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Proposed Development of  
**Crudine Ridge Wind Farm**

Central New South Wales



**Response to Submissions  
and Preferred Project Report**

November 2013

Prepared for Crudine Ridge Wind Farm Pty Ltd by Wind Prospect CWP Pty Ltd

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- Appendix 11 MWRC’s cover and form letter to Mudgee residents dated 8<sup>th</sup> October 2013

# 1. INTRODUCTION

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The proposed Crudine Ridge Wind Farm (the Project) consists of up to 106 wind turbines and associated ancillary infrastructure located along Crudine ridge, 45 km south of Mudgee and 45 km north of Bathurst, New South Wales (NSW).

The Project is being assessed as a Part 3A Major Project under the *NSW Environmental Planning and Assessment Act 1979* and the consent authority is the Minister for Planning and Infrastructure. Part 3A was repealed on the 1<sup>st</sup> October 2011 and the Project is now subject to the transitional provisions identified in Schedule 6A of the Act. The Project is also consistent with the criteria of *Critical Infrastructure* as it is a power generator with the capacity to generate in excess of 30 MW. It is acknowledged that the lease of land for a period of greater than five years is deemed to be the 'subdivision' of land pursuant to Section 4B(1)(b) of the Environmental Planning and Assessment Act 1979 (although it is not an actual subdivision of the land which creates a new allotment and deposited plan) and requires approval under that legislation. This deemed 'subdivision' forms part of the Project the subject of this Project application.

The Project is being developed by Wind Prospect CWP Pty Ltd (WPCWP), on behalf of Crudine Ridge Wind Farm Pty Ltd (the Proponent). Both the Proponent and WPCWP are Australian registered companies whose ultimate shareholders are Wind Prospect Group and Continental Wind Partners (CWP).

The Project was publicly announced in March 2011, at the commencement of detailed feasibility studies and early stages of planning. The Project Environmental Assessment (Project EA) was submitted to the NSW Department of Planning and Infrastructure (DoPI), and placed on public exhibition from 12<sup>th</sup> December 2012 to 19<sup>th</sup> March 2013. During this period, submissions were sought from the local community, government agencies, interested parties and other stakeholders. The DoPI accepted submissions up to 19<sup>th</sup> March 2013, though a few late submissions were also received and included.

## 1.1 Purpose of the Report

Submissions that were made by members of the public, government and other agencies were provided to the Proponent by DoPI. The DoPI sought a response to the issues raised within those submissions in accordance with Section 75H of the *NSW Environmental and Planning Assessment Act 1979*.

The Response to Submissions Sections of this report consider and respond to the issues raised in the submissions for the Project EA.

The Preferred Project Report (PPR) Sections of this report provide a response to the concerns that have been raised regarding the construction transport routes proposed in the Project EA in particular. A number of revised transport routes are proposed, and a number of technical and environmental assessments of these routes have been undertaken. The revised transport routes, technical and environmental assessments and consultation undertaken regarding these routes are provided.

## 1.2 Format of the Report

The Response to Submissions Report has endeavoured to capture all comments made, questions put, and issues raised through the Exhibition phase of the Project assessment. Responses have been provided in two Sections; Section 3 Agency Submission responses and Section 4 Public Submission responses. These comments and responses are further categorised to mirror the original EA Chapters (totalling 21). As such, this Response to Submissions and Preferred Project Report should be read in conjunction with the Project EA.

Section 5 of the Report provides reconciliation between submissions and the detail that has been provided in response to them. Table 11 in this Section refers to the Submission Statement number (a five digit number) which is a unique identifying number assigned by DoPI to each submission.

The PPR, which incorporates changes to the Project that have come about through a broader response to submissions and feedback, is detailed in Section 6 of the Report. Finally, Section 7 of the Report contains the Statement of Commitments associated with the Project that were originally provided in Chapter 20 of the Project EA. This has been updated as required and should be referred to, where reference is made to a Statement of Commitment in this report. For ease of comparison, those Statements of Commitment that have been revised are listed in a subsequent section, Amended Statement of Commitments.

Volume 1 contains additional technical and environmental assessments that were undertaken for the Response to Submissions Report and Preferred Project Report.



## 2. SUBMISSIONS SUMMARY

### 2.1 Submissions Received

The DoPI received and classified a total of 125 submissions during the public exhibition period (Table 1). In accordance with section 75H of the *Environmental Planning and Assessment Act 1979*, this Response to Submissions and Preferred Project Report considers the issues raised in those submissions.

**Table 1** Submissions received for the Project

Type	Position	Number
Public	Support	7
	Comment	7
	Objection	33
	Objection (Form)	24
	Objection (Form+)	40
Agency		14
<b>Total</b>		<b>125</b>

Of the 97 objection submissions received, 66 % (64) were what can be described as “form letters” as shown by the “Objection (Form)” and “Objection (Form+)” descriptions (Figure 1). These are pro-forma letters with a number of stated concerns which submitters can “box-tick” without necessarily describing their specific concern in relation to the Project. Shown in Table 1 as “Objection (Form)”, 24 submissions received were form letters which did not contain any additional specific concern, beyond the pro-forma descriptions. A further 40 submissions, shown in Table 1 as “Objection (Form+)”, either contained a brief comment on the form letter which highlighted a specific concern or attached an additional document(s).

Figure 2 below summarises public submissions by submission suburb, providing further context in which to understand and interpret submission issues. The analysis based on submission suburb excludes nine submissions that did not provide a location, and 8 submissions made by businesses or groups. Of the 94 individual submissions that did provide a suburb, distances between submission suburb and the Project were assessed as per Table 2.

**Table 2** Proximity of submission suburbs to the Project

Distance to the Project	Number of Submissions
Within 10 km	37
10 - 50 km	30
Outside 50 km	27

Agency submission comments were also summarised, in order to provide an overview of concern and relevance (Table 3).

**Table 3** Agency submission comments by EA Chapter

	Introduction	Project Description	Project Justification	Planning Context	Consultation	LVIA	Noise	Ecology	Heritage	Traffic & Transport	Aviation	Communication	EMF	Fire & Bushfire	Water	GEA	SEA
Office of Environment & Heritage																	
Environmental Protection Agency																	
Roads & Maritime Services																	
Mid-Western Regional Council																	
Bathurst Regional Council																	
Catchment Management Authority																	
Airservices Australia																	
Commonwealth Aviation Safety Authority																	
Department of Defence																	
Rural Fire Service																	
Trade & Investment – Minerals																	
Department of Primary Industries (Crown)																	
Department of Primary Industries (NOW/Fisheries/Agriculture)																	

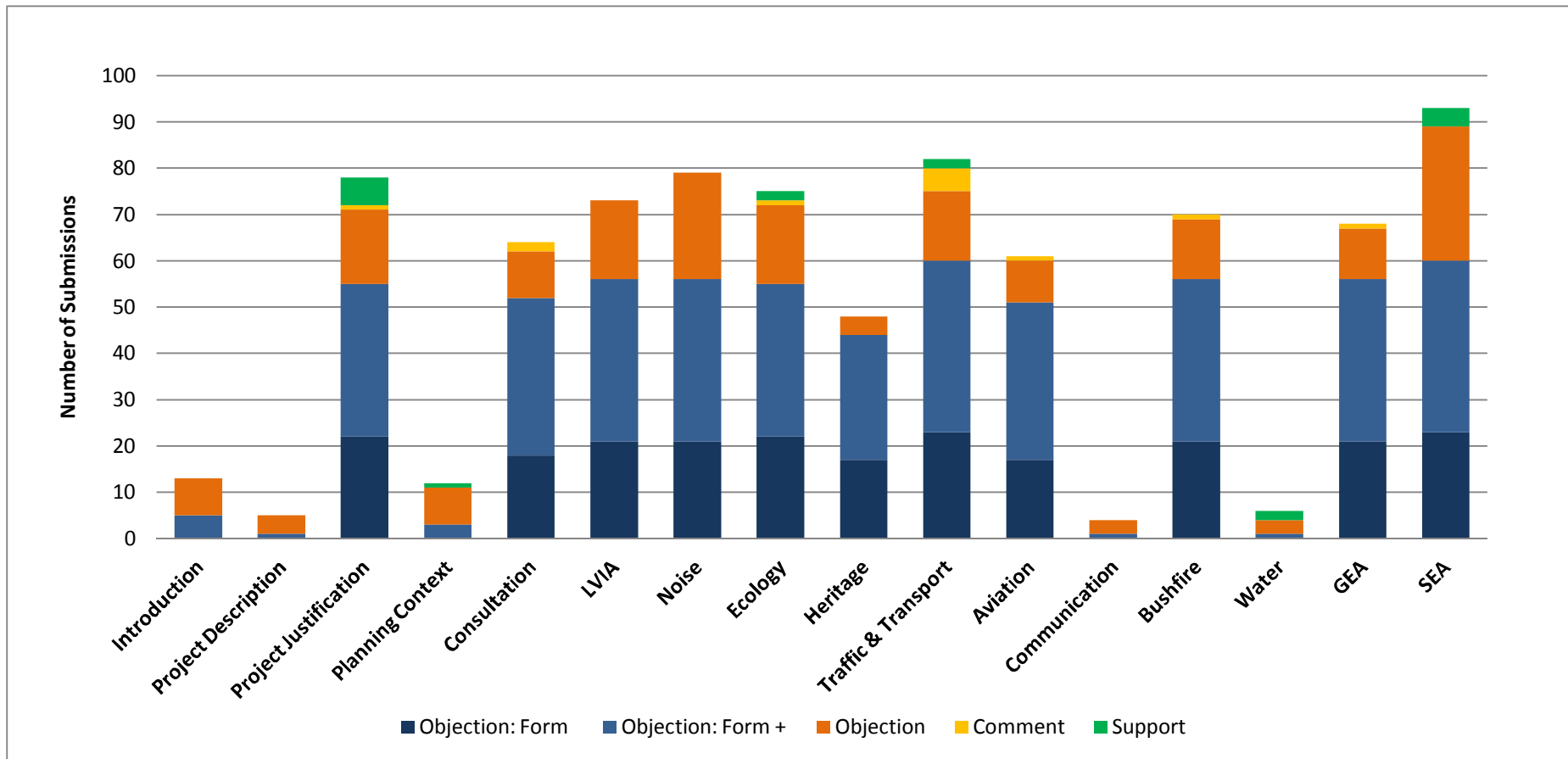


Figure 1 Number of public submission issues by EA Chapter

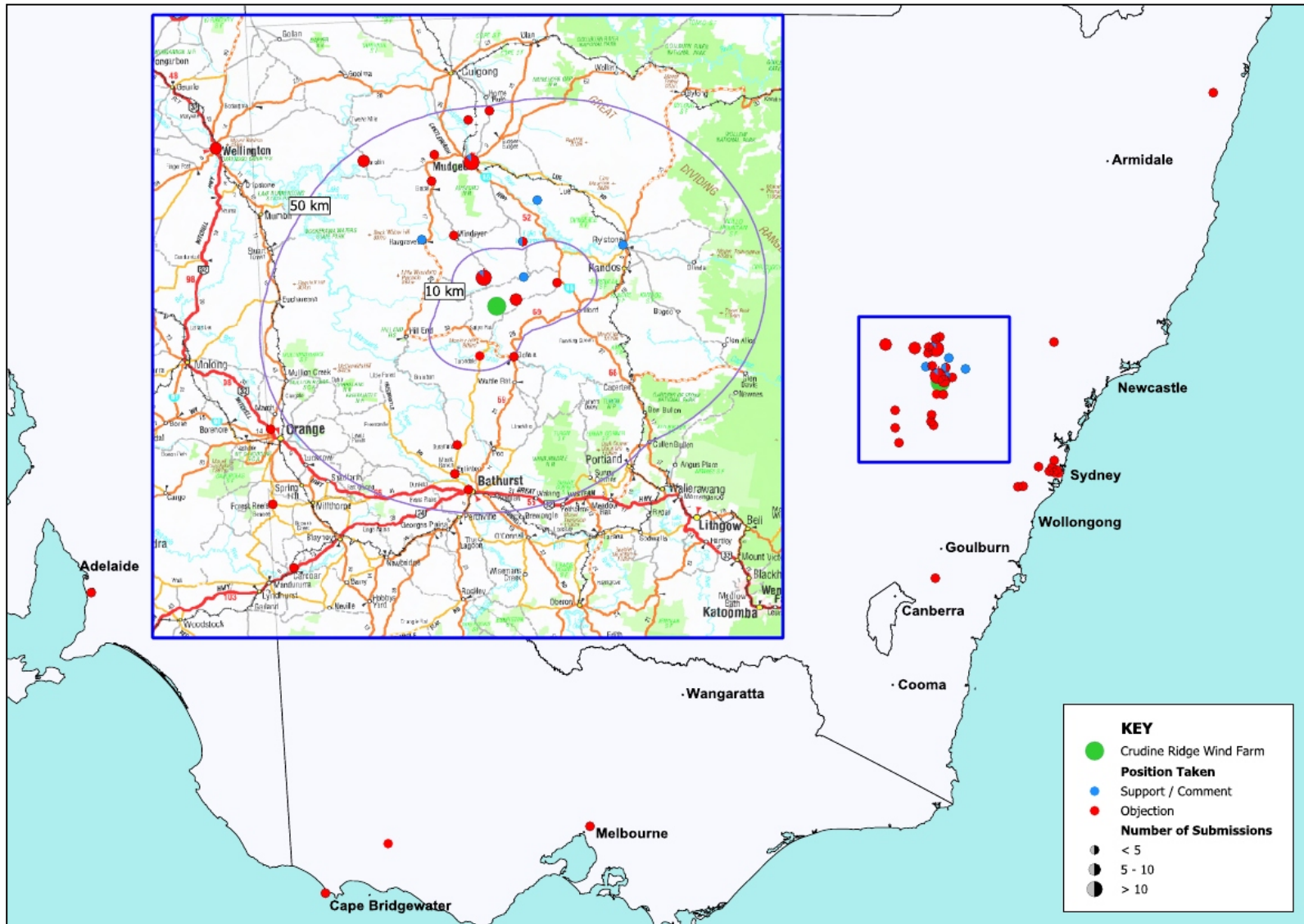


Figure 2 Summary of public submissions by location

## 3. AGENCY SUBMISSION RESPONSE

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### Chapter 1: Executive Summary

No responses received.

### Chapter 2: Introduction

**3.2.1** *MWRC* **Crudine Ridge Wind Farm Pty Ltd is a \$10.00 company with one shareholder being Asia Pacific Renewables Limited, registered in Malta holding 1,000 shares paid up to the value of 1 cent each.**

**Response:** Crudine Ridge Wind Farm Pty Limited is an Australian company registered in Victoria in April 2010. Its registered office is in Adelaide, South Australia.

Crudine Ridge Wind Farm Pty Limited continues to be ultimately owned by the Wind Prospect Group and Continental Wind Partners, although there have been changes to the shareholding due to internal group re-structures in 2012-3. Such changes are an ordinary part of all businesses, particularly those involving large group structures and development companies.

The comments regarding the ownership and share value of CRWF are misleading and, in any event, are not relevant to the Environmental Assessment (Project EA).

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### Chapter 3: Project Description

No responses received.

### Chapter 4: Project Justification

**3.4.1** *MWRC* **The company is strongly reliant on Federal Government forced consumer subsidies pursuant to Renewable Energy Target legislation. That could net the Crudine Ridge Wind Farm up to \$500,000 per tower per annum. If that subsidy was ever reduced by change in Federal Government policy which is always a strong possibility then the continued reality of the wind farm operation would be questionable. The applicant suggests that the Crudine Ridge Wind Farm is consistent with Council's stated environmental social and economic objectives and will assist in attaining these objectives. This is disputed. The consistency of the project with Council's objectives cannot and should not be asserted unless the project is consistent with the DCP as the DCP has been specifically formulated in accordance with Council's and the community's objectives.**

**Response:** Historically, new and emerging technologies have required investment in order to develop greater efficiencies and become competitive in their markets. In electricity generation, industries such as coal, natural gas and oil all benefited from significant state investment during development to become the large industries they are today.

Despite the maturity of those industries and technologies, governments worldwide

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continue to spend billions of dollars each year subsidising fossil fuels. In 2008, this figure was \$557 billion, compared to \$46 billion to renewable energy and biofuel in 2010.

The price distortion created by these subsidies, as well as other indirect subsidies, means that the true cost of fossil fuel electricity production is not reflected in the market price.

In Australia, support for renewable energy sources and technology comes solely through the Renewable Energy Target and Renewable Energy Certificates. The Renewable Energy Target sets a goal for the contribution of renewable energy to national energy consumption, which requires electricity retailers to purchase Renewable Energy Certificates from producers of renewable energy, including solar power and wind farms.

The cost of these Renewable Energy Certificates is passed on by the electricity retailers to consumers according to their energy use. This follows the “polluter pays” principle – the more energy you use, the more you pay. Renewable Energy Certificates are issued only for actual production – so there is every incentive for producers to ensure maximum production and efficiency.

The Renewable Energy Target legislation, which creates Renewable Energy Certificates, had bipartisan support for its passage through parliament in 2001, with amendments setting the current target in 2009. Both major political parties have indicated their ongoing support for the Renewable Energy Target.

The merits or otherwise of this or any other policy or legislation are matters for political debate and action. The Proponent and DoPI are both bound to consider and act in accordance with the legal and policy framework which currently exists for renewable energy and the wind farm industry. Further discussion on this point is not relevant to the Project EA.

Please see response to Comment 3.5.1 for matters relating to the MWRC DCP 2013.

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## Chapter 5: Planning Context

**3.5.1** **The applicant has failed to disclose the Mid-Western Development Control Plan for the purposes of the EA. The applicant has failed to consider its provisions and has failed to consider the consistency of the CRWF with the DCP. The failure to consider and disclose the DCP has occurred notwithstanding the applicant’s knowledge of the local planning instrument.**  
*MWRC*

**Response:** Mid-Western Regional Council (MWRC) formed a development control plan (DCP) in February 2013 to define development standards that deliver desired outcomes for the Council and community. *Section 6.3: Wind Farms* of the DCP sets out guidelines for the development of large scale wind farms in the MWRC LGA.

As the draft form of the MWRC DCP was released at the same time the Project EA was being finalised for Exhibition, it was DoPI’s view that there was insufficient time to comprehensively consider the draft document.

As such, and now the DCP has been finalised, the Project EA has now been considered against the guidelines set out in the MWRC DCP. Table 4 below outlines guidelines taken

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from Section 6.3 of the DCP and identifies where in the Project EA those issues have been addressed.

**Table 4** Outline of the MWRC DCP 2013, and where guidelines are addressed within the Project EA

<b>MWRC DCP 2013</b>	<b>Chapter of the Project EA</b>
Location context	<b>Chapter 3 and 4</b>
Site plan	<b>Chapter 3 and Figure 3.1</b>
Description of the wind turbines	<b>Chapter 3</b>
Land use description	<b>Chapter 3 and 4</b>
Noise impact assessment	<b>Chapter 9</b>
Visual impact assessment	<b>Chapter 8</b>
Electromagnetic radiation assessment	<b>Chapter 15</b>
Construction program and Environmental Management Plan	<b>Chapter 18 and 20</b>
Impact of construction vehicles	<b>Chapter 12</b>
Flora and fauna impacts	<b>Chapter 10</b>
Decommissioning and site restoration	<b>Chapter 18</b>
Addressing agency issues	<b>Chapter 6 and 18</b>
Cultural heritage	<b>Chapter 11</b>
Soil disturbance and impacts on hydrology	<b>Chapter 17 and 18</b>
Consistency with legislation and policy	<b>Chapter 5</b>
Consultation during design process	<b>Chapter 6</b>
Impacts on farming and forestry	<b>Chapter 3, 4 and 10</b>
Impact on adjoining land	<b>Chapters 8, 9, 16, 18 and 19</b>
Cumulative Impacts	Relevant chapters
Wind Turbine setback from residences, roads and property boundaries	<b>Chapter 4, 6 and Chapter 18</b>
Tree screening	<b>Chapter 8</b>
Shadow flicker at existing residences	<b>Chapter 8</b>
Communication Impacts	<b>Chapter 14</b>
Route for construction vehicles	<b>Chapter 12</b>
Impact assessment of transportation route	<b>Chapter 12</b>
Road upgrades and maintenance	<b>Chapter 12</b>
Site facilities	<b>Chapter 3</b>
Description of the grid connection arrangement	<b>Chapter 3</b>

The Project has been designed and assessed in accordance with the DGRs for the Project (Project EA, Section 5.2.3). The DGRs require the EA to address the suitability of the Project with respect to potential land use conflicts and future surrounding land use, taking into account local and strategic land use objectives. The Proponent has given due regard to MWRC DCP 2013 where relevant, however the DCP and the DGRs conflict in certain regards. In particular:

- MWRC DCP 2013 seeks that wind turbines shall not be located within 5 km of any residence not associated with the Project or from any lot upon which a residence may be constructed. The 5 km setback in MWRC DCP 2013 proposes utilising a precautionary principle in addressing perceived visual, noise and health concerns. The Draft Guidelines require assessment of noise, visual and health impacts for residences within 2 km of proposed wind turbines and the proponent to consider seeking

agreement with neighbours within that zone. The DGRs, issued in 2011, require assessment of noise and visual impacts, as well as risks associated with the Project both within and outside a 2 km zone. Noise, visual and health assessments have therefore considered involved and non-involved residences within and outside the 2 km zone; and

- MWRC DCP 2013 seeks that wind turbines be setback 2 km from non-involved property boundaries. The Project EA considered a range of risk and safety issues regarding setbacks in Chapter 18.

## Chapter 6: Stakeholder Consultation

**3.6.1** The CMA notes the range of engagement mechanisms employed by the proponent during the course of developing this project proposal and the inclusion of responses to issues raised during consultation within various chapters of the Environmental Assessment. The CMA strongly encourages ongoing and inclusive community consultation during the subsequent stages of the project in order to ensure issues relevant to the social well being on the affected community are raised with the proponent and mitigating strategies are developed in consultation with affected stakeholders.

*CMA – Central West*

**Response:** Noted. A Community Consultative Committee (CCC) was formed in February 2013 and will continue to operate throughout the development and operation of the Project in accordance with relevant policy and guidelines at that time. Further, the Proponent will continue to actively engage with the local community and all relevant stakeholders, and to maintain an open door communication policy at all times.

**3.6.2** During the exhibition, Council requested hard copies from the proponent who refused to supply these copies.

*MWRC*

**Response:** It is the role of the DoPI to determine the number of hard and electronic copies of the Project EA required, and to request these of the Proponent. For this Project, the copies requested by the DoPI were provided. It is not the role of the Proponent to determine the Project EA requirements for the Exhibition period.

Despite this, where an additional copy was requested by DoPI for MWRC to replace a missing copy, this was provided immediately. Further, as a result of consultation with the community, including through the Community Consultative Committee, an additional hard copy was printed. This copy was placed in Pyramul Hall, Pyramul for use by local community members who had expressed difficulty in attending Mudgee, Rylstone, Kandos or Bathurst where hard copies were already located.

## Chapter 7: Assessment of Key Issues

No responses received.



## Chapter 8: Landscape and Visual Impact Assessment

No responses received.

## Chapter 9: Noise Assessment

**3.9.1** The Environmental Noise Assessment (ENA) refers to two models of wind turbines both with hub heights of 80 m. The EA in Section 3.3.2 states that the tower heights under consideration are from 80m to 110m, and the maximum blade tip height is 160m. The EPA notes that DoPI usually requires modelling of noise impacts once the turbine of choice is confirmed, and a compliance assessment is usually required once the wind farm begins operation. The EPA supports these requirements.

NSW  
EPA

**Response:** Noted.

**3.9.2** The EPA notes that the sound power levels for the two assessed wind turbines are provided in octave bands, and no further information is provided on how these were derived. The EPA recommends that 1/3 octave sound power levels derived in accordance with IEC 61400-11 should be provided for the selected turbines to be used in the project.

NSW  
EPA

**Response:** The sound power levels for a wind turbine are determined by the measurement of noise from the wind turbine in accordance with International Standard IEC 61400-11, "*Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*". The standard does not require 1/3 octave band data to be collected and therefore such data is not always available for all models. The 1/3 octave band data would typically be used to identify the presence of tones from the wind turbine.

**3.9.3** The ENA states that wind speed measurements have been conducted at various heights (30m, 45m, 40m, 60m, 80m and 110m) and that these measurements were extrapolated to obtain 10m above ground level wind speeds for analysis in accordance with the SA Guidelines. The methods and formulas for the wind shear model(s) used to extrapolate this data should be detailed and justified in the ENA. This has the potential to significantly affect the relationship between background noise and turbine noise at sensitive receivers for any given wind speed.

NSW  
EPA

**Response:** The South Australian Environmental Noise Wind Farm Guidelines 2003 (the SA Guidelines) specify that the background noise data should be correlated with wind speeds at 10 m above ground level (AGL). Historically, such data has been collected from a wind mast with an anemometer located directly at 10 m AGL. A disadvantage of such an approach is that it might indicate lower wind speeds, should high wind shear conditions occur at the site. Therefore, the data analysis in the Noise Assessment went beyond the requirements of the SA Guideline and used the two highest anemometer locations.

The wind shear for each 10 minute measurement period was calculated based on the methodology provided by the Australian Standard AS 4959-2010 *Acoustics – Measurement, prediction and assessment of noise from wind turbine generators* using the

power law wind profile model:

$$U = U_0 (h/h_0)^\alpha$$

Where U is the wind speed at height h, U<sub>0</sub> is the reference wind speed at reference height h<sub>0</sub>, and α is the shear coefficient. The value of α was estimated for each set of 10 minute average wind speeds using the results at the two measurement heights of the mast.

The wind speed at 10 m AGL was then determined for each 10 minute data point using the formula above to include the influence of wind shear during the 10 minute measurement period.

Notwithstanding this approach, a hub height analysis has been conducted which considers the wind speed data referenced directly at an 80 m hub height (see Appendix 1). The results of this analysis are consistent with the original analysis using 10 m AGL wind data with both wind turbines analysed complying with the SA Guidelines. The wind turbines also comply with the separated daytime and night-time criteria when a noise reduction strategy is used.

**3.9.4 It is unclear how micrositing has been accounted for in the modelling of the proposal.**

NSW  
EPA

**Response:** The Noise Assessment will be repeated, if considered necessary, when the final wind turbine model and micro-sited locations have been procured and finalised respectively. Condition 2(a) of the recommended Project conditions of approval provided by the EPA requires such an assessment. This is addressed in Statement of Commitment 008.

**3.9.5 It is unclear how the modelling has accounted for varying atmospheric stability (temperature inversions), although the wind shear model may provide insight into this aspect.**

NSW  
EPA

**Response:** Whilst the SA Guidelines specify that background noise data should be correlated with wind speeds at 10 m above ground level (AGL), as discussed in response to Comment 3.9.3, the Noise Assessment uses the two highest anemometer locations to take account of varying atmospheric stability conditions.

In addition, a hub height analysis has been conducted which considers the wind speed data referenced directly at an 80 m hub height (see Appendix 1).

**3.9.6 The EPA notes that the background noise regression curves typically exhibit lower than ideal R<sup>2</sup> correlation coefficients (around 0.15 to about 0.5). This may be a reflection of the relationship between noise at ground level and wind speed at height, and the ENA should comment on this.**

NSW  
EPA

**Response:** The correlation co-efficient provided for each regression curve indicates the relationship between the background noise at a residence and the wind speed at the wind farm site.

A low correlation co-efficient indicates a limited relationship, as will naturally occur in

many circumstances. For example, if the residence is in a location that is shielded from the winds across the wind farm site, then a low correlation co-efficient could be expected. A low correlation co-efficient is a measure of, and is subject to, the natural environment - it does not indicate any deficiency in the data analysis.

The Noise Assessment incorporates a detailed background noise measurement methodology and data analysis process which is the same for each noise monitoring location.

**3.9.7** The EPA notes that the EA predicts low frequency and infrasound noise emissions to be below the relevant criteria.  
NSW  
EPA

**Response:** Noted.

**3.9.8** The EPA notes that for Layout A, the ENA predicts an exceedance of the noise criterion at CR34 of 1dB for wind speeds of 6 m/s and 7 m/s. Options including the removal of turbines and operating some turbines in low noise modes facilitates compliance with the criteria. The EPA considers that the removal of turbines A87 and A89 from the proposal is the preferred option as detailed in the ENA. The EPA also notes that the ENA predicts compliance at all receivers for all wind speeds for Layout B.  
NSW  
EPA

**Response:** Noted. As discussed in response to Comment 3.9.4, the Noise Assessment will be repeated, as required, when the final wind turbine model and micro-sited locations have been procured and finalised respectively. Final decisions regarding noise reduction strategies, if required, will be made at this point in time.

**3.9.9** The EPA notes that the assessment of road traffic noise impacts is brief, however acknowledges that any impacts will be generally limited to the construction period.  
NSW  
EPA

**Response:** Noted.

**3.9.10** The predicted levels of construction noise (above the 'noise affected' level but not more than the 'highly noise affected' level in the Interim Construction Noise Guidelines) warrant the limiting of construction to standard hours and requiring the proponent to develop and implement a Construction Noise Management Plan.  
NSW  
EPA

**Response:** Noted.

**3.9.11** EPA Recommended Conditions of Project Approval.  
NSW  
EPA  
Two sets of recommended conditions of approval were provided by the EPA. The first is contained in Submission 57448, dated 21<sup>st</sup> March 2013, the second was provided in correspondence dated 16<sup>th</sup> August 2013 (see Appendix 10). Responses to all the recommended conditions of approval received from the EPA to date are provided below.

**Response:** A summary of responses and suggested condition modifications is below. For further details, please refer to Appendix 2, Volume 1.

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**Condition 2(a) Revised Noise Impact Assessment**

Noted.

**Condition 2(b) Noise Management Plan**

Noted.

**Condition 2(c) – Recommended Construction Hours**

Condition 2(c) recommends that “construction must only take place within the hours of 7:00 am to 6:00 pm Monday to Friday, 8:00 am to 1:00 pm Saturday. No construction may take place on Sundays or Public Holidays.”

It is recommended that flexibility is provided, as with previous wind farm conditions of approval, which allows for low noise construction activity and delivery of materials outside normal hours.

Certain activities will require work to be conducted outside normal work hours to prevent damage to concrete tower bases and trenches, to reduce the safety risk of having open trenches and to reduce the risk of tower self-oscillation. These activities include the following:

Concrete Placing

Concrete work is to be carried out as a continuous process (once bases are prepared) for some 8 - 10 hours per base. Weather conditions play a major role; the concrete can only be placed (specification) at temperatures between 5 and 35°C and not during rain periods.

Once bases have been prepared it is essential that concrete is poured immediately so as to prevent any damage that may be caused by rain or prolonged exposure (reinforcement, etc).

In Ground Electrical Works

Once electrical trenches have been excavated it is important that cables are laid and trenches backfilled as soon as practical so as to avoid damage to trenches (and surrounding areas) due to exposure to the elements.

Safety issues, for both people and livestock, are reduced on early backfill of trenches.

Wind Turbine Installation

Wind turbine installation is intended to fit in the six day working week. However, when erecting the tower, once the top of the tower is attached, the nacelle must go on without delay due to the risk of tower self-oscillation.

Unfavourable weather can cause delays in mounting the nacelle. Continuing this work outside of standard construction hours will ensure that there is a reduced risk to people, property and the surrounding environment from tower self-oscillation.

The Project area is naturally a high wind area and as such, Sunday work would be needed to make up for high wind days during the week.

If concrete placing, in-ground electrical works, or wind turbine installation is required to

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be carried out outside of normal construction hours, protocol as described in Table 5 below will be followed.

**Table 5** Inaudible Works Protocol for concrete placing, in-ground electrical works, or wind turbine installation

Step	Responsibility
1. Identify the need for works to be carried out outside of standard working hours and discuss the noise implications with the Environmental Advisor. Issues for consideration include: <ul style="list-style-type: none"> <li>• Timing and duration;</li> <li>• Need and justification;</li> <li>• Site-based noise generation; and</li> <li>• Traffic-noise generation along traffic routes.</li> </ul>	Construction Site Manager
2. Environmental Advisor to determine whether the works are likely to be inaudible at nearby sensitive receivers, and relay this to the Site Manager.	Construction Environmental Advisor
3. If the works are likely to be inaudible and are likely to proceed, Environmental Advisor to notify the Environmental Representative and seek Environmental Representative endorsement of the works.	Construction Environmental Advisor and independent Environmental Representative
4. If the works are likely to be audible at nearby sensitive receivers, prior to the commencement or continuation of works the Environmental Advisor will door knock these sensitive receivers to inform them of the likely timeframe associated with the activity.	Construction Environmental Advisor

#### Variation to working hours for Other Activities

All other activities not mentioned above or not deemed inaudible, will be subject to the normal consultative process with DoPI in accordance with the conditions of approval. Typically, the approved working hours for construction activities can be varied with prior written approval from the Director General. Each request will be considered on a case-by-case basis and must include:

- Details of the nature and need for activities to be conducted during the varied construction hours;
- Proof that the activities undertaken during the varied construction hours will not adversely impact on sensitive receivers in the vicinity of the site; and
- Consultation with affected landholders including to provide information regarding the timing, duration and location of works undertaken within the varied times and providing a contact point for any inquiries or complaints at least 48 hours before any

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works commence.

**Condition 2(d) Recommended inclusions in a Construction Noise Management Plan**

Noted.

**Condition 2(e) Noise Limit Conditions**

Condition 2(e) refers to hub height wind speeds. However, the Noise Assessment uses the 10 m height in accordance with the SA Guidelines. The Project criteria using a hub height reference have been determined and are summarised in Appendix 1. Should the hub height reference be retained, it is recommended the condition is reviewed to align with the revised Project criteria in the attached hub height analysis (Appendix 1). In addition, the definition of the measurement location and method do not align with SA Guidelines. To ensure consistency with the SA Guidelines, it is recommended the first line of the condition is modified as follows:

“Noise generated at the premises must not exceed the noise limits in the table below when measured in accordance with the Environmental Noise Guidelines: Wind Farms (SA EPA 2003).

Further references in the condition to the measurement location and the  $L_{Aeq(10 \text{ minute})}$  could then be removed to avoid the current conflict with the SA Guidelines.

This condition, however, is understood to be replaced by Condition L6.1 in EPA correspondence of 16<sup>th</sup> August 2013.

**Condition L6.1 Noise Limit Conditions (see Appendix 10)**

Condition L6.1 can be interpreted to require any 10 minute measurement to achieve the noise limits provided in the table rather than the averaging process over 2000 data points required under the SA Guidelines methodology.

To ensure consistency with the SA Guidelines, it is recommended the first line of the condition be modified as follows:

“Noise generated at the premises must not exceed the noise limits below when measured in accordance with the Environmental Noise Guidelines: Wind Farms (SA EPA 2003).”

Condition L6.1 also establishes criteria at “any other residential receiver not subject to a negotiated agreement” as 35 dB(A) at all wind speeds. These criteria are more onerous than the DGRs and the SA Guidelines, and will be difficult to measure and confirm in practice.

It is recommended that the table in L6.1 be replaced with the criteria table developed in Appendix C of the Noise Assessment – Supplementary Analysis (Appendix 1). That table can be inserted into Condition L6.1 to provide consistency with the approach of the SA Guidelines, with the exception that a hub height wind speed is used (see discussion above and Appendix 2).

**Condition L6.2 Wind Speed Measurements (see Appendix 10)**

Noted.

**Condition L6.6 Tonality (see Appendix 10)**

Condition L6.6 does not allow a penalty for tonality to occur at a residence. The DGRs and the SA Guidelines require a 5 dB(A) addition to the Project's measured noise levels where tonality is present. Therefore, in requiring that the Project "must not attract a penalty, Condition L6.6 establishes a requirement which is more onerous than the DGRs and the SA Guidelines.

It is recommended that Condition L6.6 be removed, as the modified Condition L6.1 (above) will require the addition of a 5 dB(A) penalty for the presence of tonality.

Alternatively, it is suggested Condition L6.6 is modified to read:

For the purposes of Condition L6.1, a 5 dB(A) penalty must be added to the measured wind farm noise level at the premises where tonal noise emissions from the Project are measured at the premises in accordance with a method which is consistent with the Draft Guidelines or final approved version thereof.

#### **Conditions L6.3 to L6.5 inclusive**

Conditions L6.3 to L6.5 have not been provided and might be the subject of separate correspondence. It is also possible that Conditions L6.3, L6.4 and L6.5 correlate with Conditions 2(a), 2(b) and 2(d) from submission 57448.

The recommended conditions should be reviewed to take into account these proposed changes and a full list provided.

**3.9.12 Council is concerned regarding the potential impacts of noise on existing and future residents. It is considered that development of this nature fails to take into account the extremely low current background noise levels, inadequacy of modelling to take into account topographical effects and the low tolerance level of rural residents.**

MWRC

**For the reasons expressed above, Council is concerned that the noise assessment does not fulfil the Director-General's Requirements for the project to properly assess noise impact.**

**Response:** The DGRs require operational noise to be assessed against the *South Australian Environmental Noise Wind Farm Guidelines 2003* (the SA Guidelines). The criteria of the SA Guidelines are established to ensure any audible wind farm noise is low enough in level such that it does not adversely impact on the health or amenity of the community (as discussed in Appendix 2). The SA Guidelines are considered to provide some of the most onerous criteria for wind farms in the World.

Notwithstanding this, the assessment goes beyond the requirements of the SA Guidelines and conducts a specific and more onerous analysis for both the daytime and night-time periods in accordance with the Draft Guidelines.

The SA Guidelines establish a base noise level of 35 dB(A). The base noise level generally applies during low wind speed and background noise conditions. The base noise level is significantly more onerous than the criterion established by the World Health Organisation (WHO) *Guidelines for Community Noise* (the WHO Guidelines) of 45 dB(A) to protect against the potential onset of sleep disturbance. The WHO Guidelines criterion is based on bedroom windows being open.

Noise predictions were conducted using the propagation model ISO 9613-2:1996 “Acoustics – Attenuation of sound during propagation outdoors” (ISO 9613) in the SoundPlan noise modelling software. This noise propagation model accounts for the influence of topography and is widely accepted as an appropriate model for the assessment of wind farms when appropriate inputs are used.

Results from the background noise measurements that were conducted for the Project EA are available in the Noise Assessment (Project EA, Appendix 10) and results from subsequent background noise measurements are available in Appendix 1 of this report.

**3.9.13** **Conditions of approval should also specify that, for the purposes of complaints, the applicant should be required to make available to residents who are impacted all necessary wind and noise data to enable independent noise assessments to be undertaken if desired.**  
*MWRC*

**Response:** There are commercial sensitivities regarding the release of raw data which can be used to predict wind farm performance. The Proponent will adhere to the relevant legislation of the day regarding the public release of this data but should not be given an unprecedented condition of approval that puts it at a disadvantage to its competitors.

## Chapter 10: Ecology Assessment

**3.10.1** **The Proponent aims to set up a monitoring program to monitor impacts of strike across the wind farm. The proponent has indicated that it would consult with OEH and SEWPaC for recommendations on the frequency of monitoring and reporting, including the thresholds for which impacts are considered unacceptable. Consideration was given to OEH’s previous comments regarding feathering and / or temporary shutdown of turbines during high risk periods where monitoring program exceeds thresholds. The EA, however, does not provide detail of the methodology that will be adopted by the proponent to monitor the impacts of bat and bird strike. OEH recommends that the proponent provide detail of how they will be monitoring the impacts of bird and bat strike.**  
*OEH*

**Response:** The purpose of the Ecological Assessment was not to provide detail on how bird and bat strike will be monitored. Section 5.3, paragraph 2 of the Ecological Assessment states:

*“Whilst the likelihood of bird and bat species being struck cannot be accurately predicted, a commitment to monitoring strike across CRWF has been made. This will include the preparation of a bird and bat monitoring program prior to operation of the wind farm that, in consultation with OEH and SEWPaC, will identify the frequency of monitoring and reporting, the thresholds at which impacts are considered unacceptable and the adaptive management approaches which are acceptable.”*

Development of a monitoring program prior to the operation of the Project will allow for it to be tailored to the final wind turbine layout and to identify wind turbines that may require more frequent monitoring than others. The development of a monitoring plan in



consultation with OEH, and SEWPaC where required, will ensure that input from Government agencies feeds into the final monitoring plan based on their knowledge and experience of wind farms, more broadly.

**3.10.2** *OEH* **OEH understands that the proponent has not undertaken fauna surveys along the entire length of the power line easement. The EA justifies this on the grounds that there is limited fauna habitat in this area in comparison to the remainder of the study area. OEH considers this justification an inadequate reason, especially considering that EPBC and EEC listed Box Gum Woodland occurs along this easement line. OEH recommends that fauna surveys be conducted to complete the assessment of likely impacts of the powerline easement on fauna habitat.**

**Response:** Use of a stratified sampling methodology is a widely accepted approach to ecological survey, particularly in larger sites where the logistics and reality of sampling an entire site is not feasible. Survey effort and timing has been outlined in Table 10 of the Ecological Assessment report, however, the entire length of the external transmission line easement was traversed as part of the flora survey.

OEH have referred to Section 4.2.4 where the Ecological Assessment states that “detailed surveys for fauna were not conducted along the entire length of the external transmission line easement due to the limited fauna habitat in this area”. However, this section goes on to state “detailed fauna surveys were conducted across other parts of the study area that support similar and / or better quality habitat than that located within the proposed transmission line easement”. Data collected from similar vegetation in other parts of the site were used to elucidate the possible fauna assemblage within the external transmission line easement based on vegetation type and habitat structure.

In addition, the assessment of potential habitat of and impact on threatened species has been conservative, whereby vegetation and habitat type have been used to inform the potential occurrence of threatened species or their habitat.

The Proponent and Eco Logical Australia, the independent ecological consultant that undertook the Assessment, are of the view that the fauna data captured across the Project site, along with a traverse of the external transmission line easement, was sufficient to inform the likely assemblage of species within the easement.

