Acciona Energy Oceania Pty Ltd
Level 1, 95 Coventry Street
South Melbourne Victoria 3205
Australia
Tel: +61 3 9863 9922
Fax: +61 3 9686 6120

www.acciona.com.au

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Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

By email: community.affairs.sen@aph.gov.au

ACCIONA Energy welcomes the opportunity to contribute to the Senate Inquiry into the Social and Economic Impact of Rural Wind Farms.

In framing our response, we first provide a summary of ACCIONA Energy's renewable energy credentials. We believe our long-term and international experience in the wind energy sector could bring a unique perspective to the Senate's Inquiry.

About ACCIONA Energy

ACCIONA Energy belongs to the ACCIONA group, a world leader in renewable energy, water services and infrastructure development in over 30 countries on five continents.

We are one of the largest pure renewable energy companies in the world, having installed over 9,000 MW of renewable energy capacity across the five major generation technologies of wind, solar photovoltaic, solar thermal, hydro and biomass. With respect to wind power, we have installed over 7,700 MW of wind energy capacity (5% of the total capacity installed worldwide) in 271 wind farms in more than 14 countries. We are the third largest wind farm operator in terms of global wind capacity ownership[1], as well as a major wind turbine manufacturer.

ACCIONA Energy has been operating in Australia since 2002 and in that time has invested over A$650 million and employed more than 500 people locally. Our business is the development, construction and operation of renewable energy generation facilities, evidenced by the 66 MW Cathedral Rocks wind farm, which we own jointly with Roaring 40's and the 192 MW Waubra Wind Farm in Victoria. Waubra is the largest wind power project operating in Australia. We have over A$799 million in wind power projects in our development portfolio ready for delivery over the next three years, with our 46.5 MW Gunning wind farm in New South Wales already well under construction.

[1] Spanish Wind Energy Association (AEE): *Wind Power 2010*.

Submission Responses to the Terms of Reference

(a) Any adverse health effects for people living in close proximity to wind farms.

In our opinion, wind farms are a safe form of technology to work and live around.

In Spain, where wind energy capacity represents 12% of the cumulative installed capacity worldwide [2], ACCIONA Energy and other companies that operate wind energy facilities do not encounter health complaints in the regular course of their business. Around the world, we have integrated safety and respect for people with how we design, plan, build and operate wind energy technology.

Globally, wind energy generation is a mature technology that has been successfully operating for more than 20 years. In fact, more than 150,000 wind turbines have been installed worldwide. Accordingly, there has been significant opportunity for any negative human health effects to be identified, studied and reported. This is a question for science.

In response, there is no scientific, peer-reviewed research to support any assertion that wind farms negatively affect human health. Australia's leading government-based independent medical research body, the National Health and Medical Research Council (NHMRC), found that "*there is currently no published scientific evidence to positively link wind turbines with adverse health effects*."[3] This finding is consistent with a wide range of studies that have been conducted in Australia and worldwide. In fact the 2010 NHMRC report went further, stating: "*there are no direct pathological effects from wind farms*."[4]

This view is reinforced by the Victorian Department of Health which states there are no direct health effects that can be attributed to modern wind turbines.[5]

After examining the current literature to identify the impact of wind turbines on both human health and human safety, the Chatham-Kent Public Health Unit (Ontario, Canada) indicated that "*…opposition to wind farms on the basis of potential adverse health consequences is not justified by the evidence."*[6]

Prof. Gary Wittert, Head of the Discipline of Medicine at The University of Adelaide[7], was engaged by Thomson's Lawyers as an independent medical expert to assist the Environment Resources and Development Court. In assessing the extent of any anticipated adverse health effects associated with the establishment of the Allendale wind farm in South Australia, he underlined in his evidence to the Court that "*there is no credible evidence of a causal link between the physical outputs of a turbine (or sets of turbines)…and adverse health effects*."[8]

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[2] Global Wind Energy Council (March 2010): *Global Wind 2009 Report*. Available at www.gwec.net.

