

Submission Opposing “Jupiter Wind Farm Project” - Electromagnetic Interference (EMI)

Summary

I object to the proposed Jupiter Wind Project (Jupiter) proposal because it will create substantial disruption to wireless communications that are important to the Mount Fairy area where I have a residence. The EIS has not put forward a credible plan for mitigation of the impacts. Information presented in the EIS is misleading and wrong.

- This submission raises serious questions that undermine the benign conclusion that either there are no electromagnetic interference (EMI) and electromagnetic field (EMF) impacts posed by Jupiter or that mitigation processes will be easily put in place to avoid disruption that does occur.
- The consultants that prepared the EMI assessment do not advertise any expertise for EMI assessment. DNV GL consultants were commissioned to provide an independent assessment of EMI and EMF for Jupiter. According to their website, they have expertise in workplace EMF assessment but do not mention any expertise in relation to EMI.
- TV broadcast reception will be disrupted for large numbers of residences - according to maps included in the EIS, at least 288 residences will have reception disrupted, provided that the assumptions underlying these maps are correct - but the consultants provide a disclaimer that the ‘simplified’ modelling may be unreliable and therefore this disruption could be worse. Further the consulting company does not advertise skills in modelling tv reception or interference.
- The maps of TV broadcast reception show that most of the area surrounding Jupiter receives only marginal TV reception ranging from ‘none’ to ‘variable’. There are very limited areas shown as green or ‘good’ on these maps.
- Marginal TV reception is an example of marginal wireless reception for multiple important services for the Jupiter area, including emergency services, CB radio, mobile phone, wireless internet and radio broadcasting. Our residence (marked as residence J5) has already had to take special steps to achieve acceptable reception in a number of these areas.
- The EIS fails to include any modelling of disruption to reception of other important services including emergency services, CB radio, mobile phone, wireless internet and radio broadcasting.
- There is no assurance that any mitigation processes relating to wireless reception will be put in place by the proponent or that, if they were to be put in place, they would be

convenient, reliable or effective - particularly given that they have been proposed by a consultant without advertised expertise in EMI. In any event, who will be responsible for policing any mitigation measures, should approval be granted.

- Misleading claims are made in the EIS either because they are unsupported by evidence or misleading interpretations of available information.
 - For instance, assurances from Telstra and Optus that Jupiter would not interfere with microwave services (page 67 - APPENDIX C CONSULTATION PROCESS) have been interpreted as advice that "Telstra and Optus indicating that the Project will have no impact on their operations and services" page 16.8.
 - For instance, the statement that for emergency "No direct interference to services has been determined" appears to be based on consultation with the NSW Fire and Rescue Service, when the NSW Rural Fire Service is the prime fire agency for the Jupiter area.
- Claims that use of 'normal equipment' in Jupiter will not cause disruption because they are widely used elsewhere, are misleading because they do not take account of the local marginal wireless reception. For instance, while trying to drive into Braidwood from the north and listen to Canberra broadcast radio, significant interference is experienced from the existing power line installations.

I call for the following actions to avoid disruption to a vital range of community services that will be disrupted by EMI from Jupiter:

- deny approval for the Jupiter project in the light of substantial disruption to essential and important wireless services for the local community
- if approval is not denied, then the current EIS should be rejected in the light of inadequate consideration of EMI, inadequate modelling of EMI interference to television reception, no modelling or satisfactory information on EMI interference to other essential wireless services, lack of certainty around any mitigation measures and inadequate consultation about the impacts of EMI
- if the current EIS is not rejected, then construction or operation of Jupiter should not be allowed until a thorough documented assessment of EMI disruption is undertaken including adequately skilled personnel and properly authorised public assessments by all relevant agencies

