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Meering West Wind Farm

Telecommunications Assessment

Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust

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Executive Summary

Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust is proposing to construct, operate and maintain up to 164 wind turbines in Meering West, Victoria (the Project). Aurecon Australasia (Aurecon) has carried out a telecommunications (electromagnetic interference) assessment for the Project to support a planning application.

Aurecon has obtained the licence details of all licensed telecommunication equipment in the vicinity of the Project Area to assess if any impact is expected.

Fixed telecommunications towers

One fixed telecommunication tower was identified within 2 km of the Project, ~1.3 km from the nearest turbine and just outside the Project Area. Although considered unlikely, interference with communications from this tower may occur due to reflection/scattering effects, and Aurecon recommends consulting with the licence owner.

Point-to-point assessment

There is only one point-to-point link signal crossing the Project Area in the east but is ~1.3 km away from the nearest turbine and at the end of the link. Therefore, interference is not expected, and no mitigation is required.

Point-to-multipoint assessment

Three licensed towers are located within 20 km of the Project, and so interference may occur if telecommunications from these sites pass through the Project. It is recommended to consult with the licence operators identified to confirm whether their communications will be impacted.

Point-to-area assessment

One broadcasting location is within 2 km of a proposed turbine location, so interference may occur for this broadcasting tower and mitigation may be required. Aurecon recommends consulting with the licence owners.

Several dwellings are near or within no coverage areas for two mobile phone networks (Optus and Vodafone) and digital TV that are available in the area around the Project, and may experience reduced signal as a result of the Project. Several dwellings may also experience reduced wireless internet signal. It is recommended to contact the providers of these services to seek feedback on any potential impact that the Project could have, and if required confirm what mitigation options are available for users, such as a signal amplifier.

Radar

The closest meteorological radar is ~140 km from the Project, and while interference is considered unlikely it was recommended to contact the Bureau of Meteorology (BOM) as a courtesy so that any potential effect of the Project on this weather radar can be assessed. BOM advised in September 2025 that it has no objection to the proposed development proceeding. Further consultation will be undertaken throughout the Project for any significant changes to the project layout.

The closest aeronautical radar is ~50 km from the Project. It is recommended to contact Airservices Australia so that any effect of the Project on this radar can be assessed. All other aeronautical radars are over 150 km from the Project and not expected to be affected.

The closest defence radar is ~145 km from the Project, and while interference is considered unlikely it is recommended to contact the Department of Defence as a courtesy so that any potential effect of the Project on this radar can be assessed.

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Glossary

Acronym	Definition
ACMA	Australian Communications and Media Authority
Aurecon	Aurecon Australasia Pty Ltd.
BESS	Battery Energy Storage System
BOM	Bureau Of Meteorology
DOD	Department of Defence
EMI	Electromagnetic Interference
GHz	Gigahertz
GW	Gigawatt
ha	Hectares
Hz	Hertz
km	Kilometres
kV	Kilovolt
m	Meters
MW	Megawatts
MWh	Megawatt hours
The Project	Meering West Wind Farm Project
The Proponent	Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust
Project Area	The area in which construction will take place and for which approvals will be sought.
VNI West	Victoria to New South Wales Interconnector West

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1 Introduction

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust (the Proponent) to facilitate the environmental and planning assessments and approvals for the Meering West Wind Farm Project (the Project), located near Meering West in Northern Victoria.

1.1 Purpose

The purpose of this telecommunications assessment report is to provide an assessment of the potential electromagnetic interference effects and potential impacts on telecommunications for the Project. Matters required to be considered under the Australian Draft National Guidelines and the Planning Guidelines for Development of Wind Energy Facilities are identified and addressed in this report.

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2 The Project

The following section provides an overview of the Project, including highlighting the key infrastructure components, as well as important details regarding construction and operational information for the Project.

2.1 Project Background

The Meering West Wind Farm is a proposed wind energy project by the Proponent, located approximately 25 kilometres south-west of Kerang, Victoria (to the centre of the Project). The Project is located within the Loddon and Gannawarra municipalities. This Project is poised to become one of the largest onshore wind and energy storage developments in Australia. The Project supports Victoria's transition towards a renewable energy.

The Project involves over 30 host landowners, and the Project has been co-designed with the landowners and environmental specialists to minimise the impacts to the ongoing agricultural practises and native vegetation. Key design features from the process include positioning wind turbines out of pivot irrigation areas, providing property by property access to minimise weed spread and positioning access tracks on the edge of paddocks.

2.2 Project Area

The Meering West Wind Farm is situated in Northern Victoria, approximately 250 km north of Melbourne and around 110 km north of Bendigo.

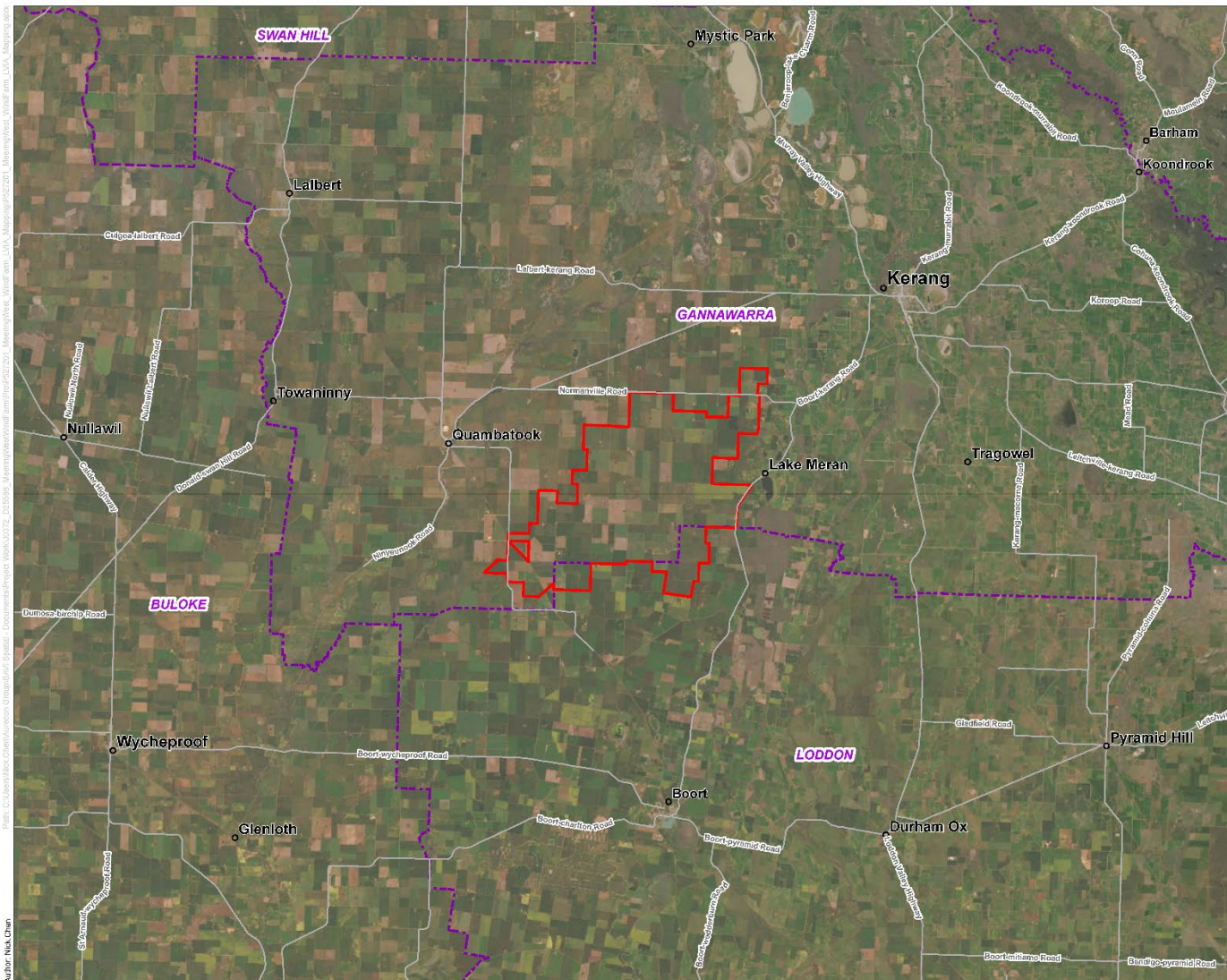
The Project encompasses approximately 20,000 ha, with the majority of the area located within the Shire of Gannawarra. The landscape is predominantly characterized by agricultural land, featuring cropped fields that are well-maintained and utilised for various farming practices. The environment is largely flat to gently rolling terrain.

VNI West (Victoria to New South Wales Interconnector West) is a proposed new high capacity 500 kV transmission line between Victoria and New South Wales. The exact location of the VNI West has not been finalised however it is expected VNI West will run through the Project Area and Meering West Wind Farm will connect directly to the new transmission line.

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Legend

- Town
- Road
- ▭ Project Area
- - - LGA

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Notes:

Base maps: ViMAP, Esri, TomTom, Garmin, FAO, NOAA, USGS, Earthstar Geographics

Data source: DEWLP (2023), Aurecon (2023)

Date: 19/03/2025

Version: 1

Meering West Wind Farm
Regional Context

Figure 2-1 Regional Context

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2.3 Project Description

The Project includes the following permanent and ancillary infrastructure, further details on the project infrastructure is shown in Table 2-1 and Figure 2-2.

Permanent core and ancillary infrastructure

- Up to 164 wind turbines.
- An operation and maintenance building, including a car park and an office
- Internal access tracks
- 1000 MW / MWh Battery Energy Storage System (BESS)
- A terminal station
- Three collector substations
- Internal access tracks
- Internal feeder transmission lines
- Permanent meteorological monitoring mast
- An operation and maintenance building, including a car park and an office.

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Temporary ancillary infrastructure:

- A construction office and compounds, including site offices, car parking, storage and amenities.
- Concrete batching plants
- Temporary civil works
- Concrete batching plant
- Hard stands, laydown areas and temporary structural supports.

Table 2-1 Key Parameters

Feature	Parameters	Quantity
Turbines		
Maximum Hub Heights	194 m	164
Maximum Blade Length	84.6 m	
Maximum Tip Height	280 m	
Rotor Swept Area	23,235 m²	
Clearance (space between ground and lowest point of blade)	80-104 m	
Indicative Cut-in wind speed	3 m/s	
Indicative Cut-out wind speed	25 m/s	
Assessed Sound Power Level – Serrated Trailing Edges (STE)	107.8 db(A)	
Ancillary Infrastructure - Permanent		
BESS	Up to 8 ha	1
Operation and maintenance building	Up to 4 ha	1
Terminal station	Up to 4 ha	1
Collector substations	Up to 4 ha	3
Permanent meteorological monitoring masts.	N/A	1

Feature	Parameters	Quantity
Ancillary Infrastructure – Temporary		
Construction Compound	Up to 10 ha	1
Batching Plant	1 ha	2
Hardstand area	50m x 40m	164

2.4 Construction and Operational information

The anticipated construction phase for the Project is anticipated to last for approximately 4 years and the operational life of the Project is expected to be approximately 40 years, further information is provided in Table 2-2 Construction and Operational Information Table 2-2.

