

Dugald River Wind Farm Preliminary Telecommunications Impact Assessment

Prepared: Johanna Rigby
Reviewed: Priyanga Ambanwala
Approved: Abrar Aziz

Date: 4 July 2025
Revision: C

Executive Summary

Middleton Group Engineering (MGE) has assessed the proposed Dugald River Wind Farm Project (the Project), for any potential impact on the following telecommunication services:

- Point-to-point radio frequency (RF) links and associated ACMA-listed transmission sites.
- Meteorological radars.
- Mobile voice-based communications.
- Wireless and satellite internet services.
- Broadcast and digital radio.
- Broadcast, digital and satellite television.

This preliminary impact assessment indicates that any potential impact on telecommunication services can be appropriately managed if stakeholder consultation is undertaken. Initial stakeholder consultation is provided in Appendix A.1.

Stakeholder consultation has been conducted over the past 3 months and the responses can be broken down into two categories. The majority of stakeholders have responded indicating no impact. Telstra has responded asking for a detailed analysis of the full power coordination impact (Low Frequency Induction (LFI) and/or Earth Potential Rise (EPR)) of the wind farm development; this will be completed at the detailed design stage of the project after a more mature design has been developed, the stakeholder has accepted this approach. The BoM has responded that they need to do additional assessments to confirm the impact and if any mitigations are required.

Figure 1 shows the project and surrounding telecommunication services.

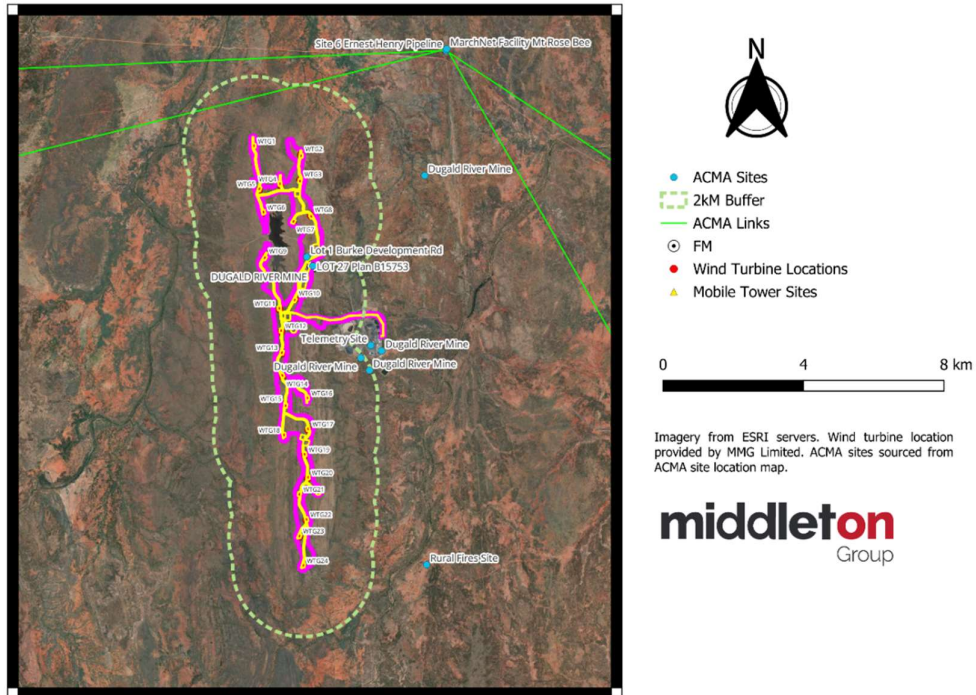


Figure 1: Dugald River Wind Farm Project Area Overview

1 Inputs and Assumptions

Key inputs and assumptions were:

- The ACMA database is relied upon as the sole source of information regarding existing telecommunications infrastructure.
- The candidate WTG is the 'Goldwind DW 165-5.2/5.6/6.0MW' which has the following features and dimensions:
 - Hub height: 130m.
 - Rotor diameter: Up to 165m.
 - Rotor sweep area: 21,382 m² between 47.5m and 212.5m above the WTG pad.

2 Methodology

A preliminary assessment has been carried out by applying the exclusion zones shown in Table 1. These exclusion zones are based on the Clean Energy Council Best Practice Guidelines 2018 and the Draft National Wind Farm Development Guidelines 2010.

MGE expects that if the stated exclusion zones are maintained, telecommunications stakeholders will generally not object to the Project.

Table 1: Recommended exclusion zones for avoiding interference to telecommunications signals

Type	Description	Recommended Exclusion Zone
Point-to-point radio links	These are typically links owned by government/emergency services or links privately owned by utilities and other private enterprise.	$F_{2 \text{ Max}} + \text{Blade Length}^*$
Communications transmission sites (Point-to-point link sites)	A buffer around these sites is required to avoid near-field effects. The required distance needs to be calculated using antenna radiation pattern and frequency. Note that sites may be multi-purpose including point-to-multipoint transmitters.	Varies but typically does not exceed 1 km
Communications transmission sites (Point-to-multi-point)	This includes base and repeater stations for land mobile services. A conservative exclusion zone of 1 km is applied but may be able to be reduced after consultation with stakeholders.	1 km
AM Broadcast Transmitters	Amplitude Modulation (AM) broadcast signals are medium-wave signals (wavelength up to 600m). A 2 km consultation zone exists around AM transmitters.	2 km
FM Broadcast Transmitters	Frequency modulated (FM) broadcast signals tend to be more robust with regard to obstructions such as buildings and wind farms. A 1 km radius consultation zone exists around FM radio transmitters.	1 km
DR & DTV Transmitters	Digital Radio (DR) and Digital Television (DTV) signals tend to be more robust than analogue signals. A 2 km radius is generally desirable around transmitters – for both DR and DTV.	2 km
Meteorological Radars	<p>World Meteorological Organisation (WMO) recommends avoiding siting wind turbines within 5 km of meteorological radars, and preferably not within 20 km, and maintaining blockage to less than 10% of the radar beam. WMO’s 2010 guidance statement also indicated observed effects up to 45km.</p> <p>The OPERA group of EUMETNET suggested that the wind turbines should not be located within 5 km for C-band radars and 10 km for S-band radars. The same recommendation document states that an impact study should be prepared if the wind turbines are within 20 km of C-band radars and 30 km of S-band radars.</p> <p>Since the above guidance and advice was issued, wind turbine generators have become significantly larger. Developments in weather radar technology may have increased sensitivity to wind turbine induced interference.</p> <p>MGE recommends consultation with the Bureau of Meteorology (BoM) if any weather radar is within 250 km of a wind farm. MGE has project experience where a wind farm located 100 km from an S-band radar was (justifiably) classified by BoM as “high risk”.</p>	<p>Up to 30 km but refer description for additional caveats</p> <p>BoM consultation recommended up to 250 km</p>

* For non-microwave (eg. 400 MHz) links an exclusion zone of only $F_{1 \text{ Max}} + \text{Blade Length}$ may be accepted by some stakeholders. $F_{1 \text{ Max}}$ and $F_{2 \text{ Max}}$ are the maximum first and second Fresnel zones respectively. These are a function of the frequency and length of the link.

3 Point-to-point links and transmission sites

No point-to-point links intersecting the Project have been identified. Four active communications transmission sites are located in proximity to the Project.

3.1 Point-to-point links

Detailed analyses of the two point-to-point links that run adjacent to the Project (within the 2 km buffer) are summarised in Table 2 and Table 3. Our recommendation is to locate WTGs outside the maximum 2nd Fresnel zones.

