

# Liverpool Range *Wind Farm*

Traffic and Transport Report | December 2013

EPURON

# Liverpool Range *Wind Farm*

Traffic and Transport Report | December 2013

**Prepared By:**

Epuron Pty Ltd  
Level 11, 75 Miller Street  
North Sydney NSW 2060  
AUSTRALIA  
02 8456 7400  
[www.epuron.com.au](http://www.epuron.com.au)

© Epuron 2013

# Table of Contents

<b>1</b>	<b>INTRODUCTION</b>	<b>6</b>
	1.1 Project Location	6
	1.2 Project Description	7
<b>2</b>	<b>KEY ISSUES AND THEIR ASSESSMENT</b>	<b>8</b>
<b>3</b>	<b>PREDICTED TRAFFIC AND EQUIPMENT TRANSPORT REQUIREMENTS</b>	<b>10</b>
	3.1 Construction Traffic	10
	3.2 Operational Traffic	13
<b>4</b>	<b>TRANSPORT ALTERNATIVES AND ASSESSMENT</b>	<b>14</b>
	4.1 Road Transport from Port to Cassilis	14
	4.2 Road Transport from Cassilis to Site	15
	4.3 Primary Site Access Route from the South	18
	4.4 Access Route to the Central Section of the Wind Farm Site	19
	4.5 Access Route to North West Section of the Site	21
	4.6 Access within the site	27
<b>5</b>	<b>EXISTING TRAFFIC FLOWS</b>	<b>28</b>
	5.1 Access via Main Highways	28
<b>6</b>	<b>TRANSPORT IMPACTS</b>	<b>29</b>
	6.1 General	29
	6.2 Suitability of Existing Road Layout	30
	6.3 Structural Capacity of Existing Roads and Structures	30
	6.4 Disturbance to Local Community	30
	6.5 Road Safety	30
<b>7</b>	<b>RECOMMENDATIONS AND MITIGATION MEASURES</b>	<b>32</b>
<b>8</b>	<b>CONCLUSION</b>	<b>33</b>
<b>9</b>	<b>REFERENCES</b>	<b>34</b>

## Figures

Figure 2-1 Transport of wind turbine nacelle	8
Figure 3-1 Wind turbine service van	13
Figure 4-1 Major road transport route to Cassilis from Newcastle	14
Figure 4-2 Right-hand bend on Golden Highway in Denham	15
Figure 4-3 Golden Highway at Cassilis	15
Figure 4-4 Intersection of Warrumbungles Way & Coolah Road	18
Figure 4-5 Rotherwood Road	18
Figure 4-6 Creek crossing on Rotherwood Road	19
Figure 4-7 Unsealed section of Rotherwood Road	19
Figure 4-8 Turee Vale Road	20
Figure 4-9 Turee Vale Road	20
Figure 4-10 Sherwood main gates on Turee Vale Road	21
Figure 4-11 River crossing on Turee Road after Sherwood main gate	21
Figure 4-12 Warrumbungles Way / Coolah Creek Road Intersection	22
Figure 4-13 Coolah Creek Road/Cooks Drive towards Gundare Road	22
Figure 4-14 Gundare Road	23
Figure 4-15 Intersection of Coolah Creek Road and Coolah Tops National Park Road	23
Figure 4-16 Coolah Tops National Park Road	24
Figure 4-17 Pandora Road	24
Figure 4-18 Pandora Road	25
Figure 4-19 Pandora Road	25
Figure 4-20 Wind farm site access points from minor roads	26
Figure 6-1 Transport of turbine blades with escort vehicle	29
Figure 6-2 Transport of tower section on steep site access track	29

## Tables

Table 1-1 Wind turbine major components	7
Table 3-1 Estimate of peak daily traffic volume	10
Table 3-2 Predicted program of works and traffic generation	12
Table 6-1 Accident rates in the Hunter Region (Maitland)	31
Table 6-2 Accident rates on the Golden Highway	31

# 1 Introduction

This report provides an assessment of the traffic and transport issues relevant to the construction and operation of the proposed Liverpool Range Wind Farm. It forms an appendix to the Environmental Assessment for the project.

The report, which was prepared considering relevant local council traffic and road policies, considers the relevant traffic and transport implications for the project, assesses the potential impacts arising from the project and proposes mitigation measures to be incorporated in the environmental management plan to minimise traffic related impacts. The relevant local councils were consulted during preparation of the plan and their feedback was incorporated into the plan where required. The relevant local council traffic and road policies considered include;

- ▶ Warrumbungle Shire Council
  - Access Across Road Reserves to Properties
  - Asset Management Policy
  - Contributions for Kerb and Guttering and Paving Policy
  - Upgrading of Roads Not Constructed or Maintained by Council Policy
- ▶ Upper Hunter Shire Council
  - Maintenance - Dust Seal Criteria
  - Maintenance - Unmaintained Dedicated Public Roads
  - Ramps, Public Gates & Motor Bypasses
  - Upgrading Crown Roads
- ▶ Liverpool Plains Shire Council
  - Road Crossings
  - Road Policies (Various)
  - Ramps and Gates on Public Roads
- ▶ Mid-Western Regional Council
  - Bitumen Sealing of Gravel Roads Policy
  - Kerbing, Guttering and Footpaths Charges Policy
  - Permanent Road Closures Policy
  - Road Encroachments on Private Land Policy
  - Road Naming Policy
  - Temporary Road Closures Policy
  - Unmaintained and Unformed Roads Policy
  - Water Pipes Across and Along Roads Policy

The predicted traffic impacts, approximately 401 vehicle movements per day, will occur during the construction phase which generates the maximum traffic volumes including heavy and oversized vehicles. This report focuses on the construction impacts on the public road network in the immediate surrounds of the project considering the likely wind farm components and construction schedule.

