" layout have not increased the impacts of the project as originally approved.</li> </ul>	No additional conditions or amendments necessary.

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<i>Traffic and Transport</i>	<ul style="list-style-type: none"> <li>The proponent’s assessment considers that changes to turbine locations have had little impact on traffic and transport issues with the main changes involving minor adjustments of access routes to the adjusted turbine locations.</li> <li>The original Environmental Assessment (2008) considered traffic and transport impacts of the construction of 84 turbines. However, as a smaller number of turbines was approved (73 turbines), this has resulted in a reduced volume of imported components and therefore reduced volume of construction vehicle movements.</li> <li>The proponent further states that the weight and size of the turbine components has been reduced when compared to other turbine models considered in the approved project (see table below), which has resulted in marginally smaller transport vehicles.</li> </ul> <table border="1" data-bbox="368 555 1082 786"> <thead> <tr> <th data-bbox="368 555 560 584">Transport component</th> <th data-bbox="560 555 767 584">EA 2008 (84 turbines)</th> <th colspan="2" data-bbox="767 555 1082 584">Final Design (73 turbines)</th> </tr> </thead> <tbody> <tr> <td data-bbox="368 600 560 629" rowspan="2">Tower sections</td> <td data-bbox="560 600 767 629" rowspan="2">336</td> <td data-bbox="767 600 895 629">GW82 - 4 parts</td> <td data-bbox="895 600 1082 629">68</td> </tr> <tr> <td data-bbox="767 629 895 658">GW100 - 3 parts</td> <td data-bbox="895 629 1082 658">168</td> </tr> <tr> <td data-bbox="368 658 560 687">Nacelles</td> <td data-bbox="560 658 767 687">84 (60-70 tonnes)</td> <td colspan="2" data-bbox="767 658 1082 687">73 (40-50 tonnes)</td> </tr> <tr> <td data-bbox="368 687 560 716">Rotors</td> <td data-bbox="560 687 767 716">84</td> <td colspan="2" data-bbox="767 687 1082 716">73</td> </tr> <tr> <td data-bbox="368 716 560 745">Blades</td> <td data-bbox="560 716 767 745">252</td> <td colspan="2" data-bbox="767 716 1082 745">219</td> </tr> <tr> <td data-bbox="368 745 560 775">Concrete for Footings</td> <td data-bbox="560 745 767 775">33,600m<sup>3</sup></td> <td colspan="2" data-bbox="767 745 1082 775">29,200m<sup>3</sup></td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Therefore, the Department considers that the levels of construction traffic would have been marginally lower than what was originally proposed.</li> <li>The Department notes the proponent has prepared a post-construction dilapidation report which was submitted to the relevant road authorities in March 2014. The proponent has also commissioned a further report on the recommended works.</li> <li>The Council has raised issues about the damage caused by the project to one of the Shire’s main roads and a number of public submissions raised similar concerns.</li> <li>Condition 2.49 of the project approval requires the proponent to restore the roads to the state described in the original pre-construction road dilapidation report and to fund any remedial road works.</li> <li>The proponent has advised that the remedial road works to be conducted are the subject of ongoing consultation with Council.</li> <li>The Department considers this to be a compliance matter, and is to be addressed in accordance with Condition 2.49, which includes guidance if there is a dispute between the parties.</li> </ul>	Transport component	EA 2008 (84 turbines)	Final Design (73 turbines)		Tower sections	336	GW82 - 4 parts	68	GW100 - 3 parts	168	Nacelles	84 (60-70 tonnes)	73 (40-50 tonnes)		Rotors	84	73		Blades	252	219		Concrete for Footings	33,600m <sup>3</sup>	29,200m <sup>3</sup>		No additional conditions or amendments necessary.
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<i>Telecommunications</i>	<ul style="list-style-type: none"> <li>The proponent has assessed the potential impacts that may arise from the relocated turbines on telecommunication services.</li> <li>The assessment concluded that the final design layout would not significantly change the impacts of the project.</li> <li>The proponent has also previously undertaken an assessment of the existing quality of the television/radio transmission at 54 locations within 5 km of the wind farm prior to construction.</li> <li>The Department is not aware of any issues with telecommunications as a result of the “as constructed” wind farm, and considers that the existing conditions in the project approval are appropriate for managing any issues with telecommunications interference.</li> <li>These conditions require the proponent to rectify any television/radio transmission problems reasonably attributable to the project.</li> <li>The Department also notes the proponent has committed to consult further with the Rural Fire Service to ensure that there is no interference with emergency service communications.</li> <li>Based on the above, the Department considers that the likelihood of any issues with telecommunications as a result of the modified project layout.</li> </ul>	No additional conditions or amendments necessary.																										