If a link is below 1 GHz frequency, it may be possible to obtain stakeholder acceptance for a turbine to be as close as the edge of the maximum 1st Fresnel zone.

Three-dimensional analysis tools and stakeholder consultation in a full telecommunication interference assessment will assess the impact more closely. Such analysis may demonstrate suitability of WTG placement closer than the nominal maximum Fresnel zone width, due to the relative vertical positions of the link path and WTG.

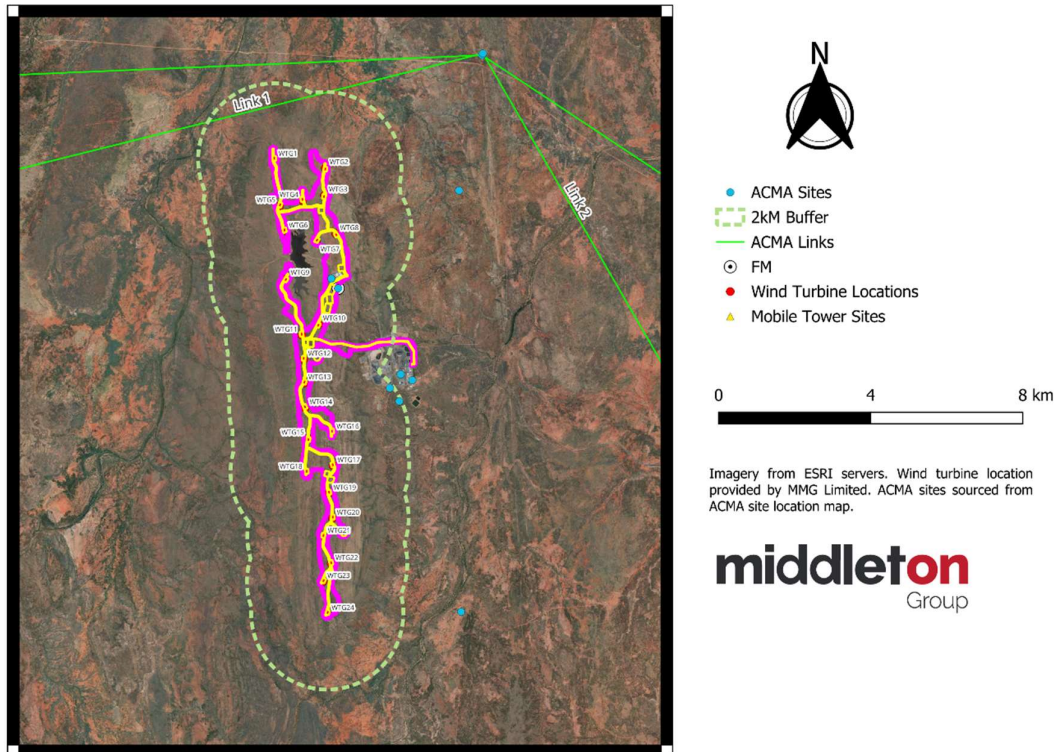


Figure 2: Point-to-point Links within the project site

Figure 2 shows the point-to-point links running adjacent to the Project. A nominal 2km buffer is used as a screening tool. A detailed analysis of individual affected links is found in Table 2 below.

Table 2: Point-to-point links crossing or adjacent the project area

Link Number	BSL / Licence No	Site 1	Site 2	Length (km)	Frequency (GHz)	Owner
1	12187081/1	MarchNet Facility Battle Ridge, West Leichhardt, 6km E of Lake Julius Road Mount Isa Site ID: 10029016	MarchNet Facility Mt Rose Bee, 66km NW of Cloncurry Cloncurry Site ID: 10028982	33.1	6.56	March IT Pty Ltd
2	12187077/1	MarchNet Facility Patricia Vale, Burke Developmental Road, 59km NW of Cloncurry Cloncurry Site ID: 10028981	MarchNet Facility Mt Rose Bee, 66km NW of Cloncurry Cloncurry Site ID: 10028982	12.6	10.755	March IT Pty Ltd

Where multiple licences are assigned to one link, this assessment uses the licence with the lowest frequency when calculating Fresnel zones, as this results in the worst-case value for the exclusion zone. The maximum width (which in practice occurs only at the mid-point of the link) of the first and second Fresnel zones, $F_{1\text{max}}$ and $F_{2\text{max}}$, are shown in Table 3.

Table 3: Fresnel zones for point-to-point links.

Link Number	BSL / Licence No	Length (km)	Frequency (MHz)	$F_{1\text{Max}}$ (m)	$F_{2\text{Max}}$ (m)
1	12187081/1	33.1	6.56	19.45	27.5
2	12187077/1	12.6	10.755	9.37	13.25

3.1.1 Non-Microwave Links

All links passing close to the site or through the site are microwave links.

3.1.2 Microwave Links

The 2nd Fresnel zones ($F_{2\text{ MAX}}$) for links 1 and 2 have been plotted in Figure 3. These links operate at microwave frequencies and it is necessary to position the WTGs such that the WTG rotor extents do not impinge upon the maximum 2nd Fresnel zone.

WTGs within the maximum 2nd Fresnel Zone are likely to interfere with the telecommunication signal. Detailed 3-dimensional analysis may demonstrate that at a particular location along the link path, the WTG can be placed closer without impinging on the Fresnel zone. It is recommended that rotor extents for WTGs remain outside of the 2nd Fresnel zone to mitigate any interference to these signals as shown in Figure 3.

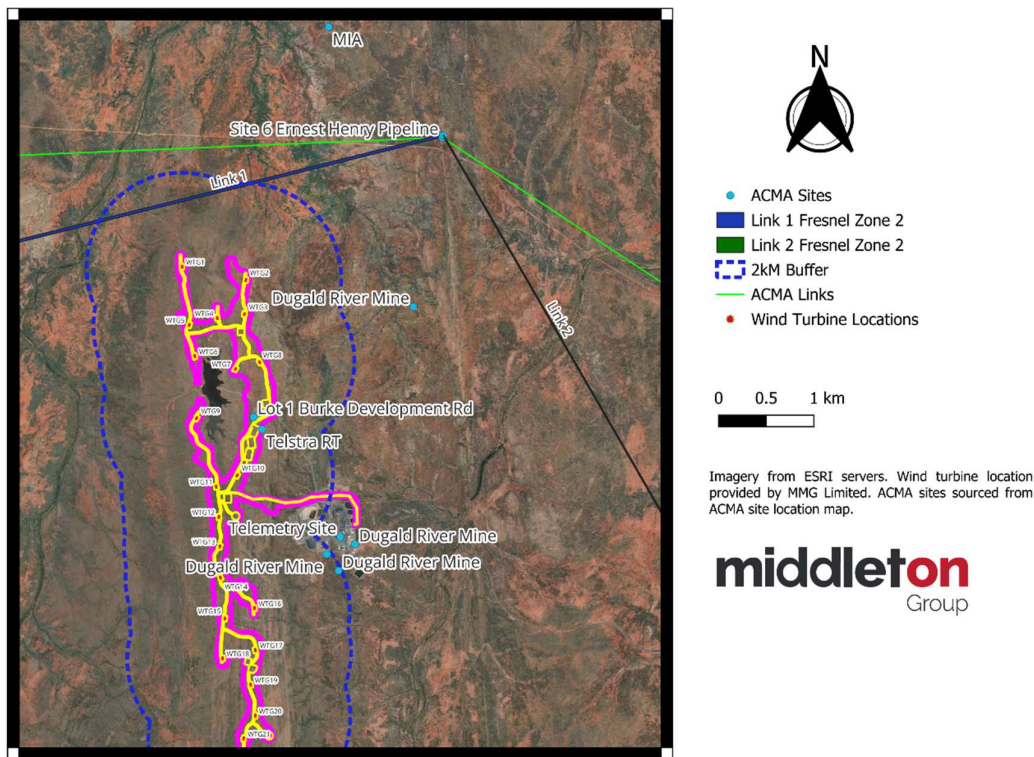


Figure 3 Microwave Frequency RF Links

With the presently proposed WTG location area as represented by the pink-coloured boundary in Figure 3, no WTG's impinge on the 2nd Fresnel zone of any of the links, therefore it is unlikely that the Project will interfere with the identified links. Marchnet has been contacted and has responded that they do not object to the location of the windfarm, refer to correspondence in Appendix A.3.