General

- 16.9 - "It was concluded that EMF emitted from WTGs are well within the applicable guidelines, and that EMF from other associated components (transformers, underground cables, substation and transmission lines) are typical of similar installations that are used elsewhere, and therefore do not pose a particular risk." - EIS does not mention that this is a marginal reception area for many forms of wireless communication including broadcast radio, broadcast TV, mobile phone (notified under the Australian Government Blackspot Programme), wireless internet. Therefore issues that do not disrupt communications in other areas may have a much more significant impact in the PA and for associated residences. Also, mobile communications is much more important in this area when people need to move around on their own and neighbouring properties. They also need a reliable mobile service for emergency situations. There is a recent example of an elderly person who, in a confused state of mind, was knocked over on the Goulburn Road where inadequate mobile coverage hindered attempts to find him before the accident. There have been notifications to the Australian Government's mobile blackspots program.

Electromagnetic Interference (EMI)

- 16.6 - EMI is associated with wind turbines. The EIS admits "Wind farms have the potential to affect the performance of radiocommunication services through the introduction of EMI. Services most likely to be affected include terrestrial broadcast signals and fixed point-to-point microwave signals. Terrestrial broadcast signals are commonly used to transmit domestic television, while microwave links are used for line-of-sight connections for data, voice and video."

TV Reception - disrupted - at least 288 residences impacted

- 16.9 - TV Reception - "The area around the PA is able to receive a digital television signal from any of the three towers in Canberra, Braidwood or Illawarra, therefore it is possible that areas of poor coverage from one or two of the three towers might receive a reasonable level of signal from the third. It is expected that interference to terrestrial television can be mitigated by improving the equipment at a dwelling location or other options as listed in the mitigation measures below." We (residence J5) currently receive digital TV signals and use signals from Canberra and Braidwood
- We had to get professional assistance to set up our TV reception following the introduction of digital TV broadcasting. Even so, these signals are disrupted at times

and it may be possible to use a different signal if one of these broadcast locations is disrupted eg by weather. In any event, programming on the three towers is not equivalent and we would be severely disrupted if we had to change from our current reception arrangements.

- 16.10 - Figure 16.1 - Potential Television Interference Zone (Black Mountain Tower, Canberra) - 119 residences impacted
- 16.11 - Figure 16.2 - Potential Television Interference Zone (Mt Gillamatong Broadcast Tower, Braidwood) - 111 residences impacted
- 16.12 - Figure 16.3 - Potential Television Interference Zone (Knights Hill Broadcast Tower, Illawarra) - 93 residences impacted
- $119 + 111 + 93 = 323$
- P 41 - Table B-2: Details of dwellings falling within potential TV interference zones - each page lists 36 residences and there are 8 pages - $36 + 36 + 36 + 36 + 36 + 36 + 36 + 36 = 288$ residences affected
- The three figures show that many residences are located in areas with variable to none TV reception. Indeed there are minimal areas of 'green' TV reception and these do not relate to any of the residences affected by EMI from Jupiter. These maps are an indication of the marginal radio reception generally in the project area.
- Residences are not labeled in the three figures, but our residence J5 is shown as affected by EMI in relation to reception from Mt Gillamatong Broadcast Tower, Braidwood and Knights Hill Broadcast Tower, Illawarra. If the EMI predictions prove to be true then our TV reception would be limited to only one transmission site: Black Mountain Tower, Canberra. This would leave us with no other options if this site is subject to interference due to other sources eg weather (a common occurrence).
- Page 22 - Misleading statement & assumption only - "It is also possible that areas of poor coverage from two out of the three towers might receive a reasonable level of television signals from the third tower." - If an overlay of the three reception maps was produced it would not show reasonable levels of TV reception for almost all of the affected residences.
- Page 22 - Disclaimer that the TV disruption modelling is based on a 'simplified model' and therefore may be unreliable - "The method used here to assess the potential interference to television signals from the Project represents a simplified approach which is expected to capture locations where interference is most likely to occur. This simplified analysis is deemed appropriate as the implications of potential television interference are reasonably low given the large range of mitigation options available."
 - This line of argument is circular. It is not logical to say that either disruption is low or

a simplified modelling approach is justified because there may be potential mitigation options.