**3.10.3** *OEH* **The EA does not adequately discuss the likely influence of weather conditions commonly occurring at the site on bird collisions. Sites which experience poor weather and/or low visibility conditions need to be assessed taking this into account because it is likely to influence flight behaviour and increase the likelihood of impacts.**

**Although the EA discusses the risk factors for affected bat species based on habitat requirements and behaviour, some additional factors, not considered, that could potentially influence their susceptibility may include:**

- Tree-roosting species may perceive turbines as potential roost trees;
- Ridge-top sites might coincide with availability of insect prey;
- Migrating bats may rely on sight (rather than echo-location) to navigate, being drawn to large structures on ridge-tops;

- **Bats may investigate moving blades as movement may be mistaken as evidence of prey;**
- **Audible sound from turbines may attract bats from considerable distances;**
- **Mating behaviour of tree-roosting bats may be centred on the tallest prominent feature in landscape; and**
- **Risk of concussion from passing through low-pressure areas near turbines.**

**These factors are all relevant considerations for an adequate impact assessment on all bat species known and likely to occur at the site. Recommends that the EA take into account weather in assessing impacts on birds and bats, including the above mentioned risk factors.**

**Response:** Section 5.5 of the Ecological Assessment discusses the direct impacts associated with operation of the Project, including bird and bat strike, and risk matrices are presented in Appendix F and G of the Ecological Assessment for bats and birds respectively. Specific discussion regarding the direct impact of the Project on birds and bats is presented in Sections 5.5.1 and 5.5.2. This includes referenced discussion on weather conditions, light winds, barotrauma and migration (birds).

#### Potential for bats to view wind turbines as roosts

Kunz et al. (2007) hypothesised that bats in the US were drawn to and view wind turbines as potential roost structures, while Horn et al. (2009) noted what appeared to be inquisitive behaviour of bats around wind turbines (also in the US), predominantly in the first two hours after sunset. Such activity was restricted to a small percentage of bats in the vicinity of the wind turbine. Therefore, it seems likely that some bats will investigate wind turbines for some reason.

Generally speaking, the potential for bat strike would be limited to those species known to fly above the canopy, which have been identified in the Ecological Assessment. It is considered unlikely that the activity of searching for potential roost sites on wind turbines would result in increased strike as bats would be searching for roosts within a canopy (below the tip of the blade). However, Eco Logical Australia has not found research to affirm this view.

#### Aggregations of prey

Microbat numbers will elevate when prey increases. It is unknown whether the sites proposed for wind turbines experience high numbers of prey items during certain times of the year compared to other areas, but it is likely that prey will increase when trees and shrubs flower. Wind turbines located on wooded hilltops may experience higher incidence of strike when prey items are numerous and seasonal conditions are favourable. However, as most hilltops in the study area are devoid of trees, the potential for this to occur is limited.

Whilst the likelihood of the species being struck cannot be accurately predicted, a commitment to monitoring strike across the Project has been made as per Statement of Commitment 014. This will include the preparation of a bird and bat monitoring program prior to operation that, in consultation with OEH and SEWPaC, will identify the frequency of monitoring and reporting, the thresholds at which impacts are considered

unacceptable and adaptive management approaches which are acceptable. Variable weather conditions are factors that could be added to the bird and bat strike monitoring program to monitor the influence of low visibility weather conditions.

Migrating bats may rely on sight

Megachiropteran bats are known to rely on sight rather than echolocation, and some micro bats, like the sheath-tail bats, use sight to ambush prey from a perched position. However, many megabats migrate along drainage lines rather than hill tops, which will reduce the potential for them to be struck by wind turbines. Otherwise, microbats are known to rely on echolocation when moving about.

The effect of common weather conditions on bird and bat collision

OEH have highlighted the need to identify the influence common weather conditions may have on bird and bat strike. The risk matrices presented in Appendices F and G of the Ecological Assessment address the known heights and patterns of flight for the birds and bats identified. We have assumed that this behaviour is documented under common weather conditions.

There is the potential for increased bird and bat strike during adverse weather conditions either due to poor visibility (birds) or changes to flight paths to avoid adverse weather conditions. This may result in species crossing through the Project along routes that they would not normally travel. The assessment of the potential impact on birds is conservative and takes into consideration the potential loss based on Australian and overseas data.

**3.10.4** **The EA states that each of the potential offset properties are capable of meeting Tier 3 or Tier 2 offset outcome in section 6.5. When referring to Table 31 in the EA however, it is clear that none of the properties contain Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest BVT. According to the OEH policy regarding offsetting biodiversity impacts, Tier 2 outcome requires no variation to offset type. The lack of Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest and the Tussock Grassy Woodland BVT's present in any of the offset properties means that only Tier 3 can be met.**

*OEH*

**The EA provides justification for the exclusion of Tussock Grassy Woodland BVT in the offset calculations, however no justification is provided for the exclusion of broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest BVT in the offset package. OEH recommends that the EA correctly state that only Tier 3 can be met due to two Biometric Types not available in any of the offset properties. OEH also recommends that the EA provide justification for the exclusion of Peppermint - Brittle Gum - Red Stringybark dry open forest BVT in the offset package. Presumably this was done due to the small area of this community.**

**Response:** Following Exhibition of the Project EA, the Proponent entered into an Option to Purchase Agreement with the owner of offset property S2.

Preliminary vegetation mapping of this property has been completed and the 'Broad-leaved Peppermint - Brittle Gum – Red Stringybark dry open forest' BVT has not been

recorded. Accordingly a Tier 2 offset cannot be met by this offset package. It is, however, noted that the impact to this vegetation type is relatively small (1.2 ha), the vegetation type is in a highly modified condition (only a derived native grassland component is being impacted) and the vegetation type is not an EEC or highly cleared vegetation type in the CMA. Further, the proposed offset property includes nearly 300 ha of White Box-Blakely's Red Gum - Yellow Box grassy woodland in woodland and DNG condition states that is in excess of the calculated requirement for impacts to this community. In fact, it is estimated that approximately 30 ha of the nearly 300 ha will fulfil offset requirements. It is proposed that this surplus offset area, which is a highly cleared vegetation type and a listed EEC, be used to meet the offset requirement for the Broad-leaved Peppermint BVT consistent with the variation criteria for a Tier 3 or mitigated net loss offset (Attachment B variation criteria (c) – remove / reduce need for offsetting where impact is minimal and / or (f) – convert ecosystem credits to a regional conservation priority).

Eco Logical Australia and the Proponent thus confirm that only a Tier 3 offset can be met.

**3.10.5** **The CMA notes the presence of the White Box – Blakely's Red Gum – Yellow Box endangered ecological community within the proposed development site and also notes the intention to clear a proportion of this community. This community is listed as a critically endangered ecological community under the Commonwealth EPBC Act 1999 and as an endangered ecological community under the NSW TSC Act 1995. This community has been significantly cleared within the Central West landscape (> 85%) and this proposed project will result in the permanent clearing of a proportion of this community that exists within the development footprint. We also note the temporary clearing of this community that exists within the development footprint. We also note the temporary clearing of an area of this community with the intention of subsequent revegetation.**

*CMA  
Central  
West*

**Whilst the CMA acknowledges the proposed impact mitigation measures and the relatively small proportion of permanent clearing of this community within the project proposal, such clearing cannot be supported given the significance of historic clearing and the deficit of this community type within the Central West landscape. Further, whilst revegetation of temporarily cleared areas may result in the successful establishment of vegetation species, such mitigation will not replace the ecological values within a short or medium timeframe. The CMA strongly considers that this project should be relocated or re-envisaged to avoid this impact.**

**Response:** Since 2008, an extensive design process has ensured the Project is appropriately sited and, to the greatest extent possible, avoids ecological impacts. The Proponent agrees that limiting fragmentation and promoting diversity of all ecological communities, including Endangered Ecological Communities such as the Box-Gum Woodland identified, is a critical concern.

In fact, wind farms have the potential to contribute to preservation of ecological communities by slowing the shift from productive agricultural land to rural residential use. The Project will also contribute to the Federal Government's Renewable Energy

Target which recognises and attempts to combat the detrimental impacts of climate change on the environment.

Section 5.2 of the Ecological Assessment undertaken by Eco Logical Australia identifies a number of avoidance measures implemented in the design of the Project. These include amendments to the wind turbine layout prior to the final layout assessment in the Ecological Assessment. Whilst avoiding all woodland was not possible in the design and layout of the Project, impacts to patches of woodland on hilltops have been avoided and minimised, wherever possible.

Erosion and sediment control measures will also be implemented during the construction and decommissioning phases in order to further avoid and minimise impacts on ecological communities. Erosion and sedimentation control devices will be monitored to ensure that they are functioning appropriately, particularly after periods of heavy rain.

Further, the Ecological Assessment indicated that fragmentation is likely to be minimal given the current degree of fragmentation in the region and the proposed avoidance measures (i.e. avoiding areas of dense woodland). Wherever possible, existing tracks will be used for roads and infrastructure to avoid further fragmentation and impact.

**3.10.6** **The CMA acknowledges that offset options are currently being explored and that there is potential for property that would provide a “like for like” offset to be purchased. However, it is impossible to support offsets as appropriate mitigation for the impacts to the endangered ecological community unless they are confirmed and in place at the time of assessment.**

*CMA  
Central  
West*

**Response:** The Proponent is committed to ‘like for like’ offsets consistent with the NSW Offset Principles for Major Projects and the OEH’s *Interim Policy on assessing and offsetting biodiversity impacts of major projects*.

An Option to Purchase Agreement has been entered into to purchase a property which will be protected and managed in perpetuity by a conservation covenant registered on title. This offset property includes the two main vegetation types being impacted (Red Stringybark – Scribbly Gum – Red Box - Long-leaved Box open forest and White Box – Blakely’s Red Gum – Yellow Box grassy woodland) with a surplus of the endangered Box-Gum Woodland community being used to meet the offset requirements for impacts to Broad-leaved Peppermint.

The property has been subject to past clearing and grazing and will be managed to enhance the biodiversity values including an integrated weed and feral animal control program, natural regeneration of derived grassland areas and implementation of an ecological burning regime. The offset property will be subject to an ongoing monitoring, reporting and compliance program.

**3.10.7** **The CMA also notes the recorded presence of one threatened flora species and a variety of threatened fauna species. Whilst noting that the project proposal avoids recorded stands of threatened flora, this project will result in the removal of more than 71 ha of threatened species habitat in a worst case scenario. Again, this impact is**

*CMA  
Central  
West*

**considered significant for species such as the pink tailed worm-lizard and is something to be avoided.**

**Response:** While all impacts to high value ecological communities cannot be avoided, a process of avoiding all possible impacts, mitigating those impacts that cannot be avoided (Section 5.3 of the Ecological Assessment) and offsetting those impacts that can neither be avoided or mitigated (Section 6 of the Ecological Assessment) has been followed. To outline and present the numerous iterations of the wind turbine layout to demonstrate avoidance is not the purpose of the Ecological Assessment, but rather it assesses a proposed layout and outlines avoidance measures considered and taken.

The direct impact to the Box-Gum Woodland EEC by the Project has been limited to 5.7 ha and impacts to habitat features such as hollow bearing trees have also been limited (to 4.6 % of hollow bearing trees within the Study area). Further, a significant amount of targeted survey effort was undertaken for Pink-tailed Worm Lizard, as the Project site was identified as potential habitat. However, the species was not recorded. Regardless, large areas of suitable habitat will not be affected and proposed mitigation measures, including the relocation of large rocks disturbed during construction to adjacent areas, will be undertaken to supplement habitat (refer to Section 5.4.6 of the Ecological Assessment).

Additionally, the Ecological Assessment presents a number of mitigation measures in Table 17. These measures address the possibility of weed spread; sedimentation, erosion and runoff; vegetation clearing; impacts to flora and fauna; impacts to soils; the incidence of fire; bank instability at creek crossings; and other general impacts.

**3.10.8** **The CMA also notes the numerous impacts to non-threatened species (both faunal and floral) and the reduction in habitat associated with this project proposal. The project is therefore considered to have an inappropriate level of ecological impact.**  
*CMA  
 Central  
 West*

**Response:** Please see response to Comments 3.10.5 and 3.10.7. As with other renewable energy sources, it is the Proponent's view that the Project has very minimal ecological impacts when considered against conventional sources of electricity generation.

**3.10.9** **Council raises concerns about the location of environmental offsets as this has impacts on a rate basis. In this regard the project requires an offset of between 206-460ha to meet the OEH Interim Offset Policy. There are potentially five (5) properties that are for sale that meet the criteria and three (3) properties have been identified whose owners are interested in entering into 'perpetuity conservation covenant'. Of these eight (8) possible properties only two of the smaller properties are located within the Mid-Western area.**  
*MWRC*

**It is recommended that following project approval and prior to construction the Proponent will purchase one or more of the properties and/or enter into legally binding 'in perpetuity conservation covenant' with the relevant land owner to meet the required level of offsets. The offsets will then either be transferred to the NSW Minister for the Environment as an addition to the public reserve network or will have**

**the covenant registered on the title.**

**Response:** Noted. Please see response to Comment 3.10.4.

**3.10.10** *MWRC* **The issue of offsets and loss of rate due to the offset land becoming non-rateable because it becomes part of the public reserve network or has a conservation covenant attached has recently been raised with the Minister and Director General of Planning. In this particular case, the issue is that most of the impacts, not only at the construction phase but also for the ongoing operation of the wind farm, will be in our LGA because 75% of the project is located in our area. This combined with the possible impacts on vegetation and biodiversity from any road upgrades to accommodate the level of traffic and transport (described above) means that Mid-Western will shoulder most of the burden in respect to neighbouring LGAs. Should the State Government amend the way offsets for large developments are rated, to recognise that these areas are required for the development to operate and therefore should be able to be rated as 'Business', then Mid-Western will be carrying a disproportionate share of the costs and impacts of the development while neighbouring LGAs may stand to gain through being able to levee a higher rate on the offset areas.**

**Response:** The Proponent is undertaking activities to fulfil offset requirements as detailed by State and Federal guidelines. Comment 3.10.10 is beyond the scope for the Proponent to comment on. The Proponent will continue to engage with OEH, SEWPaC and local Councils through the development of the Project on a range of subjects, including offsets.

## Chapter 11: Cultural Heritage Assessment

**3.11.1** *OEH* **Section 2.1 of the Cultural Heritage Report states: "For review and comment, a copy of this draft report has been forwarded to the registered parties". The dates of when the report was sent to the Registered Aboriginal Parties needs to be provided in the report. Recommendation: Provide the dates of when the draft report was sent to the Registered Aboriginal Parties.**

**Response:** The draft Cultural Heritage Report was provided to the Registered Aboriginal Parties on 6<sup>th</sup> February 2012.

**3.11.2** *OEH* **Figures 3, 4 and 5 of the Cultural Heritage Report show the location of survey units, Aboriginal Objects and European Items. However, the legend does not indicate what the red and purple lines are, and therefore it is unclear how sites / objects are likely to be impacted. Recommendation: Provide clarification of figures 3, 4 and 5 to show the purpose of the red and purple lines.**

**Response:** The red and purple lines in Figures 3, 4 and 5 of the Cultural Heritage Report show the location of survey units. The two colours are not significant, but were employed to allow the reader to identify where each survey unit started and ended.

**3.11.3** Section 7.3 provides the survey results, including a summary of locations of Aboriginal objects recorded during the survey. However, there is no clear information regarding which of these is likely to be impacted by the proposal. Recommendation: Add a column to Table 5 to indicate which sites are likely to be impacted upon and which will be avoided.

OEH

**Response:** Table 6 below, based on Table 5 of the Cultural Heritage Report, provides an indication of which sites are likely to be impacted by Project related infrastructure.

**Table 6** Summary of Aboriginal object locales recorded

ID	Easting	Northing	Contents	Within impact area?
SU1/L1	743920	6344335	3 stone artefacts in 625 sq m area	Yes
SU1/L2	743895	6344227	4 stone artefacts in 400 sq m area	Yes
SU2/L1	743574	6343444	c. 50 stone artefacts in 21,000 sq m area	Yes
SU3/L1	743944	6344890	2 stone artefacts in 400 sq m area	Yes
SU3/L2	743718	6344986	3 stone artefacts in 400 sq m area	Yes
SU3/L3	743303	6344743	2 stone artefacts in 50 sq m area	Yes
SU3/L4	743032	6344681	4 stone artefacts in 105 sq m area	Yes
SU3/L5	742930	6344713	3 stone artefacts in 8 sq m area	Yes
SU4/L1	742809	6344220	3 stone artefacts in 4 sq m area	Yes
SU4/L2	742812	6344095	4 stone artefacts in 900 sq m area	Yes
SU4/L3	742836	6343932	1 stone artefact	Yes
SU5/L1	742470	6343620	3 stone artefacts in 12 sq m area	Yes
SU6/L1	744467	6346283	6 stone artefacts in 225 sq m area	Yes
SU6/L2	744477	6346069	3 stone artefacts in 200 sq m area	Yes
SU6/L3	744451	6345854	10 stone artefacts in 75 sq m area	Yes
SU6/L4	744514	6345775	8 stone artefacts in 2400 sq m area	Yes
SU6/L5	744247	6345583	2 stone artefacts in 300 sq m area	Yes
SU7/L1	744472	6347983	1 stone artefact	Yes
SU7/L2	744270	6347436	7 stone artefacts in 1,600 sq m area	Yes
SU7/L3	744248	6347345	5 stone artefacts in 100 sq m area	Yes
SU7/L4	744229	6347331	13 stone artefacts in 600 sq m area	Yes
SU7/L5	744166	6347252	2 stone artefacts in 8 sq m area	Yes
SU7/L6	744702	6348674	1 stone artefact	Yes
SU8/L1	743822	6347354	1 stone artefact	Yes
SU8/L2	744053	6347984	1 stone artefact	No
SU9/L1	750844	6356236	1 stone artefact	Yes
SU9/L2	750955	6355239	1 stone artefact	Yes
SU9/L3	750357	6354009	1 stone artefact	Yes
SU9/L4	750396	6353928	1 stone artefact	Yes
SU10/L1	750098	6354842	1 stone artefact	Yes
SU10/L2	749783	6355096	2 stone artefacts in 300 sq m area	Yes
SU12/L1	749227	6352034	4 stone artefacts in 400 sq m area	Yes
SU12/L2	749414	6351947	2 stone artefacts in 50 sq m area	Yes
SU13/L1	748780	6351021	3 stone artefacts in 100 sq m area	Yes
SU13/L2	748798	6350947	c. 50 stone artefacts in 1,200 sq m area	Yes
SU13/L3	748614	6350897	2 stone artefacts in 3 sq m area	Yes
SU14/L1	746665	6349665	1 stone artefact	Yes
SU14/L2	747267	6350205	2 stone artefacts in 1 sq m area	Yes
SU14/L3	747424	6350286	1 stone artefact	No
SU14/L4	747827	6350521	14 stone artefacts in 1,375 sq m area	No



ID	Easting	Northing	Contents	Within impact area?
SU17/L1	750430	6353858	3 stone artefacts in 8 sq m area	Yes
SU17/L2	750460	6353723	1 stone artefact	Yes
SU17/L3	749878	6352403	1 stone artefact	Yes
SU18/L1	758305	6356311	1 stone artefact	Yes
SU18/L2	758186	6356129	4 stone artefacts in 20 sq m area	Yes

**3.11.4** *OEH* While Section 9 of the Cultural Heritage Report discusses mitigation and management strategies, it is unclear whether or not the footprint of the turbines and/or internal roads can be slightly altered to avoid sites/objects. This is particularly relevant considering that a 200m wide corridor was surveyed, and that the proposed footprint of a turbine installation requires a footings area of about 15m by 15m and a larger hardstand measuring approximately 45m by 45m. Recommendation: Provide information regarding the ability of the project to avoid Aboriginal sites / objects through minor alterations in positioning of turbines, roads and other infrastructure.

**Response:** The Cultural Heritage Report (pg. 47) states “Generally, the artefact locales are considered to be representative of the artefact distribution and density within the entire Survey Unit in which they are situated. That is, they do not appear to be representative of discrete artefact locales but instead, they form part of the very low density ‘background scatter’ which is present across the landscape”. The report also states (pg. 51) “The recorded artefact locales are unlikely to represent the sum total of Aboriginal objects in the proposed activity area. It is believed that the proposal area is likely to contain stone artefacts across the entire area, in a virtual continuum. However, any unrecorded stone artefacts, either in surveyed areas or in adjacent terrain, are predicted to be present in very low or low densities only”.

Accordingly, while the Project footprint could be altered to avoid the recorded sites, it would not be logical to do so. As stated on page 51: “It is also relevant to take into consideration that impacts will be discrete in nature and will occupy a relatively small footprint. The archaeological resource in the broader development envelope (those areas which lie outside actual proposed impacts) will not sustain any impacts as a result of the proposal”. It would be counterproductive to alter the footprint to avoid recorded sites as undetected artefacts would, instead, be impacted.

Section 9 of the report, in order to explicitly address the issue of whether or not the Project footprint should be altered to avoid sites, argues “It is specifically noted that it would be generally meaningless to implement a strategy of conservation or impact avoidance in regard to the recorded Aboriginal object locales in the proposed impact area. It would be almost certainly the case that if components of the project were re-routed to avoid certain Aboriginal object locales, other (undetected and unrecorded due to ground cover etc.) Aboriginal objects would, instead, be impacted. However, it is recommended ... “that all ground disturbance works associated with construction, be kept to an absolute minimum in order to ensure as little impact as possible to the archaeological resource which is located across the landscape”.

**3.11.5** It is unclear from the report whether or not the proposed access roads were surveyed as part of the heritage assessments. Recommendation: Clarify whether or not access roads have been included in the heritage assessments. If not, additional surveys are required to be undertaken to cover these areas.

*OEH*

**Response:** The Study area surveyed during the Cultural Heritage Assessment did include proposed internal access roads. The Study area encompassed wind turbine locations and all ancillary on ground impacts including compounds and access roads. The Cultural Heritage Report (Table 3, column 2) identifies the tracks adjoining Project access points; however all other survey units incorporate access roads as per Figure 2. Figures 3, 4 and 5 also show the locations of Survey Units (red and purple lines).

**3.11.6** Section 3.2 states: “However, with regard to Aboriginal object locales such as artefact scatters assessed to be of low significance, the impacts can be viewed as being correspondingly low”. It is unclear from this statement whether the author is referring to cultural or archaeological significance. Recommendation: Author needs to clarify which significance (cultural or archaeological) is being referred to.

*OEH*

**Response:** The significance referred to in Section 3.2 of the Cultural Heritage Report is Archaeological.

**3.11.7** The CMA notes the extensive list of Aboriginal groups that were consulted during the development of this project proposal. The CMA also notes the development, in consultation with the Aboriginal community, of a Cultural Heritage Management Protocol and the intention to provide cultural heritage training to employees associated with construction activities in order to implement management initiatives within the Protocol. The CMA strongly recommends continued consultation with the Aboriginal community during the course of this development particularly with regard to identification of additional Aboriginal objects should they occur. Salvage of Aboriginal artefacts should only be undertaken after consultation with Aboriginal people with the authority to speak for Country.

*CMA*  
*Central*  
*West*

**Response:** Noted. Consultation with relevant Aboriginal communities will continue through the pre-construction and construction phases of the Project.

## Chapter 12: Traffic and Transport Assessment

**3.12.1** The preferred southern route assumes access from Sydney using the Great Western Highway and / or Bells Line of Road. Access across the great dividing range for over-size / over-mass and some low loader vehicles is inappropriate due to terrain and traffic volumes. Access from east to west will need to be obtained, subject to approval, via either the Hume Highway or Golden Highway. In developing new southern routes, the proponent is strongly encouraged to consult with RMS Special Permits Unit.

*RMS*

**Response:** Noted. Transport access routes have been revised and re-assessed in response to feedback (see Section 6 PPR). Access for over-dimensional vehicles will occur via a

northern route only. The southern access route will be used for standard heavy vehicles. As acknowledged, all requirements will be fulfilled in order to obtain necessary permits for transport.

**3.12.2** *RMS* **The preferred northern route will access the wind farm site from the Castlereagh Highway and then following Hill End Road, Windeyer Road, Pyramul Road and Aarons Pass Road. This preferred route requires a number of bridges to be assessed to determine if the bridges are able to accommodate projected over-mass and over-size vehicle movements. Should a number of the bridges be found to be unsuitable, it is assumed that other routes will be considered. Should this occur, RMS would request an opportunity to review and comment on the alternative route(s) proposed.**

**Response:** Noted. Transport access routes have been revised and re-assessed in response to feedback (see Section 6 PPR). If bridges along the route are unsuitable, appropriate (temporary or permanent) upgrades will be undertaken. Dilapidation surveys of transport routes will be undertaken prior to construction in order to document existing conditions with a view to repairing any damage resulting from construction traffic, except that resulting from normal wear and tear, as per Statement of Commitment 024.

**3.12.3** *RMS* **Assumptions made in the report (Section 3.2.3) of current annual average daily traffic (AADT) based on 2005 counts are incorrect. RMS traffic counts taken since 2005 and projected daily traffic flows up to 2011 show some AADT figures as being 1000 vehicles per day higher than assumptions made in the report.**

**Response:** Traffic counts were provided to Samsa Consulting by on 19<sup>th</sup> September 2011 for analysis. All traffic volumes that were used in the Traffic and Transport Assessment were confirmed by sample counts during site visits and are considered to be correct estimations. Updated traffic volumes have also been obtained for various relevant road sections from RMS and included, where applicable and relevant, in Appendix 3.

**3.12.4** *RMS* **The EA lacks a robust assessment of alternative methods for the transportation of materials to the site.**

**Response:** Section 3.1 of the Traffic and Transport Report considers transport by air and rail as well as by road. Transport by both air and rail were assessed as unfeasible, for both the large wind turbine components, and ancillary material that may be smaller and / or transported in containers. See Appendix 3 for further details of this assessment.

**3.12.5** *RMS* **Assessment of tourist traffic is inadequate.**

**Response:** While it is likely that the Project will generate some tourist traffic, the increase in vehicles numbers is not expected to significantly increase traffic volumes or cause adverse impacts. As outlined in the Project EA, any traffic management requirements associated with the construction or operation phases of the Project will be dealt with in detail in the appropriate EMP sub-plan.

**3.12.6** **Section 4.6 of the traffic and transport report states that there are no known major**

*RMS* developments or projects that would result in cumulative impacts to the subject wind farm development. The Caerleon Planning Proposal which has frontage to and is proposed to gain access from Hill End Road involves the creation of 2000 residential allotments. This proposal alone will significantly increase traffic generation at the intersection of Hill End Road and Castlereagh Highway during both the construction and occupation stages. Similarly the Kelso Great Western Highway upgrade in Bathurst will also have an impact on transportation of materials, staff etc to the site for traffic using the proposed southern route.

**Response:** The Traffic and Transport Assessment considered the cumulative impact of the Project with other projects as required by the DGRs. As such, MWRC was contacted by Samsa Consulting requesting information on other developments in the region that may contribute to a cumulative impact on roads and traffic. No information about the Caerleon Planning Proposal or Kelso Great Western Highway was provided at the time of assessment. These proposed developments and other potentially relevant developments have, however, been subsequently addressed in Appendix 3.

**3.12.7** No details of intersection upgrades stated in the report as being necessary to accommodating over-size / over-mass vehicles have been provided.  
*RMS*

**Response:** Section 5.3 of the Traffic and Transport Report provides an assessment of the upgrades that may have been required for the then proposed over-dimensional transport route. Upgrades required for the preferred over-dimensional transport routes are detailed in Section 6 Preferred Project Report and Appendix 4.

**3.12.8** A Traffic Management Plan (TMP) shall be prepared in consultation with the Councils affected by the haulage of materials and construction of the wind farm and RMS. The TMP shall identify the proposed route(s) and associated impacts (temporary street closures, removal and replacement of road infrastructure, upgrading of road infrastructure etc) which will be required in order for the necessary materials and machinery to be delivered to site. The TMP shall include assessment of high risk locations that prevent safe two-way passage of traffic and how traffic movements are to be negotiated, projected delays experienced by traffic on affected roads (origin to destination), cumulative impacts and mitigating measures to be employed. The applicant is to be accountable for this process rather than the haulage contractor.  
*RMS*

**Response:** Noted. Statement of Commitment 022 details the development of a CEMP sub-plan, which will be prepared by the Proponent in consultation with the licensed haulage contractor and relevant road authorities. Road authorities would include MWRC, BRC and the RMS.

**3.12.9** Prior to any haulage requiring over-size / over-mass vehicles and loads the proponent will be required to obtain special permits. To obtain a permit, the proponent will need to contact RMS Special Permits Unit in Glen Innes.  
*RMS*

**Response:** Noted. The requirement to obtain relevant over-dimensional vehicle transport permits from the RMS and local Councils, following appropriate guidelines / requirements

is acknowledged and addressed in the Traffic and Transport Report.

**3.12.10** The requirements outlined in the RTA publication *Operating Conditions: specific permits for over-size and over-mass vehicles and loads* are to be followed.  
*RMS*

**Response:** Please see response to Comment 3.12.9.

**3.12.11** If any parts of the proposed transport routes on classified roads are unable to cater for the project related traffic and transport, the proponent shall be required to improve such part of the road to safely cater for the length, size and volume of vehicles and their loads, and to protect the integrity of the classified road network. This may include the proponent constructing stopping bays (suitable hard stand areas) at distances and dimensions determined by the RMS. These areas would be required along the proposed route to allow the following vehicle queue to pass.  
*RMS*

**Response:** It is acknowledged that road improvements will be required to safely cater for the length, size and volume of vehicles and their loads, and to protect the integrity of the classified road network. Road upgrades have been proposed in Section 6 PPR including the construction of stopping / passing bays (see also Appendix 4 for further detail).

**3.12.12** Any disturbances to traffic lanes, shoulders, verges or other disturbance within the road reserve of classified roads are to be reinstated to pre-existing or better condition. This includes any impact on the road pavement, culverts, bridges, causeways, stock grids, signage and traffic islands.  
*RMS*

**Response:** Noted. A commitment to this effect is made in Statement of Commitment 024.

**3.12.13** A full and independent risk analysis and inspection of the transport route is required and a copy of the analysis is to be supplied to RMS. Further analysis and reporting to assess possible damage to and repair of the route will be required on a regular basis.  
*RMS*

**Response:** Noted. Full and independent risk analyses will be part of any route assessments in order to satisfy the RMS permit system.

**3.12.14** RMS requires a commitment from the proponent to provide funding for the maintenance and repair of any affected classified roads for the duration of transportation of over-size and over-mass vehicles and loads, to the satisfaction of RMS.  
*RMS*

**Response:** Subject to finalisation of transport routes and requirements, and detailed design, the Proponent will liaise with RMS regarding road maintenance and repair.

**3.12.15** Vehicles transporting loads will not be permitted to travel in convoys or platoons.  
*RMS*

**Response:** Noted. However, with regard to the preferred over-dimensional transport routes proposed in Section 6 PPR, it is considered that impact mitigation could be achieved by using escorted convoys of two or more over-dimensional routes through the Mudgee township. Further consultation on this issue will take place with relevant road

authorities in the pre-construction phase of the Project.

**3.12.16** All arrangements for the control of traffic on classified roads are to be in accordance with the RTA publication *Traffic Control at Work Sites*. A Road Occupancy Licence will be required prior to any works commencing within three metres of the traffic lanes of classified roads and submission of the TMP will be part of the Road Occupancy Licence.

*RMS*

**Response:** Noted. The requirement to obtain relevant permits and licences is acknowledged and addressed in the Traffic and Transport Report.

**3.12.17** The proponent will be required to undertake private financing and construction of any works that are to be undertaken on a road in which RMS has a statutory interest (state roads). A formal agreement in the form of a Works Authorisation Deed will be required between the developer and RMS prior to the commencement of any such works.

*RMS*

**Response:** Noted. Subject to finalisation of transport routes and requirements, and detailed design, the Proponent commits to bearing the costs of pre-construction upgrades and post-construction road repairs as required, and as outlined in Statement of Commitment 024.

**3.12.18** All works associated with the project, including consultation and planning, are to be at no cost to RMS.

*RMS*

**Response:** Noted.

**3.12.19** The EA states that one of the preferred routes to the Crudine Ridge Wind Farm site is by the Golden Highway to Mudgee via the Castlereagh Highway including through Gulgong and then onto the site via Hill End Road, Windeyer Road and Pyramul Road. Additional to this route the proponents also require access to their substation up on Bombandi and Crudine Roads. The Bombandi Road is no more than a farm track and will require substantial upgrade. Crudine Road is generally wide enough but the traffic lanes will require to be upgraded and drainage installed.

*MWRC*

**Response:** Upgrade requirements along Bombandi Road, and the then proposed transport routes were acknowledged in the Project EA. Similarly, Section 6 PPR and Appendices 3 and 4 acknowledge and detail upgrade requirements for the preferred transport routes for the Project.

**3.12.20** The proponents will cart components through Gulgong township. The current road through the Gulgong township is not designed for the type of loads proposed by the Crudine Ridge Wind Farm EA. Council will require \$500,000 to upgrade this road for a distance of 2 kms in Gulgong township to acceptable safety standards.

*MWRC*

**Response:** Heavy vehicles currently utilise routes through Gulgong. Further, the route described was assessed for over-dimensional vehicle transport by Downer Infrastructure (see Appendix 4). Based on Downer Infrastructure's engineering experience with wind turbine component haulage, only minor works were recommended at one right hand turn (Medley Road / Castlereagh Hwy corner) (Appendix 4 pg. 26), and no other road upgrades

are required with respect to the type of loads proposed. As such, a lump sum of \$500,000 was considered beyond what is reasonably required to upgrade the corner.

Further to this assessment, in response to a request by MWRC use of this intersection has now been discounted. A route variation proposed by MWRC has now been assessed and is preferred (see Section 6.4.3).

**3.12.21** *MWRC* **The Golden Highway is outside of this Council’s jurisdiction and thus no comment is made. The Castlereagh Highway from the intersection of the Golden Highway is predominantly in the Mid-Western Regional Council area, and is a State Highway. Other than the portion of the Castlereagh Highway through Gulgong the road is considered adequate to cope with the heavy and wide loads stated in the EA. In stating that the road is adequate Council does make the comment that the road is non-conforming to Austroads standards in many areas.**

**Response:** Noted.

**3.12.22** *MWRC* **The EA (Section 4.1 in Appendix 14) sets out the significant numbers of “over-size” (width and/or length) and the “over-mass” or both for loads to the site for the components. These vehicles can only travel on roads with RMS and Council operating permits. The loads will be up to 70 tonnes in weight and 63 metres in length.**

**Response:** Noted. Please see response to Comment 3.12.9.

**3.12.23** *MWRC* **In addition to these over-size and over-mass loads, there will also be considerable traffic movements, within legal weight limits, of trucks carrying construction material to site. For example, some days there will be 84 truck movements per day to cart pre-mix product for towers.**

**Response:** The additional traffic generation of standard heavy vehicles and light vehicles is acknowledged. It should be noted that the figure of 84 vpd used in the Project EA was the peak construction period estimate – a period of approximately four months of construction. For the majority of the construction period (14 months out of 18 month construction period) the daily traffic generation would be significantly less (less than a quarter of the peak four months). Construction traffic, including the standard heavy trucks and light vehicles, will be managed under the relevant CEMP sub-plan, which will be prepared through consultation with RMS and local Councils.

Please see Section 6 and Appendix 3 for further discussion regarding standard heavy vehicle movements and preferred transport routes.

**3.12.24** *MWRC* **Additional to this, up to 100 construction workers will be on-site daily for certain periods travelling to the site daily in presumably light vehicles.**

**Response:** Additional light vehicle generation associated with the construction phase of the Project is acknowledged. Note that the figure quoted is the estimation of the peak construction period - a period of approximately four months. It is estimated that for the majority of the construction period, up to approximately 50 construction staff will be accessing the Project site. Further, the addition of light vehicles during the operational

phase of the Project was assessed as negligible (Appendix 3).

**3.12.25** *MWRC* The component vehicles will travel the Golden and Castlereagh Highways but all traffic will use the Hill End, Windeyer and Pyramul Roads. The Hill End Road currently has traffic volumes of 381 vehicles per day (5.7% heavy). The Windeyer Roads has 389 vpd (7% heavy) and Pyramul Road 89 vpd (6.9% heavy). The Austroad standard for this expected traffic volume – that is local traffic and the expected construction traffic – will require this road to be upgraded to the following:

	Hill End / Windeyer Roads (m)	Pyramul Road (m)
Traffic Lanes	2 x 3.5	2 x 3.1
Shoulder (sealed)	2 x 0.5	2 x 0.5
Shoulder (unsealed)	2 x 1.0	2 x 1
Total Carriageway	10.0	9.2

**Response:** Upgrades to roads where required have been acknowledged and identified within the Traffic and Transport Report (Appendix 14, Project EA). Likely upgrades required for the preferred transport routes are discussed in Section 6 PPR and detailed in Appendix 4.

However, the upgrades proposed by MWRC above are considered to be beyond what would be reasonably required and are based on incorrect Austroad Standards. The correct Austroad standards for these roads (based on traffic volumes) are listed in Table 7 below. Irrespective of this, these standards refer to permanent upgrades, despite the construction period for the Project being an 18 month period only. Upgrading roads to permanent Austroad standards is inappropriate and excessive in light of the impacts proposed and assessed when other upgrade options are available in conjunction with suitable traffic management.

**Table 7** Relevant Austroad Standards for the relevant roads

	Hill End Road (m)	Windeyer Road (m)	Pyramul Road (m)
Traffic Lanes	2 x 3.1	2 x 3.1	1 x 3.5
Shoulder (sealed)	0.5	0.5	0.5
Shoulder (unsealed)	1.5	1.5	2.0
Total Carriageway	7.7	7.7	5.5

**3.12.26** *MWRC* Attached to this submission is a detailed analysis of the road with the upgrades required at various points. This analysis gives a summary of upgrading works required plus costs. It must be noted by the Department of Planning as the determining authority that it is normal for Council to request this level of upgrade (and costs) for state significant developments to be contributed by the proponent. The Department of Planning has imposed the Ulan Road Strategy on the coal mines in the Ulan area, the Cobbora coal mine (and State Government) is currently in discussion with Council for



**major infrastructure upgrade and most other developments in the region have accepted their responsibility to upgrade infrastructure. The Crudine Ridge Wind Farm need to be brought into line with all other developments in our region and accept the responsibility of user pays.**

**The attachments includes photographs which clearly shows the roads, nothing more than a country lane in parts. The road is narrow and well below acceptable standards for almost the total 53 km to cater for the type of traffic being proposed by the proponent.**

**Response:** The Proponent notes MWRC's concern regarding the use of the Hill End / Windeyer and Pyramul Road route for standard heavy and over-dimensional vehicles. The MWRC submission also identifies Aarons Pass Road as an alternative route option for construction traffic. In recognising this, the Proponent has undertaken assessments of the Castlereagh Highway / Aarons Pass Road route, and is proposing this as the preferred over-dimensional route for the construction period. See Section 6 PPR and Volume 1 for full details of the assessments undertaken.

The upgrades recommended by MWRC, however, are considered to be beyond what is reasonably required and inappropriate for the amount of traffic generated by the Project, and the length of the construction period. Upgrades required along Aarons Pass Road have been identified and include widening at certain corners, general road widening to 6 m where required and gravel paving of the road. Sealing and widening to 9.5 m is not considered necessary to accommodate Project related traffic, including over-dimensional traffic, given the temporary nature of the impacts (Appendices 3 and 4). Moreover, widening the road to 9.5 m would have considerable impact on the roadside vegetation corridor along the road. MWRC itself has identified the significance of these remnant communities. The Proponent has considered this ecological value and has sought to minimise, to the greatest extent possible, potential vegetation clearance and general impacts on the roadside vegetation.

**3.12.27** *MWRC* **The roads with the increased volume from the construction traffic will become a significant safety issue if not upgraded. It is simply not reasonable to allow this volume of over-size, over-mass and construction vehicles onto these roads without substantial upgrades.**

**Response:** The Proponent is committed to maintaining safety during all phases of the Project via actions and commitments within the relevant CEMP sub-plan to be prepared and actioned in conjunction with local Councils and RMS. Where upgrades to proposed transport routes have been identified to safely accommodate Project related traffic, these have been acknowledged and committed to. Upgrades to Aarons Pass Road and other road sections as identified and proposed are detailed in Appendices 3 and 4. Again, construction traffic impacts need to be considered in light of the assessment of both the average construction period (approximately 14 out of 18 months) and the peak construction period (approximately four out of 18 months).

**3.12.28** The proponent will argue that the high value of traffic is only for a short period of time somewhere around 18 months to 2 years. In this Council's opinion that is irrelevant as the traffic over-sized and over-weight and including a greater number, will travel this road causing extreme safety dangers to other users. It is unacceptable if this road is not upgraded to the Austroad Standards as required by all other users.

*MWRC*

**Response:** Road upgrades to Austroad Standards are not required for the construction of wind farms. Unlike other major projects, such as mines, the bulk of road impacts associated with wind farms occur during construction. An 18 month period is proposed for construction of the Project, after which any damage resulting from construction traffic will be repaired at the Proponent's cost (see Statement of Commitment 024). Gravel roads such as Aarons Pass Road (once upgraded as proposed) have successfully been used to build a number of wind farms previously constructed by experienced engineering companies such as Downer Infrastructure (Appendix 4).

**3.12.29** The proponents require rolling stoppages whilst transporting the components. On many parts of the roads there will be no areas for local traffic to get off the road to allow these vehicles to pass.

*MWRC*

**Response:** Construction traffic is temporary, considered to be 18 months (average Project traffic volumes), of which approximately four months would be peak Project traffic volumes. All traffic movements would be strictly controlled through implementation of CEMP sub-plans, VMPs, driver code of conduct, the RMS over-size permit system and other necessary permits and licences. Rolling stops, just one proposed mitigation measure, would be controlled by the RMS permit system, using experienced transport operators with upstream warning vehicles, passing bays and other measures where required.

However, concerns about the ability for local traffic to pull off the roads along the originally proposed route, including Hill End / Windeyer / Pyramul Roads, is acknowledged. Route assessments undertaken in response to feedback identified significant sections of narrow carriageways, which, if utilised by Project traffic, would severely restrict use by local traffic. In contrast, assessment of Aarons Pass Road identified a number of locations that would be suitable for passing bays with only minor upgrades (Appendix 4).