3.2 Communications transmission sites

The ACMA database shows two active, and two inactive communications transmission sites located in proximity to the Project. These are shown in Figure 4. A buffer around the currently active sites is required to mitigate against near-field effects. For sites used only as transmission locations for point-to-point links, the buffer size varies as a function of antenna radiation pattern and frequency.

However, if the site includes transmitters for point-to-multipoint systems then a conservative exclusion zone of 1 km, as per Table 1, is recommended but may be able to be reduced after consultation with stakeholders.

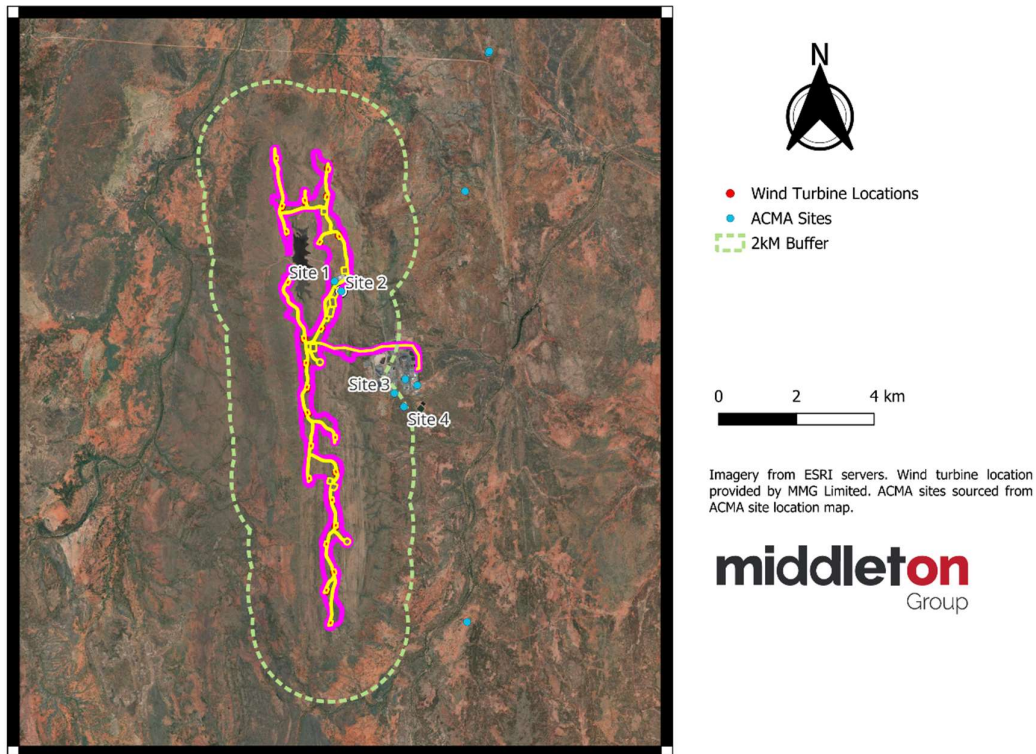


Figure 4: Communications transmission sites

3.2.1 Site 1

This site is currently shown as inactive and having no assignments.

3.2.2 Site 2

The site details are:

- **Owner:** Telstra RT
- **ID:** 9017286
- **Name:** Telstra RT CLONCURRY

- **Location:** DUGALD RIVER MINE QLD 4824
- **Assignments:** 12

The near-field clearances of the site are summarised in the table below.

Table 4: Summary of Site 2

Licence	Frequency (MHz)	Gain (dB)	Near-field Clearance (or 1km Point to Multi Point Buffer) (m)
9263433	837.5	17.5	7 *
9263433	837.5	17.5	7 *
9263433	837.5	17.5	7 *
9263433	882.5	17.5	6 *
9263433	882.5	17.5	6 *
9263433	882.5	17.5	6 *
9469862	723	15.5	5 *
9469862	778	15.5	5 *
9469862	723	15.5	5 *
9469862	778	15.5	5 *
9469862	723	15.5	5 *
9469862	778	15.5	5 *

* This site appears to be used for Telstra’s Remote Telemetry service, which we assume is a point-to-multipoint service. Usually a 1km exclusion zone is recommended for point-to-multipoint sites. Refer to section 3.2.5 for commentary.

3.2.3 Site 3

The site details are:

- **Owner:** Dugald River Mine
- **ID:** 9013505

- **Name:** Dugald River Mine 62 km NW of Cloncurry
- **Location:** CLONCURRY QLD 4824
- **Assignments:** 8
- The near-field effects of the site are summarised in the table below.
- **Table 5: Summary of Site 3**

Licence	Frequency (GHz)	Gain (dB)	Near-field Clearance (m)
11275634/2	2.125	18	3
11275634/2	1.935	18	3
1927751/1	1.9675	18.5	4
1927751/1	2.1575	18.5	3
1927751/1	2.1625	18.5	3
1927751/1	1.9725	18.5	4
11275006/1	1.855	17.5	3
11275006/1	1.76	17.5	3

This site appears to only be used for point-to-point links and therefore only the calculated near field clearance needs to be considered.

3.2.4 Site 4

This site is currently shown as inactive and having no assignments.

3.2.5 Preliminary Commentary

There is one active telecommunications site, Site 2, within the Project boundary and one active telecommunications site, Site 3, located within 2km of the Project boundary. It is unlikely that Site 3 will be impacted by the Project, due to the small near field clearance values. However Site 2 appears to be used for point-to-multipoint services and it is possible that WTG's will be located closer than 1km. The stakeholder has been contacted and has stated that the WTG should not impact Telstra's existing point to point radio links. The stakeholder has asked for a detailed analysis of the full power coordination impact (Low Frequency Induction (LFI) and/or Earth Potential Rise (EPR)) of the wind farm development . This will be completed after a more mature design is available, the stakeholder has agreed with this approach, refer to Appendix A.4 for detailed correspondence.

4 Meteorological Radar

The preliminary study identified four Bureau of Meteorology (BoM) radars within 250 km of the Project. In some instances, WTGs can be visible on meteorological radar beyond 50 km, with total range of some radars more than 200 km. The impacts vary as a function of:

- Type of radar.
- Topography between the wind turbine and the radar.
- Wind farm layout.
- Distance between wind turbines and the radar.

This study identified the nearest meteorological radar to be Mount Isa at distance of approximately 75 km from the Project. All other radars are more than 250 km away.

The WTGs may be visible to the Mount Isa radar. Consultation with the Bureau of Meteorology has commenced, the email correspondence is in Appendix A.1, the BoM has requested to do their own study to confirm that there is no impact or if any mitigation measures are required, refer to Appendix A.1 for detailed correspondence.

4.1.1 Preliminary Comments

While the distances from the Project to the above radars are beyond the distances highlighted by the World Meteorological Organisation (see Table 1), it is possible that the Project may still appear on the radars. The BoM has requested that a full service level assessment is completed to understand the impact and any mitigations required.

