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To whom it may concern

I urge you to read the following submission regarding the Federal Senate Inquiry into 'Excessive noise from wind farms' bill to amend the Renewable Energy Act, on the issue of acceptable acoustic amenity, offensive noise and excessive noise.

I support these proposed amendments to the Renewable Energy Act, because these changes to the Act will ensure that residents living and working near industrial wind turbines will be protected from excessive noise generated by these developments. Currently there is a clear lack of transparency regarding the availability of wind monitoring data, both wind speed and noise collection, to verify the compliance of operating wind turbines with their conditions of consent, and as a consequence the public can not be assured that future developments will not create offensive and excessive noise leading to illness and sleep disturbance. Noise polluters must be held accountable across all industries, with no exception. If industrial wind turbine operators are 'doing the right thing', then they should have no concern with this amendment which will essentially bring the noise pollution standards relating to the wind industry in line with all other industries.

Whilst it may be the opinion of state Planning departments and the wind industry that state wind farm guidelines are the 'strictest in the world' and ensures that rural residents will not be adversely impacted by the placement of IWTs near their homes, this submission clearly highlights the inadequacy of these noise guidelines to protect rural residents from noise pollution, loss of acoustic amenity and adverse health impacts. That includes all rural residents, associated and non-associated residents and their employees. Infrasound does not discriminate between human receivers.

I have personally attended properties in close proximity to Crookwell 1, Capital, Cullerin and Woodlawn industrial wind turbine power stations in NSW and Waubra in Victoria. At these wind farms I have experienced varying degrees of noise pollution. I have spent a night in the abandoned home of at Waubra whilst the Waubra wind turbine development was in operation and experienced disturbed sleep. I experienced firsthand a drumming and a pulsating noise that was clearly audible inside the residence.

During the course of my site visits I have spoken to residents of whom some are

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affected by the wind farm operations and others are not. I have discussed with residents in NSW, Victoria and SA the effects they experience from wind farms and I am aware of serious health problems that some families experience which did not occur prior to the wind farm's construction.

I have visited a host property of an operating wind development in NSW and experienced a tightening of my sinus and dull thud in my head for a short duration within 1-2kms from operating turbines.

I have met with current hosts from South Australia who are experiencing adverse health impacts and believe their illnesses are attributed to turbines being located close to their home. It must be highlighted that these people gain financially from hosting turbines. This clearly discredits a public health official unsubstantiated conviction that money is the 'antidote' to the health impacts of wind turbines.

Living on rural properties I am fully aware of how quiet the environment can be and how far sound can travel, particularly during the night-time period. I have personally experienced different ambient noise levels whilst observing those noise levels on a type 1 noise logger. I cannot accept the noise levels that have been identified in the SA EPA Environmental Noise Guidelines: Wind Farms (2003) nor the NSW draft Wind farm guidelines as being an acceptable acoustic amenity for rural areas. I will not allow my family to be subjected to the noise levels proposed in these guidelines. From what I have experienced I believe I would then be endangering the health of my family by reason of offensive noise as a result of excessive noise, and infrasound generated by such turbines.

I am also aware of many documents which clearly suggest strong links between industrial wind turbines and ill health in humans. One such paper is an appendix to this submission, *'Effects of industrial wind turbine noise on sleep and health',* Nissenbaum, et al, Noise and Health, Sept Oct 2012 Vol 14, Issue 60.

Taken from its conclusion, *'Industrial wind turbine noise is a further source of environmental noise, with the potential to harm human health. Current regulations seem to be insufficient to adequately protect the human population living close to IWTs'.*

My concerns relating to excessive noise pollution generated by industrial wind turbines is founded in good science and state and federal regulatory bodies reluctance to apply the precautionary principle in regard to the siting of wind

turbines in rural areas is irresponsible and reprehensible.

My experience with the Rugby wind turbine development relating to the collection of noise data from my residence has done nothing to give me confidence in the integrity or intentions of the representatives of the company's involved. A noise logger was located at my residence next to a chicken yard and within 10m of trees. At the time I had no idea regarding appropriate siting of noise loggers to collect pre construction data. I now appreciate the inappropriate and thoroughly misrepresentative location that the logger was positioned.

Upon requesting the replacement of the original noise data collected with another data collection session taken in an appropriate location, I was assured by the then representative, that further data would be collected from my property in due course prior to the Environmental Assessment containing the preconstruction noise assessment was submitted to the NSW Department of Planning.