Table 2-2 Construction and Operational Information

Construction Phase	Proposed timing
A - Establish site offices, compounds and concrete batching batch plants	1-2 weeks
B - commence gate installation, commence track construction, commence turbine foundation excavations and hard stands	18 months
C - commence electrical work, cables, collectors, internal powerline, the terminal station	18 months
D - Turbine installation	24 months
E - Final commissioning and site demobilisation	6 months
G - Operation of wind farm	40 years
I - Decommission and make good	12 months

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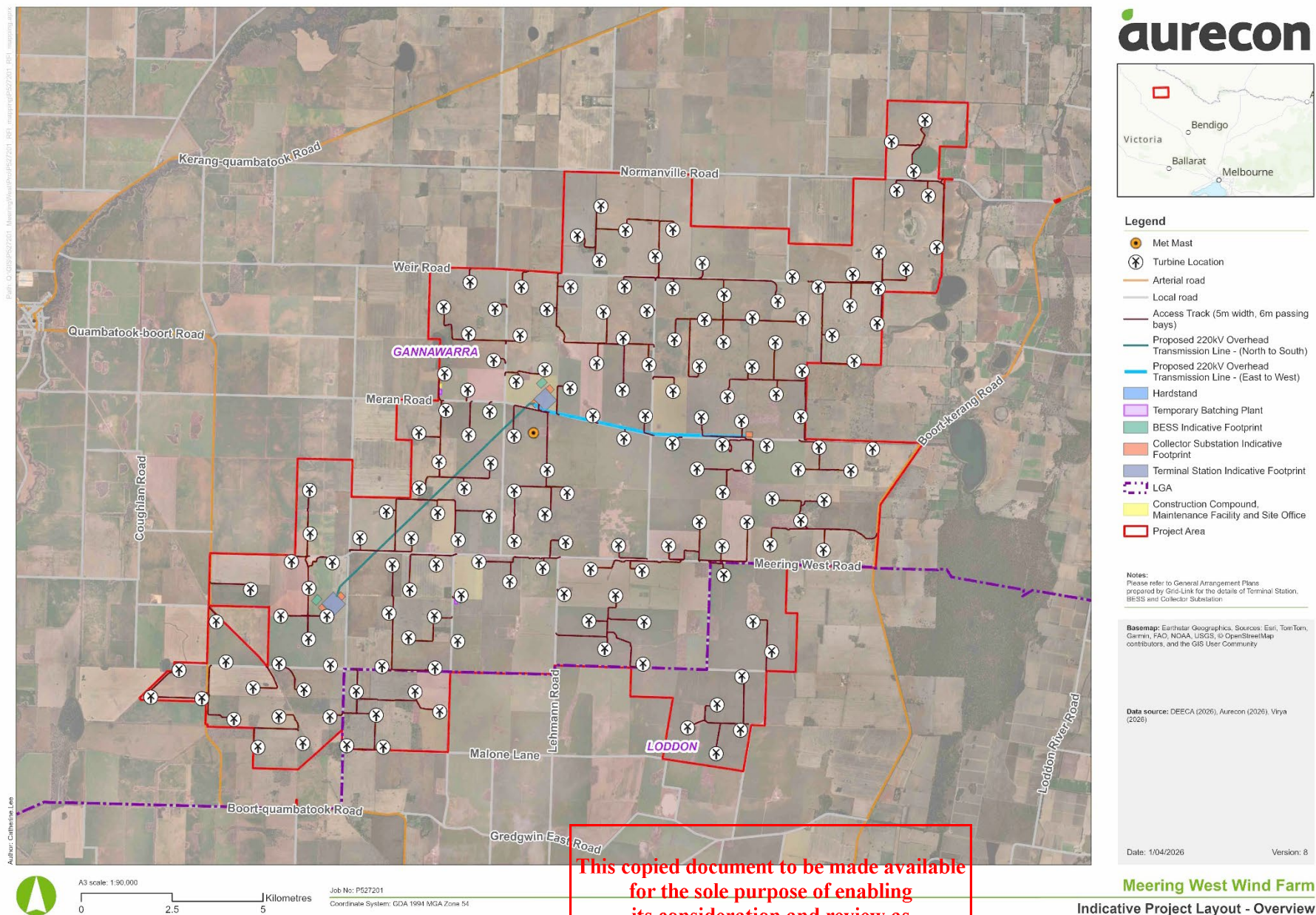


Figure 2-2 Indicative Project Layout

3 Legislative and policy context

The follow section details the legislation and policies applicable to this report.

3.1 Australian Draft National Guidelines

The most recent and relevant Australian guidelines for electromagnetic interference assessment are the Australian Draft National Guidelines¹ (2010). Aurecon considers the Draft National Guidelines to be appropriate, detailed and in accordance with other international guidelines and they have been used for reference in this assessment.

The Draft National Guidelines recommends consultation with potentially affected stakeholders who operate telecommunications services where turbines are proposed within the following distance thresholds:

- Telecommunications towers: 2 km
- Point-to-point line of sight: 2nd Fresnel Zone from link (discussed below)
- Meteorological radar: 250 nautical miles (463 km)

3.2 Planning Guidelines for Development of Wind Energy Facilities

The *Planning Guidelines for Development of Wind Energy Facilities* (DTP, 2023), provide a framework aimed at promoting the sustainable and effective deployment of wind energy projects while balancing environmental, social, and economic considerations.

These guidelines make only a brief mention electromagnetic interference and state that they “should be minimised,” but have minimal detailed on what limits apply and how the calculation should be implemented. They are therefore of limited use for this assessment.

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¹ Commonwealth of Australia Environment Protection and Heritage Council (EPHC), “National Wind Farm Development Guidelines”, DRAFT July 2010

4 Electromagnetic interference

4.1 Introduction

The presence of turbines has the potential to cause electromagnetic interference (EMI) on telecommunication services including:

- Point-to-point and point-to-multipoint between fixed transmitter and receiver tower locations
- Point-to-area such as radio and digital television broadcasts, and mobile phone and internet services
- Radar such as meteorological and aeronautical.

EMI can occur through mechanisms such as the turbine structure or blades causing obstruction, reflection or refraction of the electromagnetic waves used in various telecommunications services¹. In general, potential interference can be mitigated or avoided by appropriate siting of turbines. However, it is recommended that service operators be notified where potential impacts to their services may be anticipated, as mentioned in Section 3.2 below, to determine whether the impact of the wind farm will be acceptable.

The items listed above are included in the scope of this assessment, with the exception of aeronautical radar. This is recommended to be assessed in a separate aviation impact study.

4.2 Fresnel zone

Fixed point-to-point (as well as point-to-multipoint) radio communication signals follow the line of sight between transmitter and receiver locations. The established method to mitigate interference is to keep structures out of the Fresnel zone of the signal. This zone is represented as an ellipsoid around the line of sight between the two ends of the link (telecommunication towers). The ellipsoid radius (r) is defined by the distance along the link (d_1 , d_2), length of link (D), the telecommunications signal wavelength (λ), and the zone number (n), as shown in Figure 4-1 and the equation below:

$$r = \sqrt{\frac{nd_1d_2\lambda}{d_1 + d_2}}$$

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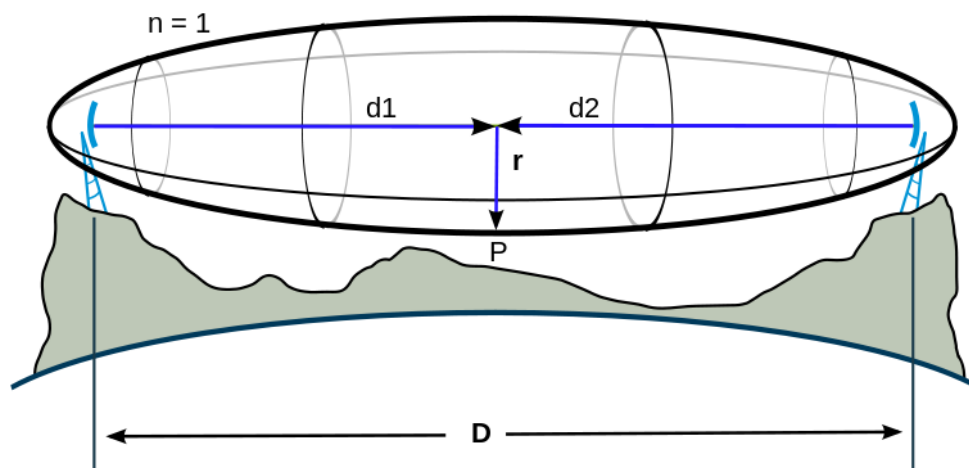


Figure 4-1 Telecommunication link Fresnel zone illustration²

The zone number can be any value greater than zero, and the radius of the Fresnel zone increases with the zone number. The zone number is an indication of how conservative the distance being allowed around the

² Podhorský, Dušan & Fabo, Peter. (2016). *Localization of rainfall and determination its intensity in the lower layers of the troposphere from the measurements of local RF transmitter characteristics*. Journal: Contributions to Geophysics and Geodesy Vol 46(4). DOI:10.1515/congeo-2016-0018

link is – a zone number of one is relatively close to the link, while a zone number of two has a larger radius around the link.

There are various recommendations to avoid adverse effects of structures on the point-to-point telecommunication signal, such as no more than 20% or 40% blockage of the first Fresnel zone ($n = 1$), and the 0.6 Fresnel zone ($n = 0.6$) is often applied when designing point-to-point telecommunications links over terrain and vegetation. The second Fresnel zone ($n = 2$) is often used as a conservative safeguarding of the telecommunications links from potential interference from turbine³.

The Draft National Guidelines recommends using a setback of the maximum second Fresnel zone of a point-to-point telecommunications signal. Therefore, the second Fresnel zone has been used in this assessment as the required exclusion zone that the turbine (including the blades) must not encroach upon, i.e. no part of the turbine may be within this area.

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³ D. Bacon, "Fixed-link wind turbine exclusion zone method - Version 1.1," 28 October 2009.

5 Assessment of potential effects

Aurecon has accessed the Australian Communications and Media Authority (ACMA) telecommunication licences database⁴ through the MAPRAD.IO website⁵ to obtain the broadcasting locations and other details for point-to-point, point-to-area and radar telecommunications in the vicinity of the Project. Sites within approximately 50 km of the Project have been included for all licence types except for meteorological radar, for which a distance of 463 km has been applied in accordance with the Draft National Guidelines.