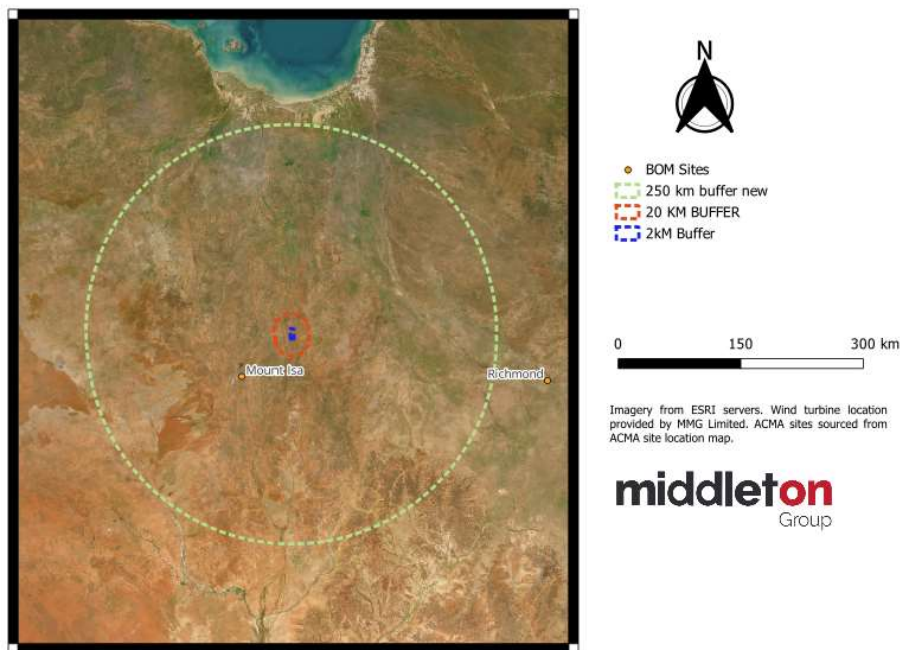


Figure 5: BoM Meteorological Radars within 250 km of the project site

5 Mobile Telephone Voice-based Communication

The preliminary study identified one mobile voice-based communication towers in proximity to the Project. Typically, the signal will not be significantly impacted where the towers are located more than 1 km from WTGs.

In the immediate vicinity of the WTGs, some reduction in signal may occur however, this can be mitigated by relocating the mobile phone receiver in the order of tens of metres. The mobile service provider has responded that there are no expected impacts to Telstra’s Mobile network with the provided turbine locations, refer to correspondence in Appendix A.4.

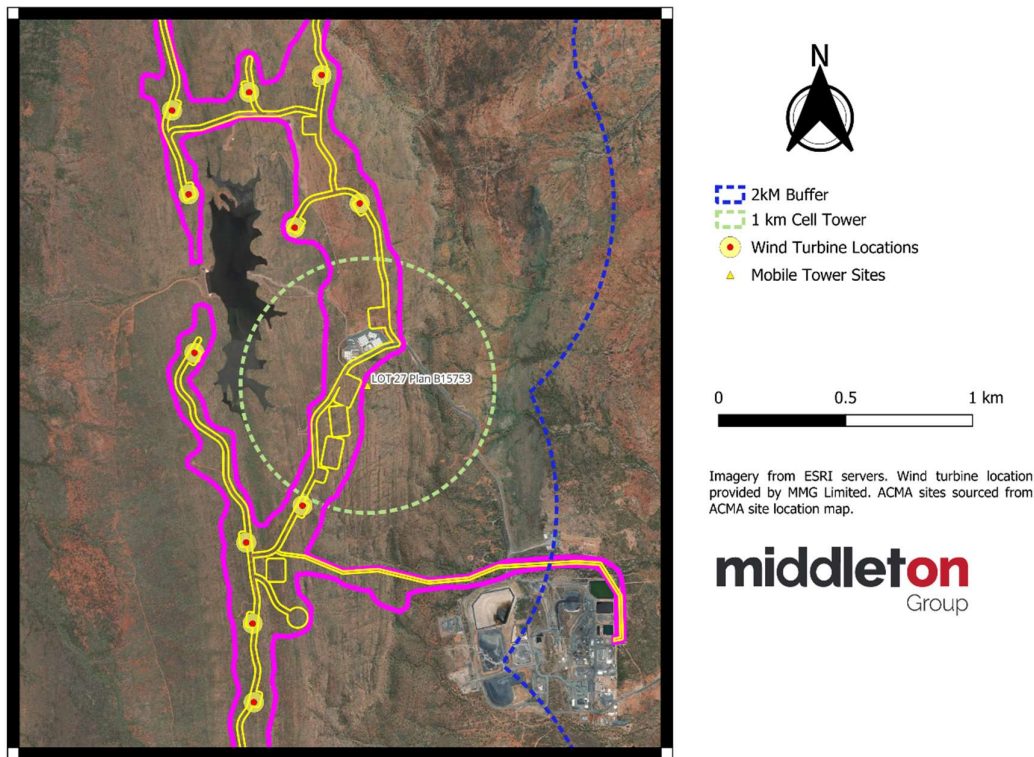


Figure 6: Mobile telephone voice-based communication towers within 2 km of the project site

5.1.1 Preliminary Commentary

MGE understands that the Project is linked to the Dugald River Mine. Clearly the cellular users/subscribers potentially impacted by any reduction in service from the cell tower shown above, are people associated with the Dugald River Mine.

6 Wireless and Satellite Internet Services

Global Navigation Satellite System (GNSS) networks are operated and maintained across the Australian region and the South Pacific. This includes the Australian Regional GNSS Network (ARGN), the South Pacific Regional GNSS Network (SPRGN) and the AuScope Network. GNSS networks provide the geodetic framework for the spatial data infrastructure in Australia and its territories. Data from the GNSS Network also contributes to the International GNSS Service (IGS).



Figure 7: GNSS stations within 2km of the Project

6.1.1 Preliminary Commentary

Based on the GNSS network map provided by Geoscience Australia, the proximity of the Project to the GNSS stations has been plotted. Figure 7 demonstrates that there are no GNSS stations within the 2 km Buffer. The closest GNSS station, 4RMA, is approximately 55 km away from the Project.

Geoscience Australia has been contacted and has responded that they do not object to the location of the windfarm, refer to correspondence in Appendix A.2.

7 Broadcast and Digital Radio and Television

Amplitude Modulation (AM) signals are medium-wave signals. Operating WTGs can influence the radiating patterns, with the potential to result in reduced signal quality and strength, as well as causing interference at neighbouring frequencies. A 2 km radius consultation zone exists around AM transmitters. The field of influence from the receiver’s perspective is in the order of tens of metres.

Frequency modulated (FM) signals tend to be more robust around obstructions such as buildings and wind farms. At the edge of their transmission range, where the signal to noise ratio is already quite low, WTGs can have an adverse influence on the signal. A 1 km radius consultation zone exists around FM radio transmitters.

A preliminary study identified one FM radio transmitter within 2 km of the Project, as shown in Figure 8. The transmitter is located at the Dugald River Mine Camp, and listeners to the station are therefore expected to receive the station at a high signal to noise ratio due to their very close proximity. We believe it is unlikely that these listeners will be impacted by the Project.