## 1.1 Project Location

The proposed Liverpool Range Wind Farm is located in the New England Tablelands region of New South Wales. The site is located between the rural centres of Coolah to the northwest and Cassilis to the southeast.

## 1.2 Project Description

The proposed site is located on freehold land within and adjacent to agricultural areas. There are a number of local residences that surround the site; these have been identified through reviews of cadastral and topographic mapping, on-site inspection and aerial imagery.

The project would involve the construction, operation and maintenance of up to 288 wind turbines, together with the associated infrastructure, access tracks and electrical infrastructure required to connect the project into the existing electricity network.

The turbines would be placed along a series of ridgelines and surrounding hilltops in order to maximise the renewable energy produced by the wind.

This assessment is based on wind turbine models with a generating capacity of between 1.5 and 3.5 MW. Table 1-1 below provides the number and approximate weight of the major components of a typical wind turbine.

*Table 1-1 Wind turbine major components*

<b>Wind Turbine Component</b>	<b>No. of parts per turbine</b>	<b>Total number of parts for 288 turbines</b>	<b>Approximate component weight (tonnes)</b>
Towers	3 - 5	864 – 1440	Up to 60
Nacelle	1	288	Up to 80
Hub	1	288	Up to 23
Blades	3	864	Up to 12

The construction phase of the project will involve the establishment of temporary construction facilities, compounds, access tracks, crane hardstand areas and concrete foundations at each turbine location, underground electrical cabling, overhead powerlines, erection of wind turbines and the construction of the electrical substations and associated switchgear and control room buildings.

The construction of the wind farm will take 2 – 3 years and will involve vehicle movements undertaking the following key activities:

- ▶ Initial site establishment, including installing temporary site facilities, construction compounds, concrete batching plant, access tracks and excavation of the foundations.
- ▶ Installation of the foundations for the wind turbines, including reinforced concrete gravity foundations and potentially rock anchors depending on the geological conditions and final engineering design. Concrete batching plants are proposed on-site and raw materials will be trucked in and stockpiled in certain areas as required.
- ▶ Construction of the electrical infrastructure including the powerline, substations and facilities buildings.
- ▶ Delivery of turbine components, their erection and commissioning.

## 2 Key Issues and their Assessment

The key traffic and transport implications from the proposal arise from additional vehicle volumes and over-dimensioned vehicles, approximately 401 vehicle movements per day, accessing the wind farm site from the public road network during the project's construction and operation phase.

These issues include:

- ▶ The suitability of the existing roads for the type of vehicles that will need to access the site. Aspects affecting suitability include overall width of roads, radius and clearance at bends in the road and the nature of existing traffic use.
- ▶ The structural capacity of existing roads and structures to handle the heavy vehicles for the delivery of turbine and transformer components.
- ▶ Disturbance to the local community as a result of increased vehicle movements.
- ▶ Management of traffic on and off the site including traffic safety, minimising disturbance to any environmentally sensitive areas, minimising erosion and dust.

The potential environmental impacts associated with the traffic and transport arising from the project is discussed in other parts of the Environmental Assessment dealing with specific environmental issues.



*Figure 2-1 Transport of wind turbine nacelle*

The wind farm will be constructed during the following standard working hours and out of hours construction activities are not currently proposed.

Monday – Friday: 7am – 6pm

Saturday: 8am – 1pm


Sunday and public holidays: Not currently proposed

These standard hours of construction have been proposed to allow reasonable efficiencies of effort to achieve maximum productivity and to minimise the overall construction duration. However, some activities (including delivery



to site of major equipment, and turbine installation) may occur outside of these standard hours due to logistic, safety or weather related reasons. Likewise, the requirements of NSW Police or roads authorities may limit transport of major equipment to and from the site to outside of standard working hours.

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

- ▶ where construction activities that generate noise are within the NSW Interim Construction Noise Guidelines, or;
  - ▶ for the delivery of material required outside those hours by the NSW police Force or other authorities for safety reasons, or;
  - ▶ where it is required in an emergency to avoid the loss of life, property and/or to prevent environmental harm;
  - ▶ works as approved through the out-of-hours work protocol outlined in the Construction Noise and Vibration Management Plan as part of the Construction Environmental Management Plan.
- 

# 3 Predicted Traffic and Equipment Transport Requirements

The proposed development will generate significant additional traffic movement during the construction phase, approximately 401 vehicle movements per day, and a minimal increase over the operational phase of the project. The anticipated additional traffic type and volume is described in the following section.

## 3.1 Construction Traffic

Construction traffic will be generated by the delivery of equipment and materials as well as the construction workforce travelling to and from the site on a daily basis. The wind farm will be constructed during the following standard working hours and out of hours construction activities are not currently proposed.

Monday – Friday: 7am – 6pm

Saturday: 8am – 1pm

Sunday and public holidays: Not currently proposed

The vehicles delivering the main crane, wind turbine components and transformer components will be oversize, over-mass or both. These vehicles will require special operating permits to allow them to travel on public roads and the appropriately licensed haulage contractor will complete a detailed assessment for approval by the NSW Roads and Maritime Services (RMS) (formally the Roads and Traffic Authority) and local council prior to construction. Because of the high quality and suitability of the surrounding main roads, no difficulty in obtaining approval is envisaged. The delivery of these major components are planned to occur during standard working hours unless otherwise required by NSW Police or other authorities.