Impacts on mobile phone, wireless internet and digital television point-to-area telecommunications to nearby buildings were investigated using coverage maps from the various service providers.

Aurecon notes that the below assessment was undertaken for a layout of 165 turbines, but one turbine in the centre of the Project Area has since been removed (leaving 164 turbines remaining). However, this does not affect the assessment or conclusions as the removed turbine does not have any individual significance.

5.1 Point-to-point and point-to-multipoint

5.1.1 Telecommunications towers

The locations of the closest identified fixed (point-to-point and point-to-multipoint) telecommunications towers within 50 km of the Project are shown in Figure 5-1. The closest site is the *Lake Meran Boort-Kerang Road Lake Meran* site (located just outside the eastern border of the Project Area), with details shown in Table 5-1. This telecommunication site was identified as within 2 km of the Project Area, therefore there is potential for interference to occur for this tower.

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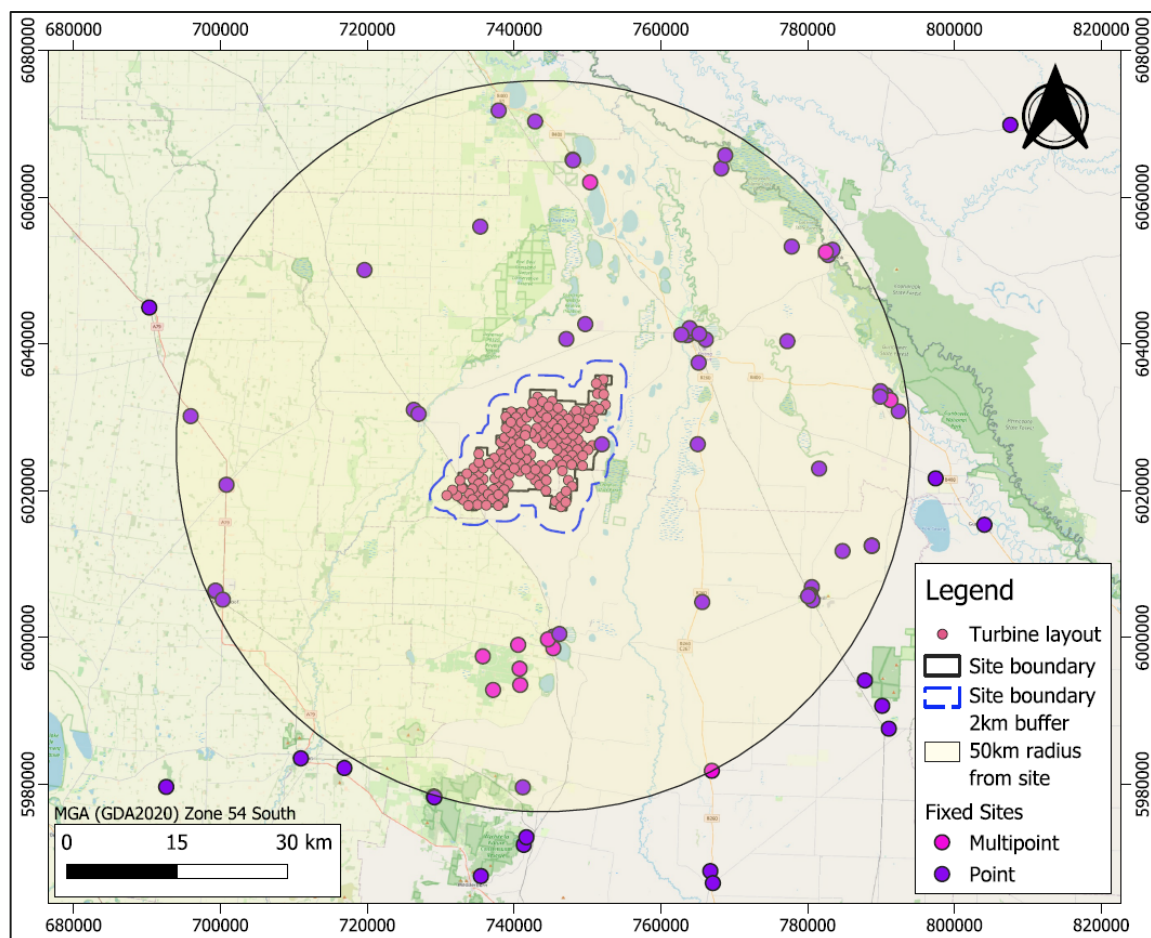


Figure 5-1 Closest telecommunications sites to the Project

⁴ Australian Communications and Media Authority, Register of Radiocommunications Licences, https://web.acma.gov.au/pls/radcom/site_proximity.main_page/

⁵ MAPRAD.IO website, <https://maprad.io/us>

Table 5-1 Closest point-to-point telecommunication site to the Project

Site name	Site ID	Lat/Long	Licence number	Licence frequencies	Licensee	Distance to nearest turbine
Lake Meran Boort-Kerang Road Lake Meran	10009437	-35.874805, 143.790948	10410986/1	8.178 GHz, 7.866 GHz	Optus Mobile Pty Limited	1.3 km

Aurecon has assessed the near-field interference zone for the registered antenna and licence frequencies for this site using the method outlined by D Bacon⁶ to be approximately 150 m from the site. The telecommunications are therefore not expected to be affected by near-field interference. Additionally, the communications from this site are relatively high frequency signals which are less susceptible to interference. However, although considered unlikely there may still be interference due to reflection / scattering and the site is within the 2 km consultation zone recommended by the Draft National Guidelines. Aurecon therefore recommends discussions with the owner of the licence to understand if any impacts to their services are expected.

Fixed point-to-multipoint licences operate on a similar basis to point-to-point licences, with the main difference being the use of a central tower communicating with a number of corresponding remote stations. Only the central tower location is registered in the ACMA database, so the signal link paths cannot be determined without consultation with the operator. However, as these licences are designed to service nearby locations, impacts are generally considered unlikely if turbines are over ~20 km from the nearest central tower.

Details of the nearest licenced towers are shown in Table 5-2. There are three towers within 20 km of the Project, and several more in the nearby vicinity southeast of Bort. These licences may experience interference if the associated communications link paths cross the Project. Aurecon notes that the towers are all over 18 km from the nearest turbine and interference is therefore considered unlikely, but Aurecon recommends consultation with the identified licence operators to confirm whether their services will be impacted.

Table 5-2 Point-to-multipoint telecommunication sites within 20 km of a turbine in the Project

Site name	Site ID	Lat/long	Licence number(s)	Licensee	Distance to nearest turbine [km]
Holloway Street BOORT	43310	-36.115880, 143.717831	1183180/1	Goulburn-Murray Rural Water Corporation	18.1
Boort water tower off Andrews Street BOORT	305150	-36.126593, 143.726310	1911124/1, 1325361/1	Coliban Region Water Corporation	19.3
Mathews Pump Site Lot 36 Boort-Charlton Road, 5 km W of BOORT	10009055	-36.123643, 143.673052	11915264/1	Boundary Bend limited	19.2

5.1.2 Point-to-point links

The locations of fixed point-to-point links identified within 50 km of the Project centre are shown in Figure 5-2 below.

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⁶ D F Bacon, "Fixed-link wind-turbine exclusion zone method," version 1.1, released 28 October 2002

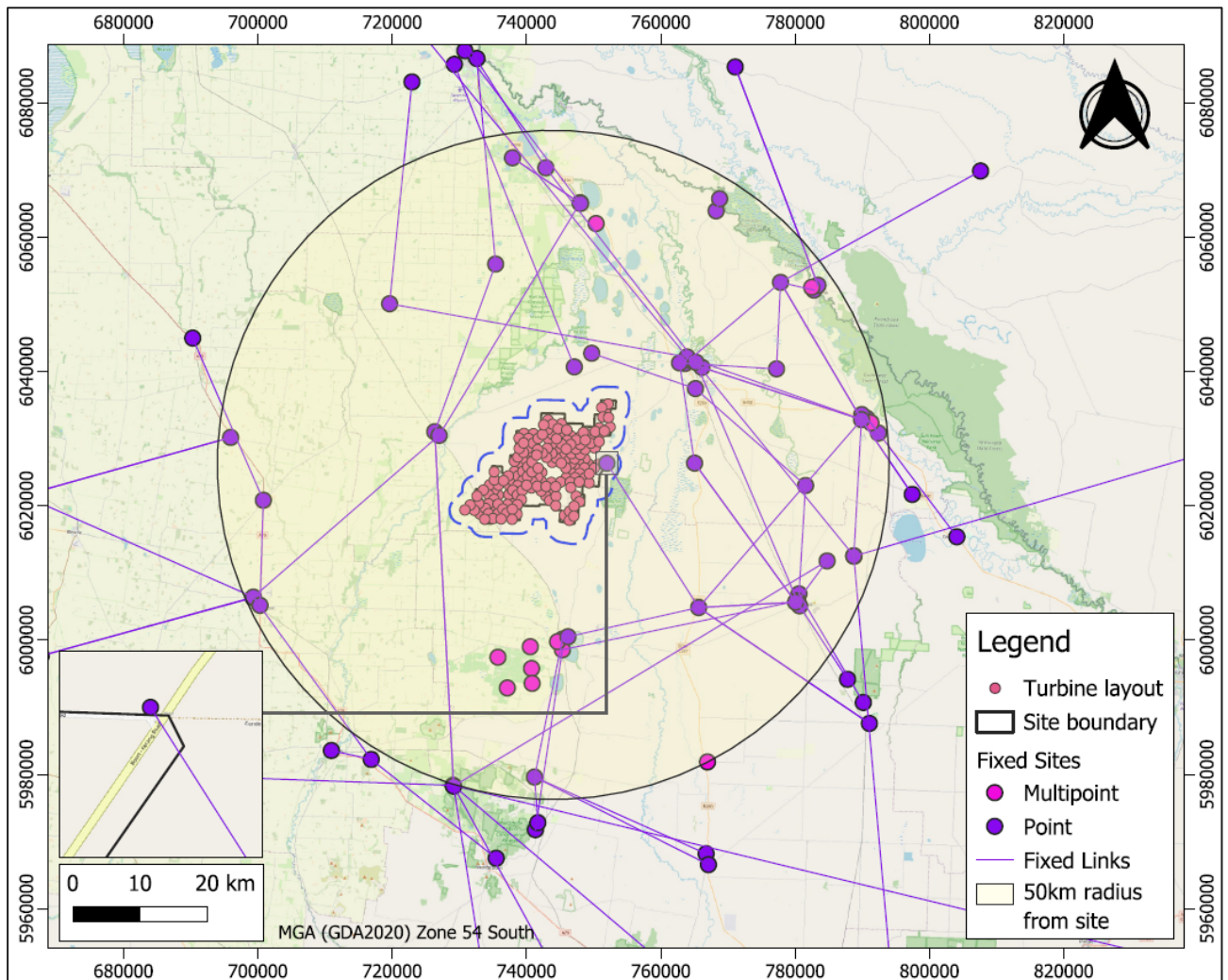


Figure 5-2 Fixed point-to-point licences in the vicinity of the Project

One point-to-point link has been identified that crosses the Project Area boundary. This link is associated with the same telecommunication tower on the Project border identified in Table 5-1 above, and only crosses through the very edge of the Project boundary. The nearest turbine is ~1.3 km away and therefore will not cause interference on the link. A Fresnel zone calculation will not impact the result as the Fresnel radius is very narrow at the ends of the link (and widest in the midpoint of the link).