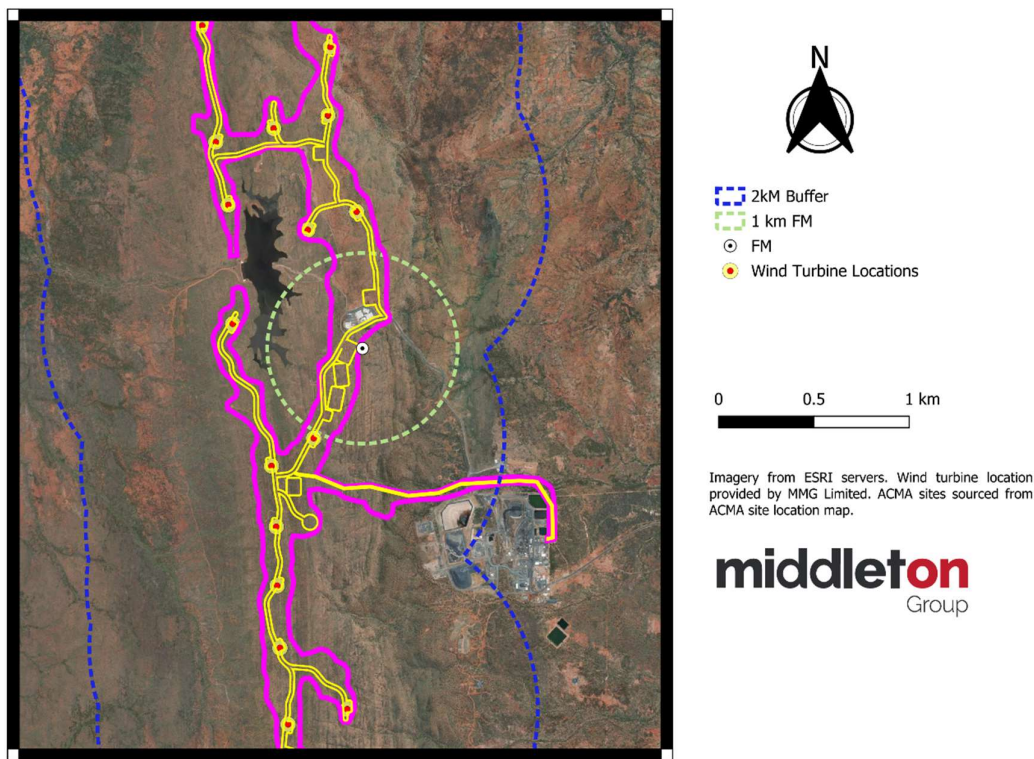


Figure 8: Broadcast Sites

7.1.1 Preliminary Commentary

MGE understands that the Dugald River Mine is associated with the Project proponent. Clearly the FM broadcast listeners potentially impacted by any reduction in service, are people associated with the mine. With this in mind, consultation with the FM transmitter operator may be quite straightforward. The stakeholder, Telstra, has asked for a detailed analysis of the full power coordination impact (Low Frequency Induction (LFI) and/or Earth Potential Rise (EPR)) of the wind

Client: MMG Limited

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Dated: 4/07/25

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farm development . This will be completed after a more mature design is available, refer to Appendix A.4 for detailed correspondence.

8 Conclusion

This preliminary impact assessment indicates that impacts on telecommunication services can be appropriately managed through stakeholder consultation.

This assessment's results are preliminary and may require further review.

A summary of the assessment results for Dugald River Wind Farm is highlighted below:

- There are no point-to-point radio links that cross the project boundary. One radio link crosses in the vicinity of the Project boundary. Consultation with the relevant stakeholders has been completed and they have indicated that there is no impact.
- Two active communications transmission sites and two inactive sites were found within the Project boundary. One of the active sites is closer than recommended, however it appears likely that any impact would be to Dugald River Mine itself, as the site seems to relate to a telemetry service. Consultation with the relevant stakeholders has been completed and the stakeholder has confirmed no impact.
- The project is 75 km from the nearest meteorological radar. This potentially makes it visible to the radar. Detailed assessment by the Bureau is required to determine impact and mitigations.
- There is one mobile telephone tower located within 2km of the project boundary. Based on Middleton Group's prior interactions with cellular network operators, the operator of this tower is unlikely to have concerns regarding this wind farm. The stakeholder has been contacted and has indicated that the wind farm should not impact the mobile network.
- No GNSS stations are within 2 km of the project boundary. Consultation with Geoscience Australia has been completed and they have indicated that there is no objection to the site location.
- The Project boundary is close to an FM transmitter service the Dugald River Mine Camp. The stakeholder has been contacted and has asked for a detailed analysis of the full power coordination impact (Low Frequency Induction (LFI) and/or Earth Potential Rise (EPR)) of the wind farm development . This will be completed after a more mature design is available, the relevant stakeholder has not objected to this approach.

This assessment includes consultation with telecommunication stakeholders, refer appendices for detailed correspondence.

Appendix A.1 Stakeholder Engagement Correspondence – Bureau of Meteorology

Johanna Rigby

From: Stephanie Osborne <stephanie.osborne@bom.gov.au>
Sent: Friday, 23 May 2025 10:40 AM
To: Johanna Rigby
Cc: windfarmenquiries; Energy; Stephen Duggan
Subject: Dugald River Wind Farm Impact Request regarding CAS-108875-Y1J8Y6
[SEC=OFFICIAL] CRM:0399000255

In reply please quote: CAS-108875-Y1J8Y6

Date: 23/05/2025

Dear Johanna,

Thank you for your continued patience.

Our assessment of the current Dugald wind farm proposal has determined it poses a significant risk to the Mount Isa radar.

The Bureau cannot support the development without a comprehensive technical assessment of potential impacts and possible mitigation measures for your development.

This service is charged at \$45,000.00 (excl. GST) per assessment and would include the following:

- Comprehensive EMI modelling of the proposed development
- Detailed service impact assessments
- Mitigation options to restore services and maintain quality, proposed as development requirements rather than detailed designs.
- Summary of Bureau's findings

We aim to complete the assessment within 8 weeks from commissioning. The delivered report findings will stand whilst the relevant technical details of the project remain the same (footprint, number of turbines, hub and tip height etc.).

You may have this work undertaken by another consultant, but The Bureau will need to review it prior to any endorsement from us. We won't be providing advice regarding wind farm developments without a very clear understanding of the potential for impacts on our services.

Please let us know if you have any questions or to arrange an assessment.

Kind regards,

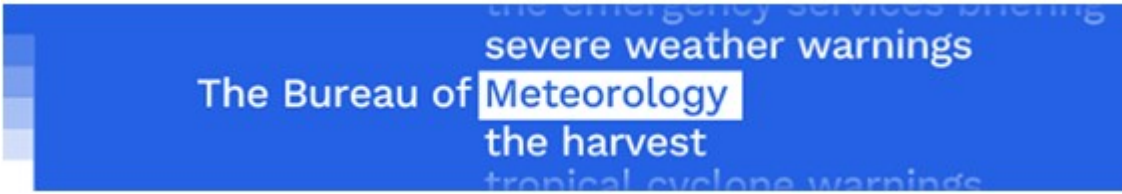
Stephanie Osborne (she/her)
Customer Specialist - Energy & Resources
Working days: Tuesday, Wednesday, Thursday, Friday (half-day)
energy@bom.gov.au | www.bom.gov.au





The Bureau of Meteorology acknowledges the Traditional Custodians of Australia and their continuing connection to land, sea and community.