[3] National Health and Medical Research Council (July 2010): *Wind Turbines and Health - Public Statement*.

[4] National Health and Medical Research Council (July 2010): *Wind Turbines and Health – A rapid review of the evidence*.

[5] Department of Health, State Government of Victoria, Australia: *Victorian Government Health Information*.

[6] Chatham-Kent Public Health Unit (June 2008): *The Health Impact of Wind Turbines: A Review of the Current White, Grey, and Published Literature*. Chatham-Kent Municipal Council, Chatham Ottawa.

[7] Dr. Gary Wittert's credentials are attached as part of this submission.

[8] Environment Resources and Development Court (end October 2010 - ongoing): Statement of Dr. Gary Allen Wittert, paragraph 38.3.

Based on his knowledge of animal physiology and his professional background in experimentation involving animal trials, Dr. Gary Wittert noted that: "*if wind farms were causing physiological impacts on human beings, you would expect to find some evidence of physiological impact on animals…and I cannot find any information that primary production in Europe has been affected by the presence of wind farms – and I use Europe as the example because of the densest concentration of wind farms*." [9]

Although at the time of making this submission the Court has not handed down its decision in the Allendale appeal, this line of evidence is independent and authoritative given the credentials of Dr. Gary Wittert.

We acknowledge that some individuals living near operating wind farms suffer real and demonstrable health conditions. People living in all parts of Australia, irrespective of the proximity of an operating wind farm, report similar health issues typically similar to hypertension symptoms. There is simply no evidence to suggest that the people living near an operating wind farm have a higher incidence of "ill health" than people elsewhere; nor that their adverse health outcomes are caused by the wind farm. Casual suggestions that link such effects to the wind turbines by the dramatically termed "wind turbine syndrome" are unproven. In fact, "wind turbine syndrome" is not a recognised medical diagnosis.[10]

From a scientific perspective, the health complaints of a few select individuals living near operating wind farms are anecdotes. When asked about the utility of the anecdotal evidence in forming opinions about cause and effect, Dr. Gary Wittert outlined that "*anecdotal evidence is not a reliable form of evidence when trying to determine a plausible cause and effect relationship between events…anecdotal evidence cannot characterise the typical experience of the majority of people*."[11]

Anecdotal evidence forms the basis of Dr. Sarah Laurie[12] and Dr. Pierpont's[13] assertions about the effect of wind farms on the health of people. However, this type of evidence is not research and must be distinguished from peer-reviewed, scientific evidence. Dr. Gary Wittert emphasized the problem with using anecdotal evidence: "…*We might, in the face of some compelling and uniform stories, believe that people are genuinely abducted by aliens*. "[14]

Separately, there are possible scientific explanations for these anecdotes.

As such there is research that purports to explain the anecdotes may be attributable to a "nocebo" effect. The nocebo effect can be defined as "*an adverse outcome, a worsening of mental or physical health, based on fear or belief in adverse effects"*. Further "*…the large volume of media coverage devoted to alleged adverse health effects of wind turbines understandably creates an anticipatory fear in some that they will experience adverse effects from wind turbines…..The resulting stress, fear, and hyper vigilance may exacerbate or even*

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[9] Environment Resources and Development Court (end October 2010 - ongoing): Testimony of Dr. Gary Allen Wittert, page 879.

[10] Colby et al. (December 2009): *Wind Turbine Sound and Health Effects An Expert Panel Review*.

[11] Environment Resources and Development Court (end October 2010 - ongoing): Statement of Dr. Gary Allen Wittert, paragraphs 27 a), 27 c).

[12] Witness who provided evidence at the Environment Resources and Development Court in relation to the Allendale Wind Farm (end October 2010 - ongoing).

[13] The main proponent of the termed "wind turbine syndrome."