CB Radio - disrupted

- 16.8 - "If interference is experienced it should be possible to improve signal quality by moving a short distance. In any event, the impact of the Project on CB radio is expected to be minimal." - What is a 'short distance' in the context of CB reception? What is the evidence for a claim of 'minimal impact'? - At residence J5 (a property of 40ha) we use CB radio as part of our property management arrangements and moving to a location of better signal may not be possible in the circumstances (because of the task being performed) and because the whole property is within 2km of the planned wind turbines.
- 17.10 - CB radio - "There is potential for cumulative impacts from multiple wind farms resulting in increased interference with CB radio systems, however there is no right of protection for CB radio, and this potential impact can be rectified by relocating or use of an external antenna, which is not considered to be a significant impact." - Use of CB radio is a lawful activity. Why should the development of Jupiter be allowed to disrupt this highly useful activity?

Mobile Phone - disrupted

- 16.8 - Mobile Phone - "Telstra and Optus indicating that the Project will have no impact on their operations and services" - "Should any potential issues be identified in the future, further consultation would be undertaken with the relevant service provider to rectify any potential issues." - Why is this commitment so vague? Why is there not a complete assurance that a key service of mobile phones will not be further degraded in the Jupiter area?
- 17.10 - Mobile Phone - "While mobile phone signals are generally not susceptible to interference from WTGs, there is potential for cumulative impacts from multiple wind farms resulting in interference to mobile phone services, with the greater number of WTGs between the phone user and tower having a greater potential for interference. However, this potential impact can be rectified by relocating to a position of higher signal quality or use of an external antenna, which is not considered to be a significant impact." - What does 'relocation' involve? Does it involve leaving the residence and driving to some location of 'higher signal quality'? - At residence J5, our mobile phone service is usually provided from Gillamatong, Braidwood - indeed this is the only practical source of mobile phone coverage for J5 - and the map of TV reception interference shows that radio signals from Gillamatong will be disrupted. Won't this also be the case for mobile phone reception?

Wireless Internet - disrupted

- 16.8 - Wireless Internet - unsupported claim - "In summary, it is considered unlikely that the presence of WTGs would interfere with wireless internet services." - EIS suggests in the absence of NBN services "for the next six months" people may be using "Telstra Next G wireless broadband" for wireless internet - Yes, at J5 we use Telstra wireless internet as well as NBN satellite. We need to have both as a backup for each other. Why is the concept of the 'next six months' introduced when Jupiter is planned to operate for 25 years? Where is the evidence that there would not be interference with wireless internet?
- Why is there no mention of WIFI interference in the EIS? WIFI is commonly used as a local distribution arrangement in residences for incoming internet services and other services.

Radio broadcasts - disrupted

- 16.9 - Radio broadcasts - "As Amplitude Modulation (AM) radio signals are able to propagate around obstructions such as WTGs, it is expected that the Project will not cause significant interference for any receivers. Frequency Modulation (FM) radio signals however, **are susceptible to interference** from buildings and other structures, which can result in hissing and distortion being heard by a listener. Any interference is likely to be limited to the immediate vicinity of a WTG and can be mitigated by the installation of a high quality antenna. According to the digital radio coverage map available on the ABC website, digital radio is not yet available within the PA." [emphasis added] - At residence J5, we are using FM and digital radio reception currently (since 2015 at least). We have already had to introduce special reception arrangements including a 'high quality antenna' for reception on both services. Our location would be within 1.8km of the nearest planned WTG and would be severely disadvantaged if these broadcasts are disrupted - What is meant by the term 'immediate vicinity of a WTG'?
- Information in the EIS on digital radio broadcasting is either out of date or misleading - page 18 "DAB+, to broadcast digital radio to Adelaide, Brisbane, Perth, Melbourne and Sydney [26]. - DAB+ is broadcast in Canberra and can be received in the Jupiter area, eg residence J5 - Reference [26] is to the ACMA website and on 7/1/2017 produced "The page you are looking for could not be found."