**3.12.30** The preferred route for transportation of the components includes travelling through Gulgong on the Castlereagh Highway. Council will require some road improvement works to ensure traffic safety is maximised and that the pavement is capable of handling the overweight loads.

*MWRC*

**Response:** Please refer to response to Comment 3.12.19 and 3.12.20.

**3.12.31** The cost of upgrading these roads is estimated at \$26.168 million.

*MWRC*

**Response:** Upgrades proposed by MWRC are considered by Samsa Consulting to be

excessive considering the temporary nature of the construction traffic. Downer Infrastructure and Rex J Andrews, with extensive experience in transporting and building wind farms, undertook a route survey, swept path and vertical alignment analysis of a number of potential over-dimensional routes including the preferred routes. Required upgrades were identified and a preliminary estimate of \$2,440,000 to upgrade Aarons Pass Road to a suitable standard was provided. The Proponent will continue to engage with MWRC regarding required road upgrades and relevant EMP sub-plans.

**3.12.32** *MWRC* **The Mid-Western Regional Council objects to the proposed Crudine Ridge Wind Farm project on the basis that current local road network is inadequate and incapable of having the traffic on it as proposed by the proponent in the EA. Further, the Council considers that the upgrading of the Hill End Road, Windeyer Road, Pyramul Road, Bombandi Road and Crudine Road as proposed by the proponent falls well short of reasonable traffic safety criteria.**

**Response:** Please refer to Section 6 PPR, which details upgrades that have been identified to ensure the proposed transport routes are suitable for the construction phase of the Project. Please see response to Comment 3.12.19 for comments regarding Bombandi Road.

**3.12.33** *BRC* **Concerns are raised that the proposed southern access route contains many sections of roadway unsuitable for the proposed heavy and over-sized transport vehicles. These constraints are both weight load issues relating to many bridge and culvert structures as well as the inherent issues relating to the roadway age, rural construction and design criteria. Therefore it is presumed that substantial upgrading of the roadway and structures will be required.**

**Response:** Noted. Please see revised transport route options in Section 6 PPR. It is acknowledged that the southern access route has a number of constraints for standard heavy vehicles. These constraints will be addressed through road upgrades where required and traffic management implemented as part of the relevant CEMP sub-plan. All road designs and access layouts will be prepared in agreement with RMS and BRC.

**3.12.34** *BRC* **I advise that all associated costs for such works will be the full responsibility of the developer. Engineering design of all such works shall be submitted to Council for consideration and approval prior to any works commencing on all Bathurst local government area roads. All works are to conform to Bathurst Regional Council's Guidelines for Engineering works and relevant Austroads and NSW Roads and Maritime Services publications.**

**Response:** Subject to finalisation of transport routes and requirements, and detailed design, the Proponent commits to bearing the costs of pre-construction upgrades and post-construction road repairs as required, and as outlined in Statement of Commitment 024. The requirement to obtain relevant permits and licences, and to adhere to all relevant guidelines, is acknowledged and addressed in the Traffic and Transport Report.

**3.12.35** **It must be noted that the report submitted does not provide comprehensive detail as to**

*BRC* the expected total number of vehicles, with particular interest in heavy vehicle movements. Only expected daily traffic has been predicted. Upon receipt of this information, Council may wish to consider the inclusion of costs for pre- and post-development asset inspections (including independent engineering assessment of all structures en-route given heavy vehicle loadings), as well as maintenance bonding and / or post development damage rectification costs.

**Response:** Daily traffic volumes described in the Project EA provided worst case estimates of traffic. Total (overall) traffic generation will be identified pre-construction. At the appropriate time, the Proponent will engage with Council regarding this matter.

## Chapter 13: Aviation Assessment

*AsA* **3.13.1** At a height of 1158m (3799ft) AHD, the proposed wind farm will not affect any instrument sector or circling altitude, nor any instrument approach or departure procedures at Mudgee aerodrome. It will also not adversely impact the performance of Airservices Precision/Non-Precision Nav Aids, HF/VHF Comms, A-SMGCS, Radar, PRM, ADS-B, WAM or Satellite/Links.

**Response:** Noted.

*CASA* **3.13.2** Details of the turbine locations should be reported for inclusion in the national database of tall structures maintained by the Royal Australian Air Force (RAAF). Information on reporting of tall structures may be found in advisory circular issued CASA "AC 139-08(0) Reporting of Tall Structures".

**Response:** Noted, please refer to Statement of Commitment 029.

*DoD* **3.13.3** The location of the wind farm will be sited wholly within Danger Area D538A which is used for Williamstown Military Flying Training. Defence requests that the proponent provide RAAF AIS with "as constructed" details of the wind farm. Defence's response is based on the extent of the proposal as shown in the exhibition package. If a significant change to the siting occurs, Defence requests opportunity to review the changes to ensure there will not be any adverse impact on Defence operations.

**Response:** Noted, please refer to Statement of Commitment 029.

*BRC* **3.13.4** Due to the extensive size of the proposal, the wind farm development warrants appropriate obstacle lighting. It is acknowledged that the developer has been advised by CASA that it is at the developer's discretion that obstacle lighting is provided. It is recommended that this be made a condition of approval.

**Response:** Statement of Commitment 032 provides that the Proponent will liaise with the Civil Aviation Safety Authority (CASA) and Department of Infrastructure and Technology on the subject of obstacle lighting once development approval has been obtained. Further, these discussions will have regard to the selected wind turbine model. Please refer also to CASA's submission comments in Comment 3.13.2.

**3.13.5** Council is concerned that the installation of wind turbines will restrict aerial fire fighting and thereby increase risk to non-host properties during episodes of extreme fire danger. It is considered that an analysis should be undertaken in conjunction with the local fire fighting service of the increased risk that arises from the inability to use aerial fire fighting options prior to the determination of the application. Whilst the EA indicated that fire fighting methods can be adapted to accommodate the wind turbines there is no comparison between the potential increase of risk and extent of the fire due to an inability to use aerial methods due to the presence of the turbines.

MWRC

**Response:** The Proponent appreciates the concerns expressed by MWRC in relation to aerial fire fighting - in fighting fires on rural land, access to the fire front is a central issue. As set out in Chapter 13 of the Project EA, the Rural Fire Service has stated that the presence of the wind turbines is unlikely to restrict fire fighting operations. Airservices Australia also did not express any concern about potential impact on aerial firefighting, and stated that they did not anticipate that the Project would affect navigational equipment (as listed in the Project EA).

In fact, as set out in Chapter 16 of the Project EA, the Project will improve access to land within the Project site through the installation of new access roads over terrain which previously had only unmade tracks, if any. This will assist fire fighters to reduce response times and provides the ability to more easily access fires on properties within and neighbouring the Project.

In addition, the Proponent will create a Bushfire Emergency and Evacuation Plan prior to the commencement of construction, adhere to all regulations under the *NSW Rural Fires Act 1997* and the Cudgegong Draft Bushfire Risk Management Plan and consult with the RFS and the NSW Fire Brigade to decrease its impact on fire and bushfire hazards. These measures are discussed in detail in Chapter 16 of the Project EA.

## Chapter 14: Communications Assessment

No responses received.

## Chapter 15: Electromagnetic Fields

No responses received.

## Chapter 16: Fire and Bushfire Assessment

**3.16.1** 1. The Development proposal is to comply with the recommendations provided by Eco Logical Pty Ltd ref.11ARMPLA-0011 dated 19 August 2011 in reference to 11\_0033.  
NSW  
RFS 2. Emergency evacuation measures in accordance with Section 4.2.7 of *Planning for Bush Fire Protection 2006*.

**Response:** Noted.

**3.16.2** Council is concerned that the installation of wind turbines will restrict aerial fire fighting and thereby increase risk to non-host properties during episodes of extreme fire  
MWRC

danger. It is considered that an analysis should be undertaken in conjunction with the local fire fighting service of the increased risk that arises from the inability to use aerial fire fighting options prior to the determination of the application. Whilst the EA indicated that fire fighting methods can be adapted to accommodate the wind turbines there is no comparison between the potential increase of risk and extent of the fire due to an inability to use aerial methods due to the presence of the turbines.

**Response:** Please refer to response to Comment 3.13.5.

## Chapter 17: Water Assessment

**3.17.1** There is the potential for groundwater to be intercepted during foundation construction. The Office of Water understands the proponent will carry out further groundwater assessment prior to foundation construction. The groundwater assessment should be forwarded to the Office of Water prior to construction, for comment. The Office of Water understands there may be uncertainties regarding groundwater, however the proponent should be made aware if there is a groundwater issue then further assessment may be required by the Office of Water at a later date.

*NOW*

**Response:** Noted. This matter is addressed in Statement of Commitment 062 which reads "Carry out a groundwater investigation prior to any blasting on-site (if required) to ensure that there is no adverse impact on groundwater for users or dependent ecosystems. If the investigation highlights areas of concern, then appropriate mitigation or alternative methods will be used." It is noted that this will be undertaken by the Proponent in consultation with NOW.

**3.17.2** The NOW supports the proponent's Statement of Commitments, in particular to design watercourses in accordance with the *NOW Guidelines for Controlled Activities on Waterfront Land* and in consultation with the NSW Office of Water. These commitments will aid in mitigation impacts to channel stability and hydrologic functioning, and ensure appropriate rehabilitation measures are applied. Please note that these guidelines have recently been updated (July 2012).

*NOW*

The EA mentions that sand and gravel will be sourced locally for the project. Any sand or gravel sourced for the project, particularly from riparian areas must have appropriate approvals from the NOW.

**Response:** Noted. Any sand or gravel that is required for construction of the Project will be sourced from an appropriately approved / licensed quarry.

**3.17.3** The EA indicates water will be required for concrete footings, concrete batching and dust suppression with a total water demand of 20.6ML. The EA outlines water for the project will be sourced and purchased from local landholders, with water being sourced from groundwater and dams, and offsite suppliers as the last option. It is important any water used for the project is from appropriately licensed sources and any water obtained from farm dams is in accordance with the *Farm Dams Policy* and

*NOW*

**Harvestable Rights Order.**

**Response:** Noted.

**3.17.4**     **The project area is located within the *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source, Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources* and the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources*. The EA outlined some of the water sharing plans were in draft form – however the plans are no longer draft and commenced late last year.**

**Response:** Noted.

**3.17.5**     **1. The Applicant must obtain a sustainable water supply for the life of the project.**  
**NOW**       **2. The proponent shall prepare a Construction Environmental Management Plan and Operation Water Management Plan in consultation with and the satisfaction of the NOW prior to commencement of activities.**  
**3. The design of waterway crossings for access roads and cable installations, and any associated in-stream works is to be included within the Construction Environmental Management Plan. These designs are to be prepared in accordance with NOW *Guidelines for Controlled Activities on Waterfront Land (2012)*.**  
**4. If rock anchoring is selected for wind tower foundations a groundwater assessment is to be undertaken and endorsed in consultation with the NOW prior to construction. The assessment is to include the risk of impact on existing licensed groundwater users and groundwater dependent ecosystems, and is to provide suitable mitigation measures. Any necessary licensing requirements under the *Water Management Act 2000* will also need to be obtained.**

**Response:**

1. The vast majority of Project water requirements will occur during the construction phase of the Project. Operation of the Project will require very minimal quantities, quantities which are likely to be fulfilled by rainwater tanks installed during construction. As such, it is considered that obtaining any further water supply for the life of the Project is beyond what would be reasonably required. Where decommissioning of the Project requires water supplies, appropriate licences and sources would be dealt with in the Decommission and Rehabilitation Plan, to be finalised in the pre-decommissioning phase.
2. As required by typical conditions of approval, the Project CEMP will be prepared to the satisfaction of the DoPI.
3. Indicative waterway crossing designs, and any associated in-stream works will be included within the CEMP. However, designs and works should not be required to be finalised in the CEMP, in order to provide flexibility in implementation and innovation where applicable.
4. Noted. This condition is in line with Statement of Condition 062.

**3.17.6**     **Fisheries NSW advise no issue with the proposal, on the basis of advice in the**

*Fisheries NSW* Environmental Assessment that watercourse crossings will be undertaken in accordance with Fisheries NSW Guidelines.

**Response:** Noted.

**3.17.7**  
*EPA* The EPA supports the recommendations summarised in parts 59 to 62 of Section 20.1 of the Statement of Commitments with respect to the protection of groundwater quality.

**Response:** Noted.

**3.17.8**  
*EPA* The EPA supports the commitments described in parts 71 and 72 of Section 20.1 with respect to protecting the quality of surface waters in the project area and notes that the proponent will adopt measures consistent with the Landcom (2004) guidelines for managing stormwater associated with construction works. While not implicit in part 72, the EPA would expect the CEMP to adopt appropriate references to the Landcom guidance material and specify the roles and responsibilities of each contractor with respect to protecting surface waters specific to their work activity.

**Response:** Noted.

**3.17.9**  
*EPA* Recommended Conditions of Project Approval: Stormwater/sediment control – Construction Phase.

A Construction Environmental Management Plan (CEMP) must be prepared and implemented prior to any construction associated with the project. The CEMP must describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities. The CEMP should be prepared in accordance with the requirements for such plans as outlined in “*Managing Urban Stormwater: Soils and Construction*” (Landcom 2004).

**Response:** Noted. These conditions are in line with Statement of Commitment 060.

**3.17.10**  
*CMA Central West* The CMA notes the intention to manage and mitigate impacts to water and riparian vegetation within the bounds of a management plan to be included in the construction environmental management plan for this project. It is strongly advised that, within this plan, every necessary action is undertaken to minimise soil disturbance in order to reduce the potential for increased erosion from ridges which would subsequently impact water quality through surface runoff.

**Response:** Noted. See response to Comment 3.10.7 which notes that the Ecological Assessment presents a number of mitigation measures in Table 17. These measures address the possibility of weed spread; sedimentation, erosion and runoff; vegetation clearing; impacts to flora and fauna; impacts to soils; the incidence of fire; bank instability at creek crossings; and other general impacts. Further, a commitment is made to minimise impact to soil and water wherever practicable in Statements of Commitment 056 - 060.



**3.17.11** The CMA notes the intention to build culvert crossings where existing drainage lines must be crossed and that such crossings will maintain existing hydraulic, hydrological, geomorphic and ecological watercourse functions. It is considered that, given the commitment to adhere to NOW and DPI guidelines for watercourse crossing construction and to the revegetation of riparian zones, appropriate mitigation strategies are in place to minimise disturbance to waterways. However, it is strongly recommended that, wherever possible, waterway crossings are removed once construction is completed and in-stream and riparian impacts rehabilitated.

*CMA  
Central  
West*

**Response:** Noted.

**3.17.12** It is also considered that hardstand areas (e.g. site office, batching plants and construction compounds) are not located within core riparian zones or vegetated buffers associated with watercourses. This assessment does address this, but only to the extent of “where practicable”. This is considered to be inadequate.

*CMA  
Central  
West*

**Response:** Noted. Every design effort has been undertaken to avoid impacts to sensitive areas, including watercourses. With regard to compound areas, the Proponent has avoided locating these in watercourse areas (refer to section 3.9.5 of the Project EA).

**3.17.13** The CMA notes that, to date, there has not been a management plan developed that will address actions to mitigate impacts to the soil landscape. It is strongly recommended that management actions dictating the control of erosion and sediment and stabilisation of disturbed soil surfaces are precautionary and rigorous. This should include the removal of stock from the construction site until such time as complete regeneration of the ground cover layer has occurred. Regeneration may require revegetation in order to accelerate positive outcomes.

*CMA  
Central  
West*

**Response:** Commitments are made to develop a CEMP and CEMP sub-plans pre-construction. See Statements of Commitment 056 - 060 and 071 - 073 for water and soil management measures that will be implemented during construction. Stock management during construction will be undertaken in consultation with landowners as required.

**3.17.14** The EA fails to identify annual water requirements but outlines the process required to secure a water licence. It is estimated that during construction of the wind farm in the order of 8.9 ML of water would be required for concrete with a further 11.7 ML of water required for road construction and dust suppression. The EA states that where a ground water source is not available then water will be brought to site by an external water supplier. This will have additional impacts on traffic number and roads. Council would encourage that a full assessment be undertaken of the cumulative impacts of redirection of water away from agricultural users to State Significant Development. It is considered that potential long term impact on agriculture within this catchment need to be assessed in light of this disturbing trend.

*MWRC*

**Response:** As noted, the Project EA estimates the water required for the 18 month

construction phase of the Project. Once constructed, there are very minimal water requirements for Project operation. It was assessed in the Project EA that the Project is of sufficient distance from other existing and proposed projects that it is anticipated there will be no cumulative effect on groundwater, riparian and watercourse corridors and wetlands as a result of the Project.

EMPs and appropriate EMP sub-plans will address and action management measures to accommodate scenarios that result from the licensing and approval processes.

## Chapter 18: General Environmental Assessment

**3.18.1**      **The EPA supports the recommendations summarised in parts 66 to 70 of Section 20.1 of the Statement of Commitments with respect to air quality particularly in regard to the proposal to develop a Construction Environmental Management Plan (CEMP). The EPA notes, however, that unlike other references to the CEMP in the Statement of Commitments, there has been no assigning of responsibility of this document or noting of for what stage of the project the plan will apply to.**

*EPA*

**Response:** Noted. This has been corrected in the revised Statement of Commitments in Section 7 of this report.

**3.18.2**      **The EPA notes from Section 18.6 of the EA that the CEMP will include a description of the roles and responsibilities for relevant employees and contractors in carrying out their duties plus relevant training and induction provisions. The EPA considers that this aspect of the CEMP is critical given the likely large number of sub-contractors working during the construction of the site and the potential for environmental matters, including dust generation, to be ignored by workers not directly employed by the proponent.**

*EPA*

**Response:** Noted.

**3.18.3**      **Recommended Conditions of Project Approval:**

*EPA*      **All operations and activities occurring on the premises must be carried out in a manner that will minimise the emissions of dust from the premises.**

**All trafficable areas, soil stockpile areas and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust.**

**Response:** Noted.

**3.18.4**      **As previously advised to the proponent in May 2011, in the initial investigation relating to this proposal, there appears to be unformed Crown roads that may be impacted by this development. It was at that time suggested to the proponent that road closure and purchase of these areas would remove any potential complications with regards to occupation in the future. It was then a matter for the**

*DPI Crown Lands*

**proponent to undertake appropriate action.**

**There are no additional issues that are apparent that will impact the Crown estate in this matter, and so Crown Lands Division of Department of Primary Industries has no issues or comments at this point.**

**Response:** Noted.

**3.18.5 Agriculture NSW advises no issues.**

*DPI  
Agriculture  
NSW*

**Response:** Noted.

**3.18.6**  
*MWRC*

**There is considerable evidence available that the cumulative effect of wind towers creates a micro-climate of its own. One such study is documented from Illinois in the United States, undertaken by a proponent of wind farms, and has shown that there has been a 2 degree change in temperature, and a substantial drop in rainfall. In fact, the cumulative effect of wind towers pushes moisture-laden air higher into the atmosphere, forcing it some considerable distance away from the affected area before it is able to condense and turn into rain. Bearing in mind that Mudgee township will be only 10 kilometres away (as the crow flies) from one of these wind farms, the whole area is going to be affected with a change in climate much wider than the proponents are acknowledging. This may affect the existing grape industry which is already experiencing difficult economic times. The EA cites studies in other areas but fails to provide any assessment within the local context. As such it is impossible for Council to provide an informed comment. For these reasons, the application fails to satisfy the Director General's Requirements in relation to a specific local examination of micro-climate impacts.**

**Response:** Consideration of microclimate impacts is not a DGR for the Project. Nor is the Project 10 km from Mudgee, but approximately 40 km to the south. Notwithstanding the absence of a requirement to consider the subject, the Proponent undertook a review of the existing literature related to microclimate effects, described in Section 18.8 of the Project EA.

Other proposed or existing wind energy projects are the subject of the Project EA only insofar as considering and assessing cumulative impacts. Given the distance between the Project and other proposed or existing wind farms in the area, potential cumulative impacts are unlikely to occur.

Furthermore, if the issue of a change in climate and economic downturn is of central concern, then it is worthy to note the significant contribution to climate change that open cut coal mines, a number of which are in close proximity to Mudgee, make through the release of greenhouse gases to the atmosphere. In 2009 fugitive emissions from coal and gas accounted for 7 % of Australia's total emissions (DCCEE 2012). Fugitive emissions from coal mining accounted for the largest proportion of

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emissions in that sector (DCCEE 2012).

**3.18.7**  
*MWRC*

**Council is aware that a number of wind towers around the world are no longer operating and thus the towers are now left dormant and weathering badly. Some are now rusting and have become an eyesore of the landscape. Council requests that if the company does not have the financial sustainability to continue operating, then it certainly won't have the financial resources to rehabilitate the site, and thus this removal of the towers should not be at the expense of taxpayers or of ratepayers. A bank bond in favour of the NSW State Government must be endorsed to offer this state and this community protection from an environmental eyesore.**

**Council makes the strong submission that the proponents must prepare bank bonds in favour of the NSW State Government to the value of \$70,000 per tower for rehabilitation.**

**Response:** The submission from MWRC is misguided. The Project is a private venture and the Project infrastructure will be installed on private land. Even if this matter were not addressed between the Proponent and the landowner, as described below, it is very difficult to imagine the circumstances in which any level of government could become responsible for the cost of decommissioning or removal of the infrastructure.

Table 3.3 of the Project EA provides an anticipated Project timeline including decommissioning. Section 3.9.1 explains why this is only anticipated, as the Project is required to obtain Development Approval, project financing where appropriate and wind turbine component supply and construction contracts prior to progressing along the timeline. Once these milestones are accomplished, wind farms generally have a lifespan of 20 to 25 years followed by either decommissioning or repowering.

The Proponent does not intend on providing a decommissioning bond because commitments related to decommissioning are covered in the individual landowner lease agreements, as stated in Section 3.9.10 of the Project EA. These agreements cover the removal of relevant and agreed infrastructure at the end of the lease period and are commercially confidential, so cannot be provided in the Project EA. As described in Section 18.9 of the Project EA, the cost of decommissioning would be more than covered by the material and recyclable cost of the wind turbines, electrical infrastructure and ancillary components, if it is necessary to fund decommissioning in this manner. This is consistent with the Taralga judgement (*Taralga Landscape Guardians Inc v Minister for Planning and RES Southern Cross Pty Ltd*).

A decommissioning plan will be prepared towards the end of the Project's life detailing what and how components will be removed from the site or left in situ. This will cover any required surveys prior to commencing decommissioning, such as flora and fauna and traffic impacts. It will then detail the timescale and process of decommissioning within the timeframe allowed by the planning consent. As the make and number of wind turbines is not yet known, and given the potential change

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to the environment during the operational phase of the Project, it is logical to prepare the decommissioning plan towards the end of the Project's life.

## Chapter 19: Socio-Economic Assessment

**3.19.1**  
MWRC

**Council has concerns regarding the potential for adverse impacts of noise on land valuations on those properties in the vicinity of the wind farm particularly those properties that are not hosting turbines. The EA in addressing wind farms cites several studies that support the proposition that wind farms in themselves do not adversely affect property values. These studies rely on case studies of other areas (including overseas) but the EA fails to provide an analysis of the study findings within the context of the project area and region. The EA appears to recognise that the “underlying land use may affect the properties sensitivity to price impacts” but fails then to make any attempt to examine the potential impacts within the project area. Notwithstanding the EAs inadequacy to truly examine the potential impacts on land values, it should be noted that there has been a recent court case in experience in Southern Gippsland (32% reduction in value was recognised by Council for rating purposes) indicates that there is a real and significant impact on land values. In addition, the ability for studies to accurately assess the impact is severely affected by the reduced marketability of properties once a wind farm in proposed within an area.**

**The EA fails to assess the potential economic and social impact of devaluation of property on Council and land holders.**

**Response:** Section 19.1 of the Project EA covers the potential impact of wind turbines on land value, including recent independent reports exploring the matter. The most recent report by the NSW Valuer General (*Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia, August 2009*) investigated eight wind farms, two in NSW and six in Victoria.

“The main finding was that the wind farms do not appear to have negatively affected 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.”

This section of the Project EA also states that many factors can influence the perceived and actual property value. In most rural areas the main determinant for property and land values is the agricultural productivity of the land, both to sustain animals and to grow crops. Such productivity is not linked to the development of a wind farm in the area, but is dependent on the innate quality of the land and the farming practices used in operating an agricultural business upon it.

MWRC relies on a single instance in which a Victorian local council reduced a landowner's rates in response to a specific complaint from that individual. In that

particular case, the council concerned said that the rates had been reduced not because of proximity to the wind farm or any wind turbines, but due to the proximity of the concrete batching plant to be used during construction of the wind farm, and the potential disturbance during the construction period. Clearly, it would be anticipated that the rates would return to market levels once construction was complete. The chief executive of the council involved stated that “I don’t believe it is a precedent because valuation reviews are done on their own merits”.

The Project has assessed the potential visual and noise impact on the surrounding area and deemed them to be acceptable within current guidelines. There is no reason to presume that the Project will affect the market value of any nearby properties.

**3.19.2**  
*MWRC*

**The EA recognises the difficulty in truly identifying impacts so it concludes that it is unnecessary to address this impact. To suggest a Community Fund or estimated local economic impact may compensate individual land holders is ridiculous. The EA fails to explore and therefore adequately address the following issues:**

- 1. The impact on land value having regard to current land uses and underlying drivers of people to live in the locality.**
- 2. Having regard to the land use, the sensitivity of valuations in relation to those land uses.**
- 3. The demography of the area and the potential impact of reduced land market and values on the long term life plans of residents in terms of superannuation investment, retirement and development potential.**
- 4. The social impacts of an aging isolated community that can no longer sell their properties at reasonable prices due to the impacts of the wind farm.**
- 5. The impacts on Council rate revenue due to reduction in land valuations and the cumulative impact of potential for 700 turbines across the LGA.**

**Council suggests that the potential impact on land values is a real impact of the project which the proponent has failed to adequately address and mitigate.**

**Response:** Please refer to response to Comment 3.19.1.

**3.19.3**  
*MWRC*

**Council disagrees with the statement within the EA that the wind farms will increase the number of tourists to the region. It is conceded that upon their introduction to Australia the turbines may have provided an increase in tourism to some areas for their novelty value but with the current numbers spread across the state it is considered that it is unlikely that wind farms would act as an attractor for tourists to the Mid-Western region and therefore be responsible for an increase in tourism.**

**Response:** In Chapter 19 of the Project EA, the Proponent discusses the possibility that the Project may attract tourists to the area. In doing so, the Project EA refers to the actual and reported experiences of other operators and communities around Australia, which have experienced a marked increase in tourism relating to wind farms. The Project EA also relates the findings of an independent survey that 32 % of NSW residents believe that wind farms would contribute to an increase in tourism.

MWRC is entitled to hold the opinion that there will be no increase in tourism to the area, however it is noted that this view does not coincide with the opinion of a significant portion of the general public and the experience of a number of wind farms around Australia, as described in the Project EA.

**3.19.4**  
*MWRC*

**The Community Well Being assessment is superficial relying on case studies of other wind farms to identify potential increases in employment and failing to make an assessment of potential impacts within the context of the Mid-Western Region. The EA states: “Cumulative impacts: It is not anticipated that the development of other wind farms in the region will have an adverse cumulative effect to community well being. Instead these wind farms will provide jobs and resources into the surrounding Councils and will help both Councils reach their aspirations and visions.” The EA fails to identify which other wind farms it is taking into account and fails to take into account the impact of other State Significant development currently operating and proposed within the region and the impact of housing, skill shortage and infrastructure provision. The Mid-Western region is currently experiencing considerable and significant pressures generated by the existing coal mining cluster centred at Ulan (i.e. Ulan, Moolarben and Wilpinjong coal mines) which will be further exacerbated when the proposed Mt Penny, Cockatoo and Inglenook coal mines and the Lue Silver mine come online. The Mid Western region currently has full employment and is experiencing skill shortages with the resultant upward pressure on wages in those skill fields and also has workforce drain from industries other than mining to the mining sector resulting in servicing gaps across a wide range of activities. Further, there is significant pressure on a limited housing stock, which hasn’t kept pace with the rapid mining expansion, with the result that there is zero vacancy for rental accommodation and a rising rental market that is having an ever increasing impact on the community. The main impacts in regard to rental housing has been the dislocation of lower socio-economic groups to more isolated areas and financial pressures on other necessary and important community professionals who are struggling to compete with mining sector incomes in terms of access to housing in the Mudgee area. There are also considerable pressures on health services in the region due to increasing demands on a limited resource.**

**Response:** The issues raised by MWRC in this comment are properly dealt with in Chapter 19 of the Project EA. However, the Proponent has considered the submissions made by MWRC and, for the sake of completeness, commissioned a further assessment by Umwelt Pty Ltd (Appendix 5). This assessment shows, in greater detail, the likely impacts of the Project on the local community, including analysis of housing and employment levels during both the construction and operation phases of the Project. In particular, given MRWC’s concerns regarding the potential cumulative impacts of other project in the regions, the assessment contains a comparison between the impacts of the Project and those of the Ulan Coal Mines Continued Operations Project (UCOP).

As shown in the extracted Table below, and consistent with the analysis provided by the Proponent in the Project EA, Umwelt’s assessment found that the Project

workforce during the two year construction phase would be approximately 50 staff during average periods and 100 staff during peak periods.

**Table 8** Comparison of construction workforce parameters

Parameter	CRWF	UCOP
Construction Staff (average period)	50	220
Construction Staff (peak period)	100	350
Construction period (years)	2	3.75
Construction job years (FTE employees x length of construction)	133	825
Anticipated peak local workforce (20%)	20	70
Anticipated peak workforce from outside the region (80%)	80	280
Incoming workforce staying in Mudgee (15%)	12	42
Increase to population in Mudgee over construction period	0.12 %	0.43 %
Maximum annual construction light vehicle movements	40	972
Maximum annual construction heavy vehicle movements	21	12

It is anticipated that the construction workforce will be comprised of local staff as available and staff from outside the region if and as required. The current forecast is for the construction workforce to be comprised of approximately 20 % local staff. This represents an anticipated incoming peak workforce of 80 people, of which 12 people will be accommodated in Mudgee – a population increase of approximately 0.12 %.

Again consistent with the Project EA, Umwelt’s assessment also found that the current available capacity at existing establishments for short term accommodation in Mudgee statistical local area alone was sufficient to accommodate the incoming workforce during the construction phase.

MRWC’s concerns are specifically acknowledged in Section 2.1 of the assessment, and Umwelt state that “[i]t is considered that the temporary CRWF workforce is unlikely to have a significant negative impact on temporary accommodation within the MRWC LGA.”

The assessment also acknowledged, per the assessment performed for UCOP, that the construction workforce are not anticipated to bring families and “consequently long term loading on social infrastructure is not anticipated to be significant with regard to construction populations”.

Finally, Umwelt’s assessment also found that a worst case scenario of 75 % of the Project’s proposed operation workforce of 15 persons relocating from outside the area, would result in approximately 11 households relocating to the MRWC or Bathurst LGAs. As a result, that the worst case scenario “is unlikely to significantly affect MRWC housing availability or affordability”.

A full copy of the assessment is contained in Appendix 5.

**3.19.5**  
*MWRC*

**The data used to describe the existing situation in terms of industry break-down in our area is taken from a secondary source, ie Council’s Comprehensive Land Use Study. This information is dated and therefore more up to date primary sources**



should have been accessed such as Australian Bureau of Statistics information. Further the data taken from Council's study has been selectively used in the assessment and therefore provides an inaccurate picture of the current status of industry breakdown in our region. This assessment should not only have accessed more up to date information, including any data that may have been released from the most recent Census held in 2011 but also the DP&I website should have been checked to establish whether any large developments had been approved in our region.

**Response:** At the time of preparation and submission of the Project EA, the statistics from the 2011 Census for Industry of Employment by Occupation were not available. These statistics were released by the Australian Bureau of Statistics on 20<sup>th</sup> November 2012.

In the absence of that information, the Proponent used the same information on which MWRC has based its Comprehensive Land Use Strategy – the document which MWRC intends to “provide clear direction and guide future development in the area for the next 15 to 20 years” (MWRC website).

To the extent that approved developments in the area are relevant to the Project EA, such developments have been appropriately considered by the Proponent, as required by the DGRs.

**3.19.6**  
*MWRC*

**These are matters that should have been addressed in the socio-economic assessment as there are implications of not only where the temporary workforce will be sourced from but also where they are likely to be housed during the construction phase. The cumulative impacts of this development taking into account the already considerable impacts on the community from an ever expanding mining sector needs to be re-assessed with suggested mediation options examined as part of the EA. These issues were raised as part of the adequacy review and were not addressed in the final EA. Mid-Western Regional Council considers it is imperative that State Significant Developments are not assessed in isolation but a more strategic and holistic view is taken of the cumulative impacts on the region. It is considered that the socio-economic assessment included in the EA is a farce that fails to identify the impacts of this and other State Significant Developments in this region and therefore fails to identify mitigating measures.**

**Response:** In response to MWRC's comments regarding the Socio-Economic Assessment, the Proponent has sought further comment and specific consideration of the issues raised by MWRC from Umwelt Pty Ltd. The comments from MWRC appear to overlook the relatively small size of the operational workforce for the Project, as well the temporary nature and comparatively small size of the construction workforce. Umwelt's assessment deals with the impacts of the Project on the region, taking into account UCOP's impacts, and demonstrates that:

“CRWF will have minimal impacts on the services and infrastructure in the region...

As long term increases are within anticipated population projections and no

significant changes to property rental or purchase affordability are predicted, no corresponding mitigation measures are recommended...

The effective assessment of the temporary construction workforce against the Manidis Roberts (2012) data is not possible given the long term perspective within the Manidis Roberts (2012) report. A preliminary assessment regarding the proposed 15 operational roles within the context of the Manidis Roberts (2012) report indicates that the increase in infrastructure loading due to the 15 operational employees and their families is not of sufficient significance for Council to change current or planned infrastructure developments, or require significant mitigative measures.”

### 3.19.7

*MWRC*

**The Director-General’s Requirements in relation to the project require “[A]n analysis of the potential for social and economic impacts on the local community.” This is a “Key Assessment” requirement in relation to which the DGR’s state that the assessment must address the worst case as well as representative impacts. In addition, the DGR’s require “A conclusion justifying the project taking into consideration the ... social and economic impacts of the project.” The proponent fails to provide any proper analysis of the potential for social and economic impacts for the local community. The proponent’s EA fails to place the proposed wind farm of Crudine Ridge into any “local community” framework at all. The “Mid Western Regional Council – Local Services Assessment Final Report by Manidis Roberts Pty Ltd is the defining document dealing with the current and future socio-economic position of the local area.**

**Response:** Please refer to Appendix 5 and responses to Comments 3.19.4, 3.19.6 and 3.19.8.

### 3.19.8

*MWRC*

**The Council is requiring that the Voluntary Planning Agreement (VPA) be included as a condition of consent. At the time of writing this submission the proponents have not commenced discussion on the contents of a VPA. This is unusual for a proponent of a major development in our region. It is important to this Council that the VPA be a condition of consent. This is because if the wind farm business is ever sold the VPA goes with the consent on the land and thus Council is not required to chase the purchaser to require the new company to adhere to the VPA payments. It is becoming practice that VPAs become a condition of consent.**

**There is no doubt that this development will have a significant social, environmental and community effect on the Mid-Western community. A VPA agreed by a proponent in a neighbouring Council for a wind farm development includes a community levy of \$2,000,000 over 25 years for 33 towers. That equates to \$80,000 per year for 33 towers. That extrapolates to \$257,000 per annum or \$6,425,000 for the 25 year period. This amount would be paid direct to Council and used for community and social purposes as the Council thinks fit.**

**Response:** The submission by MWRC overlooks the Proponent’s proposed Community Fund, which will provide a significant financial contribution each year to benefit the community in the immediate vicinity of the Project. The Proponent has committed to

the provision of these funds, as set out in Chapter 19 of the Project EA, and proposed that use of these funds be administered by a committee made up of the local community, Council and the Proponent. This proposal allows the funds to be directed to projects and activities which are supported by, and which will directly benefit, members of the community most affected by the Project – those in the immediate vicinity.

Notwithstanding the comments by MWRC, the assessment by Umwelt provides a background to the ad hoc and context specific use of VPAs, as well as the current review of such agreements being undertaken by the NSW Government. Per Umwelt's assessment, "[t]he NSW Government has recognised that the current system of VPAs is flawed and has led to unpredictable and unfair outcomes for proponents, which do not reflect the underlying principles of the development contribution system of reasonableness and accountability".

In these circumstances, and although the Proponent is willing to discuss alternative options with MWRC, it may be that the best outcome for the local community is achieved by the allocation and administration of this fund proceeding as outlined in the Project EA.

The assessment by Umwelt also provides an analysis of the amount of the Community Fund proposed in the Project EA compared to both the amounts requested by MWRC and the amounts contributed by mining operations in the local area using data obtained from the report prepared by Manidis Roberts Pty Ltd and referred to by MWRC in their submission. The table below is extracted from the assessment, and shows these amounts as well as the number of employees involved in each of the relevant projects or operations.

**Table 9** Comparison between VPAs and proposed Project Community Fund

Project	VPA - Social infrastructure	VPA - Road Maintenance	Calculated Total Over a 20 year Period	Operational Employees
Moolarben	\$750,000	\$1,000,000	\$1,750,000	196
Ulan	\$3,475,000	\$1,050,000	\$4,525,000	459
Project	VPA - Social infrastructure	VPA - Road Maintenance	Calculated Total Over a 20 year Period	Operational Employees
Wilpinjong	-	\$650,000	\$650,000	346
Charbon	\$16,611 p.a.	\$0.01/tonne, plus \$0.05 public rd or \$0.77 highway levy	\$632,220 (not inc. in public/highway levy)	149
CRWF	\$168,750 p.a.	-	\$3,375,000	15

MWRC VPA Request of CRWF	\$257,000 p.a.	\$636,000	\$5,776,000	-
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The Umwelt report uses employee numbers as a method of comparison of demand on social infrastructure created by each project, and also compares the levels of impact of each project on roads. After performing this analysis, Umwelt concludes that:

“In their submission dated 07 March 2013, MWRC (2013) has failed to demonstrate that it has appropriately considered [the] key underlying principles of the contribution system, in particular, MWRC has failed to demonstrate that its currently proposed VPA contribution demonstrates nexus and proportionality...

Comparison between SIAs undertaken for CRWF and UCOP indicates that the CRWF is a substantially smaller operation than UCOP, with a different scale of social impacts, notably regarding construction and operational workforces, other social impacts and with regard to VPAs in the local area...

When compared with previous VPA agreement outcomes in the MWRC LGA as within Manidis Roberts (2012), and assessed according to socio-economic impact quantified through workforce levels, the CRWF ‘community fund’ offers substantially higher contributions than some other major projects in the area. If a similar logic was applied to both CRWF and UCOP with regard to VPA outcomes due to social impact per operational employee, CRWF would be expected to contribute a total of \$147,900 over 20 years, or \$7,395 per annum.”

The Proponent notes that there was an error in the calculation of the Community Fund in Chapter 19, section 19.4.3 of the Project EA, which used the figure of 165 MW as the basis of the calculation. As per Statement of Commitment 088, the Proponent is proposing to contribute \$1,250 per installed mega watt (MW) to the Community Fund, which could total up to 168,750 per annum, equating to up to \$3.37 million over an estimated 20 year Project life. The correct figure of 135 MW has been used by Umwelt in their assessment.

**3.19.9**  
*MWRC*

**Additional to that, Council would be seeking a road maintenance fee included in the VPA equivalent of \$12,000 per kilometre per annum from Mudgee township to the wind farm site. This is part of the route which is not a State Highway and the distance is 53 kilometres.**

**Thus included in the VPA there needs to be an annual roads contribution fee of \$636,000. This would assist Council in the maintenance of the Hill End, Windeyer and Pyramul roads once upgraded.**

**Both the community contribution and the roads contribution should be adjusted annually by the CPI for the life of the wind farm.**

**Response:** Please refer to the Section 6 PPR for changes to the proposed transport routes.

The Proponent will continue to liaise with Council regarding impacts to Council roads, and notes the findings of the transport comparison performed by Samsa Consulting Pty Ltd (see Appendix 7). In their report, Samsa compare the transport and traffic impacts of the Project to those of Ulan Coal Continued Operations (UCCO) Project. The comparison conducted by Samsa demonstrates that, similarly to the VPA comparison performed by Umwelt, the impacts of the two projects are significantly different, with the impacts of UCCO far outweighing those of the Project.

In particular, the comparison highlights that the construction period of the Project, despite representing the peak of traffic and vehicle movements during the life of the Project, will have significantly less long-term impact than the daily vehicle movements for UCCO.

The report concludes that “while both project assessments concluded that the road networks would maintain satisfactory levels of service after addition of project traffic generation, the proposed traffic volumes generated by UCCO are significantly higher than those generated by CRWF. Moreover, the higher UCCO traffic generation would occur over a long project life span (21 years) compared to the temporary peak heavy vehicle traffic generation for CRWF (approximately 4 months out of an 18 month construction period).”

### 3.19.10

*Trade & Investment*

**The EA indicates that the proponent has liaised with the holders (Oroya Mining Ltd and Neo Resources Ltd) of exploration licences over the subject land, in keeping with the Director General's requirements. To date, the exploration companies' feedback has been nonspecific with regards to assisting with the placement of turbines and associated infrastructure. The proponent states that they will maintain open communication with licence holders and the Resources & Energy division strongly supports that course of action in order to avoid placing any turbines and associated infrastructure in areas of possible mineral potential. The Resources & Energy division has no particular concerns with the currently identified environmental offset areas. However, it is important that mineral exploration companies be informed about the locations of those areas to ensure that they will not adversely impact upon access to areas for mineral exploration and possible future mining. Oroya Mining Ltd holds exploration ground over areas S1 and C3, while Centius Gold Ltd holds EL7592 over areas C1 and S2. Should other sites be considered for environmental offsetting it is important that the Resources & Energy division be informed.**

**Response:** Noted.

## Chapter 20: Statement of Commitments

Refer to Section 7 for revised Statement of Commitments.

## Chapter 21: Conclusion

No responses received.