Aurecon notes that sometimes the ACMA coordinates for the start and end locations of links are incorrect and do not line up accurately with the actual tower that can be seen in satellite imagery. However, Aurecon has verified the position of the telecommunications tower on the Project Area boundary with satellite imagery and all other links are far enough from the Project Area that any minor adjustment to the coordinates will not impact the results.

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5.2 Point-to-area

5.2.1 Transmission locations

Point-to-area telecommunication locations are shown in Figure 5-3 below for locations that are within 50 km of the centre of the Project Area.

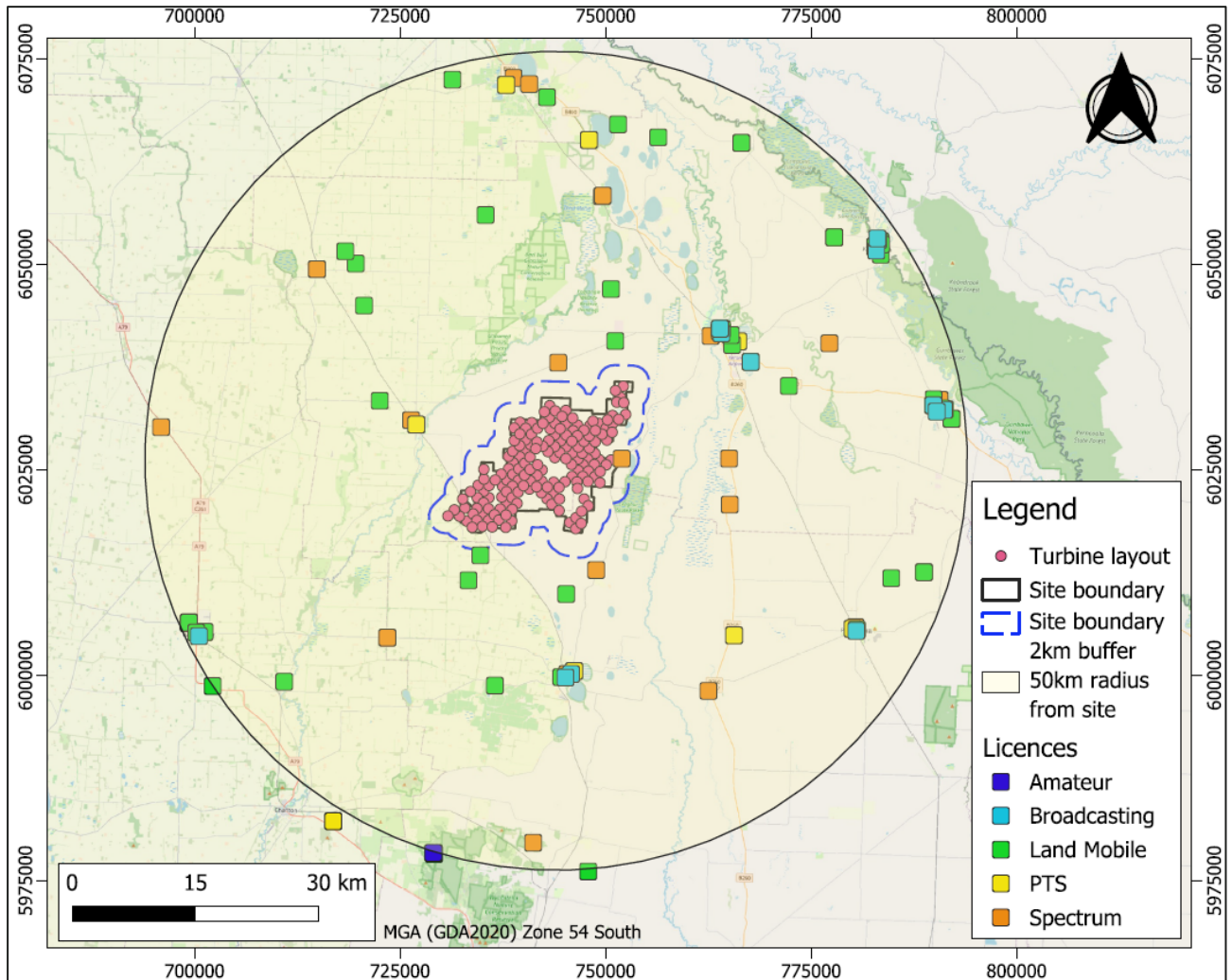


Figure 5-3 Point-to-area communication transmitters

The closest point-to-area telecommunication site to the Project is the same tower identified in Table 5-1 on the eastern Project Area boundary. There are several spectrum licences at this site as outlined in Table 5-3.

Table 5-3 Closest point-to-area telecommunication site to the Project

Site name	Site ID	Lat/Long	Licence type	Licensee	Licence number(s)	Frequency (MHz)	Distance to nearest turbine [km]
Lake Meran Boort-Kerang Road Lake Meran	10009437	-35.874805, 143.790948	Spectrum	Optus Mobile Pty Limited	9469858, 12468165	708, 763, 902.5, 947.5	1.3
				TELSTRA LIMITED	9469862	723, 778	
				TPG INTERNET PTY LTD	10391286	740.5, 795.5	

Most types of point-to-area licences are generally not expected to be impacted by the presence of turbines. However, the close proximity of the telecommunication site to the Project Area could potentially cause interference. As this site is within the 2 km consultation zone recommended by the Draft National Guidelines

Aurecon recommends discussions with the licence owners identified in Table 5-3 to understand if any impacts to their services may occur.

5.2.2 Signal coverage maps

Aurecon has also reviewed publicly available mobile phone (Optus⁷, Telstra⁸, and Vodafone⁹), wireless internet (National Broadband Network)¹⁰ and digital television coverage¹¹ maps with regards to identified dwellings within close vicinity of the proposed wind farm. Residences are categorised as “involved” (landowners hosting the wind farm) or “non-involved” and have been identified based on satellite imagery and confirmed by the Proponent. Involved landholder dwellings are of lesser concern given the expectations of some impacts from hosting wind farm infrastructure. Locations that are in presently low or no coverage areas and in close proximity to turbines may experience interference to available service due to signal scattering off the turbine.

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Mobile phone

The available signal coverage maps are shown below in Figure 5-4, Figure 5-5 and Figure 5-6. There is no mobile phone network providing 5G coverage in the Project general area, so this has not been visualised.

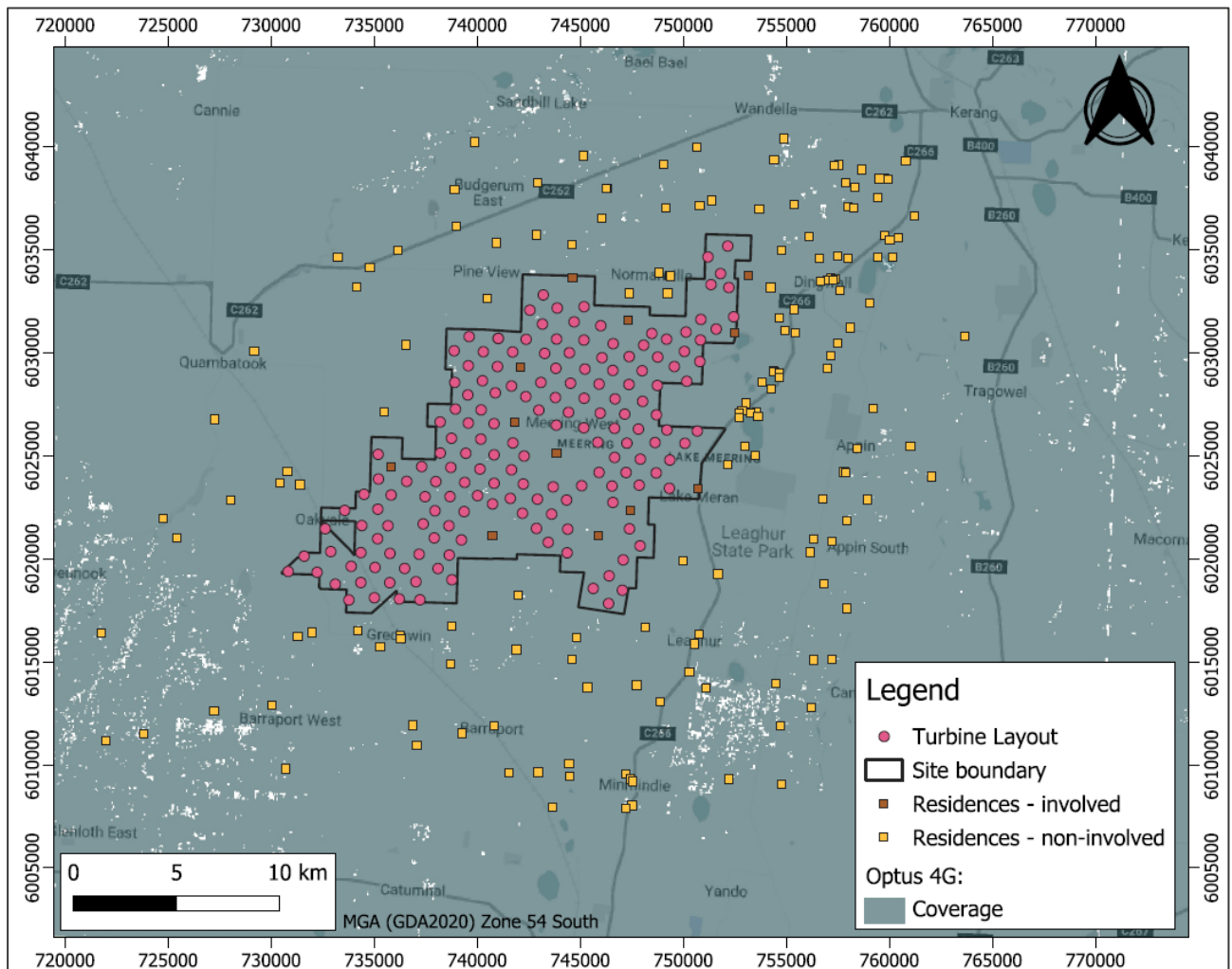


Figure 5-4 Optus mobile network coverage

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⁷ <https://www.optus.com.au/living-network/coverage>