[14] Environment Resources and Development Court (end October 2010 - ongoing): Statement of Dr. Gary Allen Wittert, paragraph 27 a).

create problems which would not otherwise exist. In this way, anti-wind farm activists may be creating with their publicity some of the problems they describe."[15]

Anecdotal health complaints are also attributed to somatoform disorders, which "*refer to those that occur when physical symptoms cannot be identified as resulting from physical problems…It is the recognition of the connection between one's mind and body*."[16] As an example, when asked to comment on the evidence presented by Dr. Sarah Laurie, Dr. Gary Wittert noted, "*…what's interesting is…when someone moves away from the personal diary within hours of driving out of Waubra [Wind Farm] they seem to be cured…it makes one wonder about the mind/body connection for some of these things…if you don't like what you fancy you feel in a particular environment and you change environments you'll feel better – and that's not uncommon*."[17]

To the extent any such nocebo reaction or somatoform disorder is based on fear and apprehension about a set of unknown and potentially aggravating circumstances we observe that wind energy is relatively new in Australia and, as with any new technology, wind turbines will take time to gain the community's confidence and understanding. With such confidence, the level of stress, to the extent it is based on the "fear of the unknown", should decrease. However, to counter the fear that arises from imbalanced publicity, proactive education backed by the large body of existing scientific research may be required.

Lastly, whether further research should be conducted on the subject is also a question for science. When asked on the justification for the allocation of funding to conduct further research, Dr. Gary Wittert responded "*…I'm always a fan of research, and I would be delighted to personally to get more funding for research but I would have a hard time writing a business plan…and saying that this is the basis for wanting to do further study, I don't think I would get the money to do so.*"[18]

A complete copy of the transcripts of the testimony by both Dr. Wittert and Dr Laurie is included as part of this submission. A copy of the Court's judgement will be forwarded to the Inquiry when it is delivered by the Court.

Recommendations

We suggest it is important to implement educational programs that address and refute concerns regarding the alleged adverse health impacts linked to wind turbines driven by negative media campaigns. We envisage that the Government can lead this process by providing the community with information sourced from appropriate public medical authorities, such as the NHMRC and corresponding international bodies. This could be effective in ensuring the community is well informed by credible, medical and scientific analysis. Such programs could be designed with reference to similar programs implemented by the Commonwealth as part of supporting the roll-out of mobile telephony. For instance, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) plays a key role in

[15] Colby et al. (December 2009): *Wind Turbine Sound and Health Effects An Expert Panel Review.*

[16] Environment Resources and Development Court (end October 2010 - ongoing): Statement of Dr. Gary Allen Wittert, paragraph 36.

[17] Environment Resources and Development Court (end October 2010 - ongoing): Testimony of Dr. Gary Allen Wittert, page 882.

[18] Environment Resources and Development Court (end October 2010 - ongoing): Testimony of Dr. Gary Allen Wittert, page 896.

effectively addressing unfounded public concerns that link mobile phones with adverse health impacts.[19]
The industry would have a role to play in supporting the dissemination of the government's materials.

(b) Concerns over the excessive noise and vibrations emitted by wind farms, which are in close proximity to people's homes.

Noise is not a health issue and thus it is appropriately discussed as a separate topic. In particular, *Colby et al 2009* examined noise annoyance as a possible "effect" of wind turbine operations, stating: "*annoyance is a subjective response that varies among people to many types of sounds.*" They also noted, "*it is important to note that although annoyance may be a frustrating experience for people, it is not considered an adverse health effect or disease of any kind. Certain everyday sounds, such as a dripping faucet – barely audible – can be annoying*."

The report also adds that "*the low frequency sound emitted by spinning wind turbines could possibly be annoying to some when winds are unusually turbulent, but there is no evidence that this level of sound could be harmful to health. If so, city dwelling would be impossible due to the similar levels of ambient sound levels normally present in urban environments Colby et al (2009).*"[20]

To some, noise at a particular level might be annoying, but this is a subjective reaction. For example, Australia's NHMRC stated, "*there are difficulties with measuring and quantifying subjective effects of noise such as annoyance…Some people are very annoyed at quite low levels of noise, whilst others are not annoyed by high levels*."[21]

In our opinion, wind farms do not generate excessive noise and vibrations.