<b>Issue</b>	<b>Impact and Consideration</b>	<b>Recommendation</b>
<i>Soil and Water Management</i>	<ul style="list-style-type: none"> <li>The proponent states that soil and water management issues have been managed in the same way for the relocated turbine locations as they would have been for the approved locations.</li> <li>The proponent also states that the construction has been undertaken in accordance with the approved Construction Environmental Management Plan (CEMP) which includes a “Soil and Water Management Plan”.</li> <li>The Department considers that soil and water management measures are site specific and that provided the measures and objectives are followed in the CEMP, there would be no substantive soil and water management issues regarding the relocation of wind turbines.</li> <li>Consequently, the Department is satisfied that this issue has been adequately addressed through the implementation of the existing management arrangements under the project approval.</li> </ul>	No additional conditions or amendments necessary.

## 5 RECOMMENDED CONDITIONS

The Department has drafted a recommended notice of modification (see Appendix A and Appendix B for the consolidated consent). The notice makes a number of recommendations to amend the project approval, including:

- updating and expanding the noise criteria for potentially affected residences;
- updating the Bird and Bat Adaptive Management Plan in consultation with OEH, including adding the Little Eagle to the list of “at risk” species that need to be carefully managed under the plan;
- revising the Compensatory Habitat Package in consultation with OEH to ensure it adequately compensates for the impacts of the “as constructed” turbine layout;
- formalising the commitment to landscape the substation to minimise impacts on nearby non-associated properties;
- various changes to ensure the impacts of decommissioning the project are appropriately incorporated in the project approval, including a requirement to prepare and implement a Decommissioning Environmental Management Plan and a Road Dilapidation Report for both construction and decommissioning; and
- a number of administrative changes to update definitions and to reflect contemporary drafting of conditions for wind farm projects.

The proponent does not object to the recommended amendments to the project approval.

## 6 CONCLUSION

The EP&A Act makes provision for the modification of development consents and approvals where the relevant work has already been carried out. Accordingly, the Department has assessed the modification application and supporting information in accordance with the relevant requirements of the EP&A Act.

Based on this assessment, including the advice of a range of experts, the Department is satisfied that the impacts of the modified project are not materially greater than those associated with the project as originally approved.

In particular, the Department notes that the two residences which were the subject of adverse visual impact by the relocations are now “associated” residences, and the visual impacts of the relocations of these turbines can now be considered acceptable. Similarly, the Department considers that the relocated turbines do not result in any material additional visual impacts on non-associated residents.

In regard to biodiversity, the Department accepts the advice of a range of ecological experts that the relocated turbines do not increase (and in some cases reduce) the risks to bird and bat species, including “at risk” species such as the Powerful Owl and Little Eagle.

The Department has also considered a range of other matters in its assessment of the application, and is satisfied that none of these matters would materially increase the impacts of the project as approved.

The Gullen Range Wind Farm is NSW's largest operational wind farm and represents an investment of over \$300 million. Its 73 wind turbines provide a generation capacity of 165.5 megawatts, which is enough to supply 60,000 NSW homes with renewable energy. The renewable energy being delivered by the project is delivering significant emissions savings to NSW equivalent to over 3 million tonnes of greenhouse gases.

The Department considers that allowing the wind farm to operate "as constructed" would ensure these benefits would not be further compromised, and would avoid the additional cost and disturbance associated with the removal/relocation of turbines. In this regard, the proponent has advised that complying with the draft order would cost well over \$12 million, and the loss of more than 6,000 megawatt hours of renewable energy in the short term, and up to 23,500 megawatts hours in the long term as a result of a sub-optimal turbine layout.