⁸ <https://www.telstra.com.au/coverage-networks/our-coverage>

⁹ <https://www.vodafone.com.au/network/coverage-checker>

¹⁰ <https://www.nbnco.com.au/learn/rollout-map>

¹¹ <https://myswitch.digitalready.gov.au/>

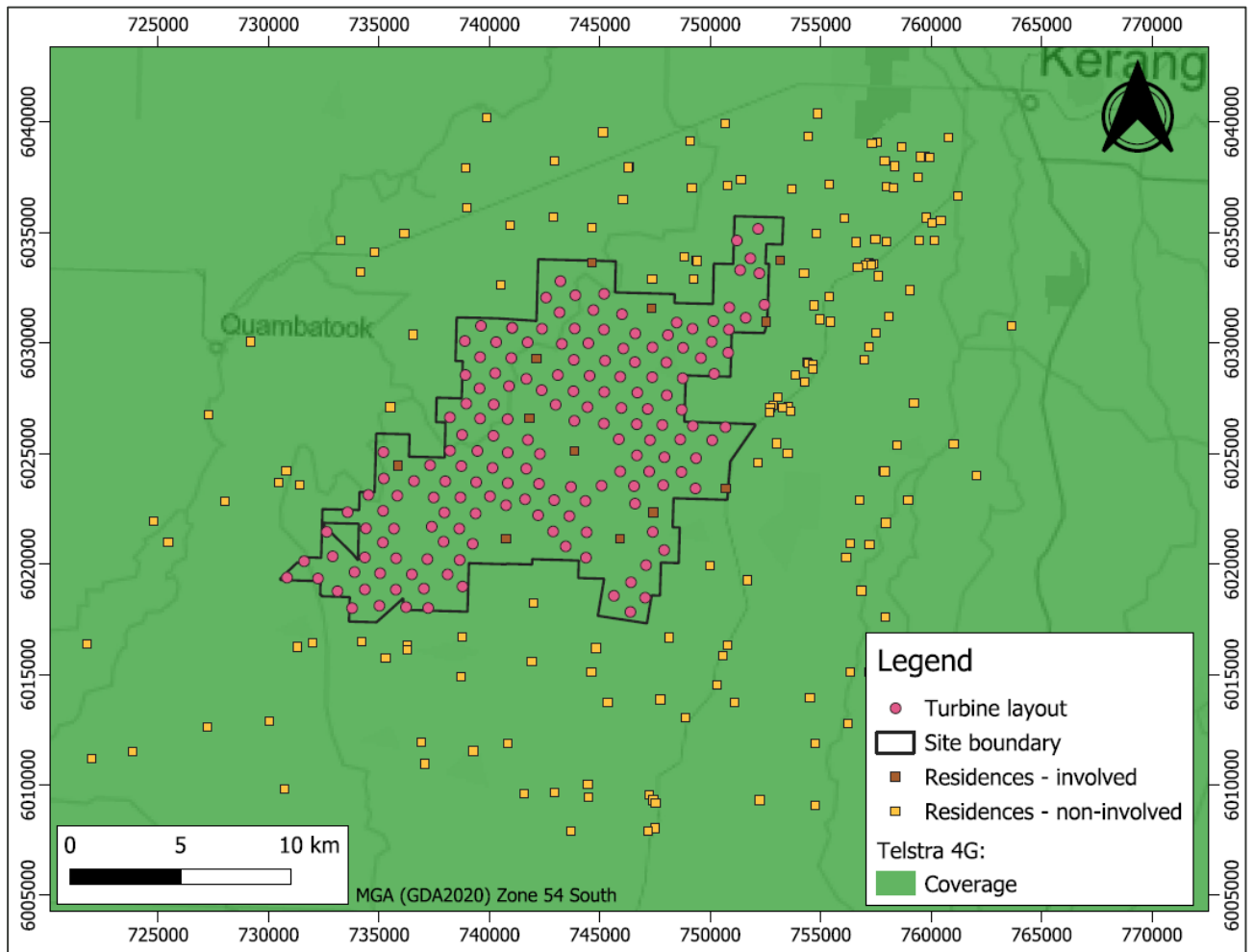


Figure 5-5 Telstra mobile network coverage

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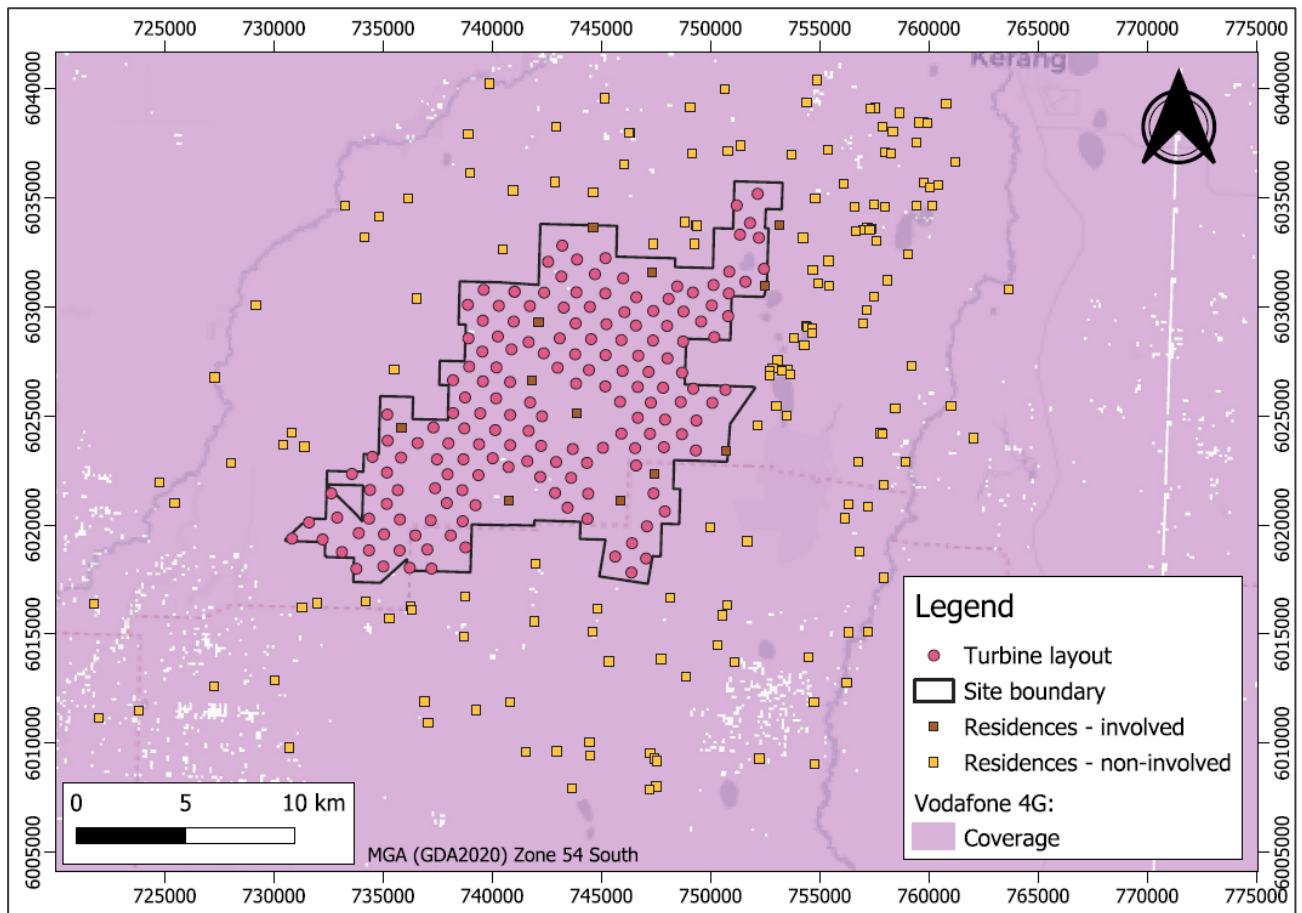


Figure 5-6 Vodafone mobile network coverage

Several dwellings are near or within no coverage areas for two (Optus and Vodafone) of the three mobile networks that are available and may experience reduced signal as a result of the Project. In the case of interference to signals, mitigation options for users may include the use of an external antenna. It is recommended to contact Optus and Vodafone to seek feedback on any potential impact that the Project could have on their services.

Internet

National Broadband Network (NBN) indicates that wireless and satellite broadband is available in various parts of the Project general area. The wireless signal available at some dwellings locations and is transmitted from stations in Boort, Tragowel and Kerang (see Figure 5-7). Several dwellings north of the Project are the only non-involved dwellings that may experience interference in their wireless signal, as there are two turbines in the far northern land parcel that are between them and the transmission site in Kerang. The involved residences (except for those on the eastern Project boundary) are also likely to be affected. All other residences with wireless signal are not obstructed by the Project and are therefore not expected to be affected. For the few users that may experience reduced signal mitigation options include installing a signal booster or external antenna, or switching to satellite broadband. Satellite broadband is typical unaffected by wind turbines as the signal is received from above rather from across the land. Therefore, no mitigation for satellite internet service is required.