Noise standards and guidelines applied in Australia are amongst the most stringent in the world. Each State and Territory presently assesses the noise from wind farms under a range of standards. Generally, the maximum noise limits imposed on wind farms are:

- Neighbouring properties: +5dBA[22], or a level of 40dBA L95, whichever is the greater.
- Host properties: +5dBA, or a level of 45dBA L95, whichever is the greater.

In providing some context, 40dBA L95 is about the noise level of a quiet library or a refrigerator[23].

Wind farm noise is said by some to affect sleep. Sonus, the independent expert noise consultants found that the baseline limits of the Australian standards are sufficiently stringent to prevent the potential onset of sleep disturbance. As a reference, the World Health Organisation (WHO) recommends a limit of 30dB inside a bedroom to prevent potential sleep disturbance effects (30bB correlates to an external noise level of the order of 45dB). By comparison, the typical baseline

[19] ARPANSA: http://www.arpansa.gov.au/radiationprotection/FactSheets/index.cfm
[20] Sonus (November 2010): *Environmental Noise - Wind Farms Technical Paper*.
[21] National Health and Medical Research Council (July 2010): *Wind Turbines and Health – A rapid review of the evidence*.
[22] Measured as an increment to the pre-existing or so-called 'background' noise.
[23] EPA publication 406.3 (October 2008): *EPA Victoria: Annoyed by Noise?*.

limits of Australian wind farm standards and guidelines (35 – 40dB), are significantly more stringent, ie less noisy, than the WHO recommendation of 45dB.[24]

ACCIONA Energy recognises that noise compliance is a critical consideration when designing and operating a wind farm. Noise levels vary with weather and topography. Importantly, noise can be measured and managed.

In relation to noise measurement, we commission independent acoustic experts to monitor a wind farm's noise levels once it begins operating. For Waubra Wind Farm, ACCIONA Energy was required to commission a Post Construction Noise Monitoring Assessment as part of the planning permit conditions. This consisted of a 12-month monitoring program by an independent acoustics expert and their assessment of the results. The report was submitted to the Victorian government in October 2010.

Secondly, as part of our operational practices, ACCIONA Energy administers a complaint management system. We commission acoustic monitoring in response to all complaints about audible noise within two kilometres of the wind farm and provide the results to the complainants. If the complainant is unsatisfied with the monitoring or the results, monitoring will be repeated two more times.

To date we have been compliant in all these circumstances. If we were to find the wind farm is exceeding noise limits, we would develop a noise reduction plan, for example operating the influential turbines in noise reduced mode to ensure noise compliance at the residence in question.

We regularly communicate with the local community so that we can identify any noise complaints and act accordingly. To this end, we may offer noise mitigation options to properties within the vicinity of the wind farm such as double glazing windows, providing air conditioning and installing noise reduction drapes.

Separately, in response to questions regarding infrasound, we cite that "*…several authors have suggested that low frequency noise or infrasound emitted by wind turbines is minimal and of no consequence (Leventhall, 2006; Jakobsen, 2005)*." [25] We also refer to the Sonus study[26] that indicated "*the infrasound generated by wind turbines is well below established guideline perception thresholds;…*For purposes of comparison, they added: *"the level of infrasound in the vicinity of the two Australian wind farms are of the same order as that measured from a range of sources including the beach..."*

Finally, with respect to noise, we offer an anecdote of our own. Rural wind farms are generally supported by the vast majority of the local community. As an example, at our Waubra Wind Farm, noise complaints have been limited to around 15 families out of the 700 residents living within 4 km of the wind farm. Currently, only 5 complaints are ongoing. We believe this statistic indicates a high level of support for the wind farm and that its noise levels are within the community's expectations.

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[24] Sonus (November 2010): *Environmental Noise - Wind Farms Technical Paper*.