Oversize vehicles are those over 19 m in length, 2.5 m in width and 4.3 m high and may require one or more escort vehicles to accompany them.

Over-mass vehicles are those with a gross mass in excess of 42.5 tonnes and will require a permit to use public roads.

On-site access tracks will generally be around 5 - 6 m wide, but will need to be wider at bends and intersections. The longest vehicles will be those delivering blades. Typically two blades are delivered in one load and oversized vehicles used to deliver turbine blades can be up to 50-60m long.

There are no turning bays required on public roads, though turning bays may be required within the project site. Placement of turning bays, if needed, will likely be at the end of dead-end on site access roads, and will be organised in consultation with the relevant landowner.

*Table 3-1 Estimate of peak daily traffic volume*

<b>Construction Activities (Many occur concurrently)</b>	<b>Approximate Duration (Months)</b>	<b>Number of trips per day</b>	<b>Primary type of vehicle</b>	<b>Comments</b>
Construction staff and management	24	174	Light	Assumes site employees travel in standard vehicles and buses
Site establishment and mobilisation	1	12	Light and Heavy	Initial access to site
Internal access track construction	19	72	Heavy	Heavy excavation
Foundation excavation and construction	19	86	Heavy	Based on off-site concrete delivery (worst case)
Collection substations construction and commissioning	19	4	Heavy	Includes over-mass vehicles
Turbine erection	18	34	Heavy	Includes restricted-access

				vehicles
Grid connection substation and overhead powerline	18	7	Heavy	Overhead powerline constructed using single pole type structure
General construction and demobilisation	1	12	Light and Heavy	Site completion works
	<b>Total per day</b>	<b>401</b>		

Table 3-1 summarises a prediction of the maximum daily traffic volumes of approximately 401 vehicles per day and figures are derived from details in Table 3-2 below. In reality this overstates the likely trip numbers per day as these activities will be spread across the construction schedule and are unlikely to occur simultaneously. It also conservatively assumes that the concrete for the turbine foundations will be delivered to site rather than sourced from on-site batching plants.

Table 3-2 presents a program of works with associated traffic generation rates for the various vehicle types. The vehicle numbers represent the number of trips per day. The return journey is included in order to produce total vehicles per day on the road network.

In order to present the worst case scenario it has been assumed that premixed concrete will be delivered to site although it is intended where possible for concrete to be mixed on site in batching plants. On site batching will reduce the number of vehicles during the peak period of construction as deliveries of raw materials can be delivered over a longer time frame and at selected times.

During the period of construction the program of works schedule indicates an average of approximately 401 construction vehicles per day on the major access routes.

Table 3-2 Predicted program of works and traffic generation

Site activity	Number of turbines	Access roads / routes	Construction period								Predicted vehicle movements				Total movements	Total movement days	Average vehicle movements per day			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Semi trailer and large haulage truck	Concrete truck	Restricted access vehicle (RAV)	4WD and commercial vehicle						
<b>Preliminary</b>																				
Site staff, supervision, management and admin			■								-	-	-	25,000	25,000	720	35			
Construction employees			■								-	-	-	75,000	75,000	540	139			
<b>Construction - Wind Farm</b>																				
Site establishment and mobilisation	90	Coolah Creek Road, Pandora	■											10	10	5	75	100	30	3
Access tracks and civil excavation		Road, Cooks		■	■									3,500	-	5	75	3,580	143	25
Turbine foundations		Road and			■	■								180	3,600	-	75	3,855	143	27
Electrical reticulation and power lines		Gundare Road				■	■							50	25	10	75	160	143	1
Turbine delivery and erection							■	■						1,440	-	20	75	1,535	143	11
General construction and demobilisation									■					25	-	10	75	110	30	4
<b>Construction - Wind Farm</b>																				
Site establishment and mobilisation	86	Turee Vale Road	■											10	10	5	75	100	30	3
Access tracks and civil excavation				■	■									3,250	-	5	75	3,330	143	23
Turbine foundations					■	■								172	3,600	-	75	3,847	143	27
Electrical reticulation and power lines						■	■							50	25	10	75	160	143	1
Turbine delivery and erection							■	■						1,376	-	20	75	1,471	143	10
General construction and demobilisation									■					25	-	10	75	110	30	4
<b>Construction - Wind Farm</b>																				
Site establishment and mobilisation	55	Rotherwood Road and Bounty Creek Road	■											10	10	5	55	80	30	3
Access tracks and civil excavation				■	■									1,550	-	5	55	1,610	143	11
Turbine foundations					■	■								10	2,200	-	55	2,265	143	16
Electrical reticulation and power lines						■	■							25	20	10	55	110	143	1
Turbine delivery and erection							■	■						880	-	12	55	947	143	7
General construction and demobilisation									■					20	-	10	55	85	30	3
<b>Construction - Wind Farm</b>																				
Site establishment and mobilisation	57	Rotherwood Road and Coolah Road	■											10	10	5	55	80	30	3
Access tracks and civil excavation				■	■									1,700	-	5	55	1,760	143	12
Turbine foundations					■	■								10	2,200	-	55	2,265	143	16
Electrical reticulation and power lines						■	■							25	20	10	55	110	143	1
Turbine delivery and erection							■	■						912	-	12	55	979	143	7
General construction and demobilisation									■					20	-	10	55	85	30	3
<b>Grid Connection and Powerlines</b>																				
Connection substation - 330kV		Ulan Road and Golden Highway			■									50	50	5	150	255	143	2
Powerline - 330kV							■	■						200	200	200	150	750	143	5
<b>Total</b>	<b>288</b>																		<b>Total</b>	<b>401</b>

## 3.2 Operational Traffic

A modern wind farm is designed to operate automatically and unmanned, but a small crew of technicians are based on the site during normal working hours (generally Monday to Friday) to carry out scheduled maintenance on the wind turbines. Unscheduled maintenance will be carried out by technicians, as required, both during and outside normal working hours. Operational staff will regularly visit all of the wind turbine locations on site using light weight service vans or utility vehicles. It is anticipated that operational requirements including scheduled and unscheduled maintenance will generate up to 30 trips per day on the nearby road network.