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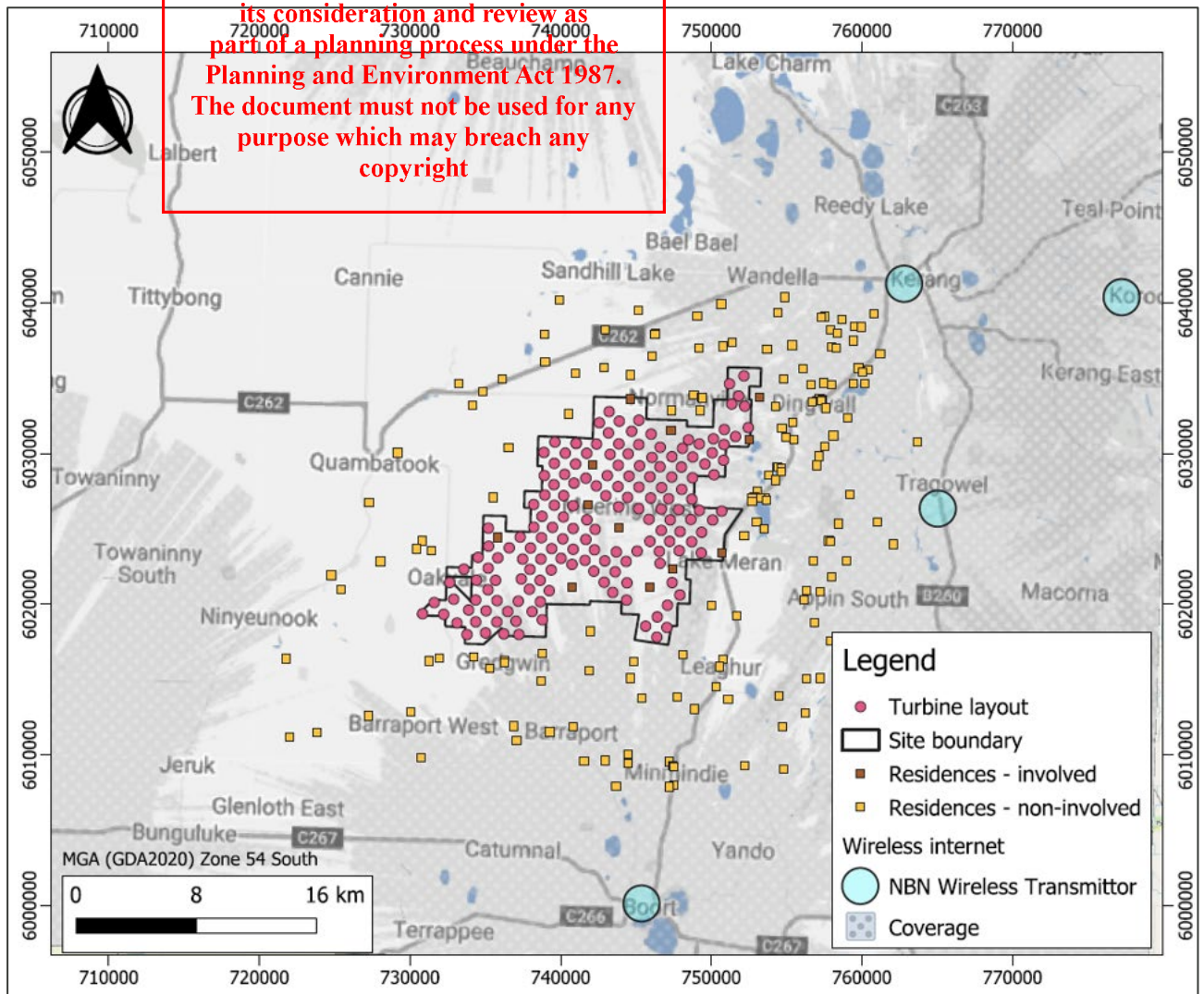


Figure 5-7 NBN Fixed Wireless Coverage

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Digital TV

The Australian Government 'MySwitch' map indicates that there are two stations that have signal coverage in the Project general area, on opposite sides of the Project Area. The closest digital television station is Murray Valley located ~45 km north-northwest of the Project, which provides "good" coverage north to west of the Project and "variable" coverage south of the Project. The second station is Bendigo located ~125 km south-southeast of the Project, which provides "variable" coverage east to south of the Project. The coverage maps are shown in Figure 5-8 and Figure 5-9 and details for each site are listed in Table 5-4 below. Note that Bendigo includes two transmitting towers for multiple networks.

Table 5-4 Digital television sites with coverage over the Project area

Name	Lat/Long	Distance and direction to the Project	Site ID	Site Name	Networks
Murray Valley	-35.472881, 143.455867	~45 km north-northwest	11885	Broadcast Australia Site Ultima-Lake Boga Rd GOSCHEN	ABC, SBS, Prime (AMV), WIN (VTV), Southern Cross Austereo (BCV)
Bendigo	-36.992363, 144.308809	~125 km south-southeast	11742	Broadcast Australia Site Mt Alexander Joseph Young Dr HARCORT NORTH	ABC, SBS
			11743	Southern Cross Site Mt Alexander Joseph Young Dr HARCORT NORTH	Prime (AMV), WIN (VTV), Southern Cross Austereo (BCV)

There is potential for television signal interference for most of the residences to the east and south of the Project, where the uninterrupted signal from Bendigo is relatively weak (“variable”) and the stronger signal from Murray Valley may be deflected by the Project turbines. Mitigation options to improve signal could include an upgraded antenna or signal booster.

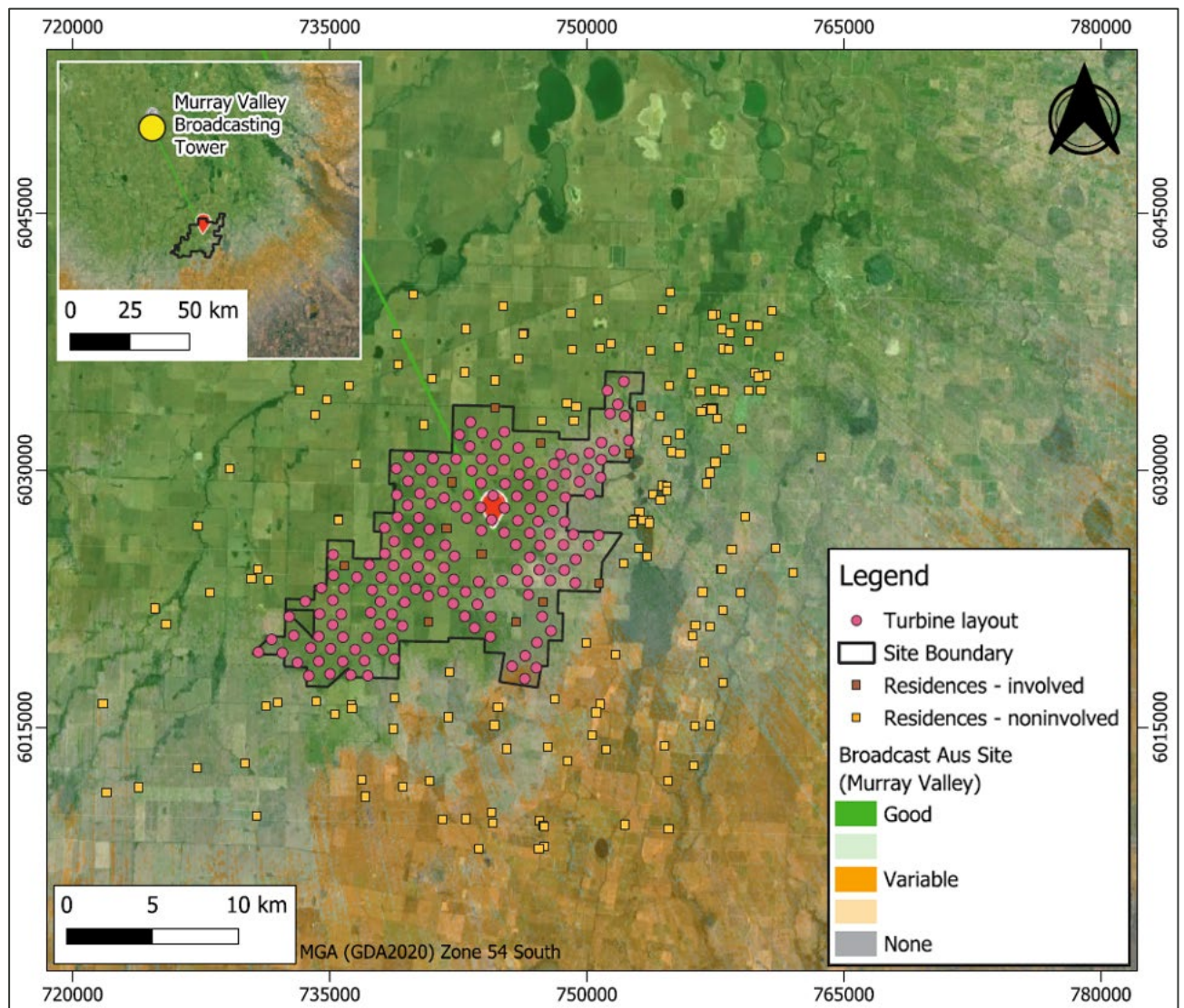


Figure 5-8 Broadcast digital TV signal for Murray Valley

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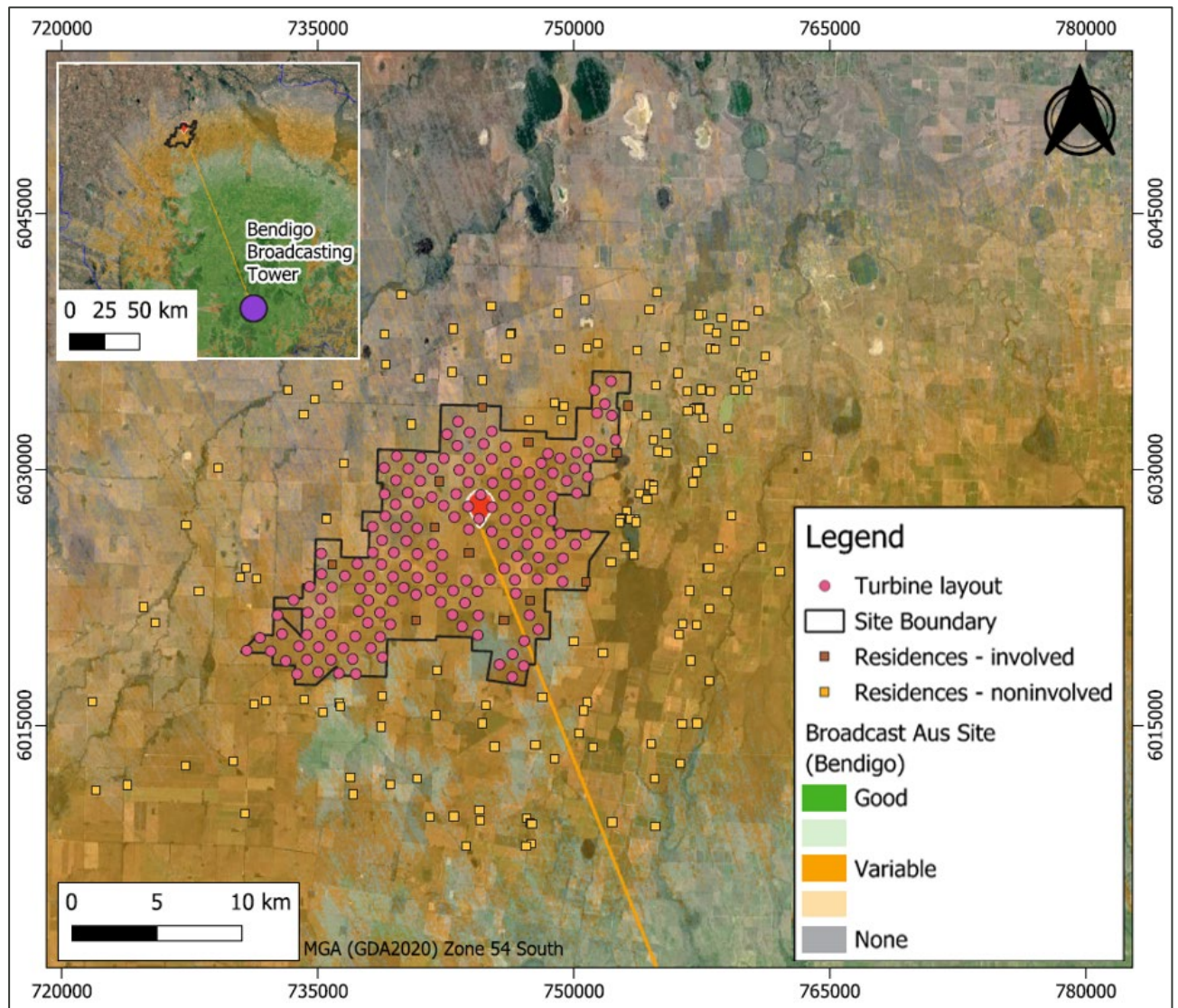


Figure 5-9 Broadcast digital TV signal for Bendigo

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5.3 Radar

According to the Draft National Guidelines¹, radar services may be impacted by the presence of turbines hundreds of kilometres away if they are located within the radar operating range and line of sight. However, due to the curvature of the earth the interference from near-ground level objects reduces over large distances. Aurecon has assessed the location of meteorological and aeronautical radar stations in line with the Draft National Guidelines, as well as defence radars.