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## 4. PUBLIC SUBMISSION RESPONSE

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### Chapter 1: Executive Summary

No responses received.

### Chapter 2: Introduction

#### 4.2.1 The identity of the Proponent is ambiguous.

**Response:** As stated in Chapter 1 of the Environmental Assessment, the Proponent of the Project is Crudine Ridge Wind Farm Pty Ltd.

#### 4.2.2 Crudine Ridge Wind Farm Pty Ltd is a \$10.00 company with one shareholder being Asia Pacific Renewables Limited, registered in Malta holding 1,000 shares paid up to the value of 1 cent each.

**Response:** Please refer to response to Comment 3.2.1.

#### 4.2.3 Suggestion was made that the Company made a donation to the ALP.

**Response:** Neither Crudine Ridge Wind Farm Pty Ltd nor Wind Prospect CWP Pty Ltd has made a donation to any Australian political party.

### Chapter 3: Project Description

#### 4.3.1 Approval was sought for two Layout Options – a commitment to one Layout Option should have been made prior to the Exhibition phase. Further, the layout should have been better designed.

**Response:** Two Layout Options were proposed in order to provide flexibility in wind turbine selection and suitability to the site. As worst case assessments of both Layout Options have been made, either of the individual Layout Options, or a combination of them would result in lesser impacts than those addressed in the Project EA, and Statement of Commitments. The inclusion of options in a Development Application is common for similar types of developments.

These layouts are the result of extensive design work, with particular reference to a number of constraints including wind resource, ecological communities, local demographics and communications. As a result of the iterative nature of the layout assessments, both Layouts are considered appropriately sited when considered against the relevant constraints.

#### 4.3.2 Micrositing should only be permitted with approval of the Minister and where impacts are reduced.

**Response:** It is likely that micrositing will reduce assessed impacts. Micrositing of wind turbines and other infrastructure is proposed to accommodate further avoidance of environmental impacts, changes based on detailed pre-construction engineering

investigations and as a response to ongoing wind resource analysis. As detailed in the Project EA, however, if impacts associated with micrositing are consistent with the approved Project, no further approval is required.

#### 4.3.3 Concerns regarding the mapping of residences – inaccuracies in mapping.

**Response:** Buildings within 5 km of the Project were ground-truthed through the course of Project development (see Appendix 6, Figure A). Methodology included:

- Identifying all existing buildings;
- Identifying locations of potential buildings (where information was available);
- Identifying locations of buildings where evidence suggested they may be located, despite lack of visibility from the roadside (locked gates, long driveways and vegetation masking views of buildings);

A conservative (worst case) approach was taken when identifying and ground-truthing buildings. This is evidenced by CR08 which is not an existing building, but a potential building location, as discussed with the landowner. For the purposes of the Project EA, those buildings that were identified as unoccupied or derelict were omitted from mapping in order to better represent residency in the area. As an example, CR20, CR22 and CR29 were all identified and marked as unoccupied, and considered in assessment, but were excluded from Project EA mapping (Appendix 6, Figure A). Despite every attempt being made, however, to correctly ascertain building locations and accuracy, it is possible that some errors were made regarding the occupancy of some buildings. A number of mapping errors were identified in Submission 56725. These are addressed in the table below.

**Table 10** Mapping of buildings within 5 km of the Project (refer to Appendix 6, Figure A)

Comment	Response	Distance to Project Layouts (km)	
		A	B
No residence is shown opposite SFR16.	This building was identified as SFR15, and incorrectly marked as unoccupied. However, due to its proximity to buildings PR13 & SFR16 assessment of impacts would be consistent with them (see Figure A).	4.5	3.9
Residence named "Bundong" not shown	The Proponent identified a residence named "Bundong", and this is depicted on the Project EA maps (see Figure A).	8.1	7.7
The building SFR13 doesn't exist	Noted. A conservative approach was taken in instances where verification was not possible.	7.5	7.2
Three "residences" north west of Sallys Flat Road are a house and two sheds.	Noted. Ground-truthing was not conducted to this distance, and a conservative approach to assessment was taken.	6.9	6.3



Comment	Response	Distance to Project Layouts (km)	
		A	B
Two houses north west of Sallys Flat Road are a house and a shed	Noted. Ground-truthing was not conducted to this distance, and a conservative approach to assessment was taken.	6.9	6.4
Others north west of Sallys Flat Road are suspect	A conservative approach to assessment was taken, and the distance to many of the buildings places them outside an appropriate assessment zone for the Project.	> 7 km	> 7 km
One residence to the south of Aarons Pass Road is not shown.	A derelict building was identified as APR11. However, an occupied building has subsequently been identified nearby (APR20). As it is similarly positioned to, but further away from the Project than APR09 and APR10, any impacts at this building would be similar to those buildings (see Figure A).	5.3	5.2
Residence near CR19 and CR21 not shown	A building was identified as CR20. This building was considered unoccupied at the time of assessment. However, if it is at some stage occupied, as it is in a similar proximity to the Project as CR21, it would be considered in a similar context to this building.	2.5	2.5
Residence near CR32 not shown	A building was identified as CR29. This building was considered unoccupied at the time of assessment. However, if it is at some stage occupied, as it is slightly further from the Project than CR28, it would be considered in a similar context to this building.	2.4	2.4
Residence near CR34 not shown	A building has been identified subsequent to exhibition, labelled CR39. This building is further from the Project than CR34, and therefore assessments of impact would be similar but lesser than CR34 (see Figure A).	2.5	2.5
CR08 is in the wrong position by 3.1 km	CR08 is not an existing building, but a potential building location, as discussed with the landowner. A conservative approach was taken.	7.8	7.8

## Chapter 4: Project Justification

### 4.4.1 "We would rather the wind farm in this isolated area than the coal mines and their dust,

**noise, trucks and visual pollution so bring them (wind farms) on.**

**Response:** Noted. As set out in Chapter 4 of the Project EA, it is anticipated that the Project will make a significant contribution to both clean energy production in NSW and to the local community more broadly, with very minimal impact compared to the impacts associated with heavy industry in the area such as coal mines.

**4.4.2 Rylstone District Environment Society Inc. supports the development of the proposed wind farm at Crudine Ridge.**

**We believe this development should go ahead because:**

- **Australians need to minimise their dependence on burning fossil fuels to create power, and instead generate energy from renewable resources such as wind.**
- **We should take advantage of technologies such as wind turbines that will allow us to minimise our contribution to global warming and climate change.**
- **Using energy derived from wind farms, rather than from alternatives such as coal, will help us to preserve our scarce resources of water.**

**Response:** Noted.

**4.4.3 It is important for NSW's economic future that it engage effectively to ensure its economic future as well as shouldering equitably its responsibilities for global environmental health.**

**The project has merit and should it be come to fruition it will provide a significant benefit to the citizens of NSW.**

**Response:** Noted.

**4.4.4 Enforced tax payer subsidies to the wind industry (Form letter).**

**Response:** Please refer to response to Comment 3.4.1.

**4.4.5 Wind energy: Inefficient and Intermittent Electricity Production (Form letter).**

**Response:** Wind energy is a highly efficient method of electricity production, which relies solely upon the natural movement of air currents in order to generate electricity. These air currents, or the 'wind resource', is extensively analysed by a developer to ensure that wind speeds, directions and the consistent movement of the wind resource are sufficient to justify the large economic investment required to build a wind farm.

The Proponent has conducted intensive studies of the wind resource in the area and determined that the wind resource at the site is very well suited for large scale wind power generation.

The NSW Department of Environment Climate Change and Water has produced some information regarding efficiency generally, which is set out in their Wind Energy Fact Sheet:

"Efficiency measures how much of the primary energy source (e.g. wind, coal, gas) is converted into electricity. NSW coal-fired power stations convert 29 % to 37 % of the coal into electricity, and NSW gas plants convert 32 % to 50 % of gas processed into electricity.

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Wind turbines convert around 45 % of the wind passing through the blades into electricity (and almost 50 % at peak efficiency).

Over time, coal power stations operate at around 85 % of full capacity (known as the capacity factor). Gas power station capacity factors vary from as high as 85 % to less than 10 % (if designed only to supply electricity at peak periods). The average capacity factor for a large solar plant that produces electricity during daylight hours is around 20 - 25 %. The average capacity factor for a wind farm in Australia is around 35 %, and can range from 25 % - 45 %. Wind farm capacity factors are lower than coal and baseload gas plants, but they use their energy source more efficiently and can be large-scale suppliers of electricity.”

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**4.4.6 The Proponent fails to establish the need for the project based on NSW generation requirements.**

**Response:** This issue is addressed in Chapter 4 of the Project EA.

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**4.4.7 The Proponent fails to demonstrate that the existing transmission infrastructure has sufficient capacity to accommodate the project.**

**Response:** Details of transmission infrastructure, including capacity requirements and availability, have been established with the relevant infrastructure operator and are readily available to the public.

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**4.4.8 Carbon emissions in Australia are not critical – the project should be assessed as a Major Project not Critical Infrastructure.**

**Response:** Australian carbon emissions are discussed in Chapter 4 of the Project EA. The question of whether it is appropriate to assess the Project as a Major Project or as Critical Infrastructure is a question of policy and legislation. It is not a matter relevant to the EA for this Project.

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**4.4.9 The Proponent should provide details of the complete carbon footprint of the Project – perhaps it is not as carbon neutral as the Proponent states.**

**Response:** The Life Cycle Assessment model of a wind turbine is described in Section 4.5 of the Project EA. This assessment and other studies referred to in this Chapter have found that the usual time required for a wind turbine to repay the energy used in construction is six to eight months.

Of the processes involved, manufacturing has the largest impact. However it is balanced by the decommissioning and wind turbine disposal stages which consist mainly of recycling, with its associated positive benefits for the environment (Martinez et al. 2009; Treméac & Meunier 2009).

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## Chapter 5: Planning Context

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**4.5.1 The NSW Government has itself a Renewable Energy Action Plan, considering the virtues and values in that 'plan' then it would be reasonable to assume that the Crudine Ridge**

**Wind Farm will be part of the community and Government's expectation to be built...**

**Response:** Noted.

**4.5.2 The Mid-Western Regional Council Development Control Plan (2013) was not considered in the EA, as required in the DGRs.**

**Response:** Please see response to Comment 3.5.1.

**4.5.3 "Approval of CRWF should be delayed until the NSW Draft Guidelines are finalised".**

**Response:** The Project, like any other planning or development application, is submitted and must be assessed in accordance with the laws and regulations in force at the time of submission. The Proponent and the DoPI are bound to consider and act in accordance with the legal and policy framework which currently exists and applies to the Project. It is not sensible or, in some cases, possible for a proponent to make a development application on the basis of planning instruments that are not currently in effect.

## Chapter 6: Stakeholder Consultation

**4.6.1 Lack of community consultation (Form letter).****Additional comments identified:**

- **Lack of contact by WPCWP with some local residents;**
- **Lack of access to (or difficulties accessing) the internet;**
- **Concerns about the validity of the Public Opinion Survey undertaken by the Proponent;**  
**and**
- **Concerns about specific consultations regarding future land use.**

**Response:** As is detailed in Chapter 6 of the Project EA, the Proponent undertook extensive consultation with relevant Government departments, relevant non-governmental agencies, local Councils, neighbours to the Project, and other relevant stakeholders.

In particular, a doorknock was undertaken out to 5 km from the Project. The Proponent made every reasonable attempt to talk face to face with all residents within that 5 km zone. Where a resident was not home, an information pack was left with contact details and information about the Project. The Public Opinion Survey (POS) was provided at the same time as initial contact was being made (surveys were also made available on an ongoing basis from there on in). These were intended only to gauge the general sentiment towards the Project, and to establish any early concerns or comments. As such the survey was appropriately worded and distributed to fulfil the purpose it was intended for. As noted a number of times, the sample size is too small to be of statistical significance.

Further to this direct contact WPCWP, on behalf of the Proponent, has maintained an open door policy of communication. Contact details, including phone numbers, a website and mail and email addresses have been and continue to be provided in order to make WPCWP available to stakeholders for information and discussion. By way of example of this, one submitter who identified access to the internet as an impediment to consultation wrote a

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letter to WPCWP, and received a lengthy reply by mail.

In preparing for the Draft Guidelines being finalised, the Proponent has also established a Community Consultative Committee (CCC) which has now met twice. This CCC provides an additional conduit between the Proponent and the community local to the Project, and again, provisions are made to overcome difficulties experienced by committee members accessing the internet.

In relation to the comments about specific consultations (submissions 57316 and 56781 in particular), the Proponent notes that it has consulted extensively with the landowners who expressed concerns about future land use and visual and health impacts, including face to face meetings and by correspondence. As indicated during those consultations, the Proponent does not intend to object to any future development of nearby land unless there is a specific interference or concern for the Project as a result of that proposed development. Further, reference to 'sterilisation' of land was not in reference in any way to the productivity of the land, but to the broader concept of land use, and the potential for conflicting developments to be permissible with approval.

Finally, submission 56792 refers to comments made during a meeting regarding wind farms. The Proponent did not make these comments and, in fact, was not present at the meeting. In the circumstances, it is not appropriate for the Proponent to respond to these comments.

#### **4.6.2 Lack of transparency (Form letter).**

**Response:** The Proponent is committed to open and direct communication and consultation with all stakeholders to the Project. To the extent that is reasonably possible the Proponent has made stakeholders aware of Project assessment developments as relevant and as they occur. As with most developments, the interplay between timing, regulatory changes and market changes can influence Project development. This is communicated to stakeholders as and when appropriate.

#### **4.6.3 "I object to Community Consultation Committees that are not so independent and are nothing more than a propaganda machine for the wind industry and are one more step to having regard for the NSW Draft Guidelines, but are not truly there to enhance the community."**

**Additional comments were made regarding the timing of the CCC in relation to the Exhibition phase of Project assessment and provision of minutes on the Project website.**

**Response:** The CCC was established according to and in preparing for finalisation of the Draft Guidelines. The first meeting of the committee was appropriately timed for the Project, in particular, the date arose as a result of the time required to advertise and establish the committee. The details of this are outlined in Chapter 6 of the Project EA.

It is standard practice to upload only finalised minutes to the Project website and minutes of the first CCC meeting were not finalised during the Exhibition phase. Draft minutes were, however, provided to all members of the committee, and, in their role as consultation points for the local community, any of those committee members should have been able to make the draft minutes available.

## Chapter 7: Assessment of Key Issues

No responses received.

## Chapter 8: Landscape and Visual Impact Assessment

### 4.8.1 Objection to Visual Pollution (Form letter).

**Additional comments included reference to impacts on cultural heritage locations that may have views of the Project; visual impacts along the proposed transport routes; impacts on beauty and aesthetics of rural areas and the industrialisation of the landscape surrounding the Project.**

**Response:** The Proponent accepts and acknowledges that some people find wind turbines unattractive, and consider them an unwelcome change to a landscape. Conversely, other people find wind turbines to be attractive elements within rural landscapes, and consider them more appealing than other forms of public infrastructure including electricity generators (such as coal fired power stations). This subjective response to aesthetic is likely to occur regardless of the viewing location, be it residential or an area of cultural heritage significance.

The exiting landscape character of the region in which the Project is proposed is broadly dominated by established rural land use. Utilisation for agricultural production since European settlement has resulted in highly modified and degraded undulating hills. The Project represents a new form of 'productive' use of the landscape, one which will have significantly less long term impacts on the landscape than the past 200 years of agricultural production has had. Further, the Project will not alter the existing agricultural land use, and may help retention of the agricultural base in the area.

As with any impacts associated with the construction phase of the Project, the visual impact of Project related traffic will be temporary.

### 4.8.2 The photomontages in the LVIA Report do not accurately display the true size of the WTG towers. The images also appear to be photoshopped to appear blurred or softened, are wide angle which compresses and stretches the view and are taken in winter. In particular, in one photomontage, the wind turbines are 50% smaller than what they should.

**Response:** The photomontages are conservative and represent the worst case, highest level visual impact with the largest proposed wind turbine (160 m blade tip height) on the closest spaced layout (Layout A). Specialist wind farm software (ReSoft WindFarm) was used to superimpose the wind turbines on the panoramas, taking into account the topography of the land. Additional checks were performed to ensure that the wind turbine scale is correct for each photomontage.

The viewpoint panoramic views were not created from single, planar, wide angle photos. The panoramas are a composition of stitched images captured with a standard prime lens to preserve the horizontal scale across the panorama and represent the most natural perspective.

The photos used to create the panoramas and photomontages were taken in winter as this is

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when the LVIA was undertaken. This does not affect the assessment and, in fact, is likely to make the photomontages more conservative as there is less screening foliage.

#### **4.8.3 Objection to Shadow Flicker (Form letter).**

**Additional comments questioned the credibility of the shadow flicker assessment; suggested that shadow flicker could extend out to 8 - 10 km depending on wind turbine hub height; claimed shadow flicker is known to extend out to 100 times hub height - approximately 16 km [sic] and raised concern that shadow flicker would be a dangerous distraction and would inhibit operation of a grazing business in proximity to the Project.**

**Response:** The Draft Guidelines state that “The impact of ‘shadow flicker’ from wind turbines on neighbours’ houses within 2 km of a proposed wind turbine should be assessed. The shadow flicker experienced at any residence should not exceed 30 hours per year as a result of the operation of the wind farm.”

The potential impact of shadow flicker was modelled utilising the current best practice guidelines in preparation of the LVIA. The modelling is also conservative, representing a worst-case scenario. In particular, the modelling assumes that:

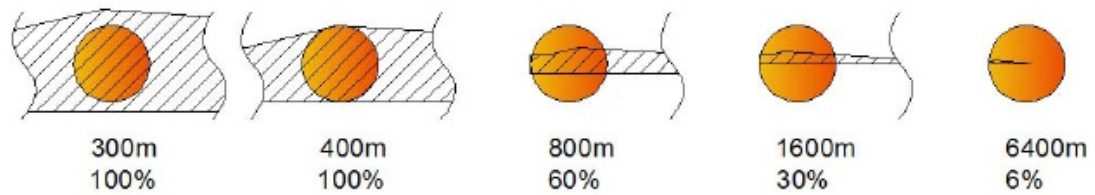
- It is a sunny day from sunrise to sunset every day of the year;
- The wind turbine is always oriented perpendicular to the sun;
- The wind turbine is always spinning; and,
- There are no obstructions to the view, such as vegetation or infrastructure.

The assessment of shadow flicker impacts found that one residence will potentially experience shadow flicker as a result of the Project. This residence was identified as potentially experiencing up to 10 hours per year, below the stipulations of the Draft Guidelines.

The Draft National Wind Farm Guidelines (2010) produced by the Environmental Protection and Heritage Council (EPHC) discuss shadow flicker assessment and methodology at length. The guidelines state that “shadow flicker can theoretically extend many kilometres from a wind turbine. However, the intensity of the shadows decreases with distance.”

The intensity of the shadow associated with shadow flicker reduces with distance as the percentage of the sun’s surface blocked by the blade reduces. An example of this variation in the blocking effect with distance is illustrated in Figure E-2 in the guidelines, reproduced below.

The guidelines establish a maximum distance for the assessment of shadow flicker of 265 x maximum blade chord, based on the reduction in blockage of the sun and thus reduction in shadow intensity. The largest wind turbine model considered for the Project has a maximum blade chord of 4.5 m which equates to a distance of 1.19 km for the Project. The shadow flicker assessment was undertaken up to 2 km from wind turbines and is thus conservative in comparison.



**Figure 3** Blockage of sunlight for various distances for a typical 2 MW wind turbine blade  
(Taken from the Draft National Wind Farm Guidelines (EPHC 2010))

The potential impacts of shadow flicker on motorists is dealt with in Section 8.3.1 of the Project EA.

#### 4.8.4 The Zone of Visual Influence assessment demonstrates wind turbines will dominate the landscape.

**Response:** The Zone of Visual influence (ZVI) is defined by computer modelling to determine the areas from which the wind turbines will be “potentially visible”. ZVI images are theoretical and used to inform field work. They are considered conservative (worst-case) as they are based solely on topography, and do not take into account vegetation, rural infrastructure or the influence of distance. As such, it is intended to provide an indicative representation of areas from which the Project is more likely to be visible.

ZVI images were produced for both Layout A and B using the maximum blade tip height of 160 m for both layouts. In this way, the worst case wind turbine size, and the worst case number of wind turbines were both considered. Layout A (with a maximum blade tip height of 160 m) was used for assessment in order to assess the overall worst case scenario.

#### 4.8.5 “A nightlighting photomontage should have been included because it seems inevitable lighting will be required.”

**Response:** CASA’s statutory power to require obstacle marking and lighting only applies within the vicinity of an aerodrome (30 km). It is CASA’s view that the decision of the lighting of obstacles outside the vicinity of aerodromes is the responsibility of the Proponent, in consideration of their duty of care. As the Project is outside 30 km from an aerodrome, the latter applies.

The majority of wind farms in Australia currently operate without obstacle lighting in order to minimise visual impacts and impacts on birds and bats. It is the Proponent’s position that lighting will similarly not be required for the Project, but will continue to consult with CASA and the Department of Infrastructure and Transport on this issue.

#### 4.8.6 “My land will be within 1 km of the turbines - in direct range of blade glint.”

**Response:** As the LVIA report states, the vast bulk of potential blade glint will occur if the viewer is located above the altitude of the wind turbine hub. Further, blade glint is effectively managed through the use of matt coatings on the wind turbine blades, to the extent that where matt coatings are used blade glint is not considered a visual impact.



**4.8.7 Concerns were raised regarding inconsistencies in the LVIA report. These included:**

- **Reference to Visual Absorption Capability;**
- **The robustness / representativeness of the LVIA survey;**
- **The Landscape Character Unit (LCU) scale bars;**
- **Identification of Pyramul road as sealed and Pyramul described as a town;**
- **Reporting errors in the Visual Impact Table (Table 2 of the LVIA), distances to receptors, CR17 missing from a table and inconsistencies between Table 15 and Table 2A of the LVIA;**
- **Similarities / discrepancies between CW04 and CW12;**
- **Inconsistencies / errors between CW26 / CW27; and**
- **Viewing angle described for CW12.**

**Response:** The landscape and visual impact assessment (LVIA) was robust, independent and based around numerous respected visual impact guidelines. Minor reporting errors have been identified through the report, however, these are transcription errors, and do not reflect errors in the assessment of landscape character or visual impact associated with the Project.

In particular, reference to Visual Absorption Capability in Chapter 8 of the Project EA is additional information, and does not affect the LVIA undertaken for the Project. Similarly, neither the road pavement of Pyramul Road nor the definition of Pyramul as a 'village' affect the assessment. The LVIA survey was undertaken by the Proponent, and, while the data collected is valid and worthy of noting, the Proponent acknowledges in Chapter 6 of the Project EA that the sample size is too small to be statistically significant. The LCU scale bars were developed using assessments undertaken on-site using a template. They are used to make a general assessment of the character, with a more detailed assessment being made from each viewpoint.

Reporting errors were identified in the viewpoint summaries. While these occurred at points, the assessed visual impact for each of the viewpoints is correct (CW27, CW09 and CW10). Inconsistencies between Table 15 and Table 2A tended to arise generally as a result of the visual impact being lower from residences due to screen planting, orientation of the property and position of ancillary buildings. The distances to receptors provided in the LVIA are approximate only, and were intended to be representative. There is no quantifiable assessment of the visual impact at these residences based on the distances detailed. It is acknowledged that CR17 was missing from the Table in Appendix A and this has been amended.

The assessment differences between CW04 and CW12 result from the assessment of CW04 as having a high visual sensitivity due to the close proximity of a residence, and CW12 having a low visual sensitivity as it is a minor road surrounded by agricultural land. Similarly, the assessment of both CW26 and CW27 is correct in the LVIA Report, based on the Study Method employed by Moir Landscape Architecture (see Volume 4, Project EA).

Finally, the visual prominence of the Project is calculated based on the viewing distance and height of the wind turbine being assessed (160 m blade tip height) and does not include the height of the ridge line. The visual prominence of the wind turbines is therefore 3.40° from

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CW12.

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## Chapter 9: Noise Assessment

### 4.9.1 Object to noise pollution both audible and infrasound (Form letter).

**Additional comments also identified concern with low frequency noise, construction noise, traffic noise generated along transport routes, inadequate insulation of residences, impacts of noise emissions on wildlife, and that “offensive noise” was not adequately addressed in the Project EA. The lack of provision of real time noise and wind data and the very low existing background noise levels were also commented on.**

#### **Response:**

##### Audible Noise

See response to Comment 3.9.12.

##### Infrasound and low frequency noise

A full response to the issue of infrasound and low frequency noise is given in Appendix 2. This response refers to a number of recent studies into infrasound that have found that:

- The measured levels of infrasound from wind farms are well below the threshold of perception;
- The measured infrasound levels around wind farms are no higher than levels measured at other locations where people live, work and sleep; and
- The characteristics of noise produced by wind farms are not unique and are common in everyday life.

It is for the above reasons that infrasound from wind farms is not required to be assessed in contemporary standards and guidelines used by Australian and International authorities.

##### Construction and traffic noise

Construction and traffic noise is discussed in detail in the Project EA and the Noise Assessment. A construction noise and vibration framework was developed in the assessment to achieve the relevant DGRs for general construction activity and road transport. A detailed Construction Noise Development Plan will be developed prior to construction once actual construction activities are determined and noise will be restricted according to the scheduling caveats within this plan.

##### Inadequate insulation of residences

The criteria within the SA Guidelines are established to protect the amenity outside of residences. The onerous nature of this approach results in noise levels inside a residence with the windows open being well below levels established to protect against impacts on internal amenity. That is, the approach of the SA Guidelines does not rely on housing insulation or treatment to ensure acceptable noise levels outside or inside a residence.

##### Impacts of noise emissions on wildlife

There is no evidence that wind turbine noise impacts wildlife. Noise levels produced by wind turbines are not higher than those that can be found within the natural environment. Please

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see response to Comment 4.10.4 for further comment.

Lack of provision of real time noise

Please see response to Comment 3.9.13.

Very low existing background noise levels

Please see response to Comment 3.9.12.

Offensive noise is ignored in the Project EA

The DGRs refer to the SA Guidelines as the key assessment tool and measure of acceptance of noise emissions from a wind farm. The SA Guidelines were established specifically for wind farms and are underpinned by the principle of preventing adverse impacts on the amenity of residences in a rural environment. The assessment extends beyond the requirements of the DGRs and the SA Guidelines and, as such, all other nuisance related and “offensive noise” publications and considerations are considered to be inherently met, rather than ignored.

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**4.9.2 Concerns were raised regarding the validity and use of sound power levels used in the Noise Assessment.**

**Response:** In order to predict the noise from a wind farm prior to its construction, it is necessary to determine the sound power level produced by proposed wind turbines. The sound power levels for a wind turbine are determined by the measurement of noise from the wind turbine in accordance with International Standard IEC 61400-11: *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*. The Standard requires determination of the sound power levels by measuring noise levels relatively close to an individual wind turbine so that the noise from other sources can be excluded. These tests are generally performed by manufacturers.

A wind turbine manufacturer and model has not been selected for the Project at this point in time. This will be determined during the procurement stage, post approval. The noise assessment was based on the Acciona AW77 for Layout A and the Siemens SWT2.3-101 for Layout B as the noise levels for these wind turbines were the ‘worst case’ (highest noise levels) available to the Proponent at the time of assessment.

The noise assessment will be repeated when the final wind turbine model and micro-sited locations have been procured and finalised respectively (response to Comment 3.9.4). This assessment will be performed using the noise levels relevant to the selected wind turbine model and will need to demonstrate compliance with the SA Guidelines and conditions of approval.

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**4.9.3 Concerns were raised regarding adequate assessment of the influence of varying atmospheric stability on noise propagation.**

**Response:** Please see response to Comment 3.9.5.

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**4.9.4 Concerns were raised that the final make and model of the wind turbine have not been provided, and therefore Project noise impacts cannot be assessed with certainty.**

**Response:** Please see response to Comment 4.9.2.

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**4.9.5 Concerns were raised that tonality was not adequately addressed in the Noise Assessment.**

**Response:** As is normally the case for environmental noise assessments at the planning stage of the project, the predictions have been conducted without a penalty for the presence of tonal characteristics.

To provide certainty, a guarantee will be sought from the manufacturer as part of the procurement process. The general form of the guarantee would be that a penalty for tonality is not applicable at any residence when tested in accordance with an accepted methodology. Such a methodology may include that provided in the Draft Guidelines or approved final version of those Guidelines.

Notwithstanding the guarantee, Condition 2(b) of the recommended project conditions provided by the Environment Protection Authority (EPA) requires compliance monitoring in accordance with the SA Guidelines. The SA Guidelines provide for a 5 dB(A) penalty to be applied should tonality be present.

**4.9.6 Concerns were raised that amplitude modulation was not adequately addressed in the Noise Assessment.**

**Response:** Amplitude modulation, or “swish”, is an inherent noise character associated with wind farms.

The SA Guidelines were developed with “swish” inherently taken into account (Section 4.5). That is, the onerous criteria of the SA Guidelines account for the presence of “swish”. Therefore, a 5 dB(A) penalty for “swish” from a properly maintained and operated wind farm is not required or applicable under the SA Guidelines.

**4.9.7 Future changes to the POEO Act and EPA regulation of wind farm compliance were not addressed.**

**Response:** In December 2012 the EPA released a consultation draft of a new regulation which requires all wind farms located in NSW with over 30 MW of generating capacity to obtain an environmental protection licence (EPL) under the Protection of the Environment Operations Act 1997 (NSW) (POEO Act). This regulation commenced 28<sup>th</sup> June 2013 with minor amendments to the draft.

The Project EA was compiled in 2012, submitted to the DoPI for adequacy review in May 2012, and placed on exhibition in December 2012. At this point in time, it was not known that the EPA would become the regulatory authority for large-scale wind farms.

The new regulation and licence requirements, however, have no impact on the assessment of the noise impacts of the Project. An EPL issued by the EPA must be substantially consistent with the development consent, as required under Part 4 of the Environmental Planning and Assessment Act 1979.

The EPA has always played a key role in the development assessment stage of wind farms and is an important stakeholder. The EPA’s submission on the Project was addressed in Section 3 of this report.

**4.9.8 Concern was raised regarding vibration from wind turbine operation.**

**Response:** Modern wind farms produce very low levels of ground vibration. Sonus engineers have performed testing at an existing South Australian wind farm and found that the measured level of vibration below a wind turbine and at different distances from the turbine are below the recommendation of Australian Standard AS2670.2 for “critical areas” such as operating theatres (see Appendix 2 for graph and further explanation). At residential distances, the ground vibration from wind turbines would be undetectable.

**4.9.9 Concerns were raised regarding inadequacy of the Noise Assessment in the EA including:**

- **Authorship of the noise assessment was not identified;**
- **The wind shear model that was employed was not supplied;**
- **Lack of provision of material to substantiate the use of the relevant standard to substation noise assessment;**
- **Incorrect inputs into the noise propagation model used;**
- **Questioning the representative nature of the monitoring mast data;**
- **Use of a Type 2 logger for background noise measurements;**
- **Incorrect siting of background noise monitoring equipment;**
- **There is no documentation of wind speeds and directions at the wind farm; and**
- **Inadequate analysis of background noise data.**

**Response:**Authorship of the noise assessment was not identified

The Project environmental noise assessment was conducted by Chris Turnbull, Jason Turner and Moharis Kamis of Sonus Pty Ltd. The three authors have a wide range of experience between them and the necessary qualifications to perform a wind farm noise assessment. A full response to the concern regarding the qualification and experience of the persons is given in Appendix 2.

The wind shear model that was employed was not supplied

Please see response to Comment 3.9.3.

Lack of provision of material to substantiate the use of the relevant standard to substation noise assessment

The assessment considers the noise from the proposed substations at the Project against the EPA’s Industrial Noise Policy 2000 (the INP) in accordance with the DGRs.

The final selection of the make and model of the substation plant and equipment for the Project will be determined following a competitive tender, post approval.

Therefore, at the planning stage of the Project, the noise from the substations has been based on the Australian / New Zealand Standard AS/NZS60076.10:2009. The standard provides the maximum noise levels for a transformer of a given capacity. The worst-case (i.e. highest predicted noise level) transformer selections for the potential collector substation arrangement have been used.

Noise from the main and secondary collector substations is predicted to be no greater than

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12 dB(A) at any residence. This level is negligible and easily achieves the INP, due to the significant separation distances of greater than 3 km between the stations and residences.

#### Incorrect inputs into the noise propagation model used

The noise from the Project has been predicted using the International Standard ISO9613 noise model. The inputs used for the modelling are listed in Appendix 2 and are considered the most appropriate inputs because they have been verified for wind farms and have been agreed by UK acoustic experts in a joint paper.

#### Questioning the representative nature of the monitoring mast data

The number and location of wind masts used for the Project are consistent with other wind farm arrangements. The southern wind mast is located at a similar location to the wind turbines nearest to residence CR34. Residence CR34 is the most important location with respect to compliance of the wind farm with the Project criteria. Therefore, the southern wind mast provides a good indication of the wind speeds expected at the wind turbines that are closest to CR34.

The southern wind mast was commissioned on 7<sup>th</sup> August 2011, approximately halfway through the background noise monitoring period. Where wind data from that mast was not available prior to this date, wind speed data from the northern mast was instead used for correlation with background noise data.

Although the two wind masts experience very similar wind regimes and a common distribution of wind speeds across direction, the northern mast generally measures higher wind speeds than the southern mast, and this was the case during the second half of the background noise monitoring period. Using wind data from the northern mast for residences closer to the southern mast provides an extra level of conservatism, as background noise levels are correlated with higher wind speeds, and thus higher predicted wind turbine noise levels than what would be produced in reality.

#### Use of a Type 2 logger for background noise measurements

The important feature of a sound level meter used for wind farm background noise monitoring is a low “noise floor” which is the lowest noise level a meter can measure. The noise floor is established by the “internal” noise of the components within a given meter. If the noise floor of a meter is too high, then the measured background noise levels can be artificially increased. As the project noise level criteria are related to the measured background noise levels, a high noise floor can therefore also artificially increase the project noise criteria.

The background noise was measured with Rion NL21 type 2 sound level meters, calibrated at the beginning and end of the measurement period with a Rion NC74 Calibrator. All microphones were fitted with 90 mm weather proof windshields. The Rion NL21 meter is considered to be amongst the best meters available with respect to a low noise floor. The noise floor of the NL21 meters is less than 20 dB(A).

The SA Guidelines, the Draft Guidelines and other jurisdictional approaches such as the New Zealand and Australian Standard allow for the use of “Type 2” meters and therefore “Type 2” meters are the predominant meters used for background noise logging at potential wind

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farm sites.

Incorrect siting of background noise monitoring equipment

Each noise logger was located in accordance with the SA Guidelines, which recommend a location on the wind farm side of the residence, at least 5 m away from significant structures and generally within 20 m of the residence. Further information on the siting criteria used is given in Appendix 2.

There is no documentation of the wind speeds and directions at the wind farm

Neither the SA Guidelines nor the DGRs require the wind directions to be collated and documented as part of the noise assessment for a project. However, the wind data collected during the regime covered the range of wind speeds and directions generally expected at the wind farm. The wind speeds collected as part of the background noise monitoring regime are presented in the Noise Assessment. The SA Guidelines require the compliance checking procedure to be based on a downwind wind direction.

Inadequate analysis of background noise data

The analysis was conducted in accordance with the SA Guidelines, which requires the collection of a minimum of 2000 data points. The minimum 2000 data points are not established for segregation into different periods. Data that is below the typical cut-in speed of a wind turbine can be removed as the wind farm will not be operating during these periods.

**4.9.10 A number of Approval Conditions related to noise impacts were recommended. These can be found in Submissions 56234 and 56725 (duplicate submissions) and 56718 and include:**

- A Compliance Noise Monitoring Report should be undertaken within 12 months of the commencement of operation of the wind farm by an independent acoustical consultant nominated by the Mid-Western Regional Council using funds deposited by the developer;
- Separate Compliance Noise Monitoring Reports should be undertaken if the wind farms commences operations in stages;
- If a request is made to the Director-General for an independent noise audit but this is not commissioned, the Proponent should make information available to the landholder including wind speed and direction, weather conditions and the power output of individual turbines so that the individual can obtain his/her own independent noise audit at his/her expense;
- Imposing a curfew for wind turbine noise as with aircraft noise from Sydney Airport;
- To obtain an independent acoustic report that covers the entire range of sound as dB rather than dB(A) which limits the range to that in the average human acoustic range;
- Modification to any approval be only with the approval of the Minister, and only modifications that reduce impact;
- To be required as a condition of approval to reduce the 'Worse Case Scenario' of 75 dB (A);
- The Proponent be required to modify, relocate or rebuild any residences within the 25-35dB (and above) noise footprint or to otherwise compensate or buy out the owners of

**these residences and land; and**

- **Monitoring the proposal.**

**Response:** A number of standard conditions of approval will be made, including those detailed by the EPA in Comment 3.9.11. As with other wind farms, these conditions will ensure that noise compliance is achieved and maintained. The Proponent will adhere to the relevant legislation of the day regarding the public release of data and compliance, but should not be given an unprecedented condition of approval that puts it at a disadvantage to its competitors.

#### **4.9.11 Concern was raised regarding noise from the rock crushing and concrete batching plants during the construction period.**

**Response:** Impacts associated with the rock crushing and concrete batching plant will be addressed in the CEMP and relevant CEMP sub-plans. The crushing plant can only be specifically assessed when the need for, the location of and frequency of use are determined through the detailed construction planning phase of the Project.

#### **4.9.12 Submission 57069 notes that Sonus provided a wind turbine noise simulation reported be produced at 35 dB(A). Concern was raised that the noise speaker was overwhelmingly dominant, despite high background noise levels being recorded at the same site (SFR05).**

**Response:** The simulation used a local speaker at SFR05 to generate noise levels representative of the Project at rated power. The purpose of the simulation was to assist in understanding the noise levels addressed in the SA Guidelines. At the time of the simulation, the wind speeds at the Project site and at SFR05 were low and below a typical “cut in” speed for wind turbines. That is, the wind turbines are unlikely to have been turning in such conditions.

Listening to a simulation of a wind farm at rated power in an environment when the wind farm is unlikely to be operating is inherently conservative, and why it could be clearly heard. In practice, the simulated noise level at rated power would only be generated at higher wind speeds, when the background noise levels will also be higher. Higher background noise levels increase masking and reduce the ability to hear the wind farm.

This effect, and the resulting conservatism, was discussed during the simulation.

## **Chapter 10: Ecology Assessment**

#### **4.10.1 Destruction of flora and fauna (Form letter).**

**Additional comments include note of specific species in the region, and noise, dust and light pollution impacts on fauna species.**

**Response:** Since 2008, an extensive design process has ensured the Project is appropriately sited, and to the greatest extent possible, avoids ecological impacts. In fact, wind farms have the potential to contribute to preservation of ecological communities by slowing the shift from productive agricultural land to rural residential use. The Project will also contribute to the Federal Government’s Renewable Energy Target which recognises and



attempts to combat the detrimental impacts of climate change on the environment.

In particular, all native fauna species (threatened and non-threatened) identified as potentially occurring in the area were the subject of detailed surveys. Section 4.3.4 of the Ecological Assessment (and Appendix E) lists 11 reptile species, five frog species, 93 birds, 14 non-bat mammals and 13 bat species that were recorded across the Project site. The habitat features used by these species are documented and mapped in the report.

The Ecological Assessment of the Project has also met the statutory requirements under the NSW *Environmental Planning and Assessment Act* and Commonwealth *Environment Protection and Biodiversity Conservation Act* to assess likely impacts to all listed threatened and migratory species, document the measures to avoid, minimise and mitigate impacts and where impacts cannot be avoided to offset these impacts.

The avoidance, minimisation and mitigation measures outlined in the report serve to benefit non-threatened species as well as threatened species. The proposed offset package also provides protected and managed habitat for these non-threatened species as well as the target threatened species.

#### **4.10.2 Concern was raised regarding impacts on Koalas in the area.**

**Response:** As with all threatened and non-threatened species identified as potentially occurring in the Project site, Koalas were the subject of detailed surveys, and were recorded as noted in the Ecological Assessment undertaken by Eco Logical Australia. Project impacts on vegetation communities have been reduced to the greatest extent practicable, and impacts are linear in nature, with extensive areas of vegetation through the Project site left intact and undisturbed. See response to Comment 4.10.4 for further detail regarding Koala surveys.

#### **4.10.3 It was suggested that no indication was provided of the use of the first principle of avoidance.**

**Response:** All of the principles of the mitigation hierarchy, including avoidance, were applied to every stage of the design phase. While all impacts to high value ecological communities cannot be avoided, a process of avoiding all possible impacts, mitigating those impacts that cannot be avoided (Section 5.3 of the Ecological Assessment) and offsetting those impacts that can neither be avoided or mitigated (Section 6 of the Ecological Assessment) has been followed. To outline and present the numerous iterations of the wind turbine layout to demonstrate avoidance is not the purpose of the Ecological Assessment, but rather it assesses a proposed layout and outlines avoidance measures considered and taken. Please see response to Comment 3.10.5 for further detail.

The Project has limited the direct impact to the Box-Gum Woodland EEC to 5.7 ha and habitat features like hollow bearing trees (impacts are estimated to 4.61 % of hollow bearing trees within the Study area).

#### **4.10.4 Australian Wildlife Services were commissioned to review the Ecological Assessment. AWS identified a number of questions and concerns raised regarding survey methodology and reporting in the report, including:**

- **Mapping of communities;**
- **Which bird survey guidelines were applied?;**
- **Were species time curves or species are curves utilised?;**
- **Why do some diurnal bird census sites appear to be paired and two not?;**
- **Was the survey intensity sufficient to define Koala habitat?;**
- **Could the proponent please clarify where these additional [Koala] sites or surveys are?; and**
- **Provide further information on camera trapping methods, trigger speeds and false triggers.**
- **Could the Proponent provide evidence of other wind turbines that coexist with Koala populations / habitat closer than 500 m.**
- **Is there an industry or Government standard for buffers? Could justification be provided on the buffers / setbacks provided.**

**Response:** The Ecological Assessment conducted for the Project was detailed and thorough. Below are direct responses to concerns raised by AWS regarding the reporting of flora and fauna surveys and ecological impacts for the Project.

