

## **CHAPTER 14**

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### **Communications Assessment**

## 14. COMMUNICATIONS ASSESSMENT

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Electromagnetic signals (or radio waves) are transmitted throughout the country as part of telecommunication systems by a wide range of operators. Such systems are used for radar, radio broadcast, television, mobile phones and mobile and fixed radio transmitters. Electromagnetic signals generally work best if a clear path exists between the transmitting and receiving locations, known as line of sight (LOS).

There is the potential for interference from any large structure, including wind turbines, which occur within or close to the signal path. Signals can be interfered with or reflected by the rotating blades of a wind turbine, which could degrade the performance of the signal (Bacon 2002). Electromagnetic emissions from generators and other machinery also have the potential to affect signals; however with modern turbine generators and strict International Electrotechnical Commission (IEC) regulations for manufacturers, there are now negligible emissions from wind turbines (Auswind 2006).

This section describes the existing radio/communication systems that operate within the Project, as well as television broadcast services. It also provides an assessment of potential interference effects caused by the Project and possible mitigation measures.

### 14.1 Methods

Experts have been consulted to assess the potential interference to radio-communications and TV signals in the area of the Project from electromagnetic signals. Lawrence Derrick & Associates (LDA) conducted an assessment on the potential impacts of radio-communication services (see **Appendix 17**), while Broadcasting Australia and commercial television (TV) stations were consulted regarding potential TV interference (see **Appendix 18**). The following sections outline the approaches taken in measuring such interference.

#### 14.1.1 *Radio-communication Investigations*

The Australian Communications and Media Authority (ACMA) Register of Radio-communications was reviewed by LDA to determine the location of any radio-communications links and towers within or close to the Project area. Once this was done, a corridor was created around each of the links or towers to ensure that the First Fresnel Zone (refer to **Appendix 17** for description) was not affected by any of the potential wind turbines or blades.

#### 14.1.2 *Television Investigations*

Broadcasting Australia (managers of the National Transmission Network transmitting both ABC and SBS channels), Prime Television, WIN Corporation and Southern Cross Ten were approached to determine what affects the Project, in particular wind turbines, would have on any of their transmission towers or television services.

## 14.2 Existing Situation

### 14.2.1 *Radio-communications*

There are two paths with three point-to-point links operated by Alinta Gas, NSW Rural Fire Service and NSW Rural Ambulance Service traversing the Project. There are also three additional paths with four point-to-point links operated by NSW Police, Telstra and Soul Pattinson occurring near the Project.

There is a FM Broadcasting Station on Brown Mountain (approximately 35 km east of the Project site) transmitting on 99.3 MHz, 100.1 MHz and 100.9MHz.

There are other existing radio sites that occur near the boundary of the Project, including:

- NSW State Emergency Service (SES) Mobile Radio Base;
- NSW Rural Fire Service Mobile Radio Base;
- Telstra Cellular Base, Link Site and Point to Multipoint; and
- Airservices Air-Ground Base.

### 14.2.2 *Television*

Residences in the vicinity of the Project receive television reception primarily from the Broadcasting Australia, Brown Mountain transmitter which provides ABC and SBS to the Bega and Cooma area, and from Mount Roberts which relays the signal of commercial channels (Prime Television, WIN Corporation and Southern Cross Ten) to Bombala (Personal communication Langridge 2009; Personal communication Searle 2009).

### 14.2.3 *Air Services Radar*

An Air Services Radar facility near Cooma is about 22 km from the north-west corner of the Project. Air Services have been notified about the Project and further details on Aviation-related communication systems is included in **Chapter 13** Aviation.

### 14.2.4 *Mobile Phones*

Vodafone currently has limited 2G and planned future 3G coverage across the Project as seen in **Figure 14.1**.