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----- Original Message -----

From: Stephanie MacDonald <stephanie.osborne@bom.gov.au>;
Received: Tue May 13 2025 16:36:51 GMT+1000 (Australian Eastern Standard Time)
To: Johanna Rigby <johanna.rigby@middletongroup.com.au>;
Cc: Wind Farm Enquiries <windfarmenquiries@bom.gov.au>; Bureau of Meteorology <energy@bom.gov.au>; Steve Duggan <stephen.duggan@bom.gov.au>; energy@bom.gov.au <energy@bom.gov.au>; Stephen Duggan <stephen.duggan@bom.gov.au>;
Subject: Dugald River Wind Farm Impact Request regarding CAS-108875-Y1J8Y6
[SEC=OFFICIAL] CRM:0399000242

In reply please quote: CAS-108875-Y1J8Y6

Date: 13/05/2025

Dear Johanna,

Thank you for updating the specs for the proposed Dugald River wind farm.

Due to competing priorities, we may not be able to meet the deadline of 23/05/2025. The proposal is currently in the queue for analysis, and I will provide you with an update as soon as I have more information regarding its impact.

Kind regards,

Stephanie Osborne (nee MacDonald)
Energy and Resources
The Bureau of Meteorology



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From: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Sent: Friday, 9 May 2025 3:15 PM
To: windfarmenquiries <windfarmenquiries@bom.gov.au>
Subject: RE: Wind Farm Impact Request

Hi,

Just following up on this enquiry and making an edit.

There was an issue with our coordinates, only one station is in the vicinity of the site:

Weather Radar Name	Coordinate	Radar type	Distance to Boomer Range Wind Farm Project Area
Mount Isa	-20.71° N, 139.56° E	DWSR 8502S 2° S-band	70 km

If you have any concerns relating to the development and any potential impacts on their communication link or mobile services, please get in contact by return email or by calling us on the phone number listed below prior to 23/05/2025.

Thanks.

Kind regards,

Johanna Rigby | Power Engineer | [middleton](http://middleton.com.au) Group
M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au



Middleton Group acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander people today.

Middleton Group acknowledges the indigenous Māori of Aotearoa New Zealand and the importance of partnership with tangata whenua (people of the land) as enshrined in Te Tiriti o Waitangi. He aha te mea nui o te ao? He tangata, he tangata, he tangata. What is the most important thing in the world? It is people.

----- Original Message -----

From: Johanna Rigby <johanna.rigby@middletongroup.com.au>;
Received: Mon May 05 2025 10:25:44 GMT+1000 (Australian Eastern Standard Time)
To: Stephanie Macdonald <stephanie.macdonald@bom.gov.au>; Stephanie MacDonald <stephanie.macdonald@bom.gov.au>;
Cc: Wind Farm Enquiries <windfarmenquiries@bom.gov.au>; Bureau of Meteorology <energy@bom.gov.au>; Steve Duggan <stephen.duggan@bom.gov.au>; energy@bom.gov.au <energy@bom.gov.au>; Stephen Duggan <stephen.duggan@bom.gov.au>;
Subject: RE: Dugald River Wind Farm Impact Request regarding CAS-108875-Y1J8Y6 [SEC=OFFICIAL] CRM:0399000227

Hi,

Please find filled out form attached.

Please let me know if you require any further details.

Thanks.

Kind regards,

Johanna Rigby | Power Engineer | **middleton** Group
M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au



Middleton Group acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander people today.

Middleton Group acknowledges the indigenous Māori of Aotearoa New Zealand and the importance of partnership with tangata whenua (people of the land) as enshrined in Te Tiriti o Waitangi. He aha te mea nui o te ao? He tangata, he tangata, he tangata. What is the most important thing in the world? It is people.

From: Stephanie MacDonald <stephanie.macdonald@bom.gov.au>
Sent: Thursday, 17 April 2025 1:31 PM
To: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Cc: Stephen Duggan <stephen.duggan@bom.gov.au>; windfarmenquiries <windfarmenquiries@bom.gov.au>; Energy <energy@bom.gov.au>
Subject: Dugald River Wind Farm Impact Request regarding CAS-108875-Y1J8Y6 [SEC=OFFICIAL] CRM:0399000227

In reply please quote: CAS-108875-Y1J8Y6

Date: 17/04/2025

Dear Johanna,

Thank you for submitting your windfarm proposal for the Bureau of Meteorology's review.

The Bureau requires detailed information about the project to assess the possible impacts of the wind farm project on its assets, including weather radars.

I can see you have provided some of this information already, however, please complete and return the technical details form attached.

Due to the large number of enquiries, this proposal will be placed in a queue for assessment. A preliminary assessment will be conducted, and we will share the results with you in due course.

Kind regards,

Stephanie MacDonald
Energy and Resources
The Bureau of Meteorology





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From: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Sent: Thursday, 17 April 2025 11:20 AM
To: windfarmenquiries <windfarmenquiries@bom.gov.au>
Subject: Wind Farm Impact Request

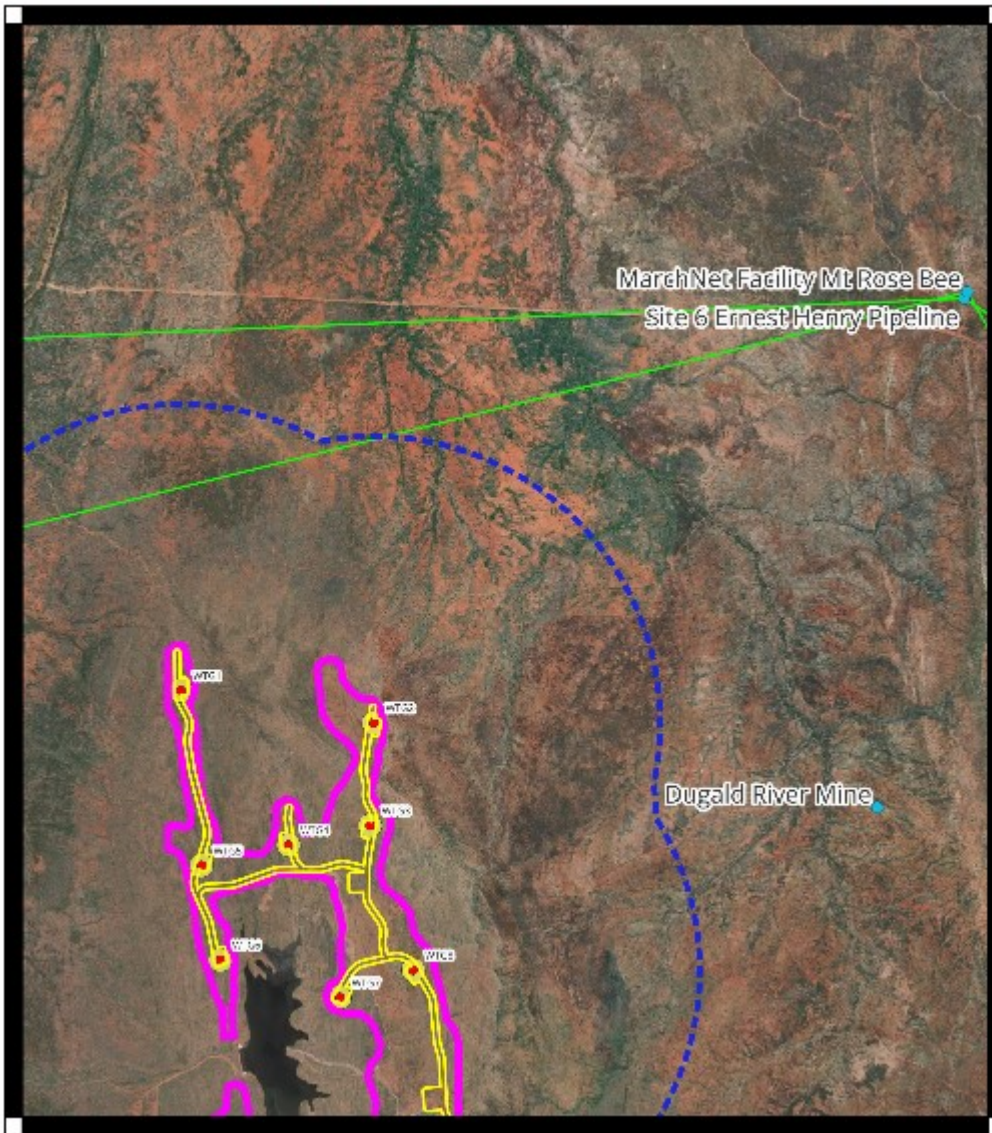
To whom it may concern,

We are conducting early-stage consultation for the Dugald River Wind Farm in Queensland, focusing on Electromagnetic Interference. An environmental impact statement is being prepared by Middleton Group and the applicant for the wind farm is MMG Limited. Our consultation particularly relates to potential impact on survey marks and GNSS stations.