On balance, the Department considers that there is no evidence of environmental harm associated with the relocation of the turbines at the Gullen Range Wind Farm, and that the proposed modification is in the public interest and should be approved, subject to conditions.

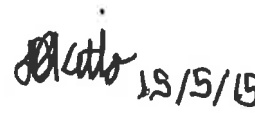
Finally, based on the findings of this assessment, and in accordance with the advice of Senior Counsel, the Department will not be issuing an order to require the removal or relocation of the 9 turbines that were the subject of the draft order issued under Section 121B of the EP&A Act on 10 October 2014.

## 7 RECOMMENDATION

It is RECOMMENDED that the Planning Assessment Commission, as delegate of the Minister:

- **considers** the findings and recommendations of this report;
- **determines** that the modification is within the scope of section 75W of the EP&A Act;
- **approves** the application under section 75W, subject to conditions; and
- **signs** the notice of modification (Appendix A).

  
Mike Young  
Director  
Resource Assessments  
15.5.15

  
David Kitto  
Executive Director  
Resource Assessments & Business Systems  
15/5/15



**APPENDIX A: NOTICE OF MODIFICATION**

**APPENDIX B: CONSOLIDATED CONSENT**



## **APPENDIX C: ENVIRONMENTAL ASSESSMENT**

See the Department's website at

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6470](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6470)

## **APPENDIX D: SUBMISSIONS**

See the Department's website at

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6470](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6470)

## **APPENDIX E: RESPONSE TO SUBMISSIONS**

See the Department's website at

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6470](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6470)



## APPENDIX F: FINAL DESIGN TURBINE LOCATIONS

*Table 1: Final design turbine locations and difference (source: Table 2-2 Modification EA)*

Turbine ID	Surveyed Final Design Coordinates and elevation			Distance relocated (m) <50 50-100 >100	Direction moved	Change in Turbine Level (m)
	Easting	Northing	Level Base of Tower			
KIA_01	722206	6178258	987.42	35.7	East	7.4
KIA_02	722106	6178003	968.24	43.4	North	7.5
BAN_01	722867	6177000	961.07	47.4	SE	5.5
BAN_02	722816	6176718	960.89	12.6	South	-0.1
BAN_03	722567	6176552	959.37	36.8	South	-0.6
BAN_04	722477	6176299	957.8	12.8	South	-1.2
BAN_05	723284	6176726	964.46	12.5	South	-1.3
BAN_06	723235	6176463	971.72	4.5	West	2.6
BAN_07	723092	6176141	973.04	33.3	NW	-7.7
BAN_08	723327	6175886	1000.99	187.0	SSW	14.8
BAN_09	722740	6174867	952.9	167.0	West	-3.8
BAN_10	722846	6174519	959.13	80.4	South	-0.9
BAN_11	723242	6174950	964.19	48.5	North	1.0
BAN_12	723177	6174649	968.18	64.8	West	5.1
BAN_13	723736	6174579	960.3	168.6	ESE	-3.6
BAN_14	723832	6174779	974.36	85.0	South	-5.6
BAN_15	724314	6174314	965.87	177.9	North	2.9
BAN_16	724441	6173780	971.89	14.0	South	1.9
BAN_17	724453	6173505	975.64	13.9	West	0.6
BAN_18	723870	6173444	957.43	32.0	West	0.7
BAN_19	724307	6173286	969.32	2.2	SE	-0.7
BAN_20	724521	6172964	970.76	0.0	N.A.	0.8
BAN_21	724485	6172357	968.7	111.9	SSE	7.6
BAN_22	724466	6172100	981.57	22.0	South	1.6
BAN_23	724269	6171949	975.81	16.1	NW	1.4
BAN_24	724049	6171628	955.85	123.6	South	2.3
BAN_25	724647	6171804	986.26	50.9	NW	1.3
BAN_26	724630	6171532	985.61	46.6	NW	1.6
BAN_27	724502	6171321	980.48	20.6	East	4.3
BAN_28	724213	6171232	973	9.9	NW	3.0
BAN_29	723793	6171252	959.5	7.1	West	4.5
BAN_30	724099	6171000	955.16	1.0	N.A.	1.2
POM_01	725833	6166934	898.69	115.2	NE	-1.3
POM_02	726044	6166594	888.82	45.0	SW	5.2
POM_03	726063	6166277	884.18	102.2	West	4.2
POM_04	726461	6166355	873.2	96.2	SW	12.5
POM_05	726800	6166565	865.08	8.1	West	5.1
POM_06	727033	6165858	862.62	56.7	SW	2.6
POM_07	727112	6165618	844.99	23.4	West	-0.2
POM_08	725438	6165310	888.16	0.0	NA	-11.8
POM_09	724870	6165173	883.05	28.3	SSW	-2.9
POM_10	725390	6165082	892.5	92.5	East	-6.0
POM_11	725525	6164826	889.87	64.4	NW	-10.1
POM_12	724220	6164723	890.59	10.2	North	-8.6
POM_13	724725	6164560	888.39	6.0	North	-4.2
POM_14	725064	6164835	892.14	36.4	SW	1.3
POM_15	725079	6164566	901.81	8.5	SW	2.7
POM_16	725216	6164233	893.4	18.1	South	8.4