During operations the on-site access roads would only require minimal maintenance as generally only light weight maintenance vehicles and service vans would require access to the wind farm. The wind farm operator is responsible for the ongoing repair and maintenance of all on-site wind farm access roads during operations. Some access road reinstatement and maintenance works may be required prior to commencement of the wind farm decommissioning phase at the end of its operational life.



*Figure 3-1 Wind turbine service van*



# 4 Transport Alternatives and Assessment

## 4.1 Road Transport from Port to Cassilis

The majority of the wind turbine components will be manufactured overseas and delivered to a major Australian shipping port. The closet suitable port to the wind farm site is located at Newcastle. The preferred road transport route from the Port of Newcastle is via the New England Highway and the Golden Highway to the town Cassilis which is approximately 230km from Newcastle. Both of these highways are approved as heavy vehicle routes by the RMS and are suitable for over-mass and oversize loads.



Figure 4-1 Major road transport route to Cassilis from Newcastle

Prior to construction a project specific Traffic Management Plan will be developed in consultation with local stakeholders (including the RMS and Councils) in accordance with regulations and to identify any specific timing and physical constraints on the transport route to the wind farm site.

It is possible that the tower sections for the turbines will be manufactured in Australia rather than delivered by to a port by ship. The tower sections would be delivered by road transport following the same route via the New England Highway and the Golden Highway.



Temporary modification of the street furniture may be required at a right-hand bend in the Golden Highway as shown in Figure 4-2 below to enable oversized vehicle manoeuvring.

The route from port to Cassilis along the New England and Golden Highways is an approved RMS B-Double route and is suitably designed to accommodate oversized and over mass loads. Where the transport route leaves the Golden Highway on Warrumbungle Way, the RMS B-Double route becomes an 'Approved Area with Conditions' and any road upgrades required for the project will be updated with the local councils.

The assessment of the route from port to Cassilis has found that the existing road design capacity is more than sufficient to accommodate the short term construction impacts.



Figure 4-2 Right-hand bend on Golden Highway in Denham



Figure 4-3 Golden Highway at Cassilis

## 4.2 Road Transport from Cassilis to Site

The township of Cassilis is located approximately 1.5 km off the Golden Highway. The proposed route will not pass through Cassilis but will continue west on the Golden Highway past the Cassilis turn off for approximately 12km to the

intersection with Warrumbungles Way (also known as Vinegaroy Road). The access route follows Warrumbungles Way in a northerly direction for approximately 7km to the intersection with Coolah Road. Refer to Figure 4-4 on the following page.