#### Mapping of communities

The area of concern that was raised by AWS is poor quality shrubby regrowth (largely *Cassinia spp.*), rather than tree cover. The shrubby regrowth appears to be the result of previous clearing. On this basis, the area was mapped as pasture rather than woodland.

#### Which bird survey guidelines were applied?

Eco Logical Australia typically survey a two ha area over 20 minutes. In some cases, where there is high bird activity, a bird census would extend beyond 20 minutes to identify the full suite of species. It was deemed more important to identify the full suite of species than to be restricted to a 20 minute survey period.

#### Were species time curves or species are curves utilised?

No. The survey guidelines are grounded by such data. While it is hard to standardise a bird survey method across the State to account for seasonal and temporal variation, Eco Logical Australia used the 20 minute survey as a guide and extended the survey period when bird diversity was high.

#### Why do some diurnal bird census sites appear to be paired and two not?

There are a number of sites that are close to each other, but they are not intended to be “paired”. It has resulted from two ecologists working from one vehicle conducting separate site surveys. These “paired” sites were often 250 to 500 m apart.

#### Was the survey intensity sufficient to define Koala habitat?

The definition of Koala habitat used in the Ecological Assessment is linked to vegetation type (Table 25 and Figure 8 of the Ecological Assessment). This was based on the outcomes of survey and observations.

#### Could the proponent please clarify where these additional [Koala] sites or survey are?

Survey for Koala scats was undertaken at five sites, but one site was surveyed twice.

Observations of Koalas were made during other surveys (spotlighting, infrared cameras) while targeting other fauna in December 2008, February 2009 and March 2011.

Provide further information on camera trapping methods, trigger speeds and false triggers.

Reconyx HC500 infrared cameras were used for the survey. Each camera was attached to a tree with an elastic cord approximately 1 m off the ground and aimed towards an inaccessible lure secured in a cage trap approximately 4 m away. Cage traps were either attached to a tree and held off the ground or secured to the ground with a tent peg. As Spotted-tailed Quoll was the target species for this method, traps were baited with chicken and rabbit (road kill).

Cameras were set to take three images per second, then rest for 15 minutes. "False triggers" were taken, although it appeared that swaying vegetation moving across the sensor activated the camera rather than an unexplained series of photographs.

While remote camera survey was not targeted at detecting Koala (Table 10 of the Ecological Assessment), Koalas were identified using this survey method.

Could the Proponent provide evidence of other wind turbines that coexist with Koala populations / habitat closer than 500 m

Eco Logical Australia has not been able to find evidence of koala populations coexisting with other wind farms. Koalas were recorded in the Study area and Project site and the general environment provides suitable habitat for them. Eco Logical Australia is of the opinion that Koalas will continue to utilise the habitat within the Project site for foraging and moving through the landscape. The only concern is whether there would be a minor impact on the range that male vocalisations may be heard during the breeding season. However, given the expected noise levels of the Project and the loudness of these calls, Eco Logical Australia is of the opinion that any impacts would be negligible.

Is there an industry or Government standard for buffers? Could justification be provided on the buffers / setback provided.

A 30 m buffer around hollow bearing trees follows the Forestry Corporation's general prescriptions in the north west of NSW to minimise impacts on particular threatened species that are vulnerable to disturbance. For bat roosts (hollow bearing trees) they recommend 30 m buffers.

Buffers have also been discussed with Government agencies for previous wind farm assessments that Eco Logical Australia has been involved with, and the buffer widths suggested in the Ecological Assessment for this Project are consistent with these discussions.

#### **4.10.5 Construction work at turbine sites on the ridge above this slope could lead to further degradation of the slope.**

**Response:** Section 5.2 of the Ecological Assessment undertaken by Eco Logical Australia identifies a number of avoidance measures implemented in the design of the Project. This includes amendments to the wind turbine layout prior to the final layout assessment in the Ecological Assessment. Whilst avoiding all woodland was not possible in the design and layout of the Project, impacts to patches of woodland on hilltops have been avoided and

minimised, wherever possible.

Erosion and sediment control measures will also be implemented during the construction and decommissioning phases in order to further avoid and minimise impacts on ecological communities. Erosion and sedimentation control devices will be monitored to ensure that they are functioning appropriately, particularly after periods of heavy rain.

Further, the Ecological Assessment has indicated that fragmentation is likely to be minimal given the current degree of fragmentation in the region and the proposed avoidance measures (i.e. avoiding areas of dense woodland). Wherever possible, existing tracks will be used for roads and infrastructure to avoid further fragmentation and impact.

#### **4.10.6 External overhead transmission line issues included:**

- **Query regarding siting of the transmission line; and**
- **Suggestion that the fauna survey of the transmission line is inadequate.**

**Response:** The siting of the external transmission line underwent the same design process as all other aspects of the Project, including adhering to the principles of avoidance, minimisation of impact, mitigation where impacts cannot be avoided or minimised and finally offset. This process resulted in the existing layout, and this is considered to be appropriate. Please see responses to Comments 3.10.5 and 4.10.3 for further discussion of the principles employed in designing the current layout.

Please see response to Comment 3.10.2 for discussion regarding the fauna survey along the transmission line.

#### **4.10.7 Use of the Biobanking Assessment Methodology & Precautionary Principle appear to have satisfied assessment of the potential environmental impacts at the site.**

**Response:** Noted.

#### **4.10.8 “Scientific studies show that wind farms do not have adverse effects on human health, livestock or birdlife - in spite of unsubstantiated claims to the contrary. Misinformation has been used to create fear and uncertainty about wind farms, but we expect our political leaders to make decisions based on scientific research. More research is needed into the impact on residents of ‘fluctuating swish’ noise but this should not be confused with infrasound.”**

**Response:** Noted.

## **Chapter 11: Cultural Heritage Assessment**

#### **4.11.1 Destruction of historic, heritage and cultural areas (Form letter).**

**Response:** The Cultural Heritage Assessment and the potential impacts of the Project are discussed in Chapter 11 of the Project EA. The assessment concluded that while impacts to Aboriginal artefacts were likely, as stone artefacts are likely to exist in a virtual continuum across the site, distribution was of a very low density, and existing significant disturbance to the land was evident. As such, the archaeological resource across the Project site was

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considered to be of correspondingly low archaeological significance. No impacts to European heritage items were identified. Unfortunately, no further information was provided in the form letters to allow the Proponent to appreciate any specific concerns which are not already addressed in Chapter 11.

**4.11.2 Submission 51558 raised concern, and objected to the Project on the understanding that, the organisation was “not involved in, nor consulted in, the drafting of” the Project EA, or “invited to undertake field surveys in relation to [the] Aboriginal Heritage Assessment Report”.**

**Response:** The Cultural Heritage assessment of the Project was undertaken by NSW Archaeology. NSW Archaeology and the Proponent can confirm that the organisation in question was consulted as is required for Registered Aboriginal Parties by OEH.

A representative for the organisation expressed their interest in the Project via email to NSW Archaeology Pty Ltd on 18<sup>th</sup> June 2011 and thereafter the organisation became a Registered Aboriginal Party (RAP) in the process of Aboriginal consultation for the Project, and was fully consulted as per the OEH guidelines.

During initial consultation, the organisation made a request that their involvement in and consultation regarding the Project remain confidential, only to be disclosed to DECCW (now OEH). As such, the name of the organisation has been excluded from the Cultural Heritage Report as per Section 2.1 of the report, stating:

“...because some registered Aboriginal parties did not wish their details to be generally disclosed, these groups are not listed in the report. Instead, their details have been forwarded to OEH in correspondence dated 15<sup>th</sup> August 2011...”

All relevant documents were provided to the organisation in accordance with OEH guidelines and as set out in Section 2 of the report. Proposed heritage assessment methodology and consultation process documents were sent via email from NSW Archaeology to the organisation’s representative on 20<sup>th</sup> July 2011. No response was received.

The organisation was subsequently sent a document via email from NSW Archaeology inviting applications to assist with fieldwork for the Project on 29<sup>th</sup> July 2011. The organisation did not respond to this invitation.

A draft report was sent to the organisation on 6<sup>th</sup> February 2012. A response dated 6<sup>th</sup> February 2012 was received. The Proponent addressed the organisation’s response in correspondence dated 21<sup>st</sup> March 2012.

At the same time that this correspondence was taking place, the organisation was also being contacted regarding another project. Responses regarding that project were being received, indicating that emails and calls were being received.

The Project is sited wholly on freehold land, with some impacts on Crown roads (see Comment 3.18.4). Native Title claims cannot affect either freehold land or Crown roads.

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## Chapter 12: Traffic and Transport Assessment

**4.12.1 At the community and LGA levels, concerns have been raised as to the capacity of the road network to support the Project during the construction phase. The concerns are overstated and disproportionate and can be addressed satisfactorily by the proponent with lasting community benefit.**

**Response:** Noted. The Proponent has committed to engaging and liaising with Council and RMS regarding traffic and transport issues.

**4.12.2 Traffic and further damage to already dangerous country roads (Form letter).**

**Additional comments made specific reference to locations along Hill End, Pyramul, Windeyer and Aarons Pass Road, impact on school bus routes and roadside businesses and the entity responsible for road upgrades and maintenance. In addition, some comments indicated support for the project, provided concerns about roads were properly addressed.**

**Response:** Alternative over-dimensional and standard heavy vehicle routes are now being proposed. The details and assessments of these routes are outlined in Section 6 Preferred Project Report. Upgrades to these routes have been proposed where necessary in order to provide suitable infrastructure for the transport of required loads. Moreover, detailed route assessments will be undertaken pre-construction under the RMS permit system, which requires rigorous assessment of transport routes.

During the construction phase of the Project, all traffic operations and impacts on road user movements (such as increased traffic volumes) will be dealt with in the relevant CEMP sub-plan, which will be developed pre-construction in consultation with RMS and local Councils. This sub-plan will include driver behaviour rules for truck drivers, amongst many other considerations. The Project EA also outlines a number of possible mitigation measures and traffic management systems that will be addressed in the sub-plan. Traffic management during school bus route hours is specifically stipulated (Chapter 12 Traffic and Transport, Project EA).

Maintenance of roads during and post construction will similarly be addressed in consultation with RMS and local Councils and in relevant EMP sub-plans. Dilapidation surveys will be used to identify any damage resulting from construction traffic, which would be repaired at the Proponent's cost. Please see responses to Agency Comments 3.12: Traffic and Transport for discussion regarding adherence to guidelines, responsibility for upgrades and maintenance and commitments to obtain relevant licences and approvals.

It is noted that a number of submissions reference incorrect figures for traffic volumes for the construction phase of the Project. It is recommended that information regarding Project related traffic and transport is sourced from the appendices in Volume 1 (3, 4 & 7) in order to obtain relevant and correct figures and facts.

**4.12.3 Road safety during the construction phase of the Project, including impacts on**

**emergency services and livestock movements.**

**Response:** Road safety during construction will be specifically managed through a CEMP sub-plan developed pre-construction. This sub-plan will deal with all specific traffic conditions and impacts on road users, including impacts on livestock movement and emergency services. Emergency vehicle access would be addressed in consultation with RMS and emergency services. The RMS permit system also incorporates incident management. Livestock movements along roads will be addressed in an EMP sub-plan and will include measures such as making drivers aware of the potential to encounter livestock and adherence to safe driving practices at all times.

**4.12.4 Concern is raised regarding dust generation along unsealed roads during the construction phase of the Project.**

**Response:** Dust generation during Project construction will be dealt with in relevant CEMP sub-plans, developed pre-construction. In particular, establishment of procedures to manage dust generation is addressed in Statement of Commitment 022. Mitigation measures proposed for dust suppression include use of water carts, covering loads where practicable and consideration of local weather conditions.

**4.12.5 Concern is raised regarding traffic noise generation during the construction phase of the Project.**

**Response:** Traffic noise generation during Project construction will be dealt with in relevant CEMP sub-plans, developed pre-construction. In particular, establishment of procedures to manage traffic noise generation is addressed in Statement of Commitment 022.

**4.12.6 The Traffic and Transport Report is not comprehensive, and omits:**

- **A Traffic Management Plan and CEMP;**
- **Consideration of roadside vegetation impacts;**
- **Consideration of bushfire risk associated with transport routes; and**
- **Sufficient detail regarding upgrade and maintenance of local roads.**

**Response:** The Project CEMP and CEMP sub-plans (including the TMP) will be developed pre-construction, once selection of a preferred wind turbine supplier and the appointment of the construction contractor have occurred. The CEMP and its sub-plans can then be tailored to suit the specifications of the selected wind turbine. Chapter 20 Statement of Commitments outlines the commitments that will be incorporated into the CEMP when it is being developed in consultation with RMS, local Councils and other relevant stakeholders. Details of proposed upgrades and maintenance have, however, been outlined both within the Project EA and in Section 6 PPR.

Chapter 10 of the Project EA addresses the impacts to roadside vegetation along proposed transport routes. Roadside vegetation impact was estimated for the routes proposed in the Project EA, and for the routes now proposed in Section 6 PPR. The Proponent recognises the value of remnant roadside vegetation, and is committed to

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minimising all Project related ecological impacts where practicable.

Bushfire risks associated with the transport routes will be addressed in relevant EMP sub-plans, along with all other bushfire risk considerations. Consultation with relevant stakeholders including RMS, local Councils, RFS and the local community will be undertaken where required in order to manage risk and safety throughout Project construction.

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## Chapter 13: Aviation Assessment

### 4.13.1 Concerns were raised regarding Project impacts on aerial weed control.

**Response:** Chapter 13 of the Project EA discussed the impact of the Project on all forms of aviation activities that were identified during planning and design through consultation with relevant aviation bodies and the local community. The chapter discusses aviation activity in the Project locality, potential impacts from the Project and appropriate mitigation actions.

As stated in this chapter, aerial pest management is unlikely to be affected by the Project. Aerial application aircraft routinely fly close (within 5 m) to obstacles such as trees, power lines, radio towers and any other obstacles found in a rural environment, it is reasonable to expect that a pilot would be able to safely manoeuvre about these obstacles.

Agricultural operations that involve low level flying can only occur in good conditions (high visibility) in accordance with the aviation regulations, where wind turbines would be highly visible. Aerial operators engaged in low level flying and agricultural operations are required to undertake a risk assessment for each flight. This would identify specific hazards such as trees and power lines. Wind turbines would be treated no differently. Therefore the operation of low flying aircraft in the vicinity of wind turbines does not represent an unacceptable risk if normal operational procedures are followed.

### 4.13.2 Concerns were raised regarding the possible impact of the Project on aerial fire-fighting, in particular that the Project would prevent or limit aerial fire-fighting in the area.

**Response:** Please refer to response Comment 3.13.5.

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## Chapter 14: Communications Assessment

### 4.14.1 Concern was raised regarding effects of the Project on wireless, television and two-way radio.

**Response:** A detailed analysis of the potential impact of the Project on communication services in the area is contained in Chapter 14 of the Project EA. That chapter identifies the point-to-point links and omni-directional services which occur across or near the Project. Consultation with service providers and assessment of the links predicts that there will be no impact on communications as a result of the Project. The Proponent has also committed to investigation of any reported interference, and implementation of appropriate solutions through Statements of Commitment 034 to 037.

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## Chapter 15: Electromagnetic Fields

No responses received.

## Chapter 16: Fire and Bushfire Assessment

### 4.16.1 Safety issues – fire danger (Form letter). Additional specific comments included:

- Increased risk of ignition from project infrastructure;
- Access to roads for local traffic for bushfire threats; and
- Mitigation and bushfire response protocols.

**Response:** As this issue was included in the form letter, the majority of responses did not provide any detail regarding the nature of the concern or whether the author had considered the Proponent's statements on these issues in Chapter 16 of the Project EA. Chapter 16 of the EA provides a comprehensive analysis of the fire and bushfire risks of the Project site, including the impact of the Project.

Section 16.3.3 discusses the operation of wind turbines and the potential for fires. A fire in a modern wind turbine is rare and dedicated monitoring systems (e.g. SCADA) enable wind turbines to be automatically shut down if ambient temperatures exceed the safe operating range, or if components overheat. Other remote alarming and maintenance procedures are required for electrical faults, which can still occur within the tower or nacelle creating a fire.

Statements of Commitment 041 to 055 relate to potential fire and bushfire impacts, outlining mitigation and management commitments and acknowledging consultation with RFS and NSW Fire Brigade. In addition to the Proponent's fire mitigation plans for Project infrastructure, the RFS and NSW Fire Brigade will be called in to assist with incidences if and as required.

Any loss or damage caused by the Project, whether by fire or other means, would be subject to insurance claims and appropriate compensation to the affected parties.

Please also refer to response to Comment 3.13.5.

### 4.16.2 Concerns were raised regarding the possible impact of the Project on aerial fire-fighting, in particular that the Project would prevent or limit aerial fire-fighting in the area.

**Response:** Please refer to response to Comment 3.13.5.

### 4.16.3 General concerns were raised regarding the possible impact of the Project on on-ground fire fighting.

**Response:** Please refer to response to Comment 3.13.5 and 4.16.1.

### 4.16.4 Fire Hazard Assessment. Additional specific comments included taking issue with the description of the "townships" of Pyramul, Sallys Flat, Crudine, Aarons Pass and Carcalgong, as well as descriptions of the land use and ground cover in the surrounding area, such as "cleared plains for many kilometres".

**Response:** Submission comments relate to terminology used in the Fire Hazard Assessment. As set out in Chapter 16 of the Project EA, and also described in the Fire Hazard Assessment itself, the assessment was conducted in accordance with:

- Director-General’s Requirements (DGRs);
- *Rural Fires Act 1997*;
- AS/NZS ISO 31000:2009 *Risk Management – Principles and guidelines* (Standards Australia 2009);
- National Inquiry on Bushfire Mitigation and Management (Council of Australian Governments (COAG) 2004); and
- NSW Bushfire Coordinating Committee (BFCC) Guidelines (2008).

Terminology and descriptions used in the Fire Hazard Assessment are consistent with the criteria set out in these documents, and other accepted methodologies which are referenced in the Fire Hazard Assessment.

## Chapter 17: Water Assessment

**4.17.1 “Using energy derived from wind farms, rather than from alternatives such as coal, will help us to preserve our scarce resources of water.”**

**Response:** Noted.

**4.17.2 Concerns were raised regarding use of groundwater during the construction phase of the Project, in particular, with potential impacts associated with rock blasting and extensive excavation. It was noted that a local bore indicates the water table is about 3 m underground.**

**Response:** Please refer to response to Comment 3.17.1.

**4.17.3 Concerns were raised regarding potential impacts of Project construction on surface water during the construction phase. Specific concerns and comments included:**

- The possibility of silt runoff into the Crudine River and Pyramul Creek;
- Where “wash out of concrete trucks” will occur;
- “A number of water quality monitoring locations are identified, but no mention is made of what parameters will be monitored or at what frequency”.

**Response:** Silt runoff and erosion impacts will be managed and mitigated in two broad manners. In the first instance, areas of vegetation have been avoided and / or minimised where possible. Retaining vegetation where possible on site will assist in reducing the possibility of soil and silt runoff. Where earthworks do take place, a number of erosion and sediment control measures will be implemented. Erosion and sedimentation control devices will be monitored to ensure that they are functioning appropriately, particularly after periods of heavy rain.

Further mitigation measures identified in the Ecological Assessment and Statement of Commitments address the possibility of weed spread; sedimentation, erosion and runoff;

vegetation clearing; impacts to flora and fauna; impacts to soils; the incidence of fire; bank instability at creek crossings; and other general impacts.

These mitigation measures will also be implemented in the vicinity of temporary and permanent ancillary structures such as rock crushing and batching plants. The use of bunding, sediment and little traps, restriction of water flow across development areas and vegetation rehabilitation are all measures that will be implemented where and as required.

Concrete trucks will be washed out within the batching plant compound. A settling pond will be established fit for purpose and managed throughout the construction period. Post construction the settling pond and batching plant compound will be remediated. A full protocol will be developed and included in the appropriate CEMP sub-plan prior to construction commencing.

Water quality monitoring is addressed in Statement of Commitment 060. As detailed, this monitoring, along with the mitigation measures discussed will be implemented in consultation with NOW and in accordance with Landcom 2004. In order for an appropriate monitoring regime to be developed, details will be finalised when the final wind turbine model and micro-sited locations have been procured and finalised respectively.

#### **4.17.4 “Has dust suppression on unsealed roads been considered in water requirements?”**

**Response:** Yes, the water requirements for dust suppression of both internal access roads and unsealed sections of the existing road network have been included in water requirement calculations. This is outlined in Section 17.5 of the Project EA.

#### **4.17.5 “The water requirements detailed in the EA are well below what is going to be utilised and is an inaccurate amount.” (Submission 56725)**

**Response:** It is difficult to interpret from the relevant submission how the figures provided were arrived at. However, the water requirement for the Project was based on worst case scenarios at each stage of calculation. By way of example, submission 56725 estimates 150 litres of water is used per cubic metre of concrete, while calculations undertaken to prepare the Project EA use a conservative estimate of 165 litres per cubic metre of concrete.

Statement of Commitment 063 notes that Project water requirements will be re-calculated once the final development footprint has been determined.

#### **4.17.6 “The Proponent fails to determine whether an adequate water supply is available.”**

**Response:** The Proponent provided a very specific outline of the process that will be undertaken in order to secure the required water supply for Project construction in the Project EA (Section 17.5.1). The EA goes on to state that “identification of appropriate water sources will be determined post-consent, during the pre-construction phase of the Project. Should this approach not prove feasible, then water will be sourced from commercial suppliers within the vicinity of the Project at the expense of the Proponent.

Statements of Commitment 064 and 065 further address water supply for the construction phase of the Project.

## Chapter 18: General Environmental Assessment

### 4.18.1 Safety issue – blade throw (Form letter).

**Response:** This issue is addressed in Chapter 18 of the Project EA. Unfortunately, no further information was provided in the form letters to allow the Proponent to appreciate any specific concerns which are not already addressed in Chapter 18.

### 4.18.2 Inadequate or non-existent provision for decommissioning & removal of old WTGs (Form letter).

**Response:** Please refer to response to Comment 3.18.7.

### 4.18.3 Microclimate effects “I have been told that wind farms can raise the temperature of their surrounding up to 10C over 10 years. In summer this could result in my property experiencing temps about 50C. It will become a desert.”

**Response:** Please refer to response to Comment 3.18.6.

### 4.18.4 Concern was raised regarding dust from the rock crushing and batching plant.

**Response:** Dust emission from the on-site rock crushing and batching plant will be addressed as part of a CEMP sub-plan, in line with Statement of Commitment 066 and an EPA recommended condition of approval. Dust suppression measures will be implemented, including dust screens and specific measures during weather conditions where high level dust episodes are probable.

## Chapter 19: Socio-Economic Assessment

### 4.19.1 “Scientific studies show that wind farms do not have adverse effects on human health, livestock or birdlife - in spite of unsubstantiated claims to the contrary. Misinformation has been used to create fear and uncertainty about wind farms, but we expect our political leaders to make decisions based on scientific research. More research is needed into the impact on residents of ‘fluctuating swish’ noise but this should not be confused with infrasound.”

**Response:** Noted. Audible noise is discussed further in Chapter 9 of the EA.

### 4.19.2 “The adoption of this technology has comparative society wide benefits when compared to the health impacts of mining and combustion driven generation.”

**Response:** Noted.

### 4.19.3 Health impacts (Form letter). Additional comments also included:

- Effects of infrasound;
- Health impacts on humans, dogs, livestock and wildlife;
- Adequacy of NSW Draft Guidelines to protect health; and

- **Various potential symptoms, including sleep loss and stress.**

**Response:** The issue of potential health impacts is discussed in Chapter 19 of the Project EA. As discussed in the EA, scientific studies from around the world overwhelmingly indicate that there is no evidence to suggest a direct causal link between wind turbines and deterioration of human health. The Proponent intends to continue to adhere to the position and advice of the Governmental bodies that set the standards for health concerns in Australia, namely the National Health and Medical Research Council and State bodies such as NSW Health.

The NSW Planning Assessment Commission (PAC) similarly recognised the role of Governmental bodies in setting standards and providing scientifically rigorous advice during a determination of the Bodangora Wind Farm in 2013. The PAC heard a number of statements from members of the public regarding health impacts associated with wind turbines. In their determination report, the PAC stated that:

"NSW Health was very clear in its advice, which is consistent with that of the National Health and Medical Research Council - that there is no published scientific evidence to link wind turbines with adverse health effects..."

NSW Health recognised that noise from the turbines may cause some disturbance to people living in very close proximity (less than 700 from the turbines). It advised that the 2 km buffer provided was highly conservative and represented a very precautionary approach...

In relation to infrasound, NSW Health echoed the advice of the World Health Organisation, which has stated that there is no reliable evidence that sounds below the hearing threshold produce physiological or psychological effects."

For further discussion regarding infrasound and low frequency noise, please refer to response to Comment 4.9.1 and Appendix 2 of this report.

#### **4.19.4 Devaluation of affected and surrounding land (Form letter).**

**Response:** Please refer to response to Comment 3.19.1.

#### **4.19.5 Division of rural communities, alienation within families and destruction of rural social infrastructure (Form letter).**

**Response:** Any proposal for major new development in an area will inspire various reactions amongst members of the local community – some members will support the proposal, some will be indifferent and others will oppose it. In some cases, a natural fear of change can be exacerbated by the spread of misinformation and unhelpful campaigns which obscure the real issues and make reasoned, sensible discussion of the proposal difficult.

The Proponent has sought to alleviate any fear of changes that may result from the Project by engaging with the local community through meetings, newsletters, mail-outs, website updates and direct engagement by phone and in person. In accordance with the Draft Guidelines, the Proponent has also established a Community Consultative Committee,

comprised of members of the community, the Council and the Proponent to create a forum for the discussion and resolution of issues which are of concern to the local community.

In addition, the Proponent has committed to the establishment of a Community Benefit Fund which will provide substantial support for initiatives in the local area, and allow the local community to have significant input into how the Project can directly benefit the community.

**4.19.6 Compensation to adjacent landowners was raised, including comment regarding compensation by the Proponent to:**

- Landowners affected by noise above 25-35 dB levels; and
- Landowners not receiving wind turbines.

**Response:** Under the Draft Guidelines, it is not permitted for noise from operation of the wind farm to exceed 35 dB(A) (or more than 5 dB(A) above background noise) at any non-associated receiver (i.e. non-involved landowner residences). This will also be a condition of consent to the Project, if it is approved. The NSW Government has also recently announced that compliance with these noise requirements will be monitored by the EPA.

The Proponent and its consultants, working closely with the DoPI, have conducted detailed noise assessments to ensure that Project's compliance with these requirements.

Infigen summarise the subject of compensation in their Submissions Response Report for Bodangora Wind Farm (2013), stating that:

"The Land and Environment's Court's decision in 2010 for the Gullen Range Wind Farm provides a succinct and authoritative response. Excerpts from the decision follow:

*"150 The Guardians [opponents to the wind farm] advance the proposition that a consequence of approval of the wind farm will be that a number of properties which are in the vicinity will suffer from "blight" for which there should be payment of compensation if the project were to be approved...*

*154 Such a proposition faces a number of insurmountable hurdles.*

*155 The first is that the wind farm, as earlier noted, is a permissible use on all of the parcels of land upon which it is proposed....*

*159 If the concepts of blight and compensation, as presented by the Guardians, were to be applied to this private project (a proposition which I reject) then any otherwise compliant private project which had some impact in lowering the amenity of another property...would be exposed to such a claim.*

*160 Creating such a right to compensation (for creating such a right it would be) would not merely 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 s 5(a)(ii) for "the promotion and co-ordination of the orderly economic use and development of the land... As a consequence, we decline to consider any issues relating to claims for compensation."*

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Accordingly, compensation to neighbouring properties of wind farms is not warranted, since this would set a precedent for any private project in which amenity is affected, and would be in contravention to land use planning which seeks to achieve the orderly and economic use of the land.”

**4.19.7 Comments were made regarding the adequacy of the Proponent’s analysis of the local community and the impacts of the Project on the community. Particular comments that were made include:**

- **Reference to documents produced by MWRC;**
- **Impact of construction on businesses along the preferred transport route;**
- **Land values and blight; and**
- **A Voluntary Planning Agreement.**

**Response:** Please refer to Appendix 6 in Volume 1 and responses to Comments 3.19.1, 3.19.3, 3.19.4, 3.19.5, 3.19.6, 3.19.8 and 3.19.9.

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## **Chapter 20: Statement of Commitments**

Refer to Section 7 for revised Statement of Commitments.

## **Chapter 21: Conclusion**

No responses received.

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## 5. SUBMISSION RECONCILIATION

**Table 11** Comments by Submission (\*Denotes form letter)

Submission Statement Number	Name	Comments Raised	Position
51558	Name Withheld, Wellington NSW	4.11.2	Objects
52715	David Groves, Carcalgong NSW	4.12.2, 4.12.4	Comment
53042	Andreas Marciniak, Glandore SA	4.4.5, 4.8.1, 4.10.1, 4.19.3, 4.19.4	Objects
53044	Name Withheld, Cape Bridgewater VIC	4.4.4, 4.4.5, 4.9.1	Objects
53048	Name Withheld, Wellington NSW	4.6.1, 4.8.1, 4.9.9, 4.10.1, 4.12.2, 4.16.1, 4.16.3, 4.19.3, 4.19.5	Objects
53345	David Halpin, Beragoo Estate NSW	4.12.2, 4.12.3	Comment
55238	Neville Mattick, Hargraves NSW	4.5.1	Supports
55684	Name Withheld, Tarago NSW	4.4.4, 4.4.5, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.13.1, 4.13.2, 4.18.2, 4.19.3, 4.19.4, 4.19.5,	Objects
55686	Ann Walker, Yarrbin NSW	4.5.2, 4.9.1, 4.16.3, 4.19.3	Objects
55688	John Rexon Walker, Yarrabin NSW	4.4.5, 4.10.1, 4.13.1, 4.13.2, 4.18.3, 4.19.3,	Objects
55702	Name Withheld, East Balmain NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
55751	Grant Winberg, Gordon NSW*	4.5.2, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5,	Objects
55812	Robert Jarvis, Wellington NSW	4.2.2, 4.6.1, 4.8.1, 4.9.1, 4.10.1, 4.19.3, 4.19.4, 4.19.5	Objects
56004	Name Withheld, Mudgee NSW*	4.4.4, 4.4.5, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects

Submission Statement Number	Name	Comments Raised	Position
56220	Name Withheld, Riverlea NSW	4.12.2	Supports
56231	Margaret Conn, Mudgee NSW	4.2.1, 4.5.2, 4.9.1, 4.9.2, 4.9.3, 4.9.4, 4.9.5, 4.9.6, 4.9.7, 4.9.9	Objects
56234	Terry & Margaret Conn, Mudgee NSW	4.2.2, 4.4.4, 4.4.5, 4.4.6, 4.4.7, 4.5.2, 4.9.10, 4.18.3, 4.19.7	Objects
56275	Amy Doorey, Currans Hill NSW	4.19.4	Objects
56280	Sue Lane, Camden NSW	4.9.1, 4.10.1, 4.19.3	Objects
56386	Name Withheld, Wilbetree NSW	4.19.7	Objects
56388	Jennifer More, Rylstone District Environmental Society Inc NSW	4.4.2, 4.10.8, 4.17.1, 4.19.1	Supports
56427	Deborah Cooke, Rylstone NSW	4.4.1, 4.4.2	Supports
56432	Buz Sanderson, Sanderson & Macdonald P/L NSW	4.4.3, 4.12.1, 4.19.2	Supports
56487	Chris Pavick, MWCAN NSW	4.10.8, 4.17.1, 4.19.1,	Supports
56599	Name Withheld, Leichhardt NSW	4.4.4, 4.8.1, 4.9.1, 4.12.2, 4.12.3, 4.16.1, 4.19.4	Objects
56607	Lyn Jarvis, IWTAMA NSW		Comment
56609	Norman Bennett, Turondale NSW*	4.4.4, 4.4.5, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.19.3, 4.19.4	Objects
56611	Name Withheld, Grattai NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.4, 4.19.5	Objects
56613	Name Withheld, Grattai NSW*	4.2.3, 4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1,	Objects

Submission Statement Number	Name	Comments Raised	Position
		4.18.2, 4.19.3, 4.19.4, 4.19.5	
56615	Ron Olson, Pyramul NSW	4.4.5, 4.6.1, 4.10.1, 4.12.2, 4.12.3, 4.19.4	Objects
56617	Jackie O'Hare, Mudgee NSW*	4.12.2	Comment
56619	Matthew O'Hare, Mudgee NSW*	4.4.4, 4.12.2, 4.13.2, 4.16.1, 4.16.2, 4.16.3, 4.18.1	Comment
56621	Name Withheld, Strathfield NSW*	4.4.4, 4.4.5, 4.6.1, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56623	Name Withheld, Pyramul NSW*	4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.19.3, 4.19.4, 4.19.5	Objects
56625	Name Withheld, Not stated NSW*	4.4.4, 4.10.1, 4.12.2, 4.16.1, 4.18.1, 4.19.4	Objects
56627	Name Withheld, Not stated NSW*	4.4.4, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.19.3, 4.19.4, 4.19.5	Objects
56629	Troy James, Aarons Pass NSW*	4.8.1, 4.10.1, 4.12.2, 4.19.4	Objects
56631	Name Withheld, Windeyer NSW*	4.12.2	Objects
56633	Name Withheld, Crudine NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.10.2, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56635	Name Withheld, Duramana NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56639	Name Withheld, Pyramul NSW*	4.4.4, 4.4.5, 4.5.2, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.10.2, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56641	Name Withheld, Sofala NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.9.11, 4.10.1, 4.10.2, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.18.4, 4.19.3, 4.19.4, 4.19.5	Objects
56644	Name Withheld, Sofala NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2,	Objects

Submission Statement Number	Name	Comments Raised	Position
		4.19.3, 4.19.4, 4.19.5	
56646	Name Withheld, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.5	Objects
56648	Name Withheld, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56650	Name Withheld, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56652	Name Withheld, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56654	Don Price, Pyramul NSW*		Supports
56656	Name Withheld, Surry Hills NSW	4.8.1, 4.8.2, 4.10.1, 4.12.2, 4.19.4	Objects
56666	Name Withheld, Pyramul NSW*	4.4.4, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.12.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56668	Mary Miller, Crudine NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.10.2, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56670	Name Withheld, Crudine NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.10.2, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56672	Ruth Newman, Mudgee NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56674	Anthony Newman, Mudgee NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56678	Gai Blackley, Mudgee NSW	4.12.2, 4.12.5	Objects
56680	Sarah Laurie, Banyule VIC	4.9.1, 4.19.3	Objects

Submission Statement Number	Name	Comments Raised	Position
56682	Name Withheld, Penhurst VIC*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56684	Graham Dowling, Erudgere NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.12.2, 4.12.3, 4.12.4, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56686	Name Withheld, Yarrabin NSW	4.4.4, 4.4.5, 4.5.2, 4.6.1, 4.8.3, 4.9.1, 4.9.8, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.16.2, 4.16.3, 4.18.2, 4.19.3	Objects
56688	Sharon Jones, Pyramul NSW	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.12.3, 4.12.4, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56690	Jake Wakeling, Bathurst NSW	4.10.1, 4.10.2	Objects
56692	Kim Bastow, Windeyer NSW	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56694	Brian English, Pyramul NSW	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.12.3, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56696	Name Withheld, Windeyer NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56698	Alan English, Windeyer NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56700	Max Price, Pyramul NSW*	4.4.4, 4.4.5, 4.5.2, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.16.3, 4.16.4, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56702	Laureen Price, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.14.1, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56704	Alan Watts, Carcoar NSW	4.9.1, 4.9.9	Objects
56706	Ralph Price, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.12.3, 4.13.1, 4.13.2, 4.16.1, 4.17.2,	Objects

Submission Statement Number	Name	Comments Raised	Position
		4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	
56708	Name Withheld, Not stated NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56710	Glen Barker, Not stated NSW*	4.3.1, 4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56712	Name Withheld, Bocoble NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56714	Name Withheld, Mudgee NSW*	4.4.4, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.19.3, 4.19.4, 4.19.5	Objects
56716	Chontelle Jones, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56718	Ingrid Saywell, Pyramul NSW	4.3.2, 4.4.4, 4.4.5, 4.4.8, 4.4.9, 4.5.3, 4.6.1, 4.6.2, 4.8.1, 4.8.2, 4.8.3, 4.9.1, 4.9.10, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.14.1, 4.16.1, 4.17.2, 4.18.1, 4.18.2, 4.18.3, 4.19.3, 4.19.4, 4.19.5, 4.19.6, 4.19.7	Objects
56725	Owain Rowland-Jones, Crudine Ridge Environment Protection Group NSW	4.2.2, 4.3.3, 4.4.4, 4.4.5, 4.4.6, 4.4.7, 4.5.2, 4.6.1, 4.8.1, 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.8.7, 4.9.1, 4.9.2, 4.9.3, 4.9.4, 4.9.5, 4.9.6, 4.9.7, 4.9.9, 4.9.10, 4.10.1, 4.10.2, 4.10.3, 4.10.4, 4.10.6, 4.10.7, 4.12.2, 4.12.3, 4.12.4, 4.12.6, 4.13.1, 4.13.2, 4.16.2, 4.16.3, 4.16.4, 4.17.2, 4.17.3, 4.17.4, 4.17.5, 4.17.6, 4.18.1, 4.18.2, 4.18.3, 4.19.4, 4.19.7	Objects
56779	Ray George, Crudine NSW	4.5.2, 4.8.3, 4.9.1, 4.14.1, 4.16.1, 4.16.2, 4.16.3, 4.19.3, 4.19.4,	Objects
56781	Heather George, Crudine NSW	4.5.2, 4.6.1, 4.8.1, 4.8.2, 4.8.3, 4.8.6, 4.9.1, 4.10.5, 4.13.1, 4.14.1, 4.16.2, 4.18.1, 4.19.3, 4.19.4	Objects
56786	Michael Lyons, Wellington NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
56788	Nicholas Lyons, Wellington NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.5	Objects
56790	Michael Lyons,	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1,	Objects

Submission Statement Number	Name	Comments Raised	Position
	Wellington NSW*	4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	
56792	Judy Rowland-Jones, Pyramul NSW	4.8.1, 4.8.3, 4.9.1, 4.12.2, 4.12.3, 4.12.4, 4.12.5, 4.19.4	Objects
56799	Alicia Hawkins, Mudgee NSW	4.19.6	Objects
56811	Owain Rowland-Jones, Pyramul NSW	4.3.3, 4.5.2, 4.8.2, 4.8.7, 4.16.4	Objects
56832	Patina Schnieder, Forest Reefs NSW	4.4.4, 4.4.5, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.9.8, 4.10.1, 4.11.1, 4.12.4, 4.13.1, 4.16.1, 4.16.2, 4.16.3, 4.18.1, 4.18.2, 4.18.3, 4.19.3, 4.19.4, 4.19.5	Objects
56834	Alison Cashen, Orange NSW	4.4.4, 4.19.3, 4.19.5, 4.19.6	Objects
56836	Agness Knapik, Bocoble NSW	4.6.1, 4.6.2, 4.10.1, 4.10.3, 4.12.2	Comment
56850	Andrew Gee MP, Member for Orange, NSW	4.3.1, 4.9.1, 4.12.2, 4.12.3, 4.18.2, 4.19.4, 4.19.5	Objects
57016	David Cooper, Mudgee NSW	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.16.3, 4.18.2, 4.19.4	Objects
57020	Susan Lewis, St Fillians NSW	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.12.2, 4.16.2, 4.16.3, 4.18.2, 4.19.4	Objects
57022	Name Withheld, Eglinton NSW*	4.8.1, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4	Objects
57024	Name Withheld, Greystanes NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57028	John Price, Pyramul NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.12.2, 4.19.5,	Objects
57032	Name Withheld, Yarrabin NSW	4.4.4, 4.4.5, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.19.3, 4.19.4,	Objects
57036	Name Withheld, Yarrabin NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects

Submission Statement Number	Name	Comments Raised	Position
57048	Tim Rowland-Jones, Not stated NSW*	4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57069	Penny Hundy, Mudgee NSW	4.3.1, 4.4.4, 4.4.5, 4.6.1, 4.9.1, 4.9.9, 4.9.12, 4.12.2, 4.17.3, 4.19.3, 4.19.5	Objects
57119	Charlie Arnott, Boorowa Landscape Guardians NSW	4.9.1, 4.9.9, 4.19.3	Objects
57206	Name Withheld, Gladesville NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.10.5, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57216	Name Withheld, Not stated NSW*	4.4.4, 4.4.5, 4.9.1, 4.10.1, 4.19.3	Objects
57234	Name Withheld, Greystanes NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57247	Name Withheld, Greystanes NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57263	Linda Beale, Eglinton NSW*	4.4.5, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57267	Pat Hundy, Not stated NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5, 4.19.6	Objects
57269	Robyn Hundy, Bathurst NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5, 4.19.6	Objects
57272	Name Withheld, Camberwell NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57284	Name Withheld, Mudgee NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
57316	Name Withheld, Pyramul NSW	4.6.1, 4.6.2, 4.8.1	Comment



Submission Statement Number	Name	Comments Raised	Position
57319	Name Withheld, Not stated NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.3, 4.9.1, 4.10.1, 4.11.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects
58090	Bradley Rowland-Jones, Not stated NSW*	4.4.4, 4.8.1, 4.8.3, 4.9.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.19.3, 4.19.4, 4.19.5	Objects
58149	Name Withheld, Grafton NSW*	4.4.4, 4.4.5, 4.6.1, 4.6.2, 4.8.1, 4.9.1, 4.10.1, 4.12.2, 4.13.1, 4.13.2, 4.16.1, 4.18.1, 4.18.2, 4.19.3, 4.19.4, 4.19.5	Objects

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## 6. PREFERRED PROJECT REPORT

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With specific regard to submissions received from NSW Roads and Maritime Services (RMS) and Mid-Western Regional Council (MWRC), and with respect to the suitability of road haulage routes to the Project site, the Proponent has revisited transport route options for the construction phase of the Project. As a result, alternative routes have been identified and assessed. These include roads through and around the Mudgee urban area and the use of Aarons Pass Road (APR) for over-dimensional vehicles (see Appendix 6, Figures 6.1, 6.2 and 6.3).

