

The complete AAT Decision can be found on the following link:

<https://waubrafoundation.org.au/wp-content/uploads/2017/12/Decision-4-Dec-17.pdf>

<https://waubrafoundation.org.au/2017/media-statement-re-aat-decision-waubra-foundation-v-acnc/>

AAT Decision & Reasons, Waubra Foundation vs ACNC Dec 4, 2017

SUMMARY OF THE EFFECT OF THE MEDICAL AND SCIENTIFIC EVIDENCE

Excerpts from Pages 141 to 148 of the Decision

468. The propositions which we understand have unanimous support from the relevant experts or are not contested include the following:

- Wind turbines emit sound, some of which is audible, and some of which is inaudible (infrasound);
- There are numerous recorded instances of WTN exceeding 40 dB(A) (which is a recognised threshold for annoyance/sleep disturbance);
- There are also recorded instances of substantial increases in sound at particular frequencies when particular wind farms are operating compared with those at times when they are shut down;
- If it is present at high enough levels, low frequency sound and even infrasound may be audible;
- WTN is complex, highly variable and has unique characteristics;
- The amount and type of sound emitted by a wind farm at a given time and in a given location is influenced by many variables including topography, temperature, wind speed, the type of wind turbines, the extent to which they are maintained, the number of turbines, and their mode of operation;
- Wind farms potentially operate 24 hours a day, seven days a week;
- There are numerous examples of WTN giving rise to complaints of annoyance from nearby residents, both in Australia and overseas.

469. The propositions which are supported by the preponderance of relevant expert opinion, and which we accept on that basis, include the following:

- A significant proportion of the sound emitted by wind turbines is in the lower frequency range, i.e. below 20 Hz;
- The dB(A) weighting system is not designed to measure that sound, and is not an appropriate way of measuring it;
- The most accurate way of determining the level and type of sound present at a particular location is to measure the sound at that location;
- The best way of accurately measuring WTN at a particular location is through 'raw' unweighted measurements which are not averaged across time and are then subjected to detailed "narrow-band" analysis;
- When it is present, due to its particular characteristics, low frequency noise and infrasound can be greater indoors than outdoors at the same location, and can cause a building to vibrate, resulting in resonance;
- Humans are more sensitive to low frequency sound, and it can therefore cause greater annoyance than higher frequency sound;
- Even if it is not audible, low frequency noise and infrasound may have other effects on the human body, which are not mediated by hearing but also not fully understood. Those effects may include motion-sickness-like symptoms, vertigo, and tinnitus-like symptoms. However, the material before us does not include any study which has explored a possible connection between such symptoms and wind turbine emissions in a particular population.

470. We consider that the evidence justifies the following conclusions:

- The proposition that sound emissions from wind farms directly cause any adverse health effects which could be regarded as a "disease" for the purposes of the ACNC Act is not established;
- Nor, on the current evidence, is there any plausible basis for concluding that wind farm emissions may directly cause any disease;
- However, noise annoyance is a plausible pathway to disease;
- There is an established association between WTN annoyance and adverse health effects (eg. this was established by the Health Canada study);
- There is an established association between noise annoyance and some diseases, including hypertension and cardiovascular disease, possibly mediated in part by disturbed sleep and/or psychological stress/distress;

- There are as yet no comprehensive studies which have combined objective health measurements with actual sound measurements in order to determine for a given population the relationships between the sound emissions of wind turbines, annoyance, and adverse health outcomes. Indeed there is as yet no study which has given rise to a soundly based understanding of the degree to which particular types or levels of wind turbine emissions give rise to annoyance, or what levels or types of emissions are associated with what level of annoyance in the population. Because it relied on calculated rather than actual sound measurements, and was limited to the A and C-weighted systems, the Health Canada study did not do this.

473. The applicant submitted that the evidence in the hearing provided plausible and credible evidence of the kind required. Counsel referred in particular to the effect of noise on sleep and, in particular, in disturbing sleep. It was not contentious that impaired sleep, if sufficiently serious, may result in a number of ailments and diseases. Professor Wittert said that “depression and sleep disturbance are, respectively, the first and third most common psychological reasons for patient encounters in general practice”. The professor went on to say that insomnia doubles the risk of future development of depression and that insomnia symptoms together with shortened sleep are associated with hypertension. Professor Wittert also said that a person suffering from restricted sleep is exposed to an increased risk of elevated blood sugar levels and endocrine disorders such as diabetes, symptomatic ischaemic heart disease, hypertension, obesity, insomnia and anxiety related illnesses.

476. As our earlier findings have indicated, some wind farms generate sound which is capable of causing, and does cause, annoyance. We are further satisfied that annoyance of the kind which is generated (often associated with psychological distress and sleep disturbance), is a recognised pathway to a range of adverse health outcomes, including hypertension and cardiovascular disease.

481. It follows in our view that the applicant has established that there is a plausible basis for thinking that wind turbine sound (mediated by annoyance) may lead to adverse health outcomes, such as to warrant further investigation. It is unnecessary for us to draw conclusions as to the precise nature of the annoyance which is caused, and whether annoyance may be caused by sound which is not audible (infrasound). That is something which we expect will be the subject of further study and investigation. For our purposes, it is sufficient that annoyance is produced, and it appears that it may be associated with adverse health outcomes. An identification of the causes of that annoyance may allow it to be reduced or mitigated and adverse health outcomes to be reduced or avoided.

482. We regard it as particularly significant that the NHMRC has considered that, despite the absence of direct evidence that exposure to wind farm noise affects physical or mental health, and the poor quality direct evidence that wind farm noise is associated with annoyance or sleep disturbance, it is appropriate to provide funding to the extent of \$3.3 million for an evaluation of the “sleep and physiological disturbance characteristics of wind farm noise compared to traffic noise” and for an investigation of whether “exposure to infrasound causes health problems”. Given this degree of recognition by the NHMRC, we do not consider that it should be held that the associations which are the subject of the applicant’s activities do not have plausibility or credibility, although not as yet positively established.

485. Given our finding that there is a plausible basis for considering that wind farm sound emissions may have an adverse effect on human health, we accept that conducting, supporting and advocating for further research or engaging in awareness raising activities could be properly characterised as activities promoting the prevention or control of diseases (in the sense of that term explained earlier).