I was subsequently informed the project manager of the Rugby wind turbine development that the data originally collected to determine 'background +5db(A)' criteria would ne to be used and the 'more conservative' 35 db(A) criteria would be.

Whilst I was able to obtain the raw noise data from the original session after I was told it would not be used in the preconstruction noise assessment, my request for the raw wind data for that period was refused.

If the data collected from my property will not be used for any purpose relating to preconstruction noise assessment, the wind data will be of no relevance to the developer in relation to that noise data and would not be considered confidential.

Other residents who allowed the developers to collect noise data at their residences have not been given the raw data when requested.

Despite numerous requests for assurances in writing, the proponents of the Rugby wind turbine development will not give my family a guarantee that;

- there will be no offensive noise,

- there will be no sleep disturbance directly attributed to the wind turbines,

- and there will be no 'direct' health impacts as a result of the proposed wind

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farm on my family?

Whilst they assure my family that the project "will comply with all government standards and any conditions of approval", this does not consider issues outside those considered in the state guidelines, such as offensive noise and health impacts attributed to Low Frequency Noise and Infrasound. Not one state in Australia addresses or sets noise criteria for these low frequencies, despite the well know impacts LFN and Infrasound can have on human health.

It is not unreasonable to suggest that if state wind farm guidelines were truly appropriate and adequate, proponents have taken all due care and diligence, and project managers and directors of the companies involved are meeting their responsibility to the public and acting in an ethical manner, then guarantees from these proponents that their projects will not affect nearby residents in the way stated above must be forthcoming. To date, the wind industry has not granted any potentially affected non associated resident this guarantee, which is reflective of the high potential for industrial wind turbines to impact on humans in close habitation of these operating power stations.

Further to this, wind project contract landholder agreements generally remove the rights of the involved farmers from complaining or objecting to the noise impacts. The clause below is taken from the landholder contract presented to me in 2009, as a prospective host.

Clause 5.5 Noise

(a) The Landlord acknowledges that the operation of the Wind Farm is predicted to have the expected noise impact of [to be inserted when the noise impact can be determined or agreed upon] dB at the residence known as [Residence name to be inserted] **[Noise Impact]**.

(b) The Tenant confirms that the Noise Impact has been determined in accordance with the relevant NSW legislation governing permissible noise impact.

(c) The Tenant will, in the operation of the Wind Farm, use its reasonable endeavours to ensure that noise will not exceed the Noise Impact.

(d) The Landlord, for itself, its successors and assigns, acknowledges and agrees that:

(i) it accepts that the Wind Farm will produce the Noise Impact.

(ii) the Noise Impact will not have an unreasonable adverse effect on the amenity of the Land or cause unreasonable interference with the Landlords enjoyment of the Land.

(iii) it will not make any claim, objection or complaint to any government agency (including the Department of Environment and Conservation (NSW)) under any relevant law in relation to the Noise Impact.

(iv) The Landlord releases the Tenant from all claims, liability and causes of action which it now has or may in the future have arising either directly or indirectly as a result of the Noise Impact on the Landlord or the amenity of the Land or the Landlords enjoyment of the Land.

Provisions such as these, contained in contracts that bind farmers to the terms of the contract for up to 60 years, highlight the lengths that proponents will go to to absolve themselves of the responsibility for any noise impacts that are experienced by their business partners (host farmers) and do nothing to imbue the community or government with confidence that those companies which sign up hosts to these contracts will act with integrity or transparency.

Further, complicit in the lack of transparency of wind development proponents and misleading preconstruction noise assessments tabled in project Environmental Assessments are acousticians employed by the project developers to collect noise data and compile these noise impact assessments. In the last 12 months a number of noise impact assessments of this nature have been analysed by Steve Cooper of The Acoustic Group and has found them to have neglected the basic premise of the assessment, that is to assess the impact of noise on nearby residents. Noise experienced by residents has been predicted, but not the resultant impact on these 'receivers'.

Mr Cooper has identified a number of other flaws, as demonstrated in The Acoustic Group report for the Friends of Collector community group's submission to the Collector wind farm (appendix).

Clearly upon professional interpretation and scrutiny, by acousticians not employed by the wind industry, of current wind turbine noise impact assessments, the reports are inadequate, misleading and misrepresentative of the real impacts that residents will experience in the event that wind turbines

are constructed.