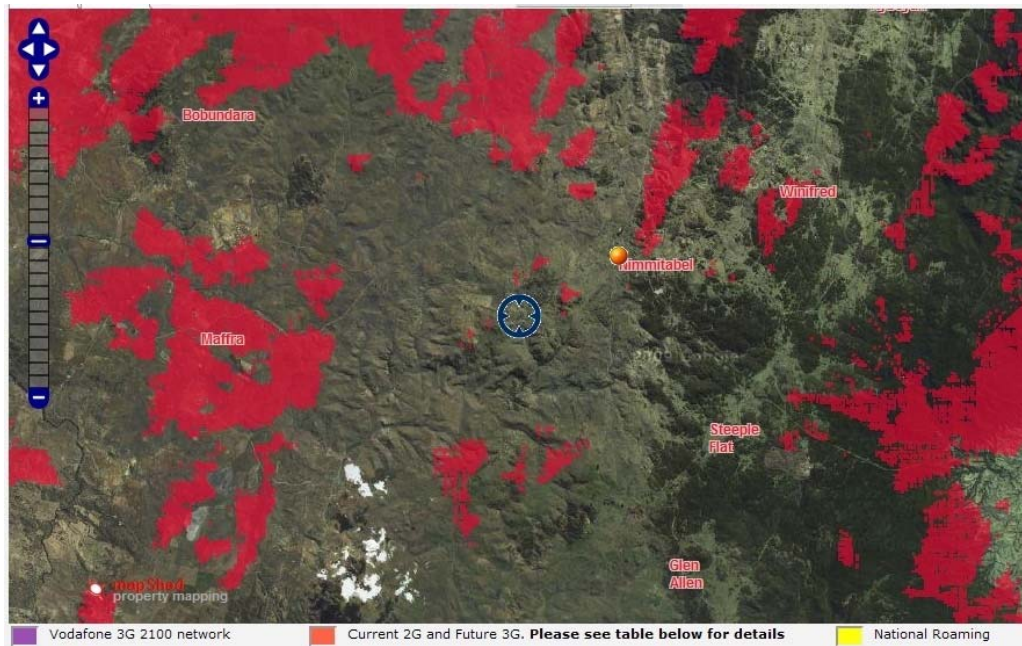


Figure 14.1 Vodafone coverage

Telstra provides coverage for mobiles across the Project via Telstra Mobile satellite as seen in Figure 14.2.

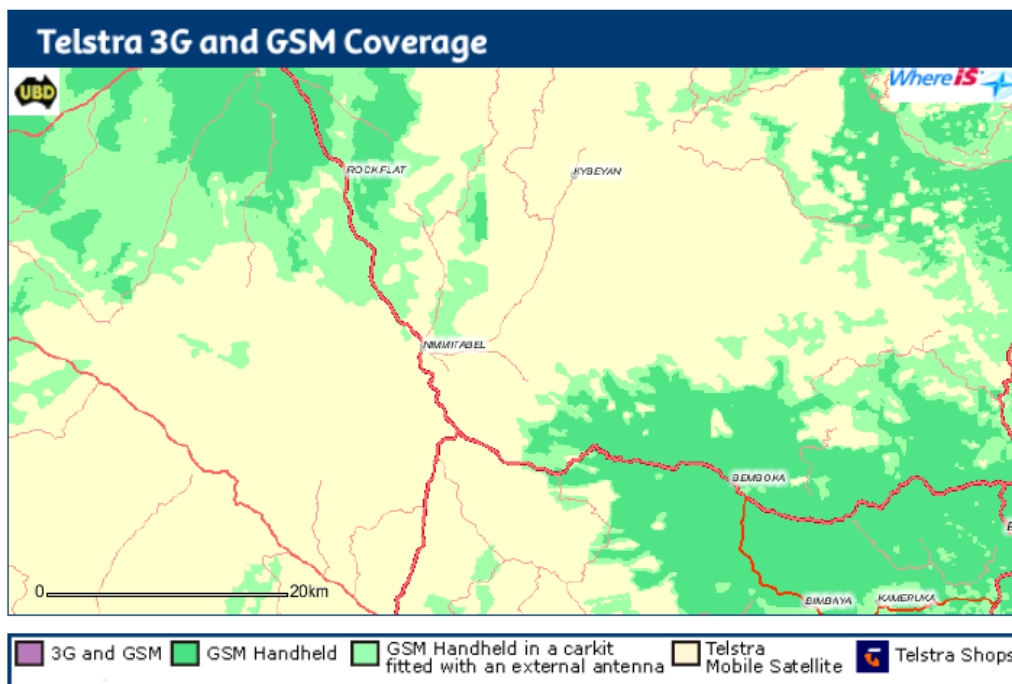


Figure 14.2 Telstra coverage

### 14.3 Potential Impacts

Potential impacts on the communications services in the area vary depending on their type.