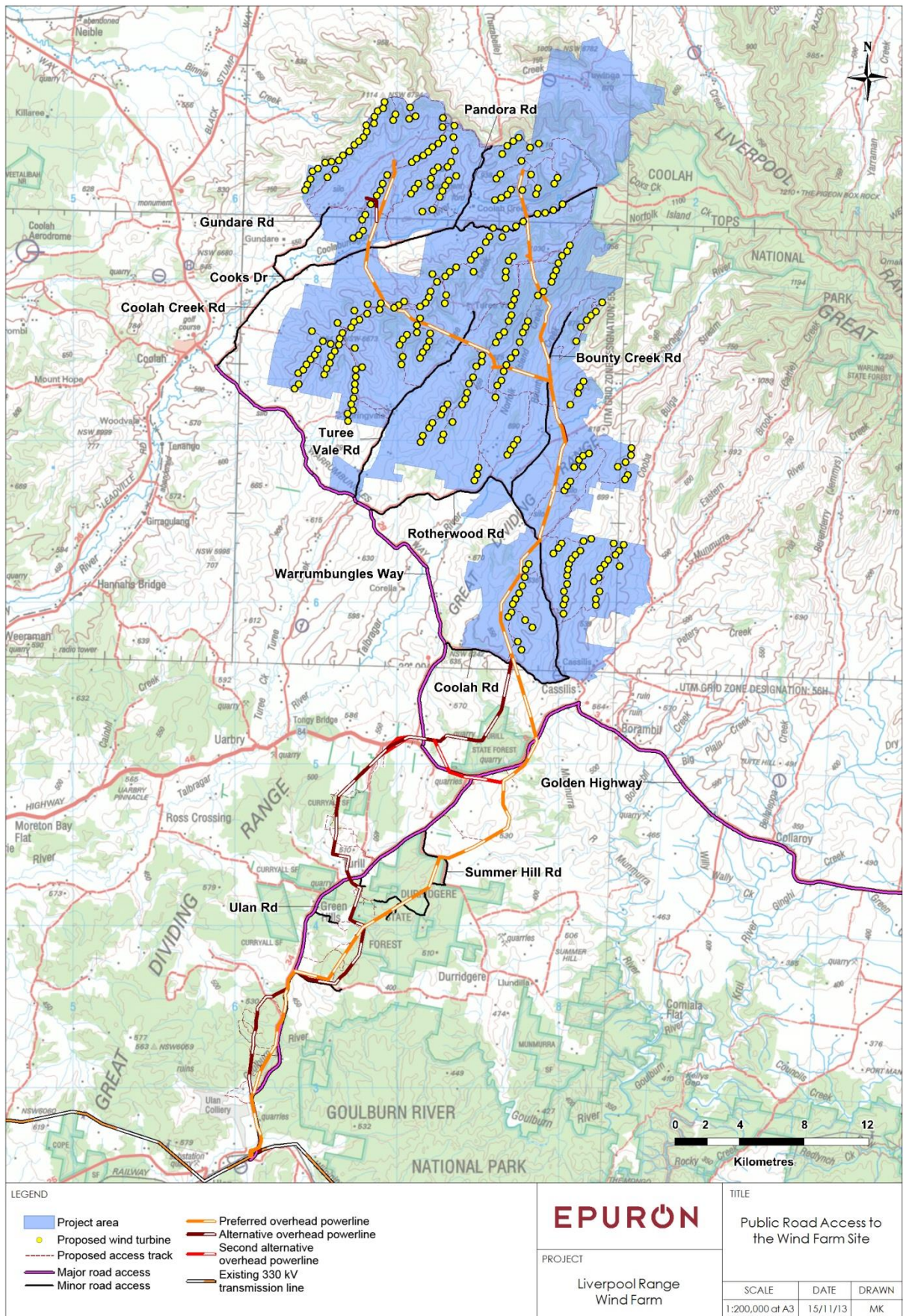


Figure 4-4 Access to the proposed wind farm site



### 4.3 Primary Site Access Route from the South

The primary access route onto the wind farm site from the south will be via Coolah Road and Rotherwood Road. Rotherwood Road forms a loop from Coolah Road onto the Warrumbungles Way near the intersection with Tongy Road.

Access to the central part of the site will be via the Warrumbungles Way and Rotherwood Road.

Views of these access roads and potential constraints that may require minor modifications to allow access for the oversize loads are shown in the figures below.



*Figure 4-4 Intersection of Warrumbungles Way & Coolah Road*



*Figure 4-5 Rotherwood Road*



*Figure 4-6 Creek crossing on Rotherwood Road*



*Figure 4-7 Unsealed section of Rotherwood Road*

#### **4.4 Access Route to the Central Section of the Wind Farm Site**

Access to the central section of the wind farm site will be via the Warrumbungles Road and Turee Vale Road. The figures below show details of Turee Vale Road. A number of modifications will be required, e.g. to creek crossings and cattle grids, to enable the access route to be used by the over mass and over-dimensional delivery vehicles.





Figure 4-8 Turee Vale Road



Figure 4-9 Turee Vale Road



*Figure 4-10 Sherwood main gates on Turee Vale Road*



*Figure 4-11 River crossing on Turee Road after Sherwood main gate*

## 4.5 Access Route to North West Section of the Site

Access to the north west section of the wind farm site will be via the Warrumbungles Way and then Coolah Creek Road. Secondary access roads off Coolah Creek Road are:

- ▶ Cooks Drive and Gundare Road;
- ▶ Pandora Road; and
- ▶ Coolah Tops National Park Access Road





*Figure 4-12 Warrumbungles Way / Coolah Creek Road Intersection*



*Figure 4-13 Coolah Creek Road/Cooks Drive towards Gundare Road*



*Figure 4-14 Gundare Road*



*Figure 4-15 Intersection of Coolah Creek Road and Coolah Tops National Park Road*