Acousticians who are engaged by the wind industry and who are members of the Australian Acoustic society are bound by a code of conduct. Steve Cooper in his paper 'Windfarm noise: An ethical dilemma for the Australian Acoustical Society' clearly highlights the issues for acousticians who knowingly act outside this societies code of conduct (appendix).

Lack of transparency exists within the NSW compliance process regarding noise levels generated by existing wind developments. Early in 2011 the compliance report for the Capital wind farm was completed and posted on the Dept Planning website along with the raw data used to complete the post construction noise assessment. Some time in the following year the raw data disappeared from the website. This raw data would have allowed the public to assess the compliance of the Capital wind farm.

Upon asking a member of the Dept Planning present at a Dept of Planning 'Draft NSW Wind farm guidelines' public exhibition session in Yass on the 14th February as to why the data had been removed, I was told that there could be 2 reasons for this. One of those reasons was that either the Department or the proponent was 'foxing'. I asked what 'foxing' meant, and was told that it means lying, because developers are as tricky as foxes. When I asked her to explain further she said that the Department may have discovered that the developer is 'foxing' (lying), or the developers noise consultants was lying, and the Dept is getting another one (noise assessment) done and put up on the website.

The raw data is still unavailable to the public, and it is clear that members, or at least one member, of the Dept of Planning in NSW knows that this conduct is not unusual, having given it a specific name 'foxing' to describe the act of lying to the Department, which would cast doubt over the accuracy and therefore validity of the Capital wind farm noise compliance report.

It is clear that the responsibility of the impact that residents will be subjected to as a result of state planning authorities approving to build industrial wind turbines close to residents will rest squarely with the state Government, the relevant Minister of Planning, Director General of Planning, and staff members of that particular department.

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Excessive noise

Current wind turbine noise guidelines are clearly not adequate to protect residents from 'adverse environmental impacts' namely noise pollution (excessive noise), as highlighted below.

The Project Approval from the Minister for Planning for Capital 1 wind farm (page 1) states that:

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule2.

These conditions are required to:

- ☐ *Prevent, minimise, and/or offset adverse environmental impacts;*
- ☐ *Set standards and performance measures for acceptable environmental performance; require regular monitoring and report; and*
- ☐ *Provide for the ongoing environmental management of the project.*

It would appear that the selection of noise criteria and the conditions/management of Capital 1 wind farm have failed to prevent, minimise, and/or offset adverse environmental impacts, by reason of the complaints from residents, the observations of the Capital wind farm operations, actual measurements and the lack of response by the Department.

If residents are subject to sleep disturbance, headaches and complain about disturbance from the wind farm then the conditions are not appropriate and need to be examined.

The SA EPA Environmental Noise Guidelines: Wind Farms (2003) and NSW draft wind farm guidelines provide noise criteria that utilise 35 dB(A) or background + 5 dB(A) whichever is the higher as per the Capital 1 approval and provide vague concepts as to addressing non-compliance even though what constitutes non-compliance is not clear.

The matter of acceptable environmental performance might very well be acceptable to the wind farm but is not acceptable to the residents. One glaring example of "acceptable environmental performance" relates to the noise limits and the absence in the SA EPA guidelines and draft NSW guidelines of the

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fundamental requirement as to "offensive" noise.

The draft guidelines refer to an acceptable noise amenity for rural receivers and cites an amenity level of 40 dB(A) at night. There are claims this limit has been in existence for years and accepted by the community. It would seem that the author of the draft noise guidelines, (as stated to the AAS technical meeting on 22nd Feb 2012) relies upon Table 2.1 in the EPA's Industrial Noise Policy (INP) document and at the same time selectively ignores the intrusive noise target of background + 5 dB(A) found in the INP.

According to Table 15, page 78, Collector Wind farm Environmental Assessment, http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3778, an unoccupied recording studio experiences noise levels of 20dBA, described as 'almost silent'. The Acoustic Group Pty Ltd *NSW draft wind farm guidelines submission 14th March 2012* clearly highlights the very low ambient background noise levels that rural residents experience at their homes.