Emergency Services - misleading information

- 16.7 - "Should any potential issues be identified in the future, further consultation would be undertaken with the Emergency Services to ensure their radio

communications would not be impacted and to rectify any potential issues.” - Given the claimed expertise of the EIS team and consultants is it not possible to predict potential EMI for wireless services used by emergency services, particularly given that such predictions have been made for TV reception? - What guarantees are being provided by the proponents that emergency services will NEVER be disrupted?

- 17.10 - Emergency services eg RFS and ambulance - vague wording - “It is not expected that the Project will have any direct interference on other communication services including emergency services, meteorological radar, trigonometrical stations, or satellite television and internet, and therefore no cumulative impacts are anticipated.” - Misleading claim given that consultation was only reported from three ‘emergency services’ organisations: NSW Fire and Rescue, St John Ambulance and Wamboin Rural Fire Brigade. What consultation about EMI was carried out with NSW Rural Fire Service, NSW Police, NSW Ambulance or SES?
- Information in the EIS on disruption to wireless services used by emergency services is unreliable due to the very low response rate of organisations listed in the table on page 11 of Annex K.
- The phrasing around access to emergency services e.g. “Should any potential issues be identified...”, “It is not expected that...” is inadequate reassurance for the affected community that at a time of need we can rely on emergency services being able to readily communicate using their wireless networks.

EMI Mitigation - misleading information

- 17.10 - EMI mitigation - “Having regard to the above, whilst the Project has the potential to contribute to cumulative EMI impacts, the mitigation measures identified at *Section 16.2.4* will be implemented to manage any associated impacts.” - Section 16.2.4 has to do with aeronautical impact assessment alone.
- There is no assurance in the EIS that EMI mitigation will occur. While there is a quote that “the following mitigation measures will be implemented”, by the time the reader looks at each mitigation measure, that assurance is watered down to being “considered” or “if required”. Who will be the decision making authority for whether mitigation of EMI is required or not? Where is the reassuring statement that “The proponent will fix any of these problems”?
- 16.13 - EMI Mitigation - Quote: “To manage potential EMI issues, the following mitigation measures will be implemented:
 - following construction, and at the request of the landholder, an assessment of potentially affected dwellings can be undertaken to determine the extent of impacts

caused by the Project and identify appropriate mitigation measures. Mitigation options to be considered will include a combination of the following:

- realigning the householder's TV antenna more directly towards their existing transmitter;
- tuning the householder's antenna into alternative sources of the same or suitable signal;
- installation of more directional and/or higher gain antenna at the affected dwelling;
- relocating the antenna to a less affected position;
- installation of cable/satellite television at the affected dwelling; and
- installation of a television relay station.
- if required, the potentially impacted fixed point-to-point link within the PA operated by TransGrid, will be re-routed, at the expense of the Proponent, to avoid any obstruction to the service, however consultation with TransGrid has indicated interference with this link is unlikely;
- if required, the potentially impacted point-to-point link operated by the former Palerang Council will be re-routed at the expense of the Proponent; and
- any interference to radio broadcasting can be mitigated through the installation of a high quality antenna and/or amplifier."
- satellite is suggested as mitigation for disruption to terrestrial tv broadcasts. However, tv programming through satellite is national rather than local and Foxtel satellite paid subscription service does not include free to air channels.
- if Jupiter is given the go ahead, who will be responsible for ensuring all the potential mitigation measures are speedily and effectively implemented?