#### 14.3.1 *Radio-communications*

Point to point, or point to multipoint services require a high degree of LOS, and therefore can be easily affected by structures within the LOS pathway. As a general rule of thumb, if objects are placed outside of the First Fresnel zone (or zone of electromagnetic interference) then impacts can be avoided. LDA's assessment shows that the current layout does not interfere with any point to point radio-communication links that cross through or near the Project (that is, turbines are well outside the First Fresnel zone), as seen in **Figure 14.3**. Also no turbines are located within a disruptive distance of a transmitting or communication tower, which means the Project is not expected to have any negative impacts on existing point-to-point links.

Amplitude Modulated (AM) and Frequency Modulated (FM) radio transmission systems are considered to be subject to negligible impacts from wind farm projects and effects only occur at very small distances from wind turbines (i.e., within 10 m) (National Research Council 2007). This will be no different at the Project site.

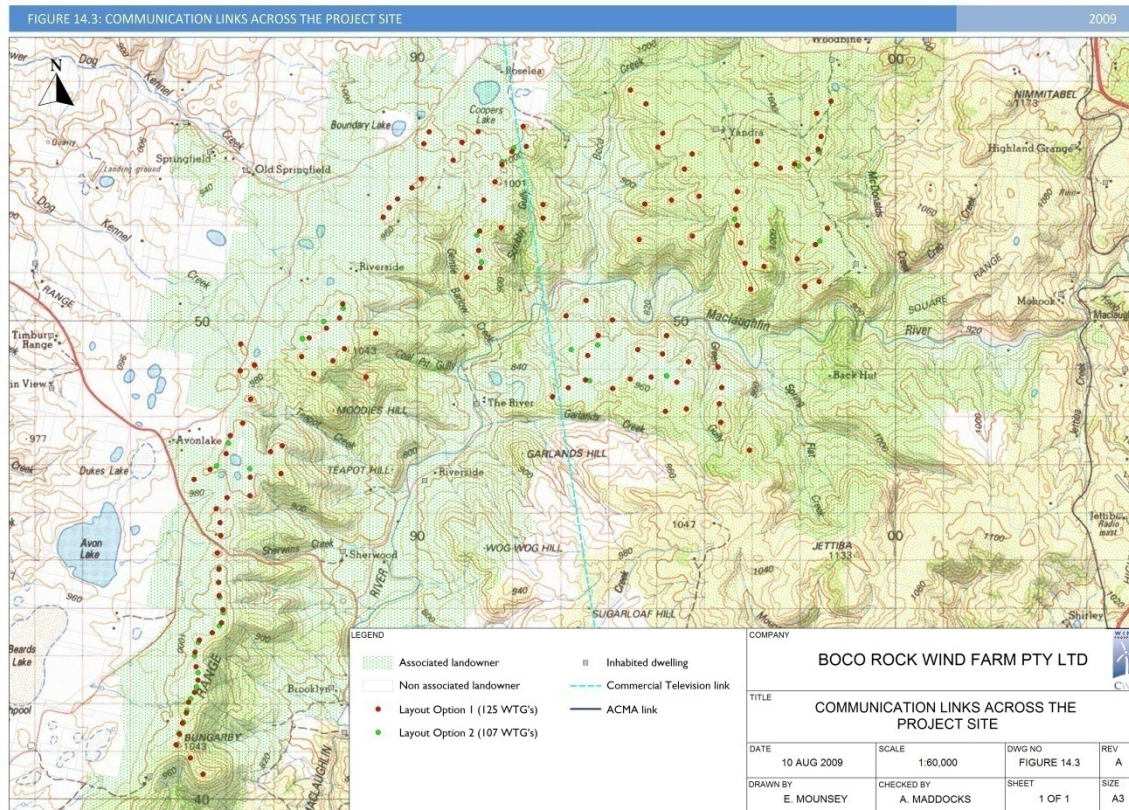
Mobile radio services do not require a high degree of LOS and so are less susceptible to interference by structures.