Because rural environments removed from transportation noise can have night time background levels below 20 dB(A) (less than 'almost silent') then on a socio-acoustic basis it is impossible to claim a Leq level of 40 dB(A) is an acceptable level in that environment. The Department's "compliance audit" report for Capital wind farm [Technical Review of the Capital Wind Farm Noise Compliance Assessment Report dated 7 March 2011] shows in Figure 3 background levels at 8pm (the evening period) of 22.4 dB(A) and a Leq level of 24.5dB(A) at house H15 with the turbines shutdown. By reference to Table 1 in the draft noise guidelines one could expect even lower levels at night (as has been measured at residential premises). The department's own report clearly shows that 40 dB(A) cannot be an acceptable amenity noise level for a rural environment.

The concept of background + 5 dB(A) for noise limits has been provided in *AS 1055.2.Acoustics – Description and measurement of environmental noise* in the format of when a noise exceeds the background level it is likely to be annoying with exceedances of up to 5 dB(A) being considered marginal.

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In relation to the amendments contained in this bill, a criteria that 'a wind farm ***creates excessive noise*** if the level of noise that is attributable to the wind farm exceeds background noise by 10 dB(A) or more when measured within 30 metres of any premises…' is more than a reasonable approach to addressing the issue of excessive noise generation by wind turbines, more favourable to the wind industry than even the standard acoustic measure of 'background plus 5db(A).

Offensive Noise

Noise can be considered offensive if it is noise that which is excessive in relation to the ambient background noise usually experienced by a receiver.

In relation to NSW pre construction noise assessment reports, noise prediction contours which identify residents may experience, for example, noise below the 35 dBA compliance limit, it also clearly identifies that those residents predicted to be subjected to even a 30 dBA noise level is a doubling of the ambient background levels these residents would normally experience. Operating industrial wind turbines in an environment that is described by proponents, as 'almost silent' will inevitably result in significant acoustic impacts of clear audibility, offensive noise and give rise to sleep disturbance.

The EPA in their advice to councils in the Noise Guide for Local Government use the background + 5 dB(A) as the basis assessment tool. The guide refers to typical noise sources encountered in suburban situation and lists wind farms as a noise source of page 1.33 but does not provide any assessment procedure of management/regulation.

Section 2.1.1 of the NGLG addresses Offensive Noise:
Depending on the type of noise under consideration, noise can be considered as offensive in three ways according to its:

- *audibility*
- *duration*
- *inherently offensive characteristics. 'Offensive noise' is defined in the dictionary of the POEO Act as noise:*

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations. The POEO Act and Noise Control Regulation allow for an assessment of offensive noise in some neighbourhood noise situations without the use of a sound level meter to measure actual noise levels.

If noise from wind farms interferes unreasonably with the comfort or repose of a person then there is offensive noise. Similarly if the noise affects a person's health then it must be offensive.

Communities around wind farms in Australia have repeatedly complained about noise impacts. In NSW, Victoria and SA there are now many instances of wind farm operators buying out residents who are suffering health impacts yet the author of the noise guideline has ignored these situations.

On returning to the NGLG section 2.1.4 discusses an offensive noise test as:

Offensive noise test

In the above cases, the times of use or duration of the noise automatically make the noise offensive.

In other cases it will be necessary to consider a range of factors to determine whether the noise is offensive, including the following:

Q1: Is the noise loud in an absolute sense? Is it loud relative to other noise in the area? This establishes that the noise is likely to be heard by neighbours. Its volume alone may be annoying. An example would be music being played at a very high volume in a residence so it can be heard over very noisy activity outside, such as construction work. The noise may also be loud relative to the background noise. An example would be loud fireworks set off late at night. Noise measurements using a sound level meter would help to determine how loud the noise is relative to the background noise level in the area.

Q2: Does the noise include characteristics that make it particularly irritating? The presence of tones, impulses or fluctuations in volume can make people more

likely to react to the noise. These can be judged subjectively but noise measurements will help to quantify the extent of these characteristics. Examples might be screeching sounds from poorly maintained equipment or a 'beeper' alarm that uses a pulsed sound made up of one or two alternating frequency tones, usually higher pitched, that are louder than the background noise in the area.

Q3: Does the noise occur at times when people expect to enjoy peace and quiet? People usually expect their surroundings to be quieter during the evening and at night. Talk to the complainants about how the noise affects them to see if it is interfering unreasonably with their comfort at home. Is it regularly disturbing their sleep, making it difficult to have a conversation, study, read or hear the TV? Noise that regularly disturbs sleep is likely to be considered offensive by complainants and this should be taken into account in your assessment.