[25] National Health and Medical Research Council (July 2010): *Wind Turbines and Health – A rapid review of the evidence*.

[26] Sonus (November 2010): *Infrasound Measurements from Wind Farms and other Sources*. A study prepared for Pacific Hydro.

(c) The impact of rural wind farms on property values, employment opportunities and farm income.

- **Property values**

The empirical evidence demonstrates that property values are not negatively affected by wind farms. This has been shown in both Australian and international studies. The most influential[27] of these was *Hoen et al 2009*[28], which found that "*neither the view of the wind facilities nor the distance of the home to those facilities is found to have any consistent, measurable and statistically significant effect on home sales prices*." In Australia, the *Duponts (2009)* study, which sought to provide objective information on likely impacts of wind farms on land value in Australia said its "*main finding was that wind farms do not appear to have negatively affected property values in most cases*"[29].

There are various factors in determining a property's value. Contrary to city areas, in rural areas the main factor influencing a property's value is the land's productivity. This is a function of its resource endowment and its condition, both of which are unaffected by the presence of a wind farm nearby.

Furthermore, aesthetics are subjective. The view of a wind farm could be perceived as a positive or as a negative determinant in an individual's decision to purchase and the price they are willing to pay for a rural property. In line with this, the *Duponts (2009)* study states "*whether the view of a wind farm is considered to be a negative one or not is largely subjective and studies looking at people's perceptions often find varying opinions*."

Also in relation to property value, wind farms provide an economic boost to the rural community as we outline below. This increases local wealth and possibly demand and, if anything, consequently should support local property prices.

In reference to properties hosting the wind turbines, wind farms should have a direct positive effect on their value. These properties receive a long term, reliable revenue stream for the placement of a wind turbine that coexists easily with other land uses, i.e. it does not materially affect the productivity of the land, generally occupying around 1.5-2% of the total land area. In some cases, the provision of improved access tracks and supply of power to remote areas of a property may also create improvements in the land's productive capacity.

- **Economic Impact**
    - **Farm income**

Wind farms provide landowners with a reliable revenue stream unaffected by climate, crop or produce prices nor other volatile elements.

This income is long term and secured by contract. This helps strengthen the landowner's balance sheet and may assist them to make long term investment

[27] According to Duponts (now Preston, Rowe, Patterson) for the NSW Valuer General (August 2009): *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*.

[28] Hoen, B., R. Wiser, P. Cappers, M. Thayer, and G. Sethi (December 2009): *The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis*.

[29] The vast majority of the property sales analysed (i.e. 40 out of 45) did not show any reductions in value, whereas five properties were found to have lower than expected sales prices. The report adds that further work is needed to confirm the extent to which the price reductions in those five properties were due to the wind farm or if other factors may have been involved.

decisions for their farming operations, e.g. pasture improvement, fencing or equipment purchases.

- **Employment opportunities and economic growth**

As a result a wind farm project, the local region as well as the state in general experiences economic benefits in terms of additional output and direct and indirect employment. The flow-on effects of such an investment are demonstrated in various studies that quantify the economic impact of wind farms, e.g. the *Economic Impact Assessment of the Hallett Wind Farms*[30], in which consultants SKM estimated that for every job created directly by the wind farm, around three further jobs are created indirectly (i.e. a multiplier of three).

In addition, rural wind farms enable the diversification of the region's economic base.

Whenever possible, we source employment locally. For example, our Waubra Wind Farm in rural western Victoria sourced approximately 80% of the jobs from the region during both the construction and operations and maintenance phases of the project. There are approximately 30 permanent operations and maintenance ongoing roles and there were 200 jobs during the 18 month construction period.

Besides the quantitative impact assessment, the development of rural wind farms stimulates high quality employment at a local and regional level, requiring specialised multi-skills and offering in turn high remuneration. For instance, the operation and maintenance of a wind farm requires electrical and mechanical skills.

