

**In the Environment Court  
I Mua I Te Kōti Taiao O Aotearoa**

Under the Resource Management Act 1991

and in the matter of the direct referral of an application for resource consents by Meridian Energy Limited in respect of the proposed Mt Munro wind farm under section 87G of the Resource Management Act 1991 (**RMA**).

**Meridian Energy Limited**  
Applicant

and

**Tararua District Council, Masterton District Council, Manawatū-Whanganui Regional Council and Greater Wellington Regional Council (Councils)**  
Consent Authorities

and

**s 274 Parties**

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**Statement of Rebuttal Evidence of Simon Andrew Faulkner on behalf of Meridian Energy Limited**

**6 September 2024**

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## INTRODUCTION

1. My full name is Simon Andrew Faulkner. My statement of evidence in chief dated 24 May 2024 addresses wind technical matters and shadow flicker in relation to the proposed Mt Munro Wind Farm. My qualifications and experience are set out in that statement of evidence, and I reaffirm my commitment to comply with the code of conduct for expert witnesses.
2. The purpose of this rebuttal evidence is to respond to matters relevant to shadow flicker that have been raised in the evidence of the s274 parties and Ms West on behalf of the councils.
3. Ms West and I participated in expert conferencing in relation to shadow flicker. We reached agreement on all matters raised, as is reflected in the Joint Statement of Shadow Flicker Experts (the **JWS**). I confirm the content of the JWS.
4. Following conferencing Ms West and I continued to discuss shadow flicker conditions SF3 and SF4 and we agreed to revised wording to clarify that shadow flicker assessments would be updated in response to changes in shielding over the life of the wind farm. The SF3 and SF4 wording that Ms West and I agreed is the text in the August Proposed Conditions (excluding the underlined text), and is explained in the evidence of Ms West. I confirm that these conditions (excluding the underlined text) are as agreed between Ms West and I, are appropriate and will limit shadow flicker effects to acceptable levels.
5. Ms West subsequently raised additional issues with the conditions in her evidence, which I have responded to below.

## EXISTING ENVIRONMENT

6. A point of clarification raised at mediation was how and when dwellings would be identified as needing to be included in the pre-installment shadow flicker assessment. As confirmed in the letter to parties dated 24 July 2024, the shadow flicker conditions will require the consent holder to undertake a pre-installment shadow flicker assessment based

on the final turbine layout, and provide this to the district councils at least 20 working days prior to construction. This assessment shall consider effects on dwellings that were either lawfully in existence as at the date of the granting of the consent, or for which resource consent had been obtained at the date of consent decision. I confirm that the approach set out in the proposed conditions will allow shadow flicker effects to be managed within acceptable limits for all such dwellings.

## **RESPONSE TO S 274 EVIDENCE**

7. Some points raised in s 274 party evidence were considered during expert conferencing and have been addressed in the JWS. These points have been further covered in the evidence of Ms West, and I agree with those responses.
8. I reiterate the point that both I and Ms West have made, which is that the proposed shadow flicker conditions will ensure that any shadow flicker effect experienced at neighbouring dwellings will be limited to reasonable and internationally accepted levels.

## **RESPONSE TO COUNCIL EVIDENCE**

9. I agree with the evidence of Ms West, apart from the details that I have covered below regarding proposed changes to the consent conditions. I cover each proposed amendment in turn.
10. Ms West proposes the addition in SF3 of *"The curtailment strategy must, as a minimum, describe how the irradiance threshold for determining whether a turbine is in sunny or cloudy conditions has been applied and how the shadow flicker duration will be monitored and enforced."*
11. I do not think that this additional text is necessary as I believe that it is already clear. However, I agree with it being included subject to the following amendments:

"The curtailment strategy must, as a minimum, describe how the irradiance threshold for determining whether a turbine is in sunny or

cloudy conditions has been applied and how the shadow flicker duration will be monitored and ~~enforced~~ compliance with the limit confirmed.”

12. *Addition in SF2 of “When assessing the blocking of the sun by cloud a 0.5x clear sky irradiance should be applied.”* I do not agree to this text being added for the following reasons.
13. I have not found any cases where this level of detail has been included in a consent condition and I am fairly confident that it has never been done in NZ, and rarely if ever in other countries.
14. My concern is that a wind turbine operator needs to be able to use a standard off-the-shelf shadow flicker control system supplied by a company with this specific expertise. There are several companies that provide proprietary shadow flicker control systems and have experience of the supply, installation and commissioning of such systems. I have found several such companies (SGRE, Vestas, Goldwind, DNV) that are particularly suitable to be engaged for the Mt Munro Wind Farm. They provide control systems that would be suitable to meet the proposed consent conditions, including curtailing turbines as required to meet the 10 hour limit and recording the amount of curtailed and un-curtailed shadow flicker time to use for compliance reporting. However, they all use slightly different methods to determine whether there is cloud covering the sun, none of which are exactly what Ms West has suggested.
15. SGRE uses a simple direct sunlight sensor with a threshold, Vestas uses the difference in readings between a pair of light sensors facing east and west (with thresholds set to suit the site), and Goldwind and DNV do not specify the method they use in the publicly available documentation.
16. There are a range of different suitable methods used in the industry to determine whether the sun is blocked by cloud, and in my opinion it would be unduly restrictive and is not necessary to specify an exact method of measurement in conditions of consent. This is particularly the case given that the industry methods I have researched are different to the late change proposed by Ms West. In my opinion, the

reporting and council approval process that is already included in the proposed conditions will ensure that a robust and appropriate method is utilised and implemented.

## **CONCLUSIONS**

17. I agree with the evidence of Ms West and her responses to the s 274 evidence. However, as noted above I disagree with the changes she now proposes be made to the consent conditions that we discussed and agreed at and following the joint witness conferencing.
18. Specifically, I consider that the proposed additional text in SF3 be amended and that the following text should not be included in the shadow flicker conditions: “When assessing the blocking of the sun by cloud a 0.5x clear sky irradiance should be applied.”, for the reasons outlined above.

**Simon Faulkner**

6 September 2024