5.3.1 Meteorological

Meteorological radar stations licensed to the Bureau of Meteorology (BOM) are shown in Figure 5-10.

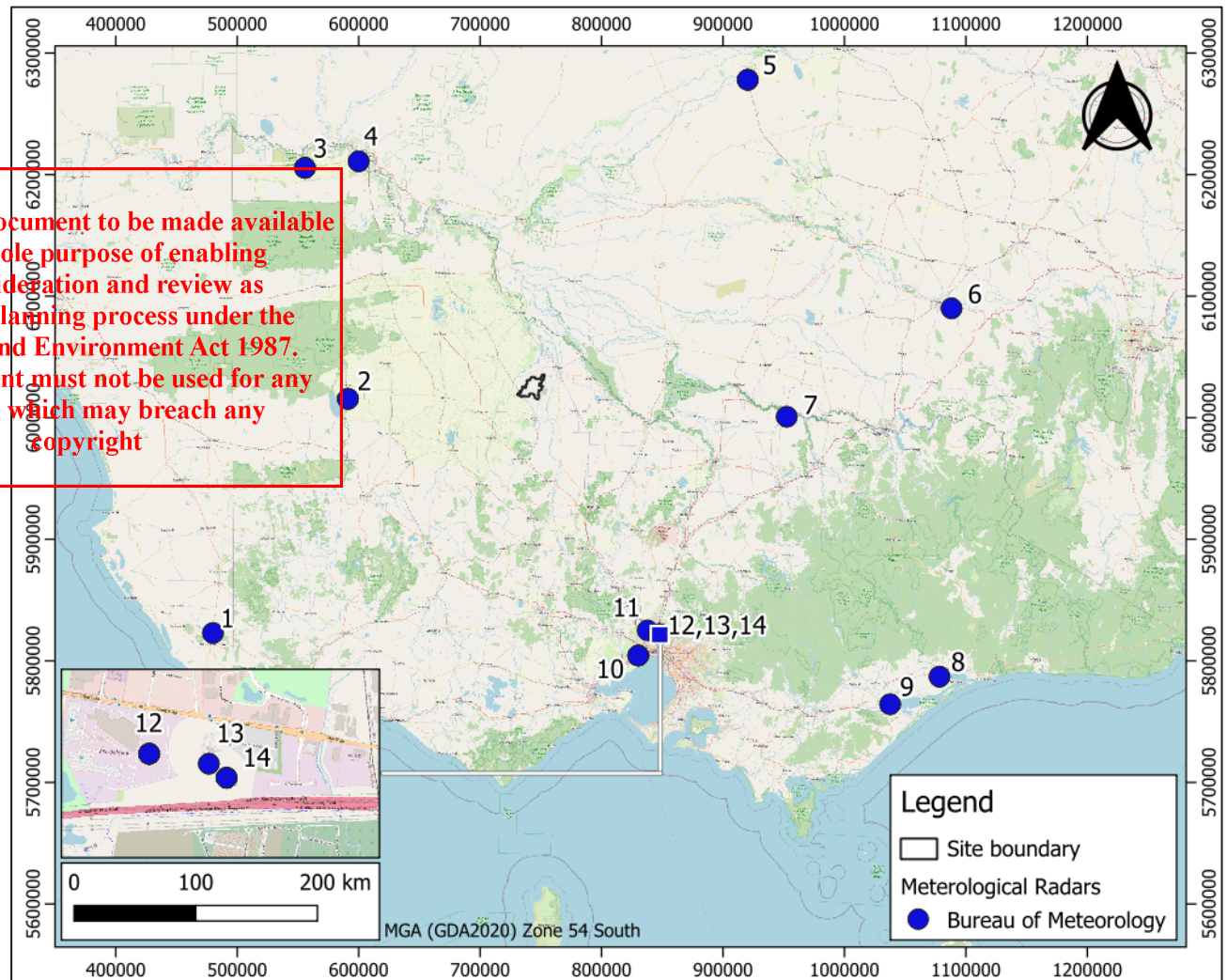


Figure 5-10 BOM radar locations

Details of the closest BOM radar site to the Project are shown in Table 5-5. All other sites are over 200 km from the Project and are not expected to be affected.

Table 5-5 Closest BOM radar site to the Project

Site name	Site ID	Lat/Long	Licence number	Frequency (GHz)	Distance from Project [km]
Wimmera Radar Pullut West Road PULLUT	10009437	-35.997652, 142.013441	10547311/1	5.625	140

It is not expected that the Project will cause interference for any of the BOM radars given their large distance from the Project. However, in line with the Guidelines Aurecon recommended informing the BOM so that any potential effects on the above closest weather radar location can be assessed. BOM advised in September

2025 that it has no objection to the proposed development proceeding. Further consultation will be undertaken throughout the Project for any significant changes to the project layout.

5.3.2 Aeronautical

Aeronautical radar stations licensed to Airservices Australia are shown in Figure 5-11.

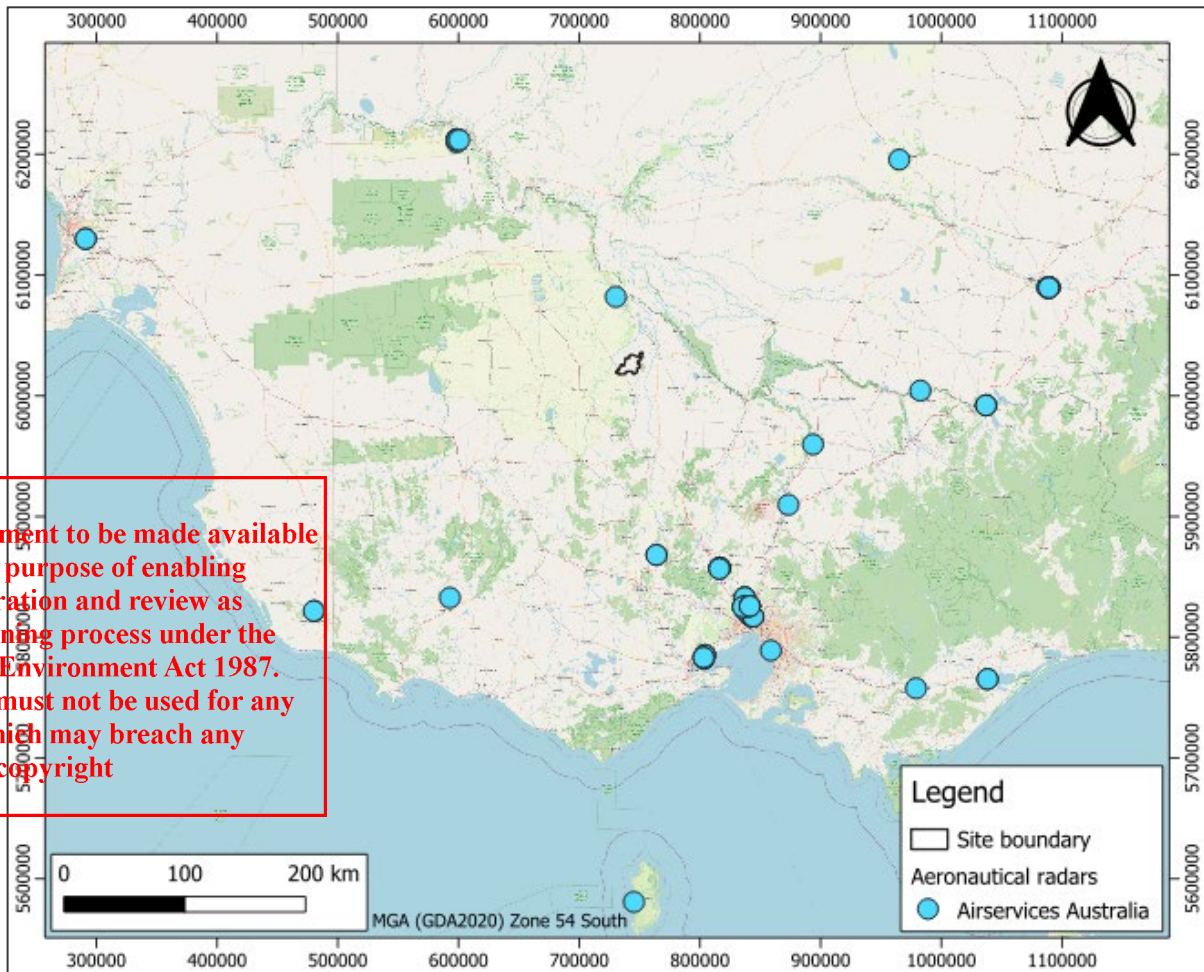


Figure 5-11 Aeronautical radar locations

Details of the closest aeronautical radar site to the Project are shown in Table 5-6. All other sites are over 150 km from the Project and are not expected to be affected.

Table 5-6 Closest aeronautical radar site to the Project

Site name	Site ID	Lat/Long	Licence number	Frequency (MHz)	Distance from Project [km]
Airservices NDB Site Swan Hill Airport SWAN HILL	9010672	-35.3804941, 143.54030356	419548/1	0.407	50

The Project may cause interference for the Swan Hill Airport radar. Aurecon recommends informing Airservices Australia so that any potential effects on this radar station can be assessed. Air Servies Australia has been notified of the planning application and consultation with Air Services will continue throughout the Project. Mitigation options may include the use of enhanced radar filters by the operator that can remove reflections caused by turbines.