Turbine ID	Surveyed Final Design Coordinates and elevation			Distance relocated (m) <50 50-100 >100	Direction moved	Change in Turbine Level (m)
	Easting	Northing	Level Base of Tower			
POM_17	725509	6163949	865.02	7.2	SW	7.6
POM_18	725752	6163649	849.99	11.0	North	10.0
POM_19	724788	6163595	899.03	56.6	North	0.2
POM_20	725434	6163257	833.73	7.6	West	13.7
POM_21	725752	6162969	828	7.2	NE	8.0
POM_22	726057	6162593	821.56	81.5	SE	6.0
POM_23	726339	6162361	812.01	20.2	East	12.2
GUR_01	727827	6161200	787.19	2.2	South	2.2
GUR_02	727730	6160921	805.09	8.9	North	-3.8
GUR_03	727826	6160598	820.43	10.0	North	-3.0
GUR_04	727464	6160571	799.12	13.5	NW	-0.8
GUR_05	727307	6160350	816.25	3.2	West	1.3
GUR_06	727298	6160051	779.65	10.8	NE	2.7
GUR_07	727912	6160363	836.3	101.5	North	12.0
GUR_08	727832	6159846	773.02	0.0	N.A.	-0.7
GUR_09	727269	6159369	811.32	36.9	South	1.7
GUR_10	727389	6158918	819.87	60.5	SSE	8.5
GUR_11	727520	6158639	833.15	6.4	NW	3.1
GUR_12	727479	6158308	839.08	59.7	South	7.5
GUR_13	727642	6158039	824.07	19.0	SW	4.1
GUR_14	727753	6157727	832.16	0.0	N.A.	2.2
GUR_15	727834	6157450	833.9	43.7	North	5.1
GUR_16	728211	6159145	785.91	12.0	SW	1.6
GUR_17	727997	6158925	803.51	29.4	South	3.5
GUR_18	728036	6158675	810.96	55.3	East	4.4
<b>Note:</b> GW100 is a GW100-2.5 and has hub height of 80 metres. GW82 is a GW82-1.5 and has a hub height of 85 metres.						

**APPENDIX G: SUPPLEMENTARY INFORMATION PROVIDED BY PROPONENT**



**APPENDIX H: LITTLE EAGLE REVIEW**

**APPENDIX I: POWERFUL OWL AND LITTLE EAGLE SURVEY**

**APPENDIX J: EXPERT WITNESS REPORT OF IAN SMALES**



**APPENDIX K: EXPERT WITNESS REPORT OF BRETT LANE**

## **APPENDIX L: INDEPENDENT ECOLOGICAL ADVICE**

## **APPENDIX M: INDEPENDENT NOISE REPORT**

**APPENDIX N: LEGAL ADVICE**