The wind energy sector contributes to building skilled employment, which is particularly relevant to addressing skill gaps and providing a pathway for industry growth in the renewable energy industry, a long-term and worldwide industry. As an example of the upskilling of the local workforce, at ACCIONA Energy we provide in-house training for tradespeople to become technicians that acquire both electrical and mechanical skills. Moreover, many of the skills are transferable to other industries, both locally or further afield.

On a national scale, the wind industry provides 2,184 full time equivalent jobs, which is expected to increase to over 19,000 by 2020. In 2009-10 alone, wind energy in Australia generated around $1.6 billion in investment[31].

Dr Robert Passey describes this in a 2003 report[32]: "*Australia is already reaping significant employment and financial benefits from wind power, particularly in the rural and regional sector through employment and inward investment*" .

On an international scale, we cite a European Union report[33], which in addition to considering the impact of renewable energy policies on all sectors of the economy (ie the multiplier effect), captures the net effect of these policies in the whole

[30] SKM (8 July 2010)*: Economic Impact Assessment of the Hallett Wind Farms*.

[31] Clean Energy Council *(2010): Clean Energy Australia 2010*.

[32] SGS Economics & Planning, March 2008: *Silverton Wind Farm: Far West region NSW – Assessment of the social and economic impacts*.

[33] Fraunhofer ISI, Ecofys, Energy Economics Group, Rütter + Partner Socioeconomic Research + Consulting, Lithuanian Energy Institute, Société Européenne d'Économie (April 2009): *The impact of renewable energy policy on economic growth and employment in the European Union*. This study was conducted on behalf of the European Commission's Directorate-General Energy and Transport. NOTE: "*It is the first study to assess the economic effects of supporting energy from renewable sources in this detail, looking not only at jobs in the renewable energy sector itself, but taking into account its impact on all sectors of the economy*."

economy, ie both the positive effects (eg investment in clean energy) and negative effects (eg investment reduction in fossil energy). Thus, it concluded: "*Policies that support renewable energy sources give a significant boost to the economy and the number of jobs in the EU. Improving current policies so that the target of 20% of energy from renewable sources in final energy consumption in 2020 can be achieved will provide a net effect of about 410,000 additional jobs and 0.24% additional gross domestic product (GDP)*."

- **Other community benefits**

At ACCIONA Energy, we engage with the local community in the development of all our projects. Some examples include:

- Providing additional rates to local council at virtually no extra cost burden. For example, in Victoria, a typical rate contribution from a wind farm is $40,000 + $900 per megawatt of rated capacity per annum. Over 20-25 years of a 100 MW wind farm, this can equate to $130,000 per year or $3.6 million (indexed to CPI) in local rates in aggregate.

- Making financial contributions to the community to support local projects. The Community Benefit Fund for Waubra Wind Farm, for example, provides $64,000 per year (indexed to CPI) which will contribute over $1.6 million to that community over the initial term of the project.

- In addition, supporting community festivals, local environmental and education programs and sporting teams.

- Operating community reference groups, providing a forum for the community to ask questions about the operations about their local wind farm.

- Hosting tours of interested groups to learn about the wind farm and renewable energy.

Overall, the development of rural wind farms provides benefits that extend well beyond direct lease payments to the landowners.

(d) The interface between Commonwealth, state and local planning laws as they pertain to wind farms.

The development of renewable energy is supported by high level climate change policy at both Commonwealth and State level. There is however a disconnect between that high level policy and local environmental objectives applied by state and federal referral authorities.

In our experience, securing a planning permit for a wind farm development is a time consuming and costly process. These extensive timeframes and costs reflect the complex and inconsistent regulatory approval systems adopted by each state.

Policy Framework

In the emerging policy framework, ACCIONA Energy is concerned that the development of multiple overlapping statutory and non statutory guidelines, is at the very least, confusing for all parties and undermines the value of such guidelines.

Our principal concerns are:

- The inconsistency between the "National Wind Farm Development Guidelines" and the relevant State guidelines, in a circumstance where planning control lies with the State.