*Figure 4-16 Coolah Tops National Park Road*

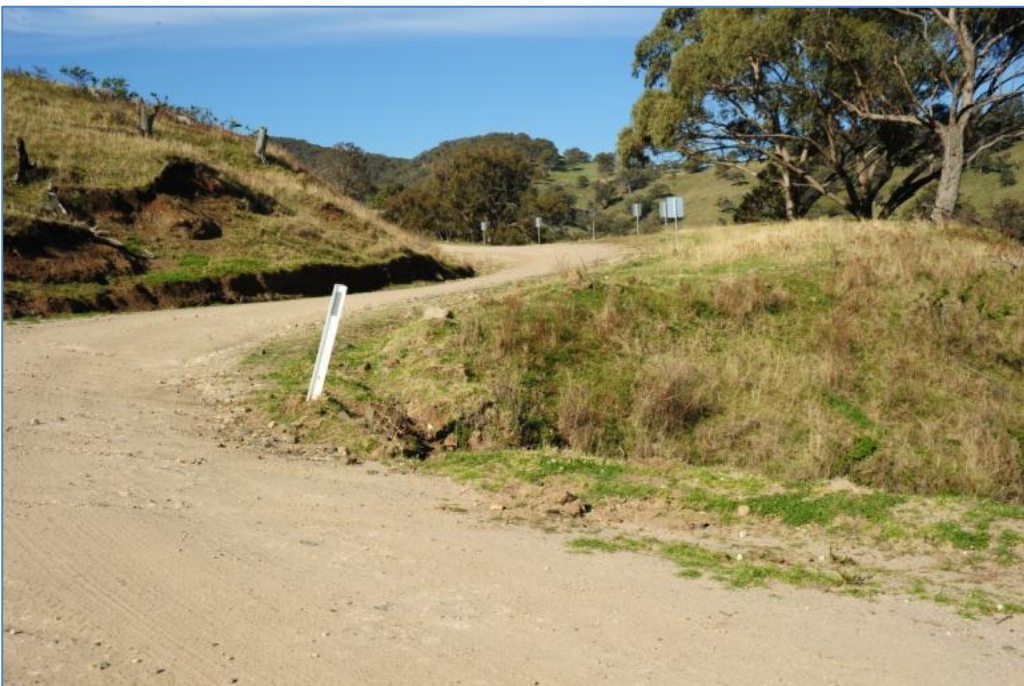


*Figure 4-17 Pandora Road*



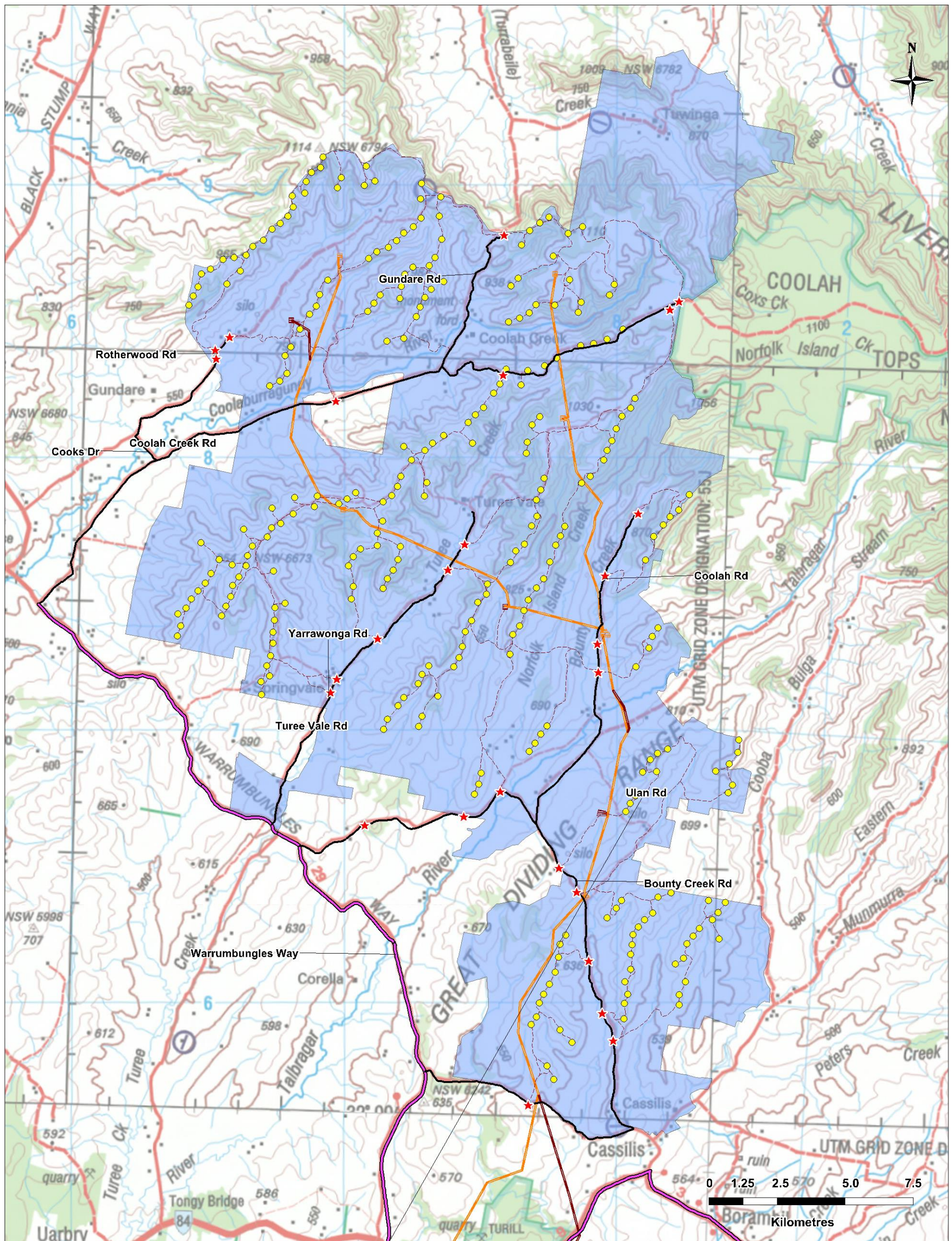


*Figure 4-18 Pandora Road*



*Figure 4-19 Pandora Road*





<b>LEGEND</b> — Line — Major access road — Minor access road Site boundary Proposed wind turbine ★ Proposed site access point — Proposed overhead powerline corridor — Alternative overhead		<b>EPURON</b> PROJECT Liverpool Range Wind Farm	TITLE Wind farm site access points		
			SCALE	DATE	DRAWN
		1:125,000 at A3    17/11/13    VR			

Figure 4-20 Wind farm site access points from minor roads



## 4.6 Access within the site

Access tracks to each of the wind turbine locations will generally be across open paddocks and be along the ridgelines that the turbines are located on. The location of the access tracks has been selected with consideration for existing environmental constraints and to minimise the overall length of tracks on the site.

The internal site access tracks are generally private roads and there will be no traffic impacts to the general public from vehicle movements within the site.

Empty delivery vehicles will exit the site via the same entry point. The Traffic Management Plan will address and avoid potential scheduling conflicts of vehicles entering and leaving the site. Provision will be made on site for an area that will allow for the turning of semi-trailers and oversized vehicles so no vehicles would need to reverse onto the public road network.

# 5 Existing Traffic Flows

## 5.1 Access via Main Highways

The Port of Newcastle is located within a large city and the surrounding road network has significant peak traffic flows. Deliveries from these locations will need to be timed to avoid the peak periods where possible. The New England Highway which will provide the main access route has been constructed to a high standard and is expected to be suitable for the over-mass and oversize vehicles needed for the construction of the wind farm.