As a consequence, the Proponent asserts that the revised routes assessed and presented here in the Preferred Project Report (PPR) shall supersede Chapter 12 of the Crudine Ridge Wind Farm Environmental Assessment (November 2012).

### 6.1 Background

Samsa Consulting was commissioned in August 2011 to undertake a Traffic and Transport Assessment for the Project (see Appendix 14 of the Project Environmental Assessment (EA) for full report). The study was conducted in accordance with the NSW Roads and Traffic Authority (RTA) (now RMS) *Guide to Traffic Generating Developments* and the Director-General's Requirements (DGRs), and provided a technical appraisal of the traffic and safety implications arising from the Project, in particular use of the Hill End, Windeyer and Pyramul Roads to access the site.

Submissions received during Public Exhibition of the EA highlighted a range of concerns (see Sections 3.12 and 4.12) that prompted the Proponent to reconsider all available options for the transportation of over-dimensional and standard heavy loads to the Project site during construction. This review included the commissioning of two companies highly experienced in the haulage of wind turbine components and construction of wind farms within Australia; Rex J Andrews and Downer Infrastructure.

A fundamental finding from this review was the potential for APR to be used for haulage of over-dimensional loads, with minor upgrade works to make the road fit for purpose. The extents of these works are outlined in the attached Route Survey and Upgrade Assessment Report (Downer Infrastructure 2013, Appendix 4). Consequently, this opened the potential for transport routes to the intersection of APR and State Highway B55 (Castlereagh Highway) to be explored. Noting the response from the RMS regarding routes from Sydney via the Blue Mountains to the Castlereagh Highway as being untenable (see Comment 3.12.1), routes from the north, through and around Mudgee, have been considered and developed over a period of time in response to ongoing feedback.

The following chapter outlines the revised traffic and transport assessment undertaken for the Project, including the alternate transport routes for over-dimensional and standard heavy vehicles (SHV). In addition, technical and environmental assessments of APR, and those steps the Proponent has taken to consult with MWRC and the community regarding proposed changes to the Project are outlined.

## 6.2 Methods

This revised traffic and transport assessment comprised a desktop study, consultation and fieldwork. The desktop study involved reviewing maps of the area to identify options and an evaluation of available data to establish existing traffic volumes. Consultation with RMS, MWRC, Bathurst Regional Council (BRC) and heavy vehicle operators experienced in handling wind turbine components helped in evaluation of alternative heavy vehicle route options, provided advice on existing traffic conditions and identified the potential extent of road upgrades required for Project construction. Fieldwork by Rex J Andrews, Downer Infrastructure and Samsa Consulting involved inspection of Project involved roads, route surveys, swept path and vertical alignment analyses. To establish existing traffic volumes, existing data was obtained and route specific traffic counts were undertaken in September 2011 and updated where available and applicable in 2013.

The reassessment has resulted in revised strategies and recommendations to minimise traffic impacts throughout the life of the Project. The main focus of this assessment, however, is the construction phase, as this is likely to generate greater traffic impacts on the existing public road network and internal access tracks than other phases of the Project (see Appendix 7).

## 6.3 Existing Situation

To establish existing traffic conditions within the locality of the Project, Samsa Consulting reviewed traffic volumes and accident records along routes that will potentially be used for Project traffic (see Sections 6.4, 6.5 and 6.6). The most recent traffic volume data available were obtained from the RMS, local Councils and consultant reports as available.

Definitions used to assess Project related traffic impacts:

**Vehicles per day (vpd):** Used to describe traffic volumes at a single location on a particular road.

**Vehicles per hour (vph):** Vehicles per “peak” hour. Peak hour traffic flows are assumed to be between 10 % and 15 % of daily traffic flows for the more heavily trafficked roads.

Further, in order to assess the capacity of the existing rural road network to accommodate the type and volume of traffic generated by the Project, Samsa Consulting assessed the “Level of Service” (LoS) on each road. Typically, the LoS is based on road capacity analysis as described in Austroads’ *Guide to Traffic Engineering Practice, Part 2 – Roadway Capacity* (see Appendix 3). The assessment of the effect that additional Project related traffic will have on the LoS of each road is presented in Section 6.4.5, however, descriptions are provided below and existing traffic volumes are provided in Table 12 below.

The LoS descriptions are:

LOS A: Free flow conditions, high degree of freedom for drivers to select desired speed and manoeuvre within traffic stream. Individual drivers are virtually unaffected by the presence of others in the traffic stream.

LOS B: Zone of stable flow, reasonable freedom for drivers to select desired speed and manoeuvre within traffic stream.

- LOS C: Zone of stable flow, but restricted freedom for drivers to select desired speed and manoeuvre within traffic stream.
- LOS D: Approaching unstable flow, severely restricted freedom for drivers to select desired speed and manoeuvre within traffic stream. Small increases in flow generally cause operational problems.
- LOS E: Traffic volumes close to capacity, virtually no freedom to select desired speed or manoeuvre within traffic stream. Unstable flow and minor disturbances and / or small increases in flow would cause operational break-downs.
- LOS F: Forced flow conditions where the amount of traffic approaching a point exceeds that which can pass it. Flow break-down occurs resulting in queuing and delays.

The LoS for the urban road network is largely defined in terms of average travel speed rather than actual road capacity (traffic volumes). This is because the urban road network generally has interrupted flow caused by intersection controls, side-street and parking manoeuvres, and turn movements. The increase in daily flows along each urban road considered as a result of Project related traffic is also presented in Section 6.4.5, while existing traffic volumes are provided in Table 12 below.

**Table 12** Existing traffic volumes on the rural and urban road network around the Project site

Road		Vehicles per day (vpd)	Vehicles per hour (vph)	Level of Service (LoS)
Castlereagh Highway	North of Hill End Road	3,751	450	C
	South of rail level crossing	4,647	550	
	South of Burrundulla Road	2,115	250	
	North of Kandos Road	1,584	200	
	South of Boulder Road	4,300	500	
Goolma Road		1,300	160	B
Mudgee urban area	Market Street	5,000	600	(n/a)
	Douro Street	7,000	800	(n/a)
	Short Street	2,100	250	(n/a)
	Lawson Street	530	100	(n/a)
	Horatio Street	8,500	900	(n/a)
	Mortimer Street (estimate)	< 1000	< 150	(n/a)
	Burrundulla Ave (estimate)	< 1000	< 150	(n/a)
Aarons Pass Road		23	< 10	(n/a)
Bombandi Road		< 50	< 10	(n/a)
Crudine Road		<100	< 10	(n/a)
Hill End Road	West of Castlereagh Highway	1,444	200	B
	North of Old Grattai Road	1,195	150	
	At Evans Shire Boundary	75	< 20	A
	West of Sofala	86	< 20	
	At 3800 Hill End Road	113	< 30	
Windeyer Road	East of Hill End Road	229	< 50	A
Pyramul Road	North	54	< 20	
	South	80	< 20	
Ulan - Cassilis Road	Southern (Mudgee) end	5,700	650	C / D
	North of Wallar Road	2,491	300	
Great Western Highway	Raglan Creek, Bathurst	22,849	2,300	C / D
	1.5 km west of Glanmire	6,770	750	
Mid Western Highway		3,782	450	B / C
Sofala / Peel Road	Near Sofala village	1,050	150	A
	West of Castlereagh Highway	900	120	
Stewart Street		13,896	1,500	(n/a)
Gilmour Street		5,218	600	(n/a)
Eleven Mile Drive		1,480	200	(n/a)
Wellington Street		2,197	300	(n/a)
Durham Street		10,445	1,200	(n/a)
Eglinton Road		4,634	550	(n/a)
Hamilton Street		2,290	300	(n/a)
Duramana Road		549	<100	A / B
Turondale Road	At 1.82 km	279	< 50	
	At 22.0 km	156	< 30	

## 6.4 Potential Impacts - Construction

Traffic involved in the construction of the Project will be using the road network over a period of approximately 18 months to two years. During this period, several tasks would generate traffic, including construction material delivery, construction staff transport and wind turbine component delivery. The types, dimensions and number of vehicles used for construction will be largely dependent on wind turbine model selection and wind farm layout finalisation. As such, worst case scenarios have been assessed (for further information see Section 6.4.5).

Construction traffic will generally consist of:

- Articulated semi-trailers (over-dimensional and regular trailer sizes), heavy duty low loaders, dolly / jinker arrangements and a variety of high power prime movers - for transporting initial establishment equipment, materials and turbine components;
- Additional SHV loads consisting of concrete, steel reinforcement, base tower ring sections, road stone and other construction materials being delivered to the site;
- Tipper trucks – to bring stone for the access tracks and to remove soil;
- Bulldozers – for road works on-site;
- Concrete agitators – to transport concrete from the batching plant for use on-site;
- Cranes – one small mobile crane (up to 100 tonne) for assembly of wind turbines on the ground and a larger mobile crane (up to 600 - 1,000 tonne, or alternatively a 300 - 400 tonne crawler crane) for the erection of the wind turbine; and
- Conventional 4WD vehicles and sedans – use by on-site personnel.

### 6.4.1 Wind turbine component delivery and over-dimensional vehicle types

A typical wind turbine will comprise the following components and involve escorted over-dimensional vehicle haulage to the Project site:

- Three blades comprising over-length loads;
- Three or five tower sections comprising over-size / over-mass loads;
- One nacelle and generator comprising up to two over-size / over-mass loads; and
- One rotor hub, typically comprising one over-size / over-mass load.

Additional over-dimensional loads will include the 600 - 1,000 tonne crane (approximately 135 tonnes, transported in up to four sections) and transformers (approximately 90 tonnes).

**Over-length vehicles:** Vehicles transporting wind turbine blades. Due to the nature of the transport routes proposed, two categories of over-length vehicles have been identified. These categories are over-length vehicles approximately up to 50 m in length and over-length vehicles approximately greater than 50 m in length (see Table 13). Over-length vehicles may have similar dimensions to over-size vehicles, but would carry blades up to 63 m in length. Over-length vehicles typically use dolly or jinker arrangements that allow for rear axle steering providing for negotiation of relatively small radius curves, and avoiding wheel drag, provided that the inside of the curve is clear of obstacles.

**Table 13** Typical dimension and weight ranges of wind turbine blades

Wind Turbine Component	Component Only		Component on Vehicle		
	Weight (tonnes)	Dimensions (metres)	Weight (tonnes)	Dimensions (metres)	Axle Load (tonnes)
Blade up to 50 m in length	10	50 m long	42.5	55 x 4 x 5	6.5
Blade over 50 m in length	12	63 m long	49	68 x 4 x 5	8.5

**Over-size vehicles:** Over-size vehicles are those over 19 m in length, 2.5 m in width and / or 4.3 m in height. Vehicles with a gross mass up to 42.5 tonnes are also defined as over-size. Over-size vehicles typically use dolly or jinker arrangements that allow for rear axle steering providing for negotiation of relatively small radius curves, and avoiding wheel drag, provided that the inside of the curve is clear of obstacles.

**Over-mass vehicles:** Vehicles transporting wind turbine components, including tower sections, nacelle, generator and rotor hub components and ancillary components above standard road haulage weights and dimensions (see Table 14). Vehicles with a gross mass greater than 42.5 tonnes are defined as over-mass. Over-mass loads will be carried on trailers, or combinations of trailers, with sufficient axle groups to ensure compliance with point load and overall load limits for the road surface. For example, one of the heaviest wind turbine component loads (nacelle / gearbox configuration in one unit) transported and installed within Australia is 125 tonnes. Such a load would typically be carried on trailers with upwards of ten axles, with up to eight tyres per axle. Including the weight of the trailers, typical axle weights under such a scenario would be up to 13 tonnes, or less than two tonne per tyre. This is less than a typical semi-trailer with 11 tonnes per axle but only four tyres per axle. As such, over-mass vehicles will generally incur less loading stress on the road surface, especially when run under escort with limited speed, than normal heavy vehicle traffic. Wind turbine specifications are continually changing as new models enter the market. However, with trailer and axle variations, a similar result can also be achieved for heavier components.

**Table 14** Typical dimension and weight ranges of wind turbine components

Wind Turbine Component	Component Only		Component on Vehicle		
	Weight (tonnes)	Dimensions (metres)	Weight (tonnes)	Dimension (metres)	Axle Load (tonnes)
Tower Section	20 - 65	20 - 30 m long	105	39 x 4.5 x 5.5	12.5
Nacelle	75	12 x 4.5 x 4	120	28 x 4.5 x 5.5	15
Separate Generator and Gearbox	30		60	25 x 4.5 x 5	9
Nacelle with Generator and Gearbox	100 to 140		215	39 x 4.5 x 5	13.5
Rotor Hub	40	4.5 x 3	78	27 x 4.5 x 4.5	9



**Over-dimensional vehicles:** Collective term to describe all of the above classifications.

A number of routes have been evaluated for deliveries requiring the use of over-dimensional vehicles (see 6.4.3). These routes have been developed in response to feedback from relevant road authorities and the local community, and technical assessments have been undertaken to ensure impacts are minimised. Final traffic volumes and routes will be determined prior to construction between the Proponent, haulage contractor and road authorities and any required road modifications or upgrades undertaken prior to the relevant stage of construction.

#### **6.4.2 Balance of construction vehicles**

**Standard Heavy Haulage:** A number of route options were also identified for the balance of vehicle movements, and in particular, for SHVs (see Section 6.4.4). Consideration of a number of route options provides flexibility for sourcing materials, and allows scope for contractors and businesses from around the region to be engaged in Project construction.

**Light Vehicle Access:** Access to the Project site by light vehicles could be facilitated by any number of routes along the urban and rural road network in the region. A transport Code of Conduct and support for construction staff car-pooling are measures that could be used to minimise impacts from light vehicle generation.

**Public Visits:** Experience gained from operational wind farms at Hallett and Starfish Hill in South Australia, Albany and Esperance in Western Australia, Ravenshoe in Queensland, Crookwell and Blayney in New South Wales and Codrington in Victoria suggests that there will be a great deal of interest generated during the construction phase of the Project. This could be true for the Project as there are currently no operational wind farms in either local Council area, and public awareness of wind farms is of growing interest.

An increase in traffic volumes during construction can impact on road safety and road condition and can create logistical issues. Potential impacts could include:

- Traffic noise and delays;
- Vehicle collisions (with stock or due to obstruction by long loads) or loss of control;
- Dust from unsealed roads; and
- Road surface deterioration, particularly during wet weather.

#### **6.4.3 Over-dimensional vehicle transport routes**

The Port of Newcastle is the preferred Port of Import for wind turbine components (Downer Infrastructure 2013). Due to the size and weight of these components, it is expected that many of the delivery vehicles will be over-dimensional. As such, a transport route for the Project from Newcastle to the northern site access point that is suitable for over-dimensional vehicles was identified and assessed (Downer Infrastructure 2013). This route includes the Golden Highway, the Castlereagh Highway and APR, as well as transport through Gulgong and Mudgee urban areas.

As a result of technical assessments and the PPR consultation process (see Section 6.8) preferred over-dimensional transport routes are proposed. These routes have been chosen in order to

minimise impacts to the relevant road network and local community, through providing for safe and efficient transport of Project related vehicles.

The preferred transport route extends from Newcastle to the northern site access point, passing through the Mudgee urban area and utilising APR (Route Option 1, Figure 6.1). An additional, alternative route through the Mudgee urban area is proposed for over-length vehicles only (Route Option 2, Figure 6.3).

It is important to note that once deliveries have been made to the Project site, these vehicles will undertake the return journey empty and often as SHVs rather than over-dimensional vehicles.

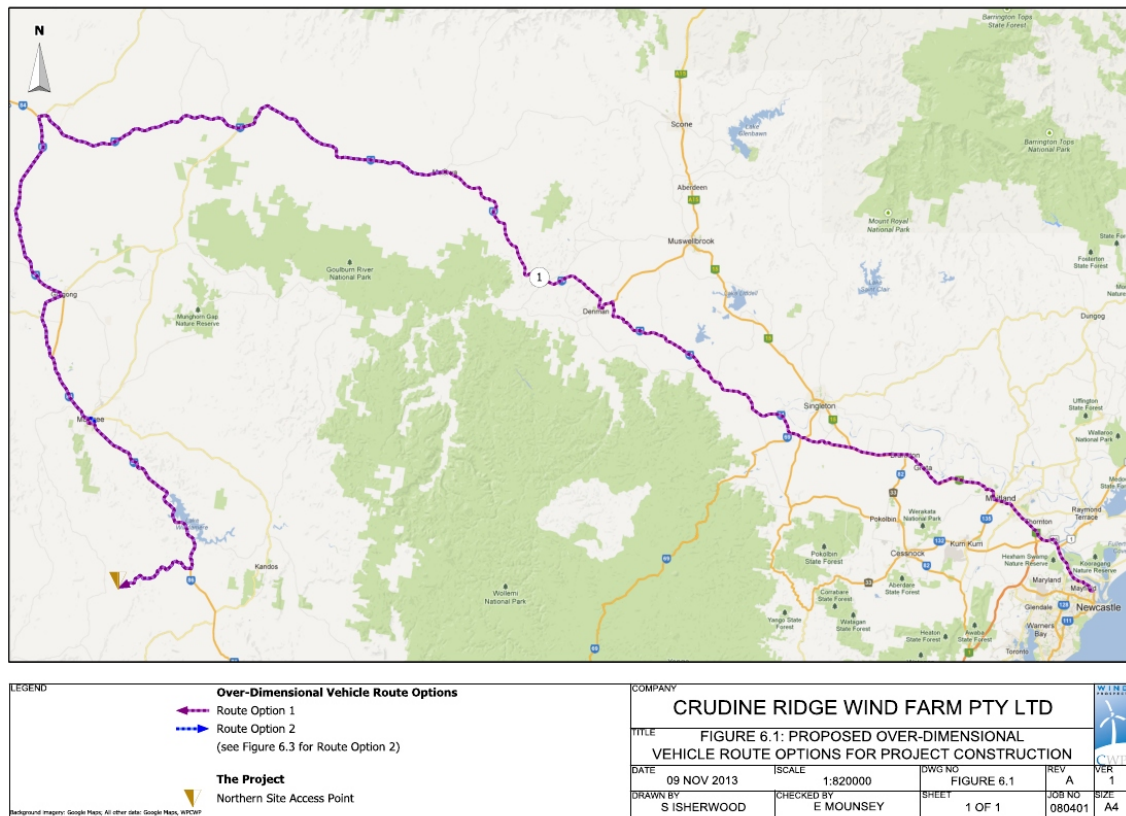


Figure 6.1 Proposed over-dimensional vehicle route options for Project construction

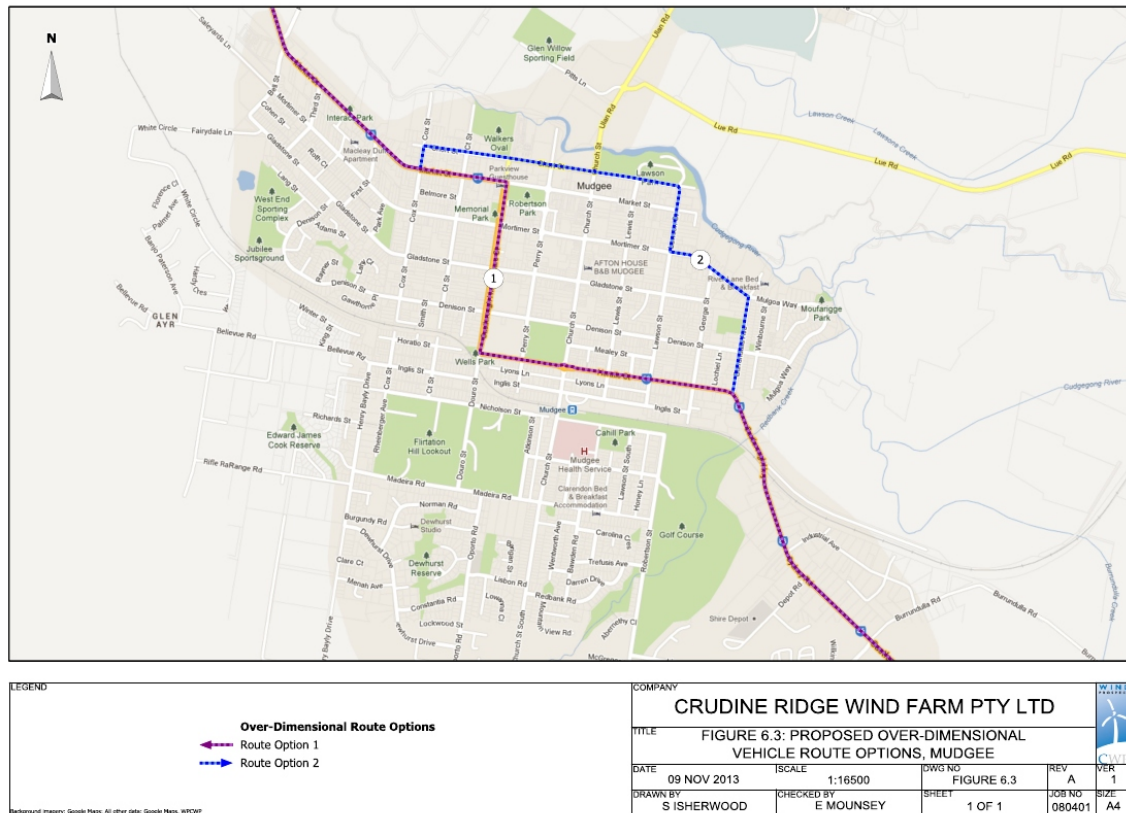


Figure 6.3 Proposed over-dimensional vehicle route options, Mudgee

The following sections focus on aspects of the transport route which are specific to MWRC.

**Route through Gulgong (Figure 6.2, Appendix 6)**

**Description:** Castlereagh Highway onto Goolma Road, continue onto Guntawang Road and return back onto the Castlereagh Highway at the Gooree intersection.

**Road Authority:** RMS and MWRC

**Approximate length of Council Road Impacted:** 15.5 km

**Rationale:** This amendment was requested by MWRC in order to avoid impacts at the corner of Medley Street.

**Limitations:** Navigation of the corners associated with this route amendment is feasible for over-dimensional vehicles with minimal works required to the exit of the corner to allow for full turning arc.

**Route through Mudgee - Route Option 1 (Figure 6.3)**

**Description:** Castlereagh Highway following Market Street, Douro Street and Horatio Street

**Road Authority:** RMS

**Approximate length of Council Road Impacted:** 0 km

**Rationale:** This route was considered and assessed in response to a number of concerns raised regarding the Hill End / Windeyer / Pyramul Road route that was presented in the Project EA. The concerns raised, and the solutions presented in Route Option 1 are listed in Table 15 below.

**Table 15** MWRC feedback and Proponent responses regarding Route Option 1 through Mudgee

Concern raised	Solution presented in Route Option 1
Deterioration of roads, including their surface condition, as a result of increased traffic.	Route Option 1 is an RMS road which is designed to accommodate higher traffic volumes and heavier loads.
Windeyer and Pyramul Roads are too narrow, windy and lightly surfaced for use by heavy vehicles.	The RMS route through Mudgee is generally wide enough and of suitable surfacing to safely and efficiently accommodate Project related traffic. A number of management measures will be employed to ensure over-dimensional vehicles are able to navigate corners with minimal impacts to the road and road users.
Impacts on unsealed roads.	It is common for unsealed roads to be used in conjunction with the transportation of wind farm related traffic, including over-dimensional vehicles. Whilst Route Option 1 through Mudgee comprises of no unsealed roads, it does facilitate the use of APR.
Single lane bridges on Windeyer and Pyramul Roads would require upgrading.	There are no bridges along Route Option 1 and subsequently on APR. Consequently delays to local traffic as a result of complete bridge upgrades are minimal.
Windeyer and Pyramul Roads are the only road access to schools and essential services.	As noted above, Route Option 1 facilitates the use of APR, alleviating potential impacts on Windeyer and Pyramul Roads from over-dimensional vehicles. Moreover, Route Option 1 provides for multiple options for local road users to avoid Project traffic due to the nature of the gridded road network in Mudgee (road grid network approximately 200 m intervals).
There are no alternative routes for local road users to avoid Windeyer and Pyramul Roads, and there are limited options for passing bays to be created.	As detailed above, use of Route Option 1 and APR alleviates potential impacts along these roads. Numerous potential passing bay options have also been identified, and are proposed along APR.
Windeyer and Pyramul Roads are already in need of repair.	Route Option 1 alleviates potential impacts from over-dimensional vehicles on Hill End, Windeyer and Pyramul roads.
General impacts on local road users.	Route Option 1 provides opportunities for local road users to avoid and pass Project related traffic. This is the case in both Mudgee, with a gridded road

	network and along APR with multiple passing bays. There are also pull off options along the Castlereagh Highway. Traffic management measures will be utilised along the route in order to further minimise impacts.
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**Limitations:** Whilst this route would efficiently accommodate over-size / over-mass vehicles, two corners on the RMS route (Route Option 1) were identified as having the potential to create delays if navigated by over-length vehicles carrying blades > 50 m. These corners are the right turn from Market Street onto Douro Street and the left turn from Douro Street onto Horatio Street.

To avoid use of the right turn from Market Street onto Douro Street for over-length vehicles carrying blades > 50 m a diversion off the RMS route (Cox Street / Short Street / Douro Street diversion) was assessed and proposed. The corners associated with this variation are suitable for all over-length vehicles, and road pavement conditions were assessed as suitable for the loads proposed (Downer Infrastructure 2013).

It was also determined that it would be possible for over-length vehicles to navigate the left turn from Douro Street onto Horatio, however, those carrying blades > 50 m would require use of the incorrect side of the road (on Douro Street) and parking restriction zones adjacent to the intersection. It was assessed that over-length vehicles carrying blades > 50 m could take up to five minutes to travel through this intersection.

Route Option 1 and alternate over-length vehicle routes were discussed with MWRC on 11<sup>th</sup> July 2013 as part of the PPR consultation process. A number of concerns were raised through discussions, with regard to the Douro Street / Horatio Street intersection and the adjacent Mudgee High School. In response to these concerns further route design alternatives were considered and assessed.

### **Route through Mudgee – Route Option 2 (Figure 6.3)**

**Description:** Castlereagh Highway following Market Street before turning left onto Cox Street, right onto Short Street, right onto Lawson Street, left onto Mortimer Street, slight right onto Burrundulla Street and right onto Horatio to continue along the Castlereagh Highway.

**Road Authority:** RMS and MWRC

**Approximate length of Council Road Impacted:** 2.9 km

**Rationale:** This alternative was identified for use by all over-length vehicles in order to address the limitations identified with Route Option 1, and concerns raised by MWRC (see above).

This route is proposed for three of up to 11 over-dimensional vehicles required per wind turbine and provides a constructive and feasible response to concerns raised by MWRC (see Table 16). This variation directly addresses potential delays and impacts on schools, allowing for safe and efficient navigation through the Mudgee urban area.

A survey of route identified that corners associated with this variation are suitable for all over-length vehicles, and road pavement conditions were assessed as suitable for the loads proposed (Downer Infrastructure 2013). Additional minor works that may be required include temporary removal of

street signs, some parking restrictions, and 'rolling' traffic management by escort vehicles at intersections ensuring continuous movement through Mudgee. With these considerations, it was assessed that it would take over-length vehicles approximately 15 minutes to travel through the Mudgee urban area, from the turnoff onto Cox Street to the return onto the Castlereagh Highway.

**Table 16** MWRC feedback and Proponent responses regarding Route Option 2 through Mudgee

Concern raised	Solution presented in Route Option 2
Direct traffic delays. While delays were a general concern, there was particular concern regarding impacts to traffic at the intersection of Douro Street and Horatio Street.	Diverting over-length vehicles avoids potential delays at two intersections. This includes avoiding the necessity for over-length vehicles carrying blades > 50 m to use the incorrect side of the road near Mudgee High School to navigate the Douro Street / Horatio Street intersection. It also allows for lesser restrictions on parking immediately adjacent to those corners.
Indirect and cumulative traffic delays.	During a route assessment it was estimated that it could take 5 minutes for over-length vehicles (carrying blades > 50 m in length) to navigate the left turn at the Douro Street / Horatio Street intersection. Alternatively, the corners associated with Route Option 2 have all been assessed as suitable for efficient navigation (approximately 1 minute) by all over-length vehicles.
Restrictions on parking.	Route Option 2 reduces the requirement for no-parking zones. This is especially the case at the Douro Street / Horatio Street intersection.
Impacts to schools. In particular to the schools located along Douro Street.	Route Option 2 avoids the potential requirement for over-length vehicles (carrying blades > 50 m in length) to use the incorrect side of the road to navigate the Douro Street / Horatio Street intersection near Mudgee High School.
Impacts to MWRC roads which are not designed to accommodate heavy loads.	Wind turbine blades are the only components proposed for Route Option 2. Vehicles carrying these generally have gross weights of between 6.5 and 8.5 tonnes per axle.

**Limitations:** Route Option 2 could provide an alternative for all over-dimensional vehicles. However, in order to minimise impacts to residents, the community and MWRC, the Proponent proposes that over-dimensional loads are distributed between Route Option 1 and Route Option 2; with over-length vehicles utilising Route Option 2 and all other over-size / over-mass vehicles utilising the RMS roads of Route Option 1.

As a result of technical assessments and consultation, this preferred scenario alleviates potential delays associated with over-length vehicles as well as avoiding potential impacts to road infrastructure from over-size / over-mass vehicles on the local road network.

Residual impacts to the local community and road infrastructure will be addressed through an EMP sub-plan (a Traffic Management Plan). This will be developed pre-construction in consultation with RMS and local Councils and is a critical element in safe and efficient transport through the construction phase. Typical traffic management measures that will be used to minimise impacts and maintain a high level of conduct through construction include undertaking dilapidation survey of all public roads prior to construction, appropriate scheduling of deliveries, clear and direct consultation with the community and preparation of a 'Transport Code of Conduct' for all staff and contractors (refer to Section 6.9).

With the combination of preferred transport routes that are best suited to the Mudgee urban road network, and preparation of traffic management measures to maintain safe and efficient transport of construction traffic, the Proponent is confident impacts through the 18 month construction phase can be minimised and managed effectively.

#### **Aarons Pass Road (Figure 1, Appendix 6)**

**Description:** Castlereagh Highway, right onto Aarons Pass Road, left into the Project Site at the northern site access point.

**Road Authority:** RMS and MWRC

**Approximate length of Council Road Impacted:** 20 km

**Rationale:** In response to feedback received through the Public Exhibition period, APR was reassessed for transport of over-dimensional components. In 2011 it was initially decided that APR was not suitable for use by over-dimensional vehicles due to generally poor quality of the carriageway and tight horizontal and vertical alignments (Samsa 2011). However, upon re-assessment by Rex J Andrews and Downer Infrastructure, two companies highly experienced in the haulage of wind turbine components and construction of wind farms within Australia, APR is now considered a safe, efficient and viable transport route with recommended upgrades (Downer Infrastructure 2013).

**Ecological Assessment of APR:** In considering the suitability of the proposed route along APR, the Proponent commissioned Eco Logical Australia (ELA) to undertake an Ecological Assessment of the route as an addendum to the original Project Ecological Assessment. The Report (Appendix 8) concludes that "The significant impact assessments have been reviewed, and while the impacts discussed in the addendum will result in an increased impact area for some species and ecological communities, the scale of the impact does not alter the outcomes of any of the significant impact assessment, thereby warranting that they be re-drafted".

The ecological assessment entailed a field survey (2<sup>nd</sup> - 4<sup>th</sup> July 2013) of all the identified impact areas along APR, identifying ecological communities and taking into consideration the MWRC *Roadside Management Guidelines* (MWRC 2011), and quantification and assessment of the impact areas. It was identified that the proposed upgrades to APR could increase the Project impact to Red Stringybark – Scribbly Gum – Red Box – Long-leaved Box shrub – tussock grass open forest of the NSW South Western Slopes Bioregion by 1.26 ha and to the White Box – Blakeley's Red Gum – Yellow Box grassy woodland of the NSW South Western Slopes Bioregion by 0.28 ha.

As a result of these changes, the offset requirements for the Project were recalculated in accordance with the OEH Major Projects Offset Policy (OEH 2011) and the SEWPaC *EPBC Act 1999 Environmental Offsets Policy* (SEWPaC 2012). As outlined in Appendix 8, a preferred offset property has been selected, and an “Option to Purchase” agreement has been entered into with the landowner. Even with the inclusion of additional impacts associated with APR, this proposed offset property exceeds the offset requirement for the EEC White Box – Blakeley’s Red Gum – Yellow Box grassy woodland (Appendix 8).

**Cultural Heritage Assessment of APR:** The Proponent also commissioned New South Wales Archaeology Pty Ltd (NSW Archaeology) to assess the proposed route along APR, by undertaking a European and Aboriginal Cultural Heritage Assessment. As described in their report, NSW Archaeology performed a comprehensive assessment of the potentially impacted areas, noting that the “proposed impacts are discrete in nature and will occupy a very small footprint within the overall area of Aarons Pass Road”.

In performing the assessment, NSW Archaeology conducted a pedestrian traverse survey with the assistance of a representative from Wellington Valley Wiradjuri Aboriginal Corporation, and inspected the entirety of each proposed impact area. Further notifications were also made to all Registered Aboriginal Parties.

As a result of that detailed survey, NSW Archaeology found that, in relation to Aboriginal heritage items, “No Aboriginal heritage items were recorded. Furthermore, all impact areas are assessed to be of very low archaeological potential...” and that “[t]he survey results confirm the predictions of very low density artefact distribution. Accordingly, it is concluded that the proposed impacts to the archaeological resource can be considered to be of correspondingly very low significance.” NSW Archaeology also found that “[n]o European heritage items are present in the proposed impact areas.”

Finally, following on from the survey, NSW Archaeology concluded their assessment with a recommendation “that there are no heritage constraints in regard to the survey area along Aarons Pass Rd.”

A copy of the full report by NSW Archaeology may be found in Appendix 9.

**Community Consultation along APR:** On receipt of the findings of the technical and environmental assessments of APR, the Proponent identified 26 freehold landowners with land adjacent to, or with access from APR, as well as Crown land and land owned by MWRC.

Contact was made with all 26 freehold landowners and Crown land during the week commencing 1<sup>st</sup> July 2013 by telephone, where possible, and subsequently via letter. Each letter encouraged the recipient to review the Project EA and supporting documentation, and briefly outlined:

- The Project parameters;
- The consideration of the APR transport route following submissions received in response to the EA;
- The need for minor upgrades along APR;



- An outline of the construction timeframe, including peak periods, and requirement for an EMP sub-plan (Traffic Management Plan) to be implemented prior to construction commencing;
- Where applicable, specific information detailing potential road upgrade works adjacent to their land; and
- A map with respect to each land holding to provide clarity.

Table 17 summarises how contact was made with each of these landowners, their general response, specific issues identified, and how the issues are addressed.

**Table 17** Consultation with landowners on Aarons Pass Road

Landowners	Contact Method		General Response	Specific Issues Raised	How Issues are Addressed
	Phone / In person	Letter			
<b>26 Freehold Landowners</b>	21	26	11 Positive 7 Neutral <sup>1</sup> 3 Negative <sup>2</sup> 5 No responses	- Appropriate traffic management protocols - Road maintenance - Dust suppression - Tree clearance - Impacts to overhanging trees	SoC 022 SoC 024 SoC 066 SoC 069
<b>Crown Land</b>	1	1	Positive	None	n/a
<b>MWRC</b> <i>(in the Council's capacity as a landowner)</i>	1	-	-	No comments made with respect to the MWRC land adjacent to APR	n/a

1. General comments made regarding traffic management.
2. Concerns raised regarding the use of APR and against the wind farm development.

**Limitations:** Use of APR with minimal disruption to local road users is feasible with recommended upgrades. Impacts that have been considered and addressed include opportunities for local traffic to pass Project related vehicles and potential dust generation along the route.

**Traffic Management:** Where over-dimensional vehicles would require the use of the full carriageway width on APR, traffic management will be implemented, including temporary, short-term full road closures ('rolling' road closures as vehicles pass critical locations). This process will be aided by the provision of passing bays at regular intervals along APR. Approximately 40 potential passing bays requiring minimal vegetation clearing or road works have been assessed and are proposed along the APR transport route.

In submissions regarding the Project EA, it is noted that a number of concerns were raised regarding construction traffic impacts on livestock movements on rural roads. This concern will be addressed in an EMP sub-plan, which will deal with all specific traffic conditions and impacts on road users, including impacts on livestock movement and emergency services. Emergency vehicle access would be addressed in consultation with RMS and emergency services. The RMS permit system also incorporates incident management. Livestock movements along roads will be addressed in an EMP sub-plan and will include measures such as making drivers aware of the potential to encounter livestock and adherence to safe driving practices at all times.

**Dust suppression measures:** Dust suppression is a key consideration during the construction and use of both public and internal access roads. A permit will be sought from the NSW Office of Water (NOW) for the extraction of the required quantity of water to enable the construction and dust suppression of up to 50 km of new and upgraded internal access roads and the 20 km of APR that will be utilised by over-dimensional vehicles for site access. If on-site water cannot be sourced from within the Project area, then water will be brought into the site from appropriate suppliers (Section 17.5.1, Project EA).

The expected quantities of dust produced as a result of construction will be appropriately managed in accordance with an EMP sub-plan. This sub-plan will be implemented to control potential air pollution, including the primary sources of emissions; dust, plant and vehicle emissions and odour.

### **Alternative Routes Considered**

Project design and development, including aspects such as construction traffic and transport is an iterative process, based on consideration of impacts, constraints, suitability and financial viability. Community and Council input into those considerations has been a critical part of developing the current revised over-dimensional construction routes, as has the technical expertise provided by Rex J Andrews and Downer Infrastructure. As a result of this iterative process, a number of routes were considered, and deemed to be unfeasible, these are listed below.

**Hill End Road to Pyramul Road and APR via Windeyer Road:** This route comprising approximately 53 km of MWRC's road network was previously assessed in detail for the Project EA, and at the time was considered a feasible option subject to road upgrades. However, in response to issues and concerns raised by MWRC and community members with specific respect to its current sub-standard condition and the requirement for significant upgrade works, the route was re-surveyed, and alternative route options identified. It has now been determined that the road works required in order to utilise this route would create significant delays to local traffic, including the requirement to upgrade five bridges. During component transport there would also be few opportunities for local traffic to pass Project traffic due to the narrow carriageway along much of the route. It is considered that this route would be adequate for light vehicles (cars) and smaller transport vehicles and could be used as an alternative route for these vehicles.

**Gulgong via Medley Street:** During route surveys Rex J Andrews and Downer Infrastructure determined that the corner and road surface at the Medley Street intersection were suitable for over-dimensional vehicles with only minimal works. However, during discussions with MWRC on 11<sup>th</sup> July and 24<sup>th</sup> September 2013 concerns were raised with regard to the intersection, and as a consequence MWRC requested a diversion onto Goolma and Guntawang Roads. Use of these roads by over-dimensional vehicles was subsequently assessed and the route was agreed to.

**Market Street left turn onto Cox Street, right turn onto Short Street, right turn onto Douro Street:** As discussed above, this route provided a suitable alternative for over-length vehicles carrying blades > 50 m to avoid a right turn from Market Street onto Douro Street. However, as a result of consultation with MWRC, and concerns that were raised with the Douro Street / Horatio Street intersection, this route was redesigned, resulting in Route Option 2.

**Ulan Road from the Golden Highway:** Rex J Andrews and Downer Infrastructure determined that impact minimisation could be achieved by using Ulan Road for over-length vehicles only. It was determined that the road was of a suitable standard for use of these vehicles, given their dimensions. However, during discussions with MWRC on 11<sup>th</sup> July and 24<sup>th</sup> September 2013 concerns were raised regarding use of Ulan Road. In response to MWRC's concerns, the Proponent removed Ulan Road as an option for over-length vehicles.

**Castlereagh Highway, left turn onto Putta Bucca Road, right turn onto Henry Lawson Drive, right turn onto Ulan Road, left turn onto Lue Road, right turn onto Rocky Waterhole Road, left turn to rejoin the Castlereagh Highway:** This route, which bypasses Mudgee, was identified through the PPR consultation process. Assessment determined that the route and road surfaces would be technically suitable for over-dimensional vehicles, however works would be required at three intersections; notably the left hand turn from Ulan onto Lue Road, the right hand turn from Lue onto Rocky Waterhole Road, and the left hand turn from Rocky Waterhole Road onto the Castlereagh Highway. Utilisation of these intersections would require works on freehold land at each intersection. Further, the extent of upgrade works required for the left hand turn from Ulan onto Lue Road has the potential to impact on a footpath and the visual amenity of the Mudgee township, and in particular, disruption to the landscaping that has been developed on the approach into town. Moreover, given MWRC's concerns regarding impacts to Ulan Road, it was also considered that use of even a short section of the road would not be appropriate.

#### **6.4.4 Standard heavy vehicle transport routes**

A number of route options have been identified for the balance of vehicle movements, including SHVs (see Figure 6.4 below). Consideration of a number of route options provides flexibility for sourcing materials, and allows scope for contractors and businesses from around the region to be engaged in Project construction. As such, as well as three routes identified for use by SHVs, Route Option 1, including Castlereagh Highway and APR may also be utilised by SHVs. Furthermore, both the southern and northern site access points will be used for the balance of SHVs.