Q4: Is the noise atypical for the area? Where noise from an activity that is causing nuisance is new or unusual for an area, people are more likely to react. Look at the typical uses of the area and determine whether the activity is consistent with the local environmental plan. An example might be a rock drill used on a residential construction site.

Q5: Does the noise occur often? Noise can be more annoying when it occurs frequently. Examples might be a leaf blower used every morning or a band that practises frequently without regard to the impact on neighbours.

Q6: Are a number of people affected by the noise? Only one person needs to be affected by the noise for it to be deemed offensive. However, talking to other neighbours likely to be exposed to the same noise about how it affects them may assist in deciding what action to take. Some councils have a policy of requiring a minimum number of complaints from different individuals before taking formal action.

Therefore if residents hear wind turbine noise at night in rural areas then the EPA's checklist as to offensive noise would give yes to every question. In an absolute sense when the noise is annoying the residents find it loud "relative to the background noise level in the area". So question 1 is a yes.

The residents complain as to annoying characteristics the droning noise like an aeroplane that will not land, the swish or whoosh noise as describe in the draft guidelines. So question 2 must be a yes.

The noise occurs at night when residents are expecting quiet (see the Department's compliance report that says 22 dB(A)). So question 3 is yes.

Wind farms are not a typical use for rural areas and are new noises to the environment so therefore question 4 is yes.

The noise occurs often so question 5 is yes.

There is more than one person affected by wind farm noise so question 6 is yes.

Therefore from the EPA's Noise Guide for Local Government wind farm noise is offensive noise yet the Department has deliberately chosen to ignore the fundamental rights of residents in NSW that apply to ALL other industrial noise emission sources.

<u>Infrasound</u>

Infrasound does make people sick. The Waubra Foundations submission to the NSW Dept Planning regarding the proposed Bodangora wind farm (2012) and US National Institute of Environmental Health Sciences- *Infrasound, brief review of toxicological literature (2001*) clearly highlight the evidence that LFN and infrasound creates a range of serious physical and mental problems in people exposed to it.

Infrasound and low frequency noise emitted by wind turbines has been categorically and undeniably confirmed at multiple wind developments in Australia and internationally, by multiple acousticians.

In contrast to this fact, the SA EPA state that no infrasound is produced by a 'well maintained' wind farm. Clearly all wind farms in SA and NSW where wind turbine derived LFN and infrasound has been measured are not well maintained, and therefore operating outside their conditions of consent, or there is a strong and insidious denial of the presence of infrasound by regulatory bodies.

The NSW Dept of Planning's noise expert met with residents on Monday 2nd July to discuss the audit the Dept Planning was undertaking on the nearby Cullerin wind farm. When asked why the measurement of infrasound was not included in the audit process given the evidence that it can make people ill, he dismissed outright the fact that wind farms emit infrasound, and therefore saw no need to measure it. This apparent ignorance of significant and relevant facts, both the presence of infrasound at wind turbine developments and its link to adverse health impacts in exposed people, highlights the inadequacies of the draft NSW wind farm guidelines and the apparent unwillingness of members of the Dept Planning to ensure the protection of the people of rural NSW from noise pollution.

It is clear that the use of the SA EPA Environmental Noise Guidelines: Wind Farms (2003) or NSW draft wind farm guidelines will not avoid creating offensive noise, loss of acoustic amenity or sleep disturbance for Collector residents.

Consequently it must ultimately be the responsibility of the state governments, both its elected representatives and departmental employees, who will be liable in the event that the residents are not protected from the adverse impacts of offensive noise, sleep disturbance and loss of acoustic amenity as a result of the approval to build and operate wind farms.

I retain the right to submit further information.

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Appendices

Waubra Foundation - *Mt Bodangora wind farm submission. 2012*

Levanthall - *A review of published research on Low Frequency Noise and its effects. 2003*

US National Institute of Environmental Health Sciences - *Infrasound, brief review of toxicological literature. 2001*

The Acoustic Group Pty Ltd - *NSW draft wind farm guidelines submission 14th March 2012*

Nissenbaum – *Effects of industrial wind turbine noise on sleep and health. 2012*

The Acoustic Group Pty Ltd – *Wind Farm Noise – An Ethical Dilemma for the Australian Acoustical Society? October 2012*

The Acoustic Group Pty Ltd – Peer review of Environmental Noise Assessment, Collector Wind Farm. 23rd September 2012

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