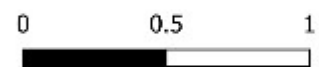
The wind farm project is located approximately 80 km North East of Mount Isa City.

We note that your organisation has one licensed communication link which passes through the proposed project boundary, license number 12187081/1.

While the link does not come into contact with a turbine, it does pass through the proposed project site. Based on our analysis, from a bird's eye the edge of the closest wind turbine (Turbine 1) will come within 1.4 km of the second Fresnel Zone. The Turbines should not reduce the performance of the wireless link, as per typical industry standards. The image below demonstrates this for turbines respectively.



- ACMA Sites
- 2km Buffer
- ACMA Links
- Wind Turbine Locations



Imagery from ESRI servers. Wir provided by MMG Limited. ACMA ACMA site location map.



We append the wind turbine co-ordinates in .csv and .kml format. Note that the rotor diameter of the turbines will be up to 165 m, with a tip height of 212.5 m.

If you have any concerns relating to the development and any potential impacts on your communication links, please get in contact by return email or by calling us on the phone number listed below prior to 2/04/2025.

Thanks.

Kind regards,

Johanna Rigby

MEng (Elec)

Power Engineer

M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au

L13, 500 Collins Street Melbourne, VIC 3000 | **W:** www.middletongroup.com.au



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**Appendix A.2 Stakeholder Engagement Correspondence – Geoscience
Australia**

Johanna Rigby

From: Positioning Operations and Support <gnss@ga.gov.au>
Sent: Thursday, 17 April 2025 1:30 PM
To: Johanna Rigby
Cc: Client Services
Subject: RE: Wind Farm Impact Request [SEC=OFFICIAL]

Hi Johanna,

Thank you for providing this information. Geoscience Australia do not foresee any interference to our GNSS infrastructure as a result of the proposed Dugald River Wind Farm in Queensland.

Kind regards,

Austin Lico | Operations Officer
GNSS Infrastructure and Informatics Section | Positioning Australia Branch
Space Division

📞 +61 2 6249 5849 📞 +61 2 6249 9004 ga.gov.au

Geoscience Australia acknowledges the traditional owners and custodians of Country throughout Australia and acknowledges their continuing connection to land, waters and community. We pay our respects to the people, the cultures and the elders past and present

From: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Sent: Thursday, 17 April 2025 11:17 AM
To: Client Services <ClientServices@ga.gov.au>
Subject: Wind Farm Impact Request

To whom it may concern,

We are conducting early-stage consultation for the Dugald River Wind Farm in Queensland, focusing on Electromagnetic Interference. An environmental impact statement is being prepared by Middleton Group and the applicant for the wind farm is MMG Limited. Our consultation particularly relates to potential impact on survey marks and GNSS stations.

The wind farm project is located approximately 80 km North East of Mount Isa City.

We append the wind turbine co-ordinates for turbines in proximity to the link in .csv format. Note that the rotor diameter of the turbines will be up to 165 m, with a tip height of 212.5 m.

We note that all installations on the wind farm will comply with the Radiocommunications Act (1992) and associated notices.

If you have any concerns relating to the development and any potential impacts on their communication link or mobile services, please get in contact by return email or by calling us on the phone number listed below prior to 2/04/2025.

Kind regards,

Johanna Rigby
MEng (Elec)
Power Engineer
M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au



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Appendix A.3 Stakeholder Engagement Correspondence – Marchnet

Johanna Rigby

From: Adam (Support) <support@marchnet.com.au>
Sent: Monday, 30 June 2025 11:24 AM
To: Johanna Rigby
Subject: MarchNet Re: MAR-191539 - [G5YW52-EK0N3] - RE: Wind Farm Impact Request

Your request (191539) has been updated. To add additional comments, reply to this email.



Adam (MarchNet)

30 June 2025, 11:24 am AEST

Hi Johanna,

Thank you for your email.

We confirm that MarchNet has no issues with the proposed location for the Wind Farm, and we do not foresee any impact on our licensed communication link based on the details provided.

Please let us know if you need any further input from our side.

Cheers,
Adam

MarchNet Support: ✉ support@marchnet.com.au | 🌐 marchnet.com.au



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Johanna Rigby

30 June 2025, 10:37 am AEST

Hi,

We are finalising the report this week.

We assume that as we have not received a response, there are no concerns with the proposed location for the windfarm.

Thank you.

Kind regards,

Johanna Rigby | Power Engineer | [middleton Group](#)
M: +61 422 589 998 | E: johanna.rigby@middletongroup.com.au



Middleton Group acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community.
We pay our respect to their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander people today.

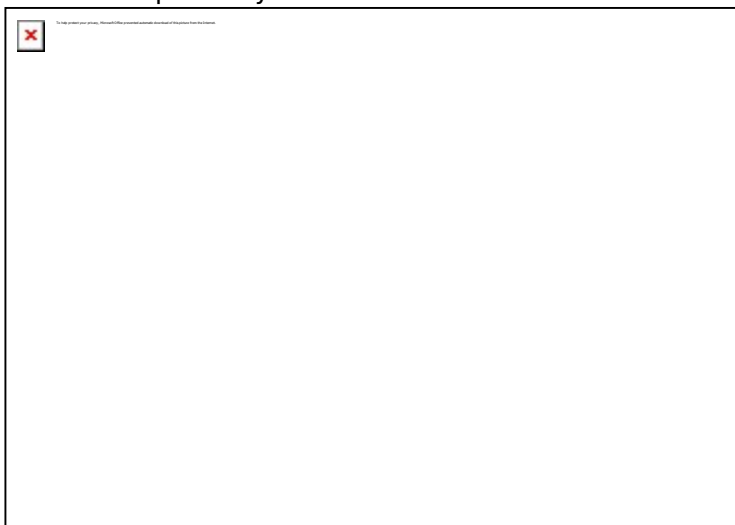
Middleton Group acknowledges the indigenous Māori of Aotearoa New Zealand and the importance of partnership with tangata whenua (people of the land) as enshrined in Te Tiriti o Waitangi. He aha te mea nui o te ao? He tangata, he tangata, he tangata. What is the most important thing in the world? It is people.

From: Johanna Rigby
Sent: Thursday, 17 April 2025 6:44 PM
To: support@marchnet.com.au
Subject: Wind Farm Impact Request

To whom it may concern,

We are conducting early-stage consultation for the Dugald River Wind Farm in Queensland, focusing on Electromagnetic Interference. An environmental impact statement is being prepared by Middleton Group and the applicant for the wind farm is MMG Limited. Our consultation particularly relates to potential impact on survey marks and GNSS stations.