5.3.3 Defence

Radar stations licensed to the Department of Defence (DOD) are shown in Figure 5-12.

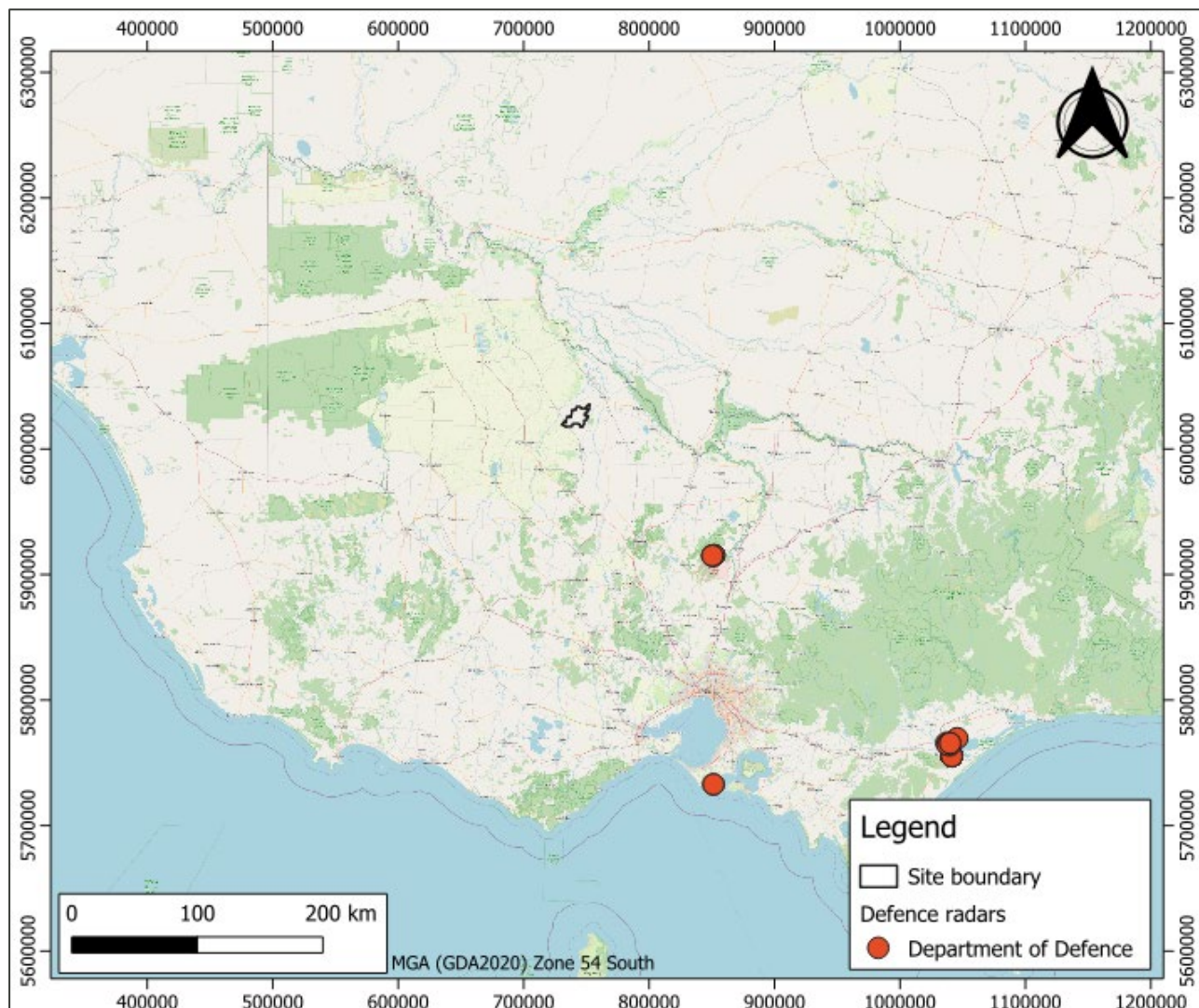


Figure 5-12 Defence radar locations

Details of the defence aeronautical radar sites to the Project are shown in Table 5-7. Both are at Puckapunyal military training area, 1.6 km apart. All other sites are over 300 km from the Project and are not expected to be affected.

Table 5-7 Closest defence radar site to the Project

Site name	Site ID	Lat/Long	Licence number(s)	Frequency (GHz)	Distance from Project [km]
Defence Site GRAYTOWN	39245	-36.846283, 144.932512	1961706/1, 1961707/1, 1961708/1	10.530, 10.525, 10.520	~146
Defence Radar Site Approx. 2.5km East of South Costerfield-Graytown Road Puckapunyal	10040014	-36.842, 144.95	12683468/1	10.532	~145

It is not expected that the Project will cause interference for these DOD radars given their large distance from the Project. However, Aurecon recommends informing the DOD so that any potential effects on these radars can be assessed.

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5.4 Farming GPS systems

At the request of the Proponent, Aurecon has also specifically considered potential impacts to local farming GPS equipment. Aurecon understands that typical farming GPS systems have two components:

1. A fixed base station that receives and calculates corrections for GPS satellite signals, which may be located on the user's property, and
2. A mobile receiver attached to agricultural machinery such as a tractor which receives GPS satellite signals, communicates with the base station via radio frequencies and applies the corrections from the base station to its location.

Potential effects on each part of the system are discussed below.

5.4.1 Base station

Aurecon understands that the base station operates under an area wide land mobile licence, which specifies the area that the base station may operate in, but not the specific location of the base station. This is a type of point-to-area communications as assessed in Section 5.2.1, although they would not show in Figure 5-3 as this type of licence does not have a registered location. Point-to-area licences are generally not expected to be impacted by the presence of turbines, but Aurecon recommends reviewing any impact caused by the Project as noted below.

5.4.2 Communication between base station and mobile receiver

Farming GPS systems may require line of site communication between the base station and the mobile receiver. There may be potential for interference if a turbine tower is between the base station and receiver e.g. tractor as it moves across the user's property. To mitigate any interference occurring within the Project Area, the base station could be relocated or a second base station installed if necessary.

Aurecon recommends:

- Undertaking a survey of farming GPS systems used within the Project Area and neighbouring properties once construction of the Project has been completed.
- Consultation with involved and neighbouring landowners to ensure no impacts to farming GPS systems. It may also be necessary to consult with the providers of these systems to confirm any potential impacts and mitigation measures.

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5.5 Cumulative impacts

Cumulative impacts on point-to-area and radar services can occur due to a collection of several neighbouring wind farms where none or minimal impacts were predicted for each individual wind farm. This can contribute to impacts such as TV and mobile service: e.g. where service may still be viable with a single wind farm, but too much interference is caused by two wind farms. Aurecon has identified one existing wind farm as well as two planned wind farms in the vicinity of the Project, as summarised in Table 5-8.

Table 5-8 Wind farms in the vicinity of the Project

Wind farm	Status	Number of turbines	Distance to the Project
Normanville	Proposed	17	~1 km (immediately adjacent)
Coonooer Bridge	Operational	6	~ 60 km
Berrimal	Pre-construction	24	~ 50 km
Cannie	Proposed	174	~ 10 km

A detailed cumulative impact analysis has not been considered as part of this assessment. Coonooer Bridge and Berrimal wind farms are at sufficient distance from the Project that no cumulative effects are expected. However, Cannie wind farm involves a large number of turbines and is located close to the Project, and cumulative effects may occur. Normanville wind farm is also in close proximity and effectively increases the Project size by 10% in terms of EMI impacts, potentially causing cumulative effects. Aurecon recommends that a cumulative assessment should be undertaken if all three projects are progressed to construction.

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6 Conclusions and recommendations

Turbines have the potential to cause EMI with telecommunications including point-to-point, point-to-multipoint, point-to area, and weather radar services. Aurecon has obtained the licence details of all licensed telecommunication equipment in the vicinity of the Project to assess if any impact is expected.

Fixed telecommunications towers

One fixed telecommunication tower was identified within 2 km of the Project, being ~1.3 km from the nearest turbine. Aurecon has calculated that near field interference is not expected, but interference due to scattering/reflection may still occur. Although considered unlikely, Aurecon recommends consulting with the owner of the licences at this tower to determine whether any impacts are expected.

Point-to-point links

There is only one point-to-point link signal crossing the Project Area but is ~1.3 km away from the nearest turbine and at the end of the link where it crosses the Project Area (meaning the Fresnel radius will be very narrow). Therefore, interference is not expected, and no mitigation is required.

Point-to-multipoint assessment

Three licensed towers are located within 20 km of the Project, and so interference may occur if communications from these towers cross the Project. It is recommended to consult with the licence operators identified to confirm whether their communications may be impacted.

Point-to-area assessment

One broadcasting location is within 2 km of a proposed turbine location, so interference may occur for the point-to-area licence from this site. Aurecon recommends consulting with the licence owners and mitigation such as relocating the transmission tower may be required.

Several dwellings are near or within no coverage areas for two mobile networks (Optus and Vodafone) that are available in the area around the Project, and may experience reduced signal as a result of the Project. It is recommended to contact Optus and Vodafone to seek feedback on any potential impact that the Project could have on their services, and if required confirm what mitigation options are available for users, such as a signal amplifier.

Wireless internet for several dwellings to the north of the Project may be affected, and mitigation such as switching to satellite broadband may be recommended.

Digital television broadcasting transmitters are expected to be impacted by the Project, and therefore a reduced and/or interrupted signal is expected to impact all dwellings identified surrounding the Project Area. It is recommended that the network owners are consulted to discuss any potential impacts.

Radar

There are 14 BOM radar sites within 250 nautical miles of the Project. All are over 140 km from the Project and so interference is considered unlikely, but as a courtesy it was recommended to contact the Bureau of Meteorology so that any potential effect of the Project on these weather radars can be assessed. BOM advised in September 2025 that it has no objection to the proposed development proceeding. Further consultation will be undertaken throughout the Project for any significant changes to the project layout.

There are 47 aeronautical radar sites within 250 nautical miles of the Project. One is approximately 50 km from the Project and may experience interference. It is recommended to consult with Airservices Australia to determine whether any impact on this radar use is expected. All other radars are over 150 km from the Project and are not expected to be affected by the Project.

There are 13 DOD radar sites within 250 nautical miles of the Project. All are over 145 km from the Project and so interference is considered unlikely. The Bureau of Meteorology has confirmed the Project is unlikely to impact any of its assets, including on the closest radars at Puckapunyal.

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Farming GPS systems

GPS systems used for farming within the Project Area may be affected by the Project, but this should generally be able to be managed by relocating or installing a second base station if required. It is recommended that a survey of these systems and consultation with landowners be undertaken.

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