#### 14.3.2 *Television*

Wind turbines can interfere with analogue television signals by causing the picture to flicker or 'ghost' in time with the rotation of the blades, also known as scattering or reflection. As there are no major population centres near the transmission from Brown Mountain (located approximately 35 km east of the Project site) there is expected to minimal impact on picture quality for ABC and SBS services. There is still the chance, however, that some landowners in the area may be effected, in particular those where the Project interferes with a direct signal from the local transmitting tower (personal communication Langridge 2009).

For the commercial channels (Prime Television, WIN Corporation and Southern Cross Ten) there is a potential impact to television signals due to the signal being transmitted through the centre of the Project, from Mount Roberts to Bombala. However the impact has been minimised following consultation with representatives from the commercial channels, by ensuring the proposed wind farm layouts do not interfere with the first Fresnel zone, as seen in **Figure 14.3**.





**Figure 14.3 Communication links across the Project site**  
**(An A3 size version of this Figure is displayed in Volume 2)**

#### 14.3.3 *Mobile Phones*

Mobile phone reception is mainly dependent on the position of the receiver. The position of the receiver is able to move around both natural and unnatural obstacles in the landscape and therefore wind turbines will have minimal impacts on signal quality.

There is a potential impact to Vodafone mobile coverage in the Yandra Cluster and the Sherwins Cluster. There is limited impact to the Telstra mobile coverage from the Project as the area is serviced via a satellite which allows the receiver to be able to move around the landscape to gain better signal quality.

#### 14.3.4 *Cumulative Impacts*

An assessment of cumulative environmental impacts considers the potential impact of a proposal in the context of existing developments and future developments to ensure that any potential environmental impacts are not considered in isolation. It is anticipated that there will be no cumulative effect to communications from the introduction of the proposed development into the area.

### 14.4 Management and Mitigation

Typical, general mitigation requirements include:

- Amend planned WTG positions if necessary and feasible within the Approval Conditions, to create corridors to ensure minimal interference on links;
- A system for recording any complaints on interference, to allow for further investigations with the affected party, to reach an amicable solution;
- Use of primarily non-metallic WTG blades, to minimise disruption; and
- Where practical use equipment complying with the Electromagnetic Emission Standard AS/NZS 4251.2:1999.

Although no impacts on radio-communications are expected, if impacts occur typical mitigation requirements for radio-communication could include:

- Modifications to or relocation of existing antennae;
- Installation of a directional antennae; and
- Installation of an amplifier to boost the signal.

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 effected landowner. These could include:

- Re-orientation of existing aerials to an alternative transmitter;
- Provision of a land line between the effected receiver and an antenna located in a suitable reception area;
- Provision of satellite or digital TV where available; and
- 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).

## 14.5 Summary

There are a few point-to-point links and omnidirectional services which occur across and next to the Project. Due to the layout of the Project, the predicted impacts are expected to be minimal. There remains a chance that television interference may occur for some landowners in the area however if any effects are noted then the Proponent will conduct an investigation with the afflicted party and provide a suitable solution.

## 14.6 Proposed Transmission Line

The proposed transmission line will be assessed apart from this EA under Part 5 of the *EP&A Act*. Possible impacts and mitigation strategies of the transmission line on communication include:

- Radio Frequency broadband noise generated by power lines could be received by the radio receivers at the radio repeaters or terminal sites if sites are close to the lines and if the links were operating at low frequencies. However, generally this is not an issue, today transmission lines are built to standard specifications reducing the potential impact; and
- The poles, towers and wires could physically obstruct the radio signal. However, due to the low height and limited dimension of the wires, there is minimal impact from such structures.

#### 14.6.1 *Cumulative Impacts*

The proposed transmission line development will occur in parallel with the planned upgrade to the existing 66 kV network as described in **Chapter 3** Project Description and the Boco Rock Wind Farm. It is anticipated that there will be no cumulative effect to communications from the introduction of the proposed transmission line in the area. However, if necessary, an assessment will be included in the Review of Environmental Factors for the transmission line.