The wind farm project is located approximately 80 km North East of Mount Isa City. We note that your organisation has one licensed communication link which passes through the proposed project boundary, license number 12187081/1. While the link does not come into contact with a turbine, it does pass through the proposed project site. Based on our analysis, from a bird's eye the edge of the closest wind turbine (Turbine 1) will come within 1.4 km of the second Fresnel Zone. The Turbines should not reduce the performance of the wireless link, as per typical industry standards. The image below demonstrates this for turbines respectively.



We append the wind turbine co-ordinates in .csv and .kml format. Note that the rotor diameter of the turbines will be up to 165 m, with a tip height of 212.5 m.

If you have any concerns relating to the development and any potential impacts on your communication links, please get in contact by return email or by calling us on the phone number listed below prior to 2/04/2025.

Thanks.

Kind regards,

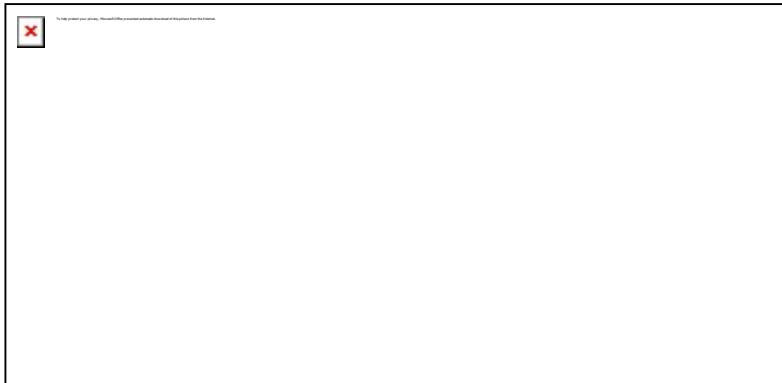
Johanna Rigby

MEng (Elec)

Power Engineer

M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au

L13, 500 Collins Street Melbourne, VIC 3000 | **W:** www.middletongroup.com.au



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Appendix A.4 Stakeholder Engagement Correspondence – Telstra

Johanna Rigby

From: ! Windfarm Assessment Requests
<WindfarmAssessmentRequests@team.telstra.com>
Sent: Friday, 4 July 2025 8:56 AM
To: Johanna Rigby; ! Windfarm Assessment Requests
Subject: Re: Wind Farm Impact Request - Dugald River

Thanks Johanna,

Understood.

This approach is fine. Keeping in mind that should any part of the current proposal be changed, then please refer this back for re-assessment.

Regards,
Andrew Panagopoulos
M 0448512519

General

From: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Sent: Thursday, 3 July 2025 4:20 PM
To: ! Windfarm Assessment Requests <WindfarmAssessmentRequests@team.telstra.com>
Subject: RE: Wind Farm Impact Request - Dugald River

You don't often get email from johanna.rigby@middletongroup.com.au. [Learn why this is important](#)

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Hi Andrew,

Thank your reply.

On point 3, the design has not been completed at this stage to facilitate such studies, the client will ensure this is completed down the line after a more mature design is available. Our study is a desktop study to assist in development applications based on a set of assumptions and proposed locations of electrical infrastructure.

Please let me know if any issues with the above approach.

Thank you.

Kind regards,

Johanna Rigby | Power Engineer | [middleton](#) Group
M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au

Middleton Group acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander people today.

Middleton Group acknowledges the indigenous Māori of Aotearoa New Zealand and the importance of partnership with tangata whenua (people of the land) as enshrined in Te Tiriti o Waitangi. He aha te mea nui o te ao? He tangata, he tangata, he tangata. What is the most important thing in the world? It is people.

From: ! Windfarm Assessment Requests <WindfarmAssessmentRequests@team.telstra.com>
Sent: Thursday, 3 July 2025 3:40 PM
To: Johanna Rigby <Johanna.rigby@middletongroup.com.au>; ! Windfarm Assessment Requests <windfarmassessmentrequests@team.telstra.com>
Subject: Re: Wind Farm Impact Request - Dugald River

Johanna Rigby

Middleton Group

RE: Proposed Dugald River Wind Farm

Dear Johanna,

To provide a better understanding of potential impacts to Telstra infrastructure a desktop assessment was undertaken. The results were as follows:

1. There are no expected impacts to Telstra's Mobile network due to this wind farm based on the turbine locations provided.
2. Based on the turbine locations provided and information regarding Telstra's existing point to point radio links obtained from Waypoint and maprad.io, the proposed wind farm should not impact on any of Telstra's existing point to point radio links.
3. A detailed analysis of the full power coordination impact (Low Frequency Induction (LFI) and/or Earth Potential Rise (EPR)) of the wind farm development is required. This includes location of the wind farm switch yard, the route and potential of any associated HV transmissions lines and the LFI and EPR impact on any Telstra plant they may affect.
4. It is recommended that you contact Before You Dig Australia, so you are aware of the underground assets in the area. They will provide you with the location of Telstra's as well as any other utilities' underground assets.

Based on this assessment, to minimise potential interference to Telstra's telecommunications network, Telstra requires the developer to confirm its agreement to the conditions and matters set out in the above points.

The developer also confirms its role as the proponent and ultimate owner of the proposed wind farm and that it has the authority to ensure that the conditions set out above are implemented and complied with. If the

agreement of any other person or entity is required to ensure the conditions set out in this letter are complied with, the developer undertakes to obtain that agreement in writing and to provide it to Telstra prior to lodging a development application for the wind farm.

If the proposed plans and specifications of the development are altered or amended, Telstra reserves the right to request further conditions and amendments to the development.

Should you wish to discuss any aspect of this letter please do not hesitate to contact the undersigned. Otherwise, I would appreciate you responding to me confirming the developer's agreement to the conditions and matters set out above.

Yours faithfully,

Andrew Panagopoulos

M 0448512519

General

From: Johanna Rigby <Johanna.rigby@middletongroup.com.au>
Sent: Thursday, 17 April 2025 11:15 AM
To: ! Windfarm Assessment Requests <windfarmassessmentrequests@team.telstra.com>
Subject: Wind Farm Impact Request

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To whom it may concern,

We are conducting early-stage consultation for the Dugald River Wind Farm in Queensland, focusing on Electromagnetic Interference. An environmental impact statement is being prepared by Middleton Group and the applicant for the wind farm is MMG Limited.

The wind farm project is located approximately 80 km North East of Mount Isa City.

The following is in the vicinity of the wind farm:

- LOT 27 Plan B15753 UNNAMED 937 RD, tower number 4824026, is located near the planned location of the turbines, just over 1 km away.
- We also note that the Dugald River, Easting: 410288.199, Northing: 7762671.482, Telstra RT FM is located within the site's boundary, just over 1 km away from a planned location for a turbine.
- We also note that site ID, 9017286, Telstra RT CLONCURRY is located within the site's boundary, just over 1 km away from a planned location for a turbine.

We append the wind turbine co-ordinates for turbines in proximity to the link in .csv format. Note that the rotor diameter of the turbines will be up to 165 m, with a tip height of 212.5 m.

We note that all installations on the wind farm will comply with the Radiocommunications Act (1992) and associated notices.

If Telstra have any concerns relating to the development and any potential impacts on their communication link or mobile services, please get in contact by return email or by calling us on the phone number listed below prior to 2/04/2025.

Thanks.

Kind regards,

Johanna Rigby

MEng (Elec)

Power Engineer

M: +61 422 589 998 | **E:** johanna.rigby@middletongroup.com.au

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