The RMS is responsible for the main highways in NSW. The highways running to Cassilis are included in the RMS's asset register; however the local council is retained to carry out the maintenance on the highways in the vicinity of Cassilis and Coolah.

The highways are used by local traffic and commercial vehicles to access or pass the town centre. They have moderate levels of use during peak periods. The RMS count in 2006 (which is the most recent reported traffic data available) recorded the annual average daily traffic (AADT) the following traffic volumes on sections of the proposed transport route (RTA, 2006):

- ▶ 10,269 vehicles per day on the New England Highway near Muswellbrook;
- ▶ 1697 vehicles per day on the Golden Highway near Cassilis ; and
- ▶ 2054 vehicles per day on Quigley St in Merriwa

As indicated by the above data there is a drop off in vehicle volumes as they move further from the New England Highway. This number is expected to be significantly lower along the primary routes chosen for wind farm construction as they are local roads compared to the more major thoroughfares monitored by the RMS.

Assuming all wind farm construction traffic enters the site along the primary routes described in Section 4.3, a daily increase of around 380 trips would be attributed to wind farm traffic. During the operation phase, the predicted 30 vehicle movements per day are not significant.

# 6 Transport Impacts

## 6.1 General

The main impact of the proposed wind farm with regard to traffic and transport is the additional number of vehicles on the roads during the construction period and the size of some of the loads.

The amount of additional traffic generated by the wind farm will be negligible relative to the significant daily traffic volumes on the Golden Highway. Some minor disruptions may be caused by the passage of the oversize vehicles on the highway.

The additional traffic between Cassilis and Coolah has the potential to cause minor disturbance to local users. Discussion with the local councils and the RMS will be required to finalise the preferred route and identify any particular issues to be address in the project Traffic and Transport Plan. It is a commitment of the Proponent to fund the necessary local road upgrade works attributed to the construction of the wind farm. These works will be funded by the Proponent which may be in the form of a voluntary planning agreement (or similar) as agreed with council.



Figure 6-1 Transport of turbine blades with escort vehicle



Figure 6-2 Transport of tower section on steep site access track

## 6.2 Suitability of Existing Road Layout

Prior to the commencement of the project a detailed route survey will be carried out by the transport contractor to ensure safe access and minimise potential impacts to other road users. If there is a need for any temporary modification of any road structures or furniture, then it will need to be discussed and agreed with the local Councils or the RMS as relevant.

Multiple access points to the wind farm site have been selected to achieve safe access and minimise community disruption during the construction stage. Further planning and consultation with local Councils and the RMS will be undertaken to ensure the safe passage of vehicles entering and leaving the site.

## 6.3 Structural Capacity of Existing Roads and Structures

The existing roads that provide the feasible access to the site are generally in good condition; however the increased traffic during construction has the potential to exacerbate any areas that are showing signs of deterioration. Increased inspection and maintenance will need to be discussed and agreed with the local Council.

The major roads have been designed to cater for large over-mass vehicles, but some structures on local roads such as cattle grids may be impacted by the passage of the large construction vehicles. These structures may require monitoring and repair or replacement during the construction period to maintain serviceability for local users and construction traffic. A road dilapidation report will be prepared prior to the commencement of construction so any road damage attributable to the construction of the wind farm can be identified and repaired.

Where any local road upgrades are required as a result of the project, including intersection widening, pavement resurfacing, bridge strengthening etc. it will be undertaken prior to construction at the cost of the proponent and in consultation with the local councils.

## 6.4 Disturbance to Local Community

The main impacts of wind farm construction traffic on the local communities will involve:

- ▶ movements of vehicles past Cassilis and along the Golden Highway and to and from the site entry;
- ▶ increased frequency of vehicle movements on the surrounding roads to the wind farms that would otherwise have low traffic volumes; and
- ▶ potential safety risks arising from increased traffic movements.

The volume of construction traffic indicated in Table 3-1 Estimate of peak daily traffic volume will be spread over the construction period but on a daily basis the frequency of vehicle movements would fluctuate depending on the construction activities occurring at the time. Deliveries of long loads such as the wind turbine blades may involve up to 6 oversize vehicles per day. Pouring concrete for a turbine foundation can involve around 50 one-way truck movements in a day.

The general increase in daily traffic has the potential to increase the short-term traffic noise levels along the proposed access route. The level of disturbance to residents will be directly related to the proximity of the existing premises to the access roads. During construction the timing of vehicle movements will be mostly within the normal site working hours. Night time deliveries will be avoided wherever possible.

The oversize and over-mass vehicles are likely to travel at lower speeds than those normally used by local residents. Some delays may be experienced by local residents due to the nature of the vehicles being used to deliver materials to the site. Special consideration will be provided to routes that pass residential areas, schools, school bus routes and intersections in the transport Management Plan to schedule deliveries outside of peak or important times where possible. Consultation with local stakeholders will be undertaken prior to the finalisation and implementation of the Traffic Management Plan.

## 6.5 Road Safety

The Cassilis and Coolah townships generally have low accident rates; however, have recorded fatalities in recent years. The 2010 statistics for the Cassilis and Coolah townships relative to the entire Hunter Region can be seen in Table 6-1 and the statistics for the Golden Highway in the local vicinity of the project relative to the entire Hunter Region can be seen in Table 6-2 (RTA, 2010).