Proposed SHV transport routes for the Project include:

**SHV Route A:** From Bathurst. Gilmour Street, continue into Sofala / Peel Road and left turn into Hill End Road.

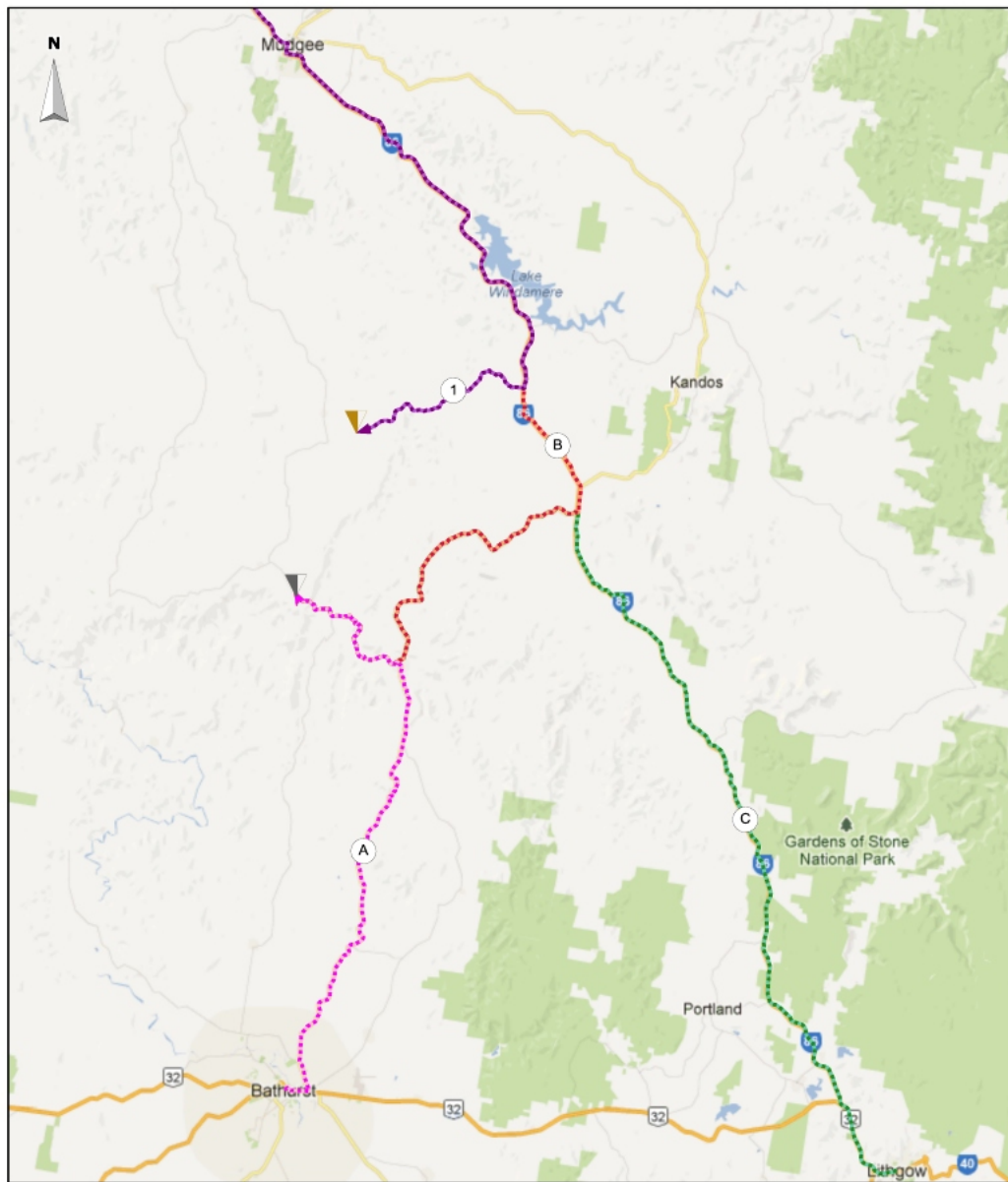
**SHV Route B:** From the North. Castlereagh Highway, right turn into Ilford – Sofala Road and right turn into Hill End Road.

**SHV Route C:** From the South. Castlereagh Highway, left turn into Ilford – Sofala Road and right turn into Hill End Road.

**Route Option 1:** From the north. As per Section 6.4.3 above.

It is noted that upgrade works on Sofala Road are currently being undertaken (relevant to Routes A and C). BRC have confirmed that these works are expected to be completed in the next 12 - 18 months (*pers. comm.*, Simon Armitage, BRC Engineer, 2013). As such, it is anticipated the road will be of higher grade for construction purposes, and significant works on the road (BRC upgrade works and Project construction traffic) will not coincide. As per all routes that are utilised by Project related

traffic, any damage resulting from Project construction vehicles will be repaired as per Statement of Commitment 024.



<b>LEGEND</b> <b>Standard Heavy Vehicle Route Options</b> Route A Route B Route C Route Option 1  <b>The Project</b> Northern Site Access Point Southern Site Access Point  <small>Background Imagery: Google Maps; All other data: Google Maps, WRCWP</small>	<b>COMPANY</b> CRUDINE RIDGE WIND FARM PTY LTD		
	<b>TITLE</b> FIGURE 6.4: PROPOSED STANDARD HEAVY VEHICLE ROUTE OPTIONS FOR PROJECT CONSTRUCTION		
DATE 09 NOV 2013	SCALE 1:450000	DWG NO FIGURE 6.4	REV A
DRAWN BY S ISHERWOOD	CHECKED BY E MOUNSEY	SHEET 1 OF 1	JOB NO 080401
			VER 1
			SIZE A4

**Figure 6.4** Proposed standard heavy vehicle route options for Project construction

Please refer to Appendix 3, Section 3.2.4 for more detail.

### Transport of Construction Materials

The major construction materials to be transported by SHVs include gravel / road base for construction of site access roads, constituent materials for the on-site concrete batching plant, steel reinforcement deliveries for foundation construction, steel strands and cabling for the transmission lines, and other miscellaneous materials deliveries for site offices and the like.

Construction material delivery typically generates the following traffic volumes:

**Concrete:** Assuming wind turbine foundations will require slab (gravity) foundations, each tower would require approximately 250 m<sup>3</sup> of reinforced concrete. It is likely that this would be prepared at onsite batching plants and delivered to foundation sites via the internal site network. At 6 m<sup>3</sup> per load, it is estimated that 42 truck loads or 84 truck movements per foundation site would be required during a single day pour. These movements would not require use of the external public road network.

If, however, on-site concrete batching plants are unable to provide the available concrete, pre-mixed concrete would be sourced from local businesses in Mudgee, Bathurst or other nearby centres. If pre-mixed concrete is transported to the Project site, the above traffic generation would use the public road network and the southern and northern site access points (see Appendix 3 for more detail).

Where on-site concrete batching is used, delivery of constituent materials such as cement, sand and aggregate for the batching plant is estimated to require 20 truck loads per week resulting in 40 truck movements per week. This may be reduced if suitable local material such as aggregate and sand is able to be sourced on-site. In addition, it is estimated that some ten truck loads per week (20 truck movements per week) would be required to deliver steel reinforcement material. To benefit the reader, transport movements associated with delivery of constituent materials have been excluded from 'worst case' transport volume estimates. This exclusion reflects the more conservative, and worst case inclusion of providing pre-mix concrete to the Project site (see estimates above). Higher traffic volumes are associated with this alternative. While a worst case scenario has been assessed, it is more likely that on-site concrete batching will occur (see Table 18).

**Water:** Water requirements will be met from within the locality where possible. Where available, groundwater will be purchased from involved or adjacent properties. The use of Windamere Dam may also be an option. If water cannot be sourced locally, it will be brought to site by external water suppliers under contract to the Project. It is conservatively estimated that in the order of 8.9 megalitres (ML) of water would be required to produce the quantity of concrete required for gravity footings for foundations. By way of comparison, it is estimated that only 2.8 ML of water would be required if standard rock anchors were used for all footings. It is estimated that a further 11.7 ML of water would be required for road construction and dust suppression activities.

On conservative assessment of these figures, it is estimated that transport of water from an external source to the Project site would require an average of some 50 truck loads per week (100 two way truck movements per week) throughout the construction period (see Appendix 3). It is assumed that water delivery to site would be split equally from the north and the south to the southern and

northern site access points. There would also be deliveries to unsealed sections of the public road network during initial upgrade works.

Water carts for dust suppression may also be required on the internal road network and along APR, the number of trips dependant on the site conditions at the time of construction.

**Gravel / Road Base:** Construction of the internal road and network, crane hardstands and any upgrades required to sections of the public road network will require delivery of road base material. Assuming 6 m wide road formations and 250 mm depth of material, it was estimated that approximately 75,000 m<sup>3</sup> of material would be required (see Appendix 3). It is assumed that half of this could be sourced onsite from foundation excavations and quarry. As such, it is predicted that some 1,500 truck loads over the course of the construction period (or 250 loads per month over an initial 6 month construction period) would be delivered to the Project site. Again, it is assumed that these deliveries would be split between the northern and southern routes, using both the southern and northern site access points as required and appropriate.

#### ***6.4.5 Effect of construction phase traffic generation***

Worst case construction traffic generation was predicted by Samsa Consulting (2013). This assessment included wind turbine components, balance of plant materials, resource requirements and construction staff. In order to assess potential traffic impacts, construction period deliveries were categorised into two stages – moderate and conservative.

The moderate (average) scenario is likely to apply for the great majority of the 18 month construction period, while the conservative (high) scenario assumes that peak traffic generating activities would occur concurrently (including high construction staff numbers, concrete pours, access road construction and wind turbine component delivery). While the conservative scenario may occur for a discrete period, it is more likely that peak access road construction activities would be undertaken during the earlier stages of the construction program, and will not necessarily coincide with peak construction staff numbers or other peak construction activities such as concrete foundation pours. Nonetheless, this conservative overlap of activities was adopted to consider a worst-case scenario in addition to the more applicable moderate scenario.

Traffic generation was classified into daily movement trips (i.e. two-way trips, generally involving vehicles travelling to site in the morning, and returning at the end of the day), shown as vehicles per day (vpd) and peak hour trips (where applicable), shown as vehicles per hour (vph). Traffic was also categorised by activity, including activities such as pre-mix concrete deliveries and steel reinforcement deliveries. Overall, estimates indicate that the moderate scenario traffic impact will contribute only approximately one third of the traffic volume that is estimated for the conservative scenario. Traffic generation for both the moderate and conservative (in brackets) scenarios is shown in Table 18 below and, in more detail, in Appendix 3.

**Table 18** Estimated Project related traffic generation

Vehicle Type vpd - based on two way trips vph - peak hour		Total Estimated Project Related Vehicles	
		Northern Site Access Point (via Route 1)	Southern Site Access Point (via Routes A and / or C from the south and Route B from the north)
Light vehicles	vpd	40 (80)	40 (80)
(Construction staff)	vph	20 (40)	20 (40)
Standard heavy vehicles <sup>1</sup>	vpd	12 (70)	24 (80)
(Miscellaneous construction)	vph	2 (14)	5 (16)
Over-dimensional vehicles <sup>2</sup>	vpd	0 (10)	0 (0)
(Wind turbine components)	vph	n/a	n/a
<b>Total Vehicles<sup>3</sup></b>	<b>vpd</b>	<b>52 (160)</b>	<b>64 (160)</b>
	<b>vph</b>	<b>22 (54)</b>	<b>25 (56)</b>

1. Use of pre-mix concrete for wind turbine foundations is a worst case impact, as such deliveries of this material is assumed. It is more likely that concrete will be batched onsite, which would result in fewer deliveries for foundation material.
2. Ten over-dimensional vehicles per day will be split between Route Options 1 (over-size / over mass vehicles) & 2 (over-length vehicles only), and include return trips, empty. As such, neither route will accommodate all ten movements in a single day.
3. Totals along different routes do not necessarily coincide but are worst case figures for each vehicle type across the Project construction period.

Source: Appendix 3 (conservative estimates in brackets).

Where ten over-dimensional vehicle trips per day are conservatively estimated, these trips need to be further defined. Community concern over this matter has been heightened by misrepresentations (see Section 6.8.2), and therefore a clear explanation is required. The ten over-dimensional vehicle trips per day also encapsulate the return trips for these vehicles. A worst case scenario of six loaded over-dimensional vehicles per day travelling to the Project site and split between Route Options 1 and 2 (depending on the component being transported) is likely. However, vehicles returning (empty) will no longer be over-length or over-mass owing to either their load having been deployed on-site and / or due to the articulated capacity of their trailer sections. As such, there will be fewer over-dimensional vehicles on the return trip. Furthermore, it is possible for these vehicles to make use of routes via Sydney back to Newcastle or via Route Option 1 to return to Newcastle.

The potential impacts on Route Option 2 have also been misrepresented (see Section 6.8.2), causing community concern. Only over-length vehicles carrying wind turbine blades are proposed to travel along Route Option 2. That is, three vehicles per wind turbine, with up to three wind turbines being delivered to site per week. As such, it is expected that impacts associated with over-length vehicles on Route Option 2 will be minimal, and existing traffic volumes are unlikely to significantly increase. It was estimated that the addition of Project related traffic along Route Option 2 would result in less than a 1 % increase in traffic flows along those roads (Appendix 3). Further, if vehicles travel through the Mudgee urban area in convoys of two, there is the potential to reduce travel times in the urban area, and therefore delays and traffic impacts. This is particularly pertinent to residents along Route Option 2, where use of convoys would reduce impact events to one (maximum two) per day.

**Road Capacity:** These traffic estimates indicate that the operating conditions (LoS) along the rural road network will only change marginally from existing conditions, even after the addition of the conservative scenario (maximum peak) Project generated construction traffic (see Table 19). The minor roads of the rural road network under consideration have significant spare capacity and are operating at high levels of service (LoS A). While most of the major roads have lower levels of service (LoS C / D), their levels of service are still considered to be acceptable as they approach or are within major urban centres. For the major road network, the addition of Project related traffic to existing traffic volumes is small, ranging from 1 - 3 %. This increase would be well within any daily or seasonal variations of average daily traffic flows along the road network.

**Table 19** Rural road network capacity - existing and potential LoS

Road Section	Existing LoS	Potential LoS with Project traffic
<i>Northern Site Access Point</i>		
Castlereagh Highway	C	C
Goolma Road	B	B
Aarons Pass Road	(n/a)	(n/a)
<i>Southern Site Access Point</i>		
Great Western Highway	C / D	C / D
Sofala / Peel Road	A	A / B
Castlereagh Highway	C	C
Ilford / Sofala Road	A	A / B
Hill End Road	A	B / C

Source: Appendix 3.

For urban roads, the LoS is largely defined in terms of average travel speed rather than actual road capacity (see Appendix 3). Along the Mudgee and Bathurst urban road networks potentially used as route options for heavy and over-dimensional vehicles, addition of Project generated traffic would constitute increases in traffic volumes as outlined in Table 20 below.

**Table 20** Urban road network capacity - Project related traffic impacts

Road Section	Additional traffic generated (vpd)	Increase in existing traffic volumes	
<i>Northern Site Access Point</i>			
Mudgee	Market Street	< 1 %	
	Douro Street	< 1 %	
	Short Street	< 1 %	
	Lawson Street	Approx. 1.9 %	
	Horatio Street	< 1 %	
	Mortimer Street	Estimated 1 %	
	Burrundulla Ave	Estimated 1 %	
<i>Southern Site Access Point</i>			
Bathurst	Gilmour Street	180 (peak)	Approx. 3.4 %



Based on the analysis of both the rural and urban road network capacities, it was determined that the addition of heavy vehicles and construction staff traffic during peak construction periods is able to be absorbed by the both the rural and urban networks with appropriate road infrastructure upgrades and construction traffic management.

## 6.5 Potential Impacts - Operation and Maintenance

Operational traffic will be restricted to maintenance and inspection vehicles, or other traffic use (e.g. visitors), which will make periodic visits to the site, as discussed in the Project EA. Vehicles used will be standard 4WD vehicles, sedans or vans. Bulldozers / graders could be needed on an infrequent basis for maintenance of access roads during the life of the Project, which will allow for continued maintenance and inspection.

Further, if a significant component of a wind turbine needs replacement, larger vehicles such as cranes and / or semi-trailers could be required, similar to that used during construction. As with the construction phase, permits or licences required for access to the Project site by any over-dimensional vehicle during operation would be obtained from the relevant bodies.

## 6.6 Potential Impacts - Decommissioning

At the end of the operational life of the Project, the wind turbines and all above ground infrastructure will be dismantled and removed from the site. The tower bases would be cut back to below ploughing level or topsoil built up over the footing to achieve a similar result. The land will be returned to prior condition and use as far as practicable.

In general, the traffic and potential impacts will be similar to the construction phase of the Project. However, there will be less traffic volume as there will be no requirement for concrete mixer trucks, which in turn will reduce the potential impacts during decommissioning.

## 6.7 Potential Impacts - Cumulative

An assessment of cumulative environmental impacts considers the potential impact of a proposal in the context of existing and future developments to ensure that any potential environmental impacts are not considered in isolation. The main source of traffic within and around the Project is currently from agricultural activities and a small number of residential dwellings.

During construction, traffic levels will increase impacts; however, the Project may be built in stages, which would limit the number of roads that are impacted during the construction phase, thereby reducing cumulative impacts. During the operation phase, a small increase to existing traffic volumes can be expected resulting in a low level of cumulative impact.

The Project is of sufficient distance from Uungula Wind Farm and other existing and proposed wind farms that it is anticipated that there will be no increase to the volume of traffic on roads within the vicinity of the Project. Cumulative impacts would only result if the construction of one or more wind farms was to occur in parallel. Impacts would be localised to main arterial routes, such as the Castlereagh Highway, which should be able to accommodate the short-term increase in vehicle numbers.

Other major developments (including Highway upgrades and coal projects) in the region were considered in relation to the Project construction period and cumulative impacts (see Appendix 3). As the construction and operation timelines for these projects are, at this stage, uncertain, the potential for cumulative impacts to occur should be reassessed in the pre-construction phase of the Project, as part of the CEMP. Typical mitigation measures to alleviate cumulative impacts of developments include:

- Independent scheduling of construction activities and deliveries for each project so that they do not overlap in order to minimise road transport movements;
- Region-wide traffic management;
- Shared road infrastructure upgrade works;
- Targeted dilapidation and reinstatement programs; and
- Collective community consultation programs.

## 6.8 Consultation

Consultation regarding the potential Project construction transport routes has occurred progressively. As detailed in the EA, input from individuals, local Councils and government agencies is important during the development of the Project in order to mitigate adverse impacts to the local community as far as practicable.

As revised transport routes have been developed in response to the feedback received through the Public Exhibition phase, feedback has been sought and / or received from:

- Mid-Western Regional Council;
- Residents in the Mudgee urban area;
- Residents along Aarons Pass Road;
- Residents in the vicinity of the Project; and
- Roads and Maritime Services.

### 6.8.1 Mid-Western Regional Council

Subsequent to receiving MWRC's submission on the Project EA, the Proponent undertook additional assessments of all available transport route options to the Project site and presented these findings to MWRC representatives on 11<sup>th</sup> July 2013. Following this date the Proponent submitted to the DoPI (for distribution to key agencies) a Draft PPR for consideration which reflected changes to the transport routes. On receipt of MWRC's draft response to the Draft PPR, the Proponent and MWRC agreed to a further meeting on 24<sup>th</sup> September 2013 to discuss the proposed changes to the transport routes and their respective merits. The meeting on 24<sup>th</sup> September 2013 was also attended by representatives from Rex J Andrews and Downer Infrastructure. Sections 6.4.3 and 6.4.4 detail MWRC's concerns, the Proponent's responses and the resulting preferred transport routes.

In addition to discussions regarding optimal transport routes to the Project site, MWRC maintain a position that any required upgrade works on MWRC maintained roads are to be undertaken by MWRC. The Proponent recognises this position, however, has concerns with regard to the private financing and construction of the Project and the need for stringent controls over Project delivery programs and budget. This is a matter recognised by RMS in their issuance of Works Authorisation

Deeds which permit the development company to undertake works on State roads for these circumstances. The Proponent proposes to undertake works in accordance with Statements of Commitment 021 to 027 with regard to Traffic and Transport impacts.

### **6.8.2 Residents in the Mudgee urban area**

On 12<sup>th</sup> July 2013 the Proponent submitted a Press Release to the local newspaper (Mudgee Guardian) informing the local community of the then proposed alternate routes, temporary impacts that may be experienced, and measures that will be used to mitigate those impacts. Two maps were also provided which presented routes including Ulan Road, Cox Street, Short Street, Lawson Street and APR (although the maps were not included with the Mudgee Guardian article printed on the 15<sup>th</sup> July 2013). The Press Release and maps were uploaded to the Project website ([www.crudineridgewindfarm.com.au](http://www.crudineridgewindfarm.com.au)) and readers were encouraged to make contact with the Proponent.

On 13<sup>th</sup> and 14<sup>th</sup> July 2013 the Proponent held a show stand at the Mudgee Small Farm Field Days event on the outskirts of Mudgee. Three staff members were on hand to discuss and answer question on all aspects of the Project, including the revised routes discussed above. Maps of the alternate routes were made available to assist those discussions.

No specific feedback was received by the Proponent following the Press Release and subsequent inclusion of an article in the Mudgee Guardian on the 15<sup>th</sup> July 2013. Submissions were, however, made through the Project website from regional service providers registering their details through the Proponent's online contractor register. To date, this register has attracted 50 businesses offering a range of services to the ongoing development and construction of the Project.

Subsequent to the Proponent's meeting with MWRC on 24<sup>th</sup> September 2013, a number of articles appeared in the Mudgee Guardian and Gulgong Advertiser stating MWRC's opposition to both the Project and the proposed transport routes. The Proponent notes that a number of the details MWRC provided in these articles were incorrect, and at times misrepresented the Project. These include:

- Photographic representations of wind turbine components, including a wind turbine nacelle. The image that appeared in newspapers displayed a nacelle from a 6 megawatt (MW) Siemens offshore wind turbine which extends an additional 3 m in height and over 2 m in width than their alternative 3 MW onshore model more suited to the Project;
- Ongoing suggestion that no road upgrades will be undertaken whatsoever. This is despite repeated reassurance from the Proponent that upgrades will be undertaken prior to construction wherever required to make transport routes fit for purpose;
- Ongoing assertions that MWRC rate payers will have to contribute to the maintenance of roads affected by Project traffic. The Proponent's position has been clear on this matter since the earliest dealings with MWRC which was clearly articulated in the commitments made in the Project EA submitted in November 2012;
- Exaggeration of direct and cumulative delays in the Mudgee urban area. During discussions held in the 11<sup>th</sup> July 2013 meeting, traffic management procedures were discussed, with specific reference to minimising impacts through the Mudgee urban area. A route survey report provided at that meeting noted that the Douro Street / Horatio Street intersection would produce the most significant delay for the routes proposed - taking up to five minutes for an

over-length vehicle to navigate. In order to avoid this delay, an alternative route for over-length vehicles (carrying blades > 50 m) was identified and is proposed. Since this meeting, MWRC have repeatedly asserted that 20 minute delays will occur at every intersection through Mudgee. This assertion has also been extrapolated to magnify potential delays as a result of queuing, despite continued discussions regarding the efficiency with which over-dimensional vehicles can navigate intersections; and

- An assertion that the Proponent “does not believe there will be any impact at all on the residents or our community”, despite discussions to date detailing how impacts to road users can be minimised.

Aspects of the above were incorporated into a cover letter and form letter (Appendix 11) sent by the General Manager of MWRC, Warwick Bennett, to residents along the proposed transport routes through Mudgee. Letters sent by the General Manager were targeted at leveraging support for the General Manager’s position that the Project should be re-exhibited due to the nature of the changes to the Project. Specifically, the cover letter referred to 16 over-dimensional vehicle movements travelling through the urban streets of Mudgee, six days per week. This is an incorrect and misleading summation of the impacts which were known to the General Manager at the time with regard to information presented in the Draft PPR, and its Addendum, Appendix 4.

It was advertised that 500 cover and form letters were sent to residents, of which 72 (15 %) were returned. Moreover, of these 72, 29 (6 %) were returned with additional arguments or comments. Feedback from these letters and the Proponent’s responses are summarised below. However, given the ongoing misrepresentation of the Project and proposed transport routes by MWRC’s General Manager prior to seeking comment from residents, many concerns raised are misguided (Table 21).

**Table 21** MWRC’s form letter to residents along proposed transport routes - feedback and responses

Feedback	Response
<p>Socio-economic impacts to businesses, particularly accommodation and tourism businesses; questions regarding compensation for loss of earnings were also raised.</p>	<p>While some level of inconvenience and disturbance will be unavoidable, the following factors will significantly minimise impacts:</p> <ul style="list-style-type: none"> <li>- A construction period of 18 months is anticipated, and a much shorter period of over-dimensional vehicle transport;</li> <li>- Vehicles will be travelling through Mudgee at defined times of the day only;</li> <li>- The proposed ten vehicle trips per day through Mudgee include approximately six to site and four return trips. Return trips will comprise empty vehicles which will be able to return via the Castlereagh Highway either north through Mudgee or south to Sydney;</li> <li>- It is anticipated that vehicles will require approximately 15 minutes to travel through the Mudgee urban road network.</li> <li>- It is similarly anticipated that vehicles will require approximately one minute to navigate each corner; and</li> <li>- Vehicles will only travel through Mudgee during daylight hours. No night time transport will occur within Mudgee.</li> </ul> <p>Further, traffic management procedures will control vehicle</p>

Feedback	Response
	speeds, and provide for a transport “Code of Conduct” to which all drivers are required to adhere.
The structural suitability of Route Option 2 and MWRC / ratepayer exposure to cover the cost of upgrades and repair.	<p>Only over-length vehicles are proposed for Route Option 2. Such vehicles are designed to minimise the impacts of loads on road infrastructure, through the use of multiple axles and wheels. These generally have gross weights of between 6.5 and 8.5 tonnes per axle.</p> <p>Regardless, a structural review of the final transport routes will be undertaken prior to construction, and the Proponent has committed to maintenance and road repairs as required, and as stated in SoC 024.</p>
<p>The need for suitable traffic controls for community safety, with particular regard to children, including:</p> <ul style="list-style-type: none"> <li>- speed of vehicles;</li> <li>- appropriate signage (diversion routes);</li> <li>- appropriate measures with regard to temporary removal of and impacts to existing road signage and / or furniture; and</li> <li>- enforceable control measures.</li> </ul>	<p>An EMP sub-plan will be developed pre-construction, this will typically include:</p> <ul style="list-style-type: none"> <li>- Scheduling of transport deliveries outside of school bus route hours;</li> <li>- Community consultation, notification and issue logging;</li> <li>- Preparation of a “Transport Code of Conduct” for all staff and contractors; and</li> <li>- Procedures to monitor traffic impacts and respond to impacts rapidly.</li> </ul> <p>Route specific issues, including timing, and impacts on amenities can be addressed in consultation with Councils and RMS in the pre-construction phase.</p> <p>All over-dimensional transport requires permits and / or licences. These permits have inherent measures of enforceability.</p>
Requests to re-assess alternative routes, including rail.	<p>A thorough analysis of all possible over-dimensional road transport routes has been undertaken, and results are presented in Section 6.4.3. Rail transport of all construction materials has also been assessed. Results of this assessment are summarised in Appendix 3.</p> <p>The preferred over-dimensional transport route has been selected to minimise impacts to road users and infrastructure to the greatest extent possible.</p>
Main routes into and out of Mudgee will be compromised.	<p>There are sufficient pull off bays along the Castlereagh Highway north and south of Mudgee to allow over-dimensional vehicles to pull off the road and allow local traffic to pass. Further, the LoS along both the rural and urban road networks are expected to change only marginally with the contribution of even a conservative estimate of Project traffic generation. As such, Project traffic is not expected to create significant impacts (Appendix 3).</p> <p>An alternative route, skirting the Mudgee urban area, was</p>

Feedback	Response
	investigated; see Section 6.4.3 for a summary of the findings of that investigation.
A belief that streets will be blocked for extended periods of time (in particular, Route Option 2) which would create delays and potentially affect emergency vehicle access.	<p>While there will be over-length vehicles utilising Route Option 2, vehicles will not be stopping within the Mudgee urban area. These vehicles will be run with escort and pilot vehicles, which will allow for “rolling” traffic management of the route.</p> <p>Speed limits will be reduced, and it will take approximately one minute for vehicles to navigate corners, however, given the gridded road network of Mudgee, local traffic will have ample opportunities to avoid Project related vehicles.</p>
Impacts to heritage listed buildings along Route Option 2 due to over-mass movements.	<p>Only over-length vehicles are proposed for Route Option 2. Such vehicles are designed to minimise the impacts of loads on road infrastructure, through the use of multiple axles and wheels. These generally have gross weights of between 6.5 and 8.5 tonnes per axle.</p> <p>Heavier vehicles will remain on the RMS Route Option 1.</p>
Difficulties entering / exiting residential properties along Route Option 2.	<p>While there will be over-length traffic utilising Route Option 2, vehicles will not be stopping within the Mudgee urban area. Speed limits will be reduced, and it will take approximately one minute for vehicles to navigate corners, however, other than these rolling delays, impacts on use of driveways is unlikely.</p>
Concern regarding the number and frequency of vehicles travelling along Route Option 2.	<p>Only wind turbine blades are proposed for Route Option 2. That is, three vehicles per wind turbine, with up to three wind turbines being delivered to site per week. As such, the number of vehicles proposed for Route Option 2 is minimal, and does not present a significant increase to the existing traffic volumes – less than 1 % increase in traffic flows along most of the roads being proposed (Appendix 3).</p>
Requests to notify residents with a schedule of over-dimensional traffic flow to allow free movement of urban traffic.	<p>An EMP sub-plan will be developed pre-construction, this typically includes:</p> <ul style="list-style-type: none"> <li>- Scheduling of transport deliveries outside of school bus route hours;</li> <li>- Community consultation, notification and issue logging;</li> <li>- Clear communication of road closures (if required);</li> <li>- Letterbox drops along transport routes; and</li> <li>- Minimising disruption to local traffic by ensuring average and maximum times.</li> </ul> <p>These measures will ensure that impacts from Project related traffic are minimised to the greatest extent possible.</p>
Potential impact of noise, pollution and dust from proposed vehicles.	<p>A conservative estimate of Project related traffic generation is expected to constitute a negligible increase in traffic flows</p>

Feedback	Response
	through the Mudgee urban area. As such, associated noise, pollution and dust impacts would be expected to be within an existing range of seasonal variation. (Note, there are no unsealed roads in the vicinity of the Mudgee urban area, so dust generation will be minimal). No overnight transport of components is proposed, and as such, there will be no impacts on night time amenity.
Need to cross over onto alternate sides of the road to navigate turns.	Over-size and over-mass vehicles will be able to navigate all corners along Route Option 1 without use of the full road width. Over-length vehicles will require use of the full road width to navigate corners along Route Option 2. However, with rolling traffic management (escort vehicles managing traffic movements, and in radio contact with over-dimensional vehicles), it is expected vehicles will require approximately one minute to navigate corners. Due to the short time periods, and the ability for local traffic to use alternative roads, it is not expected that using the full road width will create undue impacts at any point.

The Mudgee Guardian ran an online poll from 21<sup>st</sup> October 2013 which asked the question “*Should oversized and overweight trucks carrying components for the Crudine Ridge Wind Farm travel through town streets?*”. Despite being anecdotal only, and despite the ongoing misrepresentation of the Project and transport routes by MWRC, and 500 letters to residents, a snap-shot of results taken on 15<sup>th</sup> November 2013 display broad support for route options being proposed for the Project.

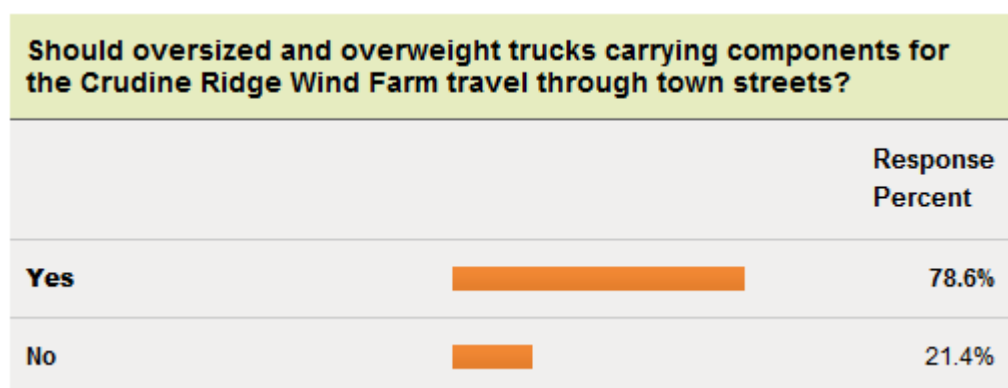


Figure 6.5 Mudgee Guardian poll regarding proposed transport routes for the Project

### 6.8.3 Landowners along Aarons Pass Road

Targeted consultation was undertaken with landowners owning properties along APR in July 2013; this is outlined in Section 6.4.3.

### 6.8.4 Residents in the vicinity of the Project

On 15<sup>th</sup> July 2013 the Proponent participated in the second Crudine Ridge Wind Farm CCC meeting at Pyramul Hall, Pyramul. In attendance were Margaret MacDonald-Hill (Independent Chair), Lisa Andrews, Lyell Miller, Vera Tomlinson, Max Price, Owain Rowland-Jones, Karen Croake, Esme

Martens, John Weatherley (MWRC), Mark Lyndon (MWRC), Ed Mounsey (WPCWP) and Siobhan Isherwood (WPCWP). The Proponent provided a summary of the submissions received for the Project EA and discussed the then proposed alternative transport routes to be put forward in this PPR.

In the week commencing the 22<sup>th</sup> July 2013, the Proponent organised for a Newsletter mail drop to occur in the proceeding weeks (Newsletter #4). It was intended to target areas surrounding both the Project and APR. The Newsletter included details of the then proposed alternate transport routes with the aim of notify the wider Pyramul community of the proposal and changes that had been made to the transport routes. The Proponent also forwarded information to the Chair of the CCC, Margaret MacDonald-Hill, for distribution to all committee members. Contact phone, mail and web details for the Proponent were included, to allow for direct contact by the local community where preferred.

### **6.8.5 Roads and Maritime Services**

Feedback on the EA provided by the RMS, and the Proponent's responses are summarised in Section 3 of this report. To summarise, however, a number of concerns were raised regarding the then proposed over-dimensional transport route; along Hill End / Windeyer / Pyramul Roads, and north from Sydney along Bells Line of Road.

In a letter dated 27<sup>th</sup> August 2013 subsequent feedback was provided by the RMS on the Draft PPR. In this correspondence, RMS state they will not object to the Project, and raise no concerns regarding the revised transport routes including Route Option 1, and variations Routes 1a and 1b summarised in Appendix 4.

Pertinently, feedback that was provided included the following recommendations:

- Use of Variable Message Signs (VMS) on the Castlereagh Highway at approximately 250 m south and north of the turnoff onto APR during construction days. Final location of the VMS will require RMS approval prior to positioning and display; and
- Execution of a formal agreement in the form of a Works Authorisation Deed between the Proponent and RMS wherever the Proponent is required to undertake private financing and construction of works undertaken on State roads.

Further, RMS state that vehicles transporting loads will not be permitted to travel in convoys or platoons. While the Proponent recognises that this is a requirement along Highway routes, it is considered that there may be benefits in over-dimensional vehicles travelling through Mudgee in escorted convoys of two or more over-dimensional vehicles (subject to finalising Project parameters). Taking two vehicles through Mudgee convoy has the potential to reduce travel times in the urban area, and therefore delays and traffic impacts. This is particularly pertinent to residents along Route Option 2, where use of convoys would reduce impact events to one (maximum two) per day.

### **6.8.6 Public Exhibition**

The Proponent recognises that the transport routes proposed within this PPR are a variation to those presented in the Project EA. The Proponent supports the DoPI's decision to place the PPR on Public Exhibition for three weeks with specific regard to the revised transport routes.



## 6.9 Management and Mitigation

### 6.9.1 CEMP / Traffic Management

To ensure adequate road safety is maintained, a comprehensive Construction Environmental Management Plan (CEMP) sub-plan will be prepared in conjunction with the chosen transport contractor and relevant road authorities (including RMS and local Councils). The CEMP sub-plan would detail appropriate construction traffic controls and management measures, and all aspects would be implemented in co-ordination with RMS and local Councils where applicable. It is acknowledged that on occasions local traffic will be inconvenienced. However, the management measures within the CEMP sub-plan will endeavour to mitigate any impacts (see Appendix 3 for more detail).

The following mitigation measures address all Project impacts, from construction through operation to decommissioning.

### 6.9.2 Construction

- Contract a licensed haulage contractor with experience in transporting heavy and over-dimensional loads. The contractor would be responsible for obtaining all required approvals and permits from the RMS and local Councils and for complying with any conditions specified in the aforementioned approvals;
- Develop an EMP sub-plan in conjunction with the haulage contractor and road authorities to include, but not be limited to, the following:
  - Scheduling of deliveries, timing of transport, limiting the number of trips per day, and reducing traffic during school bus route hours, i.e., 7:00 to 9:00 am and 3:00 to 4:30 pm;
  - Undertaking community consultation before and during all haulage activities and providing a dedicated telephone contact list to enable any issues to be rapidly identified and addressed;
  - Letterbox drop along affected routes;
  - Minimising disruption to local vehicles by ensuring average and maximum wait times due to Project related traffic along local roads are kept to a minimum;
  - Managing the haulage process, including temporary, short term road closures, the erection of warning signs and / or advisory speed signs posted in advance of isolated curves, crests, narrow bridges and changes of road conditions;
  - Placing of speed limits on all roads that would be used primarily by construction traffic to reduce the likelihood of any accidents and reduce maintenance costs;
  - Designing and implementing temporary modifications to intersections and roadside furniture as appropriate;
  - Producing a Transport Code of Conduct which would be made available to all contractors and staff detailing traffic routes, behavioural requirements and speed limits;
  - Establishing procedures to monitor traffic impacts on public and internal access tracks during construction, including noise, dust nuisance and travel times, and to implement modified work methods to reduce such impacts where practicable;
  - Where reconstruction or provision of a temporary crossing is required over a creek or drainage structure, the design of this structure will be discussed with the relevant authority; and

- Reinstating pre-existing conditions, after temporary modifications to the roads and pavements along the route where applicable, in consultation with the relevant authorities.
- Implement all aspects of the EMP sub-plan in co-ordination with the RMS, local Councils and property managers;
- Prepare road dilapidation reports covering pavement and drainage structures in consultation with the RMS and local Councils for all transport routes before and after construction. Any damage resulting from construction traffic, except that resulting from normal wear and tear, would be repaired at the Proponent's cost. Alternatively, the Proponent may negotiate other forms of compensation for road damage with the relevant roads authorities as appropriate; and
- Consideration for establishing a transport pool for employees from nearby towns to minimise traffic volumes.

**Typical Route Upgrades:** Full structural upgrades are not normally required for wind farm access routes. Exceptions include where access is via an under-rated bridge, or where there are obstructions that overhang the road or limit the width of the vehicle / load that can pass. Mitigation strategies could comprise the measures detailed below.

Selection of these measures will be dependent on a full technical assessment by a qualified structural engineer which will typically occur during the detailed design phase of the Project, once dimensions and loads are known. For a more detailed assessment of the recommended upgrades for the over-dimensional routes options see Appendix 4, Volume 1.

**Road Surface:** Generally a minimum of 300 mm clearance for over-dimensional vehicles should be considered. Mitigation measures may include;

- Review of road camber, rise, fall and undulations;
- Placement of speed limits on roads to minimise stresses on road surfaces; and
- Use of temporary surfaces of crushed rock or similar material for on on-site roads. Vehicles are designed to, and capable of, travelling on unsealed surfaces, and this measure is normally adequate to prevent loaded vehicles becoming bogged.

**Road Width:** Over-dimensional vehicles require a road width of up to 5 m, which may be larger than the width of minor roads that service remote wind farm sites. Mitigation measures may include;

- Where road width is restricted (sealed or unsealed), clear sufficient vegetation from sides of the road to allow shoulders of crushed rock to be laid;
- Match the level of the surface preparation to that of the existing road to prevent tyre damage (and in the case of sealed roads, the break-up of the edge of the sealed section);
- Undertake a swept path analysis once the wind turbine model has been determined, to ensure that obstacles such as ditches or traffic furniture can be identified and remedied ahead of time; and
- Regular maintenance of temporary or crushed rock road surfaces to be undertaken when over-dimensional vehicles are travelling to / from the Project site.

**Overhead Obstacles:** Over-dimensional vehicles can travel with a combined total height of 5.2 m without the need for an overhead pilot. Mitigation measures for overhead obstacles may include;

- Identification of any obstructions or height risks, such as low bridges, overhead power lines, hanging wires or tree branches;
- Where a bridge risk occurs, detailed calculations to be undertaken to ensure loads do not present any risk of bridge strike;
- Where overhanging wires occur, additional temporary support to be provided if required; and
- Overhanging tree branches to be cut back or restrained away from the path of the vehicle.

**Culverts:** Where culverts are deemed not strong or wide enough (typically less than 5 m travel path width) to support over-dimensional vehicles, mitigation measures may include;

- Utilising a temporary diversion with a structure that will provide necessary support, while leaving the original structure in place;
- Reinforcing the existing structure by means of steel plates / girders as required, providing necessary support. Reinforcement can be provided either below the structure, or as additional support on top of the existing road surface; and
- As a last resort, where other options are not feasible or practicable, consideration may be given to the replacement of the culvert with a structurally suitable permanent upgrade to support the projected component loads.

### **6.9.3 Operation and Maintenance**

Establish a procedure to ensure the ongoing maintenance of the Project site access roads during the operation phase. This maintenance would include sedimentation and erosion control structures, where necessary.

### **6.9.4 Decommissioning**

Prepare and implement a revised EMP sub-plan reflecting the changes in traffic volumes, during time of decommissioning. This is detailed in Statement of Commitment 027.

## **6.10 Modified Internal Road Layout**

The Proponent has modified the internal access roads at the northern site access point as a result of landowner feedback (Figure 3.3A, Appendix 6).

An ecology survey of the proposed internal road amendment was undertaken on 3<sup>rd</sup> July 2013 to assess the change in impacts with regards to area and ecological community type. It was identified that the modification could increase the Project impact to Red Stringybark – Scribbly Gum – Red Box – Long-leaved Box shrub – tussock grass open forest of the NSW South Western Slopes Bioregion by 0.11 ha and to the White Box – Blakeley's Red Gum – Yellow Box grassy woodland of the NSW South Western Slopes Bioregion by 0.01 ha. No significant vegetation communities, habitat or fauna species were identified, and the change to the Project impact area was not considered to alter the outcomes of the significant impact assessment. The slight change to impact areas associated with the layout change is assessed and quantified in Appendix 8.