EMI - lack of assurance

- Section 16.3.3 - No assurance either that EMI will not (categorically) affect services or that mitigation will definitely be provided that will definitely avoid any problems. Indeed, for example, "installation of a television relay station" is likely to be a costly exercise and under what conditions would it be implemented rather than just "considered". The following comments are made that EMI may not interfere with services

- Emergency Services - "No direct interference to services has been determined." - no evidence
- CB radio - "If interference is experienced it should be possible to improve signal quality by moving a short distance." - no evidence
- Mobile phones - "Telstra and Optus indicating that the Project will have no impact on their operations and services" - whereas these service providers actually said there would be no disruption to microwave links
- Wireless internet - "In summary, it is considered unlikely that the presence of WTGs would interfere with wireless internet services." - no evidence
- Satellite Television and Internet - "This review concluded that no WTGs intercept the line- of-sight of the television and internet satellites commonly used in Australia." - no evidence
- Radio broadcasting - "Any interference is likely to be limited to the immediate vicinity of a WTG and can be mitigated by the installation of a high quality antenna." - no evidence
- Terrestrial Television Broadcasting - "It is expected that interference to terrestrial television can be mitigated by improving the equipment at a dwelling location or other options as listed in the mitigation measures below." - no assurances on mitigation measures
- These benign assurances are provided, despite the admission in section 16.3.3. that "Wind farms have the potential to affect the performance of radiocommunication services through the introduction of EMI"

Consultant's Report Disclaimer - limited useful information

- Annex K - Extensive disclaimer by DNV GL - including "This document is intended for the sole use of the Customer" and "To the extent permitted by law, neither DNV GL nor any group company (the "Group") assumes any responsibility whether in contract, tort including without limitation negligence, or otherwise howsoever, to third parties (being persons other than the Customer)" and "This document may contain detailed technical data which is intended for use only by persons possessing requisite expertise in its subject matter." - does that mean that ordinary citizens, DPE and the PAC are excluded from directly accessing or using this material? - Does this mean the consultant is deliberately writing material for the EIS in a way that makes it impossible for the community to understand and make informed decisions? It is possible that the consultants have been wrongly briefed about the role of the EIS.

- Annex K - "No part of this document may be disclosed in any public offering memorandum, prospectus or stock exchange listing, circular or announcement without the express and prior written consent of DNV GL." - Has written consent been provided? If so, under what conditions? -
- Page iii - Who is "Garrad Hassan Pacific Pty Ltd" and what is their relationship to Environmental Resources Management Australia Pty Ltd or DNV GL? Is Garrad Hassan Pacific covered by the same disclaimers and exclusions? - "Garrad Hassan Pacific Pty Ltd, now trading as DNV GL" - What is the impact of this change of entity on the reliability of information in the EIS?
- DNV GL expertise - Website "What we do" does not include assessments of EMI or wireless reception - Service areas include: "Maritime, Oil & Gas, Energy, Business Assurance, Software" - a search of their website on services on the term "electromagnetic interference" produced the following result "Workplace EMF Assessments - DNV GL offers a uniquely comprehensive EMF Assessment including measurements of EMF, mitigation advice and training/communication for workers" - Annex K reports that DNV GL were commissioned to "independently assess the electromagnetic interference (EMI) and electromagnetic field (EMF) related impacts associated with the development and operation of the proposed Jupiter Wind Farm" - This commission differentiates between "electromagnetic field" effects and "electromagnetic interference" - Why is DNV GL qualified to report on EMI and widespread EMF, when they claim their own expertise is in relation to "Workplace EMF"?
- The DNV GL report was final as at 1 October 2015. Then it was "Revised with updated dwelling locations and reference to SEARs" on 28 June 2016 and subsequently twice "Revised following Customer comments" - The customer in this instance being stated as ERM, what 'non-expert' input was provided from ERM or EPYC for redrafting of the report in August and September 2016?
- P 67 - APPENDIX C CONSULTATION PROCESS - "There are no Telstra radio link ray lines crossing [the] proposed Jupiter Wind Farm areas." - The term 'ray lines' is not further explained in the EIS and is not publicly used by Telstra, but presumably refers to microwave links - "I wish to inform that the proposed Jupiter wind farm has no impact on the existing and planned microwave radio links in [the] Optus Network in the area." - In the body of the EIS these comments on 'ray lines' and 'microwave radio links' are interpreted to also cover mobile phone coverage - Other consultations include one RFS brigade in relation to CB radio and NSW Fire and Rescue that generally does not have a fire responsibility for the project area.