*Table 6-1 Accident rates in the Hunter Region (Maitland)*

<i>Fatal Crashes</i>	<i>Injury Crashes</i>	<i>Non Casualty Crashes</i>	<i>Total Crashes</i>	<i>Killed</i>	<i>Injured</i>
2	13	17	32	2	13

*Table 6-2 Accident rates on the Golden Highway*

<i>Fatal Crashes</i>	<i>Injury Crashes</i>	<i>Non Casualty Crashes</i>	<i>Total Crashes</i>	<i>Killed</i>	<i>Injured</i>
9	448	553	1,010	10	641

The transport of large items of equipment on oversize and over-mass vehicles as well as an increase in traffic using a road network has the potential to have some impact on road safety. Such potential safety impacts may result from:

- ▶ other road users becoming frustrated by delays behind slow moving vehicles;
- ▶ normal traffic expectation by local road users not allowing for the presence of large vehicles; and
- ▶ an increase in traffic numbers on the roads.

These potential safety impacts will be minimised by the use of escort vehicles that will accompany the oversize and over-mass vehicles. The Traffic Management Plan will be used to control the movement of vehicles between Cassilis and the site.

# 7 Recommendations and Mitigation Measures

A number of measures will be incorporated during the construction and operation of the proposed wind farm to ensure that traffic and transport impacts arising from the development are managed and minimised. These measures will be incorporated into a Traffic Management Plan for the project and developed in consultation with the RMS and the local councils to ensure that applicable safety standards are achieved and disruption to local traffic is minimised.

An important mitigation measure during the construction period will be the implementation of a community information and awareness program. This will ensure that the local residents are fully aware of the planned construction activities and construction traffic. The program will include notices in the local newspapers and newsletters to local residents.

Temporary signage will be erected during the construction period in consultation with the RMS and Councils to provide specific warning of construction traffic. Other mitigation measures will include:

- ▶ Use of a licensed and experienced haulage contractor, to be responsible for obtaining all necessary permits and approvals from the RMS and Councils and for complying with conditions of consents.
- ▶ Escorts for oversize and over-mass vehicles will be provided in accordance with RMS requirements.
- ▶ Development of a Traffic Management Plan that will identify detail actions such as scheduling of deliveries, managing timing of transport through major centres to avoid peak times (beginning / end of school), consultation activities during haulage activities, designing and implementing modifications to intersections and street furniture and managing the haulage process.
- ▶ The Traffic Management Plan will establish a procedure to monitor traffic impacts during construction such as noise, dust nuisance and travel timings so adjustments can be made to minimise impacts.
- ▶ Improvements to any public roads impacted by the project in consultation with the RMS & Councils. The improvements may include upgrades to the intersection at the site entrance, provision of entry/exit lanes and upgrades to gates and cattle grids.
- ▶ Re-instating pre-existing conditions after temporary modifications, if required.
- ▶ Providing a 24hr telephone contact during construction to enable any issue or concern to be rapidly identified and addressed.
- ▶ Prepare a road dilapidation report prior to the commencement of construction and following completion of construction to determine any damage attributable to the project. Any damage would be repaired by the Proponent.
- ▶ Should deterioration of roads occur during construction activities, an inspection and maintenance program would be established, if required by the Council.
- ▶ Implementation of appropriate erosion and sediment control measures for new access tracks within the site.
- ▶ Implementation of appropriate dust control measures for unsealed tracks within the site.



## 8 Conclusion

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

During the construction phase there is potential for temporary impacts on the local traffic. The construction phase is expected to last for approximately 24 - 36 months. In particular the delivery of the over-mass and oversize wind turbine equipment components may at times affect the flow of local traffic. Traffic management procedures will be implemented to ensure that the impacts of the oversize vehicles are minimised and safety and protection measures will be implemented to reduce the risks of accidents to an acceptable level.

The proposed access route to site via the New England Highway, Golden Highway and Vinegaroy Road together with the mitigation measures proposed in this report will minimise the impact of traffic impacts during the construction phase and ensure that the road network can be maintained to a satisfactory standard. Considering the high quality of the access roads to the site and the mitigation proposed, likely traffic impacts are considered acceptable and manageable.

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



## 9 References

RTA (2006) "*Annual Average Daily Traffic data.*" Roads and Traffic Authority. Retrieved July, 2012, from [http://www.rta.nsw.gov.au/trafficinformation/downloads/aadtdata\\_dl1.html](http://www.rta.nsw.gov.au/trafficinformation/downloads/aadtdata_dl1.html)

RTA (2010) "*Road Traffic Crashes in New South Wales - Statistical Statement for the year ended 31 December 2010.*" Roads and Traffic Authority. Retrieved July, 2012, from <http://www.rta.nsw.gov.au/roadsafety/downloads/crashstats2010.pdf>

RTA (2002) "*Guide to traffic Generating developments*" – issue 2.2. Road and Traffic Authority. Retrieved, November, 2012, from [http://www.rta.nsw.gov.au/roadprojects/community\\_environment/documents/guide\\_to\\_generating\\_traffic\\_developments.pdf](http://www.rta.nsw.gov.au/roadprojects/community_environment/documents/guide_to_generating_traffic_developments.pdf)

RTA (2004) "*Traffic volume data for Hunter and Northern Regions 2004*" - Retrieved November, 2012, from [http://www.rta.nsw.gov.au/trafficinformation/downloads/aadt\\_data\\_files/aadtnorthern2004\\_i.pdf](http://www.rta.nsw.gov.au/trafficinformation/downloads/aadt_data_files/aadtnorthern2004_i.pdf)



**EPURON** Pty Ltd  
Level 11, 75 Miller Street  
North Sydney NSW 2060

**Website:** [www.epuron.com.au](http://www.epuron.com.au)