## **6.11 Revised Offset Calculations**

Environmental offset calculations were updated with respect to the additional Project related impacts identified along APR and as a result of layout changes at the northern site access point in line with both State and Commonwealth offset policy guidelines. As a result of the proposed changes and additions, the area of impact to native vegetation communities has increased from 103.1 ha to 104.76 ha (Appendix 8, Section 7).

Since Public Exhibition of the Project EA, the Proponent has secured a suitable parcel of land for an environmental offset under an Option to Purchase Agreement. This property exceeds the offset requirement for White Box - Blakeley's Red Gum - Yellow Box grassy woodland and is only short 47 ha in meeting a full Tier 2 offset for Red Stringybark - Scribbly Gum - Red Box - Long leaved Box shrub - tussock grass open forest. This deficit is made up by the surplus 42.5 ha of existing White Box - Blakeley's Red Gum - Yellow Box grassy woodland and a further 209.8 ha of regenerating White Box - Blakeley's Red Gum - Yellow Box grassy woodland DNG. A suitable legal mechanism will be used to protect the offset policy, as discussed in Appendix 8, Section 7.

## 6.12 Summary

This Preferred Project Report presents the preferred transport route options for construction of the Project, along with a minor change to the northern site access point. With specific regard to submissions received from RMS and MWRC with respect to the suitability of road haulage routes to the Project site, the Proponent revisited transport route options for the construction phase of the Project.

A number of technical assessments were undertaken to ensure that not only are the transport routes feasible and safe, but that with appropriate traffic management measures, impacts to other road users can be mitigated and minimised to the greatest extent practicable. Environmental and heritage assessments undertaken also ensured that the Proponent is aware of areas of sensitivity, and that ecological impacts have been appropriately considered and addressed where road works are required.

Extensive consultation was undertaken in order to ensure thorough, genuine and well informed consultation with those local to the Project and those that may be impacted by the proposed transport routes. This consultation is ongoing, and will evolve as and where required.

Recognising the community concerns with over-dimensional traffic specifically, the Proponent is proposing up to ten over-dimensional vehicle trips through the Mudgee urban area (and along Aarons Pass Road) per day, including vehicles returning to Newcastle. These trips will be split between two route options through Mudgee – Route Options 1 and 2. Given the existing traffic volumes along these roads, the potential for local road users to avoid Project related traffic, and the commitment to implement a range of traffic management measures, the addition of Project traffic is not expected to present significant impacts.

Overall, impacts associated with Project related traffic and transport have the potential to affect existing road users for approximately 18 months along the preferred standard heavy vehicle and over-dimensional routes during the construction period. These impacts, however, are expected only during the construction and decommissioning phases, with minimal Project related traffic during the operational phase of the Project. While it is acknowledged that impacts and disruption will occur,

with the implementation of appropriate traffic management measures it is anticipated that construction of the Project will not create any significant adverse impacts.

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## 7. REVISED STATEMENT OF COMMITMENTS

NB. No Statements of Commitment have been added since Exhibition of the Project EA. There have, however, been some minor amendments made to existing SoCs, and SoC 028 has been deleted. Amended SoCs are listed below the revised list of Statement of Commitments.

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
<b>Landscape and Visual</b>								
001	Impact to receptors	Minimise view of infrastructure	Procure matt and / or off-white wind turbine generator (WTG) structural components to reduce visual contrast with the viewing background (this is subject to final turbine selection).	Proponent	✓	✓		✓
002	Impact to receptors	Minimise view of infrastructure	Revegetate disturbed areas and use local material to minimise colour contrast where feasible.	Proponent in consultation with road engineers	✓	✓		✓
003	Impact to receptors	Minimise view of infrastructure	Undertake landscape planting where screening is deemed appropriate and in accordance with the outcomes of the assessment process.	Proponent in consultation with affected receptor		✓	✓	✓
004	Impact to receptors	Minimise view of construction	Reinstate disturbed soil areas after completion of construction and decommissioning which would include re-contouring and re-seeding with appropriate plant species and local materials where feasible.	Proponent		✓		✓
005	Impact to receptors	Minimise view of construction	Enforce safeguards to control and minimise dust emissions during construction and decommissioning.	Proponent		✓		✓
006	Impact to receptors	Minimise view of construction	Minimise activities that may require night time lighting and, if necessary, use low lux (intensity) lighting designed to be mounted with the light projecting inwards to the Project site to minimise glare.	Proponent		✓		✓
007	Impact to receptors	Minimise view of construction	Procure materials of appropriate colour for ancillary structures in consideration of their reflective properties.	Proponent	✓			
<b>Noise</b>								

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
008	Impact to receptors	Compliance	Once final turbine selection and Project refinement has been undertaken, revised noise modelling will be carried out to ensure that the predicted noise levels of the chosen WTG comply with the relevant criteria.	Proponent in consultation with noise consultant and landowners	✓			
009	Operational noise exceedance	Compliance	<p>If WTG noise impacts are non-compliant with stated criteria used for the assessment due to temperature inversion, atmospheric stability or other reasons, then an ‘adaptive management’ approach can be implemented to mitigate or remove the impact. This process could include:</p> <ul style="list-style-type: none"> <li>• Investigating the nature of the reported impact;</li> <li>• Identifying exactly what conditions or times lead to undue impacts;</li> <li>• Consideration of operating WTGs in a reduced ‘noise optimised’ mode during offending wind directions and at night-time (sector management);</li> <li>• Providing acoustic upgrades (glazing, façade, masking noise etc) to affected residences; and</li> <li>• Turing off WTGs that are identified as causing the undue impact.</li> </ul>	Proponent			✓	
010	Construction noise exceedance	Minimisation	Where practicable, construction is to occur within recommended working hours. Wind turbine erection and concrete pours to be permitted outside of these set hours where climatic conditions are favourable to ensure construction programme is maintained. (Protocol to be provided within <b>Construction Environmental Management Plan (CEMP)</b> ).	Proponent in consultation with DoPI		✓		✓
011	Construction noise exceedance	Minimisation	Prior notification of affected public and restricted use of exhaust / engine brakes in built up areas for night-time deliveries. (Protocol to be provided within <b>CEMP sub-plan</b> ).	Proponent		✓		✓
012	Substation noise exceedance	Compliance	<p>If selected substation locations are non-compliant with the NSW Industrial Noise Policy, mitigation measures would be applied as appropriate, including;</p> <ul style="list-style-type: none"> <li>• The use of transformer(s) with a lower sound power level output;</li> <li>• Landscaping, including raised embankments and vegetation, around the substation; and</li> </ul>	Proponent			✓	



Impact	Objective	Mitigation Measure	Responsibility	Stage					
				PC	C	OM	RD		
		<ul style="list-style-type: none"> <li>Providing acoustic upgrades (glazing, façade, masking noise etc) to affected residences.</li> </ul>							
<b>Ecology</b>									
013	Spread of weeds	Minimise spread	<p>Development of a <b>CEMP sub-plan</b>, which provides:</p> <ul style="list-style-type: none"> <li>Soil which may contain exotic species to be piled at least 50 m from any water source, or areas of native vegetation;</li> <li>All construction staff and sub-contractors educated on noxious weeds present at the Project site and ways to prevent spread;</li> <li>Where a specific weed risk has been identified, all machinery, equipment and vehicles are to be washed down before entry and egress of the Project site;</li> <li>Where practicable, topsoil that is limited in weeds to be harvested to salvage the native soil seed bank and reintroduced into disturbed areas. Otherwise, revegetate with locally native endemic species characteristic of the cleared vegetation type;</li> <li>Control of perennial weed grasses within the disturbance zone for 3 to 5 years after construction;</li> <li>Where practicable, and in consultation with host landowners, manage stock access during periods of revegetation; and</li> <li>Imported soil and rubble to be certified as free of weeds and weed seeds.</li> </ul>	Proponent in consultation with ecologist and associated landowners			✓	✓	✓
014	Loss of biodiversity value	Minimise impact	<p>Development of a <b>CEMP sub-plan</b>, which provides:</p> <ul style="list-style-type: none"> <li>Where practicable, Project vehicles are to remain within the extent of the earth works designed specifically for the Project to minimise vegetation disturbance;</li> <li>Care to be taken when working in close proximity to trees to prevent damage to roots;</li> <li>A pre-clearance protocol to be designed to identify how hollow-bearing fauna will be surveyed for and managed during clearing;</li> </ul>	Proponent in consultation with ecologist, OEH and SEWPaC	✓	✓	✓	✓	

Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
		<ul style="list-style-type: none"> <li>• An Environmental Compliance Manager or field officer qualified in the handling of fauna to be present on-site during clearing to capture and re-release fauna (where appropriate);</li> <li>• Where practicable, and in consultation with host landowners, logs and large rocks removed from within the proposed development area are to be redistributed following the completion of works in temporary clearance areas or adjacent areas to supplement habitat;</li> <li>• Where practicable, trenches to be dug at least 15 m away from the base of trees and outside drip lines;</li> <li>• Minimise dust creation during construction through the use of water carts;</li> <li>• If micro-siting of the Development Footprint occurs, where practicable, maintain a 30 m buffer between all turbines and hollow-bearing trees;</li> <li>• Where practicable, boundaries of the construction area are to be clearly marked to prevent breaches of construction boundaries;</li> <li>• Where practicable, suitable fencing to be erected along trenches to prevent fauna falling in;</li> <li>• Regular checking of trenches by the Environmental Compliance Manager to ensure any captured fauna are released according to the <b>CEMP</b> (<i>Note: this will not be carried out during the operation phase</i>);</li> <li>• Pre-clearance surveys undertaken to determine if roosts, nests or dens are present in any trees proposed for clearing;</li> <li>• Outside of the Development Footprint tree clearance will be avoided where practicable;</li> <li>• Native vegetation that is removed will be chipped and mulched for on-site use where practicable;</li> <li>• Where practicable, native vegetation greater than 3 m in height to be retained during transmission line construction;</li> <li>• A bird and bat monitoring program will be prepared prior to operation of the wind farm that identifies:                         <ul style="list-style-type: none"> <li>○ the frequency of monitoring and reporting;</li> <li>○ the thresholds at which impacts are considered unacceptable;</li> </ul>                         and                     </li> </ul>					

Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
		<ul style="list-style-type: none"> <li>○ acceptable adaptive management approaches.</li> <li>● The frequency of report strike data will be determined during the preparation of the monitoring programme. The adaptive management measures that could be implemented should strike thresholds be reached will be negotiated with OEH and SEWPaC when significant strike rates are detected to allow for a more tailored and species-specific approach to mitigation. Bird and bat strike monitoring will be undertaken with consideration for the monitoring guidelines provided by the Australian Wind Energy Association (Brett Lane &amp; Associates 2005).</li> <li>● Where an adaptive management process is required, the following may be undertaken should any turbines be identified as having a high incidence of strike during monitoring:                             <ul style="list-style-type: none"> <li>○ Step 1: Feather the relevant turbine(s) to reduce strike or change the wind speed trigger at which the rotors being turning; and</li> <li>○ Step 2: Based on further monitoring, if Step 1 does not reduce incidence, the relevant turbines may be temporarily shutdown during high risk periods.</li> </ul> </li> <li>● Should WTGs require lighting, lighting that minimises the likelihood of attracting insects and hence foraging bats is to be selected, subject to CASA requirements;</li> <li>● Pre-clearance surveys will be undertaken during the flowering season for <i>Swainsona recta</i> (Spring) in areas of potential habitat within the transmission line easement impact area. This will ensure all individuals are identified and flagged for fencing during construction. Should new individuals be identified, poles will be shifted to avoid any direct impacts. Survey will only be undertaken when individuals on-site are in flower.</li> <li>● Populations or known individuals of <i>Swainsona recta</i> to be clearly marked / delineated in the field prior to construction work. Temporary fencing, incorporating a 5 m buffer, to prevent access is recommended;</li> <li>● Rehabilitation of internal access roads that are not required following construction to be undertaken; and</li> </ul>					

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
015	Loss of biodiversity value	Minimise impact	<ul style="list-style-type: none"> <li>Landscaping around the main and secondary collector substations is to incorporate native species where appropriate.</li> </ul> <p>An appropriate offset package will be secured within 12 months of commencing construction to compensate for the loss of habitat within the Study Area outlined within this EA. Final calculation of the offset area will be carried out during the pre-construction phase once turbine selection has taken place and the final Development Footprint is known.</p>	Proponent in consultation with ecologist, OEH, SEWPaC and associated land owners	✓			
<b>Cultural Heritage</b>								
016	Loss of cultural heritage items	Minimise impact	Develop a <b>CEMP sub-plan</b> , which provides procedures to be followed for impact avoidance and accidental discovery.	Proponent in consultation with relevant Aboriginal communities and OEH	✓	✓		✓
017	Loss of cultural heritage items	Minimise impact	Construction personnel to be trained in procedures to minimise impact.	Proponent in consultation with archaeologist	✓	✓	✓	✓
018	Loss of Aboriginal heritage items	Minimise impact	While the Aboriginal stone objects recorded are very low density distributions and have low archaeological significance, limiting the extent of impacts to these locales is to be undertaken where practicable.	Proponent in consultation with archaeologist	✓	✓		
019	Loss of Aboriginal heritage items	Minimise impact	Ground disturbance impacts associated with the Project be kept to a minimum and to defined areas, to ensure minimum impact on Aboriginal objects (stone artefacts), which can be expected to extend in a relatively continuous, albeit very low to low density distribution, across the broader landscape encompassed by the Project.	Proponent in consultation with archaeologist		✓		✓
020	Loss of Aboriginal heritage items	Minimise impact	Aboriginal Site Impact Recording Forms are to be completed (and submitted to the OEH) for each Aboriginal object harmed during construction of the Project.	Proponent and contractor in consultation with		✓		

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
				archaeologist				
<b>Traffic and Transport</b>								
021	Safety and asset protection	Minimise risk	Contract a licensed haulage contractor with experience in transporting heavy and over-size loads, to be responsible for obtaining all required approvals and permits from the RMS and Councils and for complying with any conditions specified in the aforementioned approvals.	Proponent in consultation with RMS and councils	✓			
022	Safety and asset protection	Minimise risk	Development of a <b>CEMP sub-plan</b> , to include, but not be limited to: <ul style="list-style-type: none"> <li>• Scheduling of deliveries, timing of transport, limiting the number of trips per day, and reducing traffic during school bus route hours, i.e., 7.00 to 9.00 am and 3.00 to 4.30 pm;</li> <li>• Undertaking community consultation before and during all haulage activities and providing a dedicated telephone contact list to enable any issues to be rapidly identified and addressed;</li> <li>• Letterbox drop along affected routes;</li> <li>• Minimise disruption to local vehicles by ensuring average and maximum wait times due to Project related traffic along local roads are kept to a minimum;</li> <li>• Managing the haulage process, including temporary, short term road closures, the erection of warning signs and / or advisory speed signs posted in advance of isolated curves, crests, narrow bridges and changes of road conditions;</li> <li>• Placing of speed limits on all roads that would be used primarily by construction traffic to reduce the likelihood of any accidents and reduce maintenance costs;</li> <li>• Designing and implementing temporary modifications to intersections and roadside furniture as appropriate;</li> <li>• Producing a Transport Code of Conduct which would be made available to all contractors and staff detailing traffic routes, behavioural requirements and speed limits;</li> <li>• Establishing procedures to monitor traffic impacts on public and internal access tracks during construction, including noise, dust</li> </ul>	Proponent in consultation with licensed haulage contractor and road authorities		✓	✓	✓

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
		<p>nuisance and travel times, and to implement modified work methods to reduce such impacts where practicable;</p> <ul style="list-style-type: none"> <li>Reinstating pre-existing conditions after temporary modifications to the roads and pavements along the route, where applicable, in consultation with relevant authorities; and</li> <li>Where reconstruction or provision of a temporary crossing is required over a creek or drainage structure, the design of this structure will be discussed with the relevant authority.</li> </ul>						
023	Safety and asset protection	Minimise risk	Implement all aspects of the <b>CEMP sub-plan</b> in co-ordination with the RMS and local Councils.	Proponent in consultation with licensed haulage contractor and road authorities		✓		✓
024	Safety and asset protection	Minimise risk	Prepare road dilapidation reports covering pavement and drainage structures, in consultation with the Councils, for all of the routes before and after construction. Any damage resulting from construction traffic, except that resulting from normal wear and tear, would be repaired at the Proponent's cost. Alternatively, the Proponent may negotiate other forms of compensation for road damage with the relevant roads authorities as appropriate.	Proponent in consultation with council and road authorities	✓	✓		✓
025	Safety and asset protection	Minimise risk	Consideration for establishing a transport pool for employees from nearby towns to minimise traffic volumes.	Proponent	✓			
026	Safety and asset protection	Minimise risk	Establish a procedure to ensure the ongoing maintenance of the Project site internal access roads during the operation phase. This maintenance would include sedimentation and erosion control structures, where necessary.	Proponent			✓	
027	Safety and asset protection	Minimise risk	Prepare and implement a revised <b>EMP sub-plan</b> reflecting change in traffic volumes, during time of decommissioning.	Proponent in consultation with council and road authorities				✓

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
<b>Aviation Assessment</b>								
029	Creation of hazard	Minimise risk	The Proponent will provide the RAAF AIS, CASA, AsA, AAAA and NSW RFS with the final turbine locations and dimensions prior to construction. After construction is complete, the Proponent will provide RAAF AIS, CASA, AsA, AAAA and NSW RFS with the "as constructed" details.	Proponent	✓	✓	✓	✓
030	Creation of hazard	Minimise risk	The Proponent will provide CASA with notification of any cranes (temporary obstacles) that exceed 110 m above ground level.	Proponent	✓	✓		✓
031	Creation of hazard	Minimise risk	Appropriate information regarding the WTG layout and dimensions will be supplied to the Rural Fire Service, if required, to assist in their planning and execution of fire response.	Proponent	✓	✓		✓
032	Creation of hazard	Minimise risk	On receipt of Development Approval for the Project, and with particular regard to the Aeronautical Impact Assessment and Obstacle Lighting Review, the Proponent will consult with CASA and DIT on the issue of obstacle lighting.	Proponent in consultation with CASA	✓			
033	Impact to nearby properties	Minimise impact	If lighting is required, the Proponent will commit to shielding provisions allowed under existing CASA guidelines. Shielding restricts the downward component of light to 5 % of nominal intensity emitted below 5° below horizontal and zero light emission below 10° below horizontal.	Proponent in consultation with CASA	✓			
<b>Communication</b>								
034	Deterioration of signal strength	Minimise deterioration	Where practicable, use equipment complying with appropriate Electromagnetic Emission Standards.	Proponent	✓	✓		✓
035	Deterioration of signal strength	Minimise deterioration	Establish a system for recording any complaints on interference, to allow for further investigations with the affected party, and to reach an amicable solution.	Proponent			✓	✓
036	Deterioration of signal strength	Minimise deterioration	General mitigation methods for radio-communication, if impacts occur, include:	Proponent			✓	✓

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
037	Deterioration of signal strength	Minimise deterioration	<ul style="list-style-type: none"> <li>• Modifications to or relocation of existing antennae;</li> <li>• Installation of a directional antennae; and</li> <li>• Installation of an amplifier to boost the signal.</li> </ul> <p>If television interference is experienced and reported by an existing receiver in the vicinity of the Project, the source and nature of the interference would be investigated by the Proponent. Should the cause of interference be attributed to the Project, then the Proponent will put suitable mitigation measures in place after consultation and agreement with the affected landowner or television broadcaster. These could include:</p> <ul style="list-style-type: none"> <li>• Re-orientation of existing aerials to an alternative transmitter;</li> <li>• Provision of a land line between the affected receiver and an antenna located in a suitable reception area;</li> <li>• Provision of satellite or digital TV where available; and</li> <li>• Installation of a new repeater station in a location where interference can be avoided (this is more complex for digital but also less likely to be required for digital television).</li> </ul>	Proponent			✓	✓
<b>Electromagnetic Fields</b>								
038	Exposure to EMFs	Minimise exposure	Bury electrical cables where feasible to shield electrical fields.	Proponent			✓	✓
039	Exposure to EMFs	Minimise exposure	Place appropriate security fencing around emitting structures (e.g. collector substations and switching station).	Proponent	✓			
040	Exposure to EMFs	Minimise exposure	Ensure the public, including tourists, that need to go near emitting structures are accompanied by a trained and qualified staff member.	Proponent			✓	✓
<b>Fire and Bushfire</b>								
041	Increase risk of fire ignition or spread	Minimise risk	Adherence to all regulations under the NSW Rural Fires Act 1997 and the Cudgegong Draft Bushfire Risk Management Plans.	Proponent in consultation with relevant	✓	✓	✓	✓



Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
			authorities					
042	Increase risk of fire ignition or spread	Minimise risk	Implementation of fire prevention measures in accordance with the relevant <b>EMP sub-plan</b> .	Proponent in consultation with RFS and NSW Fire Brigade	✓			
043	Increase risk of fire ignition or spread	Minimise risk	The Rural Fire Service (RFS) and NSW Fire Brigade will be consulted regarding the adequacy of bushfire prevention measures to be implemented on-site during construction, operation and decommissioning. These measures will potentially cover hot-work procedures, asset protection zones (APZs), safety, communication, site access and response protocols in the event of a fire originating in the Project infrastructure, or in the event of an external wildfire threatening the Project or nearby properties.	Proponent in consultation with RFS and NSW Fire Brigade	✓	✓	✓	✓
044	Increase risk of fire ignition or spread	Minimise risk	Provide RFS with the locations of individual WTG locations, ancillary infrastructure, construction work schedule, location of additional water supplies for construction, potential landing pads for firefighting aircraft and helicopters and access gates for firefighting services.	Proponent	✓	✓	✓	✓
045	Increase risk of fire ignition or spread	Minimise risk	Installation of access tracks at appropriate width and vertical clearances with access suitable for all weather conditions.	Proponent	✓	✓		✓
046	Increase risk of fire ignition or spread	Minimise risk	Train construction and maintenance staff on bushfire risk management and risks that could be present at the Project.	Proponent		✓	✓	✓
047	Increase risk of fire ignition or spread	Minimise risk	Provision of basic firefighting equipment at each active site, including fire extinguishers, knapsacks and other equipment suitable for initial response actions with a minimum of one trained person on-site.	Proponent		✓	✓	✓
048	Increase risk of fire ignition or	Minimise risk	Maintain provision for mobile telephone and UHF radio communications.	Proponent in consultation with RFS and NSW Fire		✓	✓	✓

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
	spread			Brigade				
049	Increase risk of fire ignition or spread	Minimise risk	The collector substations will be surrounded by a gravel and concrete area, free of vegetation, to provide an APZ.	Proponent	✓	✓		✓
050	Increase risk of fire ignition or spread	Minimise risk	The collector substations will be bunded with a capacity exceeding the volume of the transformer oil. The facility will 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).	Proponent	✓	✓	✓	✓
051	Increase risk of fire ignition or spread	Minimise risk	Placement and maintenance of APZ will occur around WTGs, transmission line easements and ancillary structures to minimise the spread of fire. Workplace health and safety protocols will be developed to minimise the risk of fire for workers in the control room and amenities.	Proponent	✓	✓	✓	✓
052	Increase risk of fire ignition or spread	Minimise risk	WTGs will be shut down if monitored components reach critical temperatures or if directed to by the RFS in the case of a nearby wildfire being declared (an all-hours contact number would be available to the RFS during the bushfire period).	Proponent in consultation with the RFS			✓	
053	Increase risk of fire ignition or spread	Minimise risk	Flammable materials and ignition sources brought onto the Project site will be handled and stored as per manufacturer's instructions.	Proponent		✓	✓	✓
054	Increase risk of fire ignition or spread	Minimise risk	Lightening protection will be installed correctly to minimise risk of malfunction.	Proponent		✓		✓
055	Increase risk of fire ignition or spread	Minimise risk	Total fire ban days will be considered in regard to hours within which construction takes place, minimising the risk of fire and bushfire ignition.	Proponent		✓		✓
<b>Water</b>								
056	Loss of integrity	Minimise loss	Works and disturbances not identified as part of the Development	Proponent in	✓	✓		✓

Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
to riparian corridor		Footprint within this EA (with the exception of crossings) should not be located in any riparian corridors.	consultation with NOW and DPI (Fisheries)				
057 Loss of integrity to riparian corridor	Minimise loss	NOW guidelines for river crossing designs, based on the Strahler Stream Order Categorisation to minimise environmental impact, will be followed in the design and upgrade of existing roads and river crossings.	Proponent in consultation with NOW and DPI (Fisheries)	✓	✓		✓
058 Impact on watercourses	Minimise impact	All waterway crossings are to undergo detailed assessment and design post-approval, and are to be constructed in consultation with NOW and DPI (Fisheries) and in line with the NOW <i>Guidelines for Controlled Activities</i> and DPI (Fisheries) guidelines: <i>Policy and Guidelines for Fish Friendly Waterway Crossings</i> (2004) and <i>Why do Fish Need to Cross the Road</i> (2004).	Proponent in consultation with NOW and DPI (Fisheries)	✓	✓		
059 Impact on watercourses	Minimise Impact	All required watercourse crossings will be designed to protect and enhance water flow, water quality, stream ecology and existing riparian vegetation.	Proponent in consultation with NOW and DPI (Fisheries)	✓	✓		
060 Loss of water quality and change to hydraulic regime	Minimise loss and impact on adjacent watercourses	<p>A <b>CEMP sub-plan</b> will be developed to ensure soil disturbance and erosion from surface runoff is minimised and in order to minimise disturbance to water resources and riparian zones in the area. This sub-plan will include:</p> <ul style="list-style-type: none"> <li>• Construction and operation of the Project to comply with Section 120 of the <i>Protection of the Environment Operations (POEO) Act 1997</i>;</li> <li>• Project design and construction to not worsen existing flooding characteristics in the vicinity of the Project;</li> <li>• Monitoring of low- and high- flow conditions is to be regularly undertaken prior to the commencement of works to determine baseline water quality parameters. Surface water monitoring locations should include: <ul style="list-style-type: none"> <li>○ Crudine River (downstream of the confluence with Sugarloaf Creek);</li> </ul> </li> </ul>	Proponent in consultation with NOW and DPI (Fisheries), and in reference to Landcom 2004	✓	✓	✓	✓

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
		<ul style="list-style-type: none"> <li>○ Cowflat Creek (upstream of the confluence with Stinking Water Creek);</li> <li>○ Downstream of the confluence with Tunnabidgee Creek and Long Gully; and</li> <li>○ Salters Creek (upstream of confluence with Tunnabidgee Creek).</li> <li>● All ancillary drainage infrastructure, e.g., sediment and litter traps are to, where practicable, be located outside the riparian corridor. Runoff is to be of an appropriate water quality and quantity before discharge into a riparian corridor or watercourse;</li> <li>● All stockpiles are to be located away from drainage lines and natural watercourses, road surfaces and trees and, where necessary, are to be appropriately protected to contain sediment and runoff (e.g. sediment fencing);</li> <li>● Regular inspection, maintenance and cleaning of water quality and sedimentation control devices; and</li> <li>● Due regard for the Central West CAP in the preparation of the <b>CEMP</b> and <b>OEMP</b>.</li> </ul>						
061	Loss of water quality and change to hydraulic regime	Minimise loss and impact on adjacent watercourses	Mitigate for any impacts on groundwater as a result of the construction or operation of the Project, including contamination and impacts on flow rates. Ensure that there are no lasting impacts on groundwater following decommissioning.	Proponent in consultation with Landcom 2004		✓	✓	✓
062	Loss of water quality and change to hydraulic regime	Minimise impact on groundwater	Carry out a groundwater investigation prior to any blasting on-site (if required) to ensure that there is no adverse impact on groundwater for users or dependent ecosystems. If the investigation highlights areas of concern, then appropriate mitigation or alternative methods will be used.	Proponent in consultation with NOW	✓	✓		
063	Supply of water for construction	Obtain water for construction	Calculate all necessary water demands once final Development Footprint has been determined. Identify water requirements, including the locality of proposed works, extraction points, times, volumes and rates. Secure the necessary water licensing permits required at the time of extraction.	Proponent in consultation with NOW	✓	✓		

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
064	Supply of water for construction	Obtain water for construction	Where available, and of appropriate chemical and biological quality, stormwater, recycled water or other water sources to be used in preference to potable water for construction activities, including concrete mixing and dust control.	Proponent	✓	✓		
065	Supply of water for construction	Obtain water for construction	Should the on or near-site provision of water be insufficient, water will be sourced from commercial suppliers as required.	Proponent	✓	✓		
<b>Air Quality</b>								
066	Deterioration of air quality	Minimise impact	Develop a <b>CEMP</b> sub-plan to minimise and manage impacts on air quality which shall include: <ul style="list-style-type: none"> <li>• The identification of potential sources of dust;</li> <li>• Dust management objectives;</li> <li>• Mitigations measures to be implemented, including measures during weather conditions where high level dust episodes are probable;</li> <li>• A monitoring program to assess compliance with identified objectives; and</li> <li>• Mechanisms for the monitoring, review and amendment of this plan.</li> </ul>	Proponent	✓	✓		✓
067	Deterioration of air quality	Minimise impact	During excavation topsoil will be stockpiled. After excavation topsoil will be replaced for seeding and excess subsoil will be disposed of in an appropriate manner. If any excavation occurs on steep slopes the topsoil may need to be stabilised.	Proponent		✓		✓
068	Deterioration of air quality	Minimise impact	Where practicable, stockpiled material will be covered with plastic, seeded or otherwise bound to reduce dust. Dust levels at stockpile sites are to be visually monitored. Dust suppression (e.g. water sprays) will be implemented if required.	Proponent		✓		✓
069	Deterioration of air quality	Minimise impact	During dry and windy conditions a water cart or alternative (non-chemical) dust suppression would be available and applied to work areas.	Proponent		✓		✓
070	Deterioration of	Minimise impact	If blasting is required, appropriate guidelines for control of blasting	Proponent in		✓		✓

Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
air quality		impacts will be followed. (i.e. Australian New Zealand Environment and Conservation Council).	consultation with ANZECC				
<b>Soil and Landforms</b>							
071	Disturbance to soil and water	Minimise disturbance	Soil and water management measures consistent with Landcom (2004) to be employed during construction to minimise soil erosion and the discharge of sediment and other pollutants to land and / or water.	Proponent in reference to Landcom 2004	✓	✓	
072	Disturbance to existing land formations	Minimise disturbance	Develop a <b>CEMP sub-plan</b> to provide specific measures for soil, including: <ul style="list-style-type: none"> <li>• Procedures for personnel to manage suspected contaminated soils disturbed during earthworks;</li> <li>• All disturbed soil surfaces to be stabilised as soon as practicable after works have ceased in the area;</li> <li>• All stockpiles to be covered where practicable to minimise the loss of material during high wind and rain events. Where practicable, stockpiles to be placed in areas sheltered from the wind;</li> <li>• Planning for erosion and sediment control concurrently with engineering design, prior to any works commencing;</li> <li>• Progressive rehabilitation of disturbed land as soon as practicable;</li> <li>• Jute matting or similar to be used to stabilise the soil and minimise weed invasion;</li> <li>• Implementation of management measures to minimise sediment and runoff entering watercourses;</li> </ul>	Proponent			
073	Soil compaction	Minimise impact	The <b>CEMP</b> sub-plan will have specific measures for stock management: <ul style="list-style-type: none"> <li>• Removal of stock access from construction areas for entire construction periods to allow for regeneration – subject to landowner participation; and</li> <li>• Before remediation works, grazing to be removed where practicable, and subject to landowner participation and the grass sward allowed time to recover and minimise areas of bare soil.</li> </ul>	Proponent in consultation with associated landowners			

**Waste**

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
074	Waste generation	Minimise waste and maximise recycling	Provide skip bins and recycling bins on-site to handle packaging materials and domestic waste.	Proponent		✓	✓	✓
075	Waste generation	Minimise waste and maximise recycling	Mulch vegetation and use on-site where feasible, otherwise burn on-site with permission from Council, provide firewood to landowners or take to Mudgee waste facility or Kandos and Gulgong waste transfer stations.	Proponent		✓		✓
076	Waste generation	Appropriate disposal of waste	On-site toilets will either be drained by a septic tank or be an enclosed unit.	Proponent		✓	✓	✓
077	Waste generation	Appropriate disposal of waste	All chemicals and oils will be treated as contaminated waste at the Mudgee waste facility or Kandos and Gulgong waste transfer stations.	Proponent		✓	✓	✓
078	Waste generation	Appropriate disposal of waste	Any disposal of unsuitable excavated material will require approval from local Council.	Proponent		✓		✓
<b>Crown Roads and Trigonometrical Stations</b>								
079	Damage to Trigonometrical Stations	Avoid damage	Commitment to avoid disturbing and damaging the Trigonometrical Stations and adjacent witness marks.	Proponent		✓		✓
080	Crown roads	Liaise with LPI	Relevant permits will be sought from LPI where Project infrastructure impacts upon Crown Roads.	Proponent in consultation with LPI	✓	✓		✓
<b>Construction</b>								
081	Environmental	Minimise impact	Micro-site on-site infrastructure within a 100 m radius of the proposed Project infrastructure with respect to the Study Area and Development Footprint assessed within this EA, whilst minimising impacts to non-involved residences and ecologically sensitive habitats and species.	Proponent in consultation with DoPI	✓	✓		✓

	Impact	Objective	Mitigation Measure	Responsibility	Stage			
					PC	C	OM	RD
082	Environmental	Minimise impact	Onsite Environmental Representative to be granted authorisations to permit minor modifications to the project design with general regard to this EA following detailed design activities.	Proponent	✓	✓		✓
083	Environmental	Minimise impact	<p>Development of a <b>Construction Environmental Management Plan (CEMP)</b> which outlines environmental practices and procedures to be followed during construction. The CEMP will be supported by a number of sub-plans, typically including:</p> <ul style="list-style-type: none"> <li>• Compounds and ancillary facilities management;</li> <li>• Noise and vibration;</li> <li>• Traffic and access;</li> <li>• Soil and water quality and spoil management;</li> <li>• Air quality and dust management;</li> <li>• Aboriginal and non-Aboriginal heritage management;</li> <li>• Soil contamination, hazardous material and waste management;</li> <li>• Ecological impact management; and</li> <li>• Hazard and risk management.</li> </ul>	Proponent	✓	✓		✓
084	Environmental	Minimise impact	<p>Development of an <b>Operational Environmental Management Plan (OEMP)</b>, which outlines environmental management practices and procedures that are to be followed during operation. The OEMP will be supported by a number of sub-plans, typically including:</p> <ul style="list-style-type: none"> <li>• Noise management;</li> <li>• Landscaping;</li> <li>• Bird and bat management;</li> <li>• Telecommunication interference; and</li> <li>• Decommissioning.</li> </ul>	Proponent			✓	
085	Decommissioning	Manage process	A Decommissioning and Rehabilitation Plan (DRP) will be prepared during the pre-decommissioning phase, towards the end of the Project's life. The DRP will detail the process of decommissioning, including addressing whether components are to be removed or left in situ. All decommissioning work will be the responsibility of the Project owner,	Proponent in consultation with Landowners				✓



Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
		which is a provision within the lease arrangements with relevant landowners.					
<b>Mineral Exploration</b>							
086	Future land use for mineral exploration	Minimise impact	Liaise with relevant mining companies and provide updates of any modifications to the Project design that arise during the construction of the Project.	Proponent		✓	
087	Future land use for mineral exploration	Minimise impact	At the time of decommissioning, communicate with associated landowners and mineral title holders that may wish to retain roads.	Proponent			✓
<b>Community Wellbeing</b>							
088	Affect on local area	Maximise positive effect of proposal	A contribution of \$1,250 per installed mega watt (MW) annually into a Community Fund as each stage of the Project commences commercial operation. This fund will be established in close cooperation with Mid-Western Regional and Bathurst Regional Councils with decisions on how funds are to be allocated determined by a committee made up of representatives from the local community, Council and the Proponent. The CCC may provide this forum.	Proponent in consultations with councils and community	✓		✓ ✓
<b>Economic</b>							
089	Affect on local area	Maximise positive effect of proposal	Local contractors will be used where it is feasible, which will allow the Proponent to utilise the full potential of local resources.	Proponent in consultation with local industry representatives	✓	✓	✓

Impact	Objective	Mitigation Measure	Responsibility	Stage				
				PC	C	OM	RD	
<b>Amended Statements of Commitment</b>								
022	Safety and asset protection	Minimise risk	<p>Development of a <b>CEMP sub-plan</b>, to include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• Scheduling of deliveries, timing of transport, limiting the number of trips per day, and reducing traffic during school bus route hours, i.e., 7.00 to 9.00 am and 3.00 to 4.30 pm;</li> <li>• Undertaking community consultation before and during all haulage activities and providing a dedicated telephone contact list to enable any issues to be rapidly identified and addressed;</li> <li>• Letterbox drop along affected routes;</li> <li>• Minimise disruption to local vehicles by ensuring average and maximum wait times due to Project related traffic along local roads are kept to a minimum;</li> <li>• Managing the haulage process, including temporary, short term road closures, the erection of warning signs and / or advisory speed signs posted in advance of isolated curves, crests, narrow bridges and changes of road conditions;</li> <li>• Placing of speed limits on all roads that would be used primarily by construction traffic to reduce the likelihood of any accidents and reduce maintenance costs;</li> <li>• Designing and implementing temporary modifications to intersections and roadside furniture as appropriate;</li> <li>• Producing a Transport Code of Conduct which would be made available to all contractors and staff detailing traffic routes, behavioural requirements and speed limits;</li> <li>• Establishing procedures to monitor traffic impacts on public and internal access tracks during construction, including noise, dust nuisance and travel times, and to implement modified work methods to reduce such impacts where practicable;</li> <li>• Reinstating pre-existing conditions after temporary modifications to the roads and pavements along the route, where applicable, in consultation with relevant authorities; and</li> </ul> <p>Where reconstruction or provision of a temporary crossing is required</p>	Proponent in consultation with licensed haulage contractor and road authorities				
				✓	✓		✓	

Impact	Objective	Mitigation Measure	Responsibility	Stage			
				PC	C	OM	RD
		over a creek or drainage structure, the design of this structure will be discussed with the relevant authority.					
066 Deterioration of air quality	Minimise impact	<p>Develop a <b>CEMP</b> sub-plan to minimise and manage impacts on air quality which shall include:</p> <ul style="list-style-type: none"> <li>• The identification of potential sources of dust;</li> <li>• Dust management objectives;</li> <li>• Mitigations measures to be implemented, including measures during weather conditions where high level dust episodes are probable;</li> <li>• A monitoring program to assess compliance with identified objectives; and</li> </ul> <p>Mechanisms for the monitoring, review and amendment of this plan.</p>	Proponent				
				✓	✓		✓

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## 8. ACRONYMS

**Table 22** Acronyms used throughout the Report

Acronym / Abbreviation	Full Title and/ or Description
AAAA	Aerial Agricultural Association of Australia
AADT	Annual average daily traffic
AGL	Above ground level
AHD	Australian Height Datum
APR	Aarons Pass Road
APZ	Asset Protection Zone
AsA	Airservices Australia
AWS	Australian Wildlife Services
BVT	Biometric Vegetation Type
CASA	Civil Aviation and Safety Authority
CCC	Community Consultative Committee
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
Crown	Crown Lands, formerly part of the DPI, now part of the NSW Department of Trade and Investment
CRWF	Crudine Ridge Wind Farm Pty Ltd
CWP	Continental Wind Partners
dB	Decibels
DCCEE	Department of Climate Change and Energy Efficiency
DCP	Development Control Plan
DECCW	Former NSW Department of the Environment, Climate Change and Water, now known as OEH
DGRs	Director General's Requirements
DNG	Derived Native Grasslands
DoPI	NSW Department of Planning & Infrastructure
DPI	NSW Department of Primary Industries
Draft Guidelines	Draft NSW Planning Guidelines: Wind Farms, released 2011
DRP	Decommissioning Rehabilitation Plan
EA	Environmental Assessment
EEC	Endangered Ecological Community
EMP	Environmental Management Plan
ENA	Environmental Noise Assessment
EPA	Environmental Protection Authority
EPBC	Environmental Protection and Biodiversity Conservation Act, 1999
EPHC	Environmental Protection and Heritage Council
EPL	Environmental Protection Licence
Fisheries NSW Form	Part of the NSW Department of Primary Industries Submissions which comprised of form letters which did not contain any additional specific concern, beyond the pro-forma descriptions.
Form+	Submissions which comprised of form letters which included a brief comment on the form letter highlighting a specific concern or attached an additional document(s).

INP	NSW EPA's <i>Industrial Noise Policy 2000</i>
LCU	Landscape Character Unit
LGA	Local Government Area
LPI	The Land and Property Information Division of the Department of Finance and Services
LVIA	Landscape and Visual Impact Assessment
MW	Megawatt
MWRC	Mid-Western Regional Council
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
OEMP	Operational Environmental Management Plan
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
POS	Public Opinion Survey
PPR	Preferred Project Report
RAAF	Royal Australian Air Force
RAAF AIS	Royal Australian Air Force – Aeronautical Information Service
RAP	Registered Aboriginal Party
RFS	Rural Fire Service
RMS	Roads and Maritime Services
RTA	NSW Roads and Traffic Authority
SA Guidelines	South Australian Environmental Noise Wind Farms Guidelines 2003
SCADA	Supervisory Control And Data Acquisition – a type of industrial control system.
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SHV	Standard Heavy Vehicle
SIA	Social Impact Assessment
SoC	Statement of Commitment
TMP	Traffic Management Plan
TSC Act	<i>Threatened Species Conservation Act 1995 (NSW)</i>
UCOP	Ulan Coal Mines Continued Operations Project
VMP	Vehicle management plan
VPA	Voluntary Planning Agreement
vpd	Vehicles per day
vph	Vehicles per hour
WHO	World Health Organisation
WHO Guidelines	World Health Organisation <i>Guidelines for Community Noise</i>
WPCWP	Wind Prospect CWP Pty Ltd
WTG	Wind turbine generator
ZVI	Zone of visual influence

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