- These inconsistent requirements only result in generating confusion among communities, local and State authorities, in addition to creating unnecessary burdens to the already rigorous planning process developers are subject to.

Requirements and complexity of applications

Government authorities, particularly in Victoria and New South Wales, typically take a conservative and precautionary approach when dealing with wind farm developments. The approach to environmental issues can be heavily influenced by community or individual concerns, rather than the objective threat or the specific statutory planning criteria that apply.

This is most evident when managing the impact on threatened avifauna where the species' decline is typically a result of broad changes to the regional climate or a loss of habitat through agricultural land use practices. In almost all cases where conflict arises between wind farm development and threatened avifauna, a conservative, precautionary approach is taken. The wind farm development is refused or conditions that make it unviable are imposed. However there is no corresponding investment into the species at risk. ACCIONA Energy advocates a more proactive approach. For example, in this scenario we would support taking active steps in partnership with government to support the species, such as habitat enhancement, as part of finding a sustainable and commercial model for the wind farm to proceed.

Locating Rural Wind Farms

To be most productive, a wind farm should be located in an area of consistent winds and reasonably close to the electricity grid. Such locations are relatively rare across the country. More significantly, these are rarely isolated from at least some local residential population.

In response to a vocal minority of residents, a number of local planning authorities[34] have implemented local planning controls with restrictive provisions including a 2 kilometre setback requirement from residences.

ACCIONA Energy opposes local planning authorities imposing additional localised controls. We believe the potential amenity effects of a wind farm, such as noise and visual concerns, are not efficiently addressed by merely setting an arbitrary setback. Amenity impacts vary from site to site, such that residential and environmental impacts may be negligible at distances much closer than 2 km or any other set distance. Equally, in some circumstances, site conditions may dictate a greater buffer such as for a setback from certain bird flocking sites.

Prescriptive setbacks are not applied to any other form of infrastructure development. To follow such a path will significantly hamper industry development and lead to difficulties in satisfying the Commonwealth's Renewable Energy Target (RET) legislation.

[34] Glen Innes Severn Council (NSW), Upper Lachlan Shire Council (NSW), Oberon Council (NSW) and Inverell Shire Council (NSW)..

Recommendation

The constraints associated with identifying suitable areas to develop wind farms, principally consistent wind resource and grid connectivity, should be recognised in the development of any national, state or local planning guidelines. Any measures to implement prescribed universal buffers should be avoided in favour of measures that recognise the variations in site conditions.

(e) Any other relevant matters.

In the transition to a low carbon economy, renewable energy has an important role to play worldwide. By legislating the expanded RET, Australia has committed to sourcing 20% of its electricity from renewable energy sources by 2020. Renewable energy experts Green Energy Markets estimate that the RET will require 11,000 MW of new capacity in Australia to meet this 2020 target.

Utility scale wind energy is likely to supply the greater part of that target. Wind energy is the lowest cost form of renewable energy; it is also competitive with the construction of other forms of energy generation when carbon is priced appropriately. Further, as the industry develops with further research and development activities and scale, wind energy may become cheaper yet. Accordingly, wind energy must be a significant part of Australia's future electricity supply taking into account our cost and sustainability objectives. In this context, it is important that the Government supports the development of wind farms.

Wind energy will also contribute reliably to the future electricity supply portfolio; it is a proven, mature technology. In Spain, wind energy alone covered over 14% of the national electricity demand in 2009[35]. In Denmark, wind farms provide enough power to cover 20% of the country's electricity needs[36].

Finally, there is a misconception that renewable energy will be the main or a significant driver behind rising electricity costs. Studies demonstrate the impact of the RET on power bills is relatively small when compared to other components such as transmission network infrastructure. For instance, the Department of Climate Change estimates the enhanced RET will increase electricity costs by around $4 for an average household per year[37]. If a carbon price is applied by 2020, ROAM Consulting predicts the total cost of the LRET to consumers with a carbon cost is around $4/MWh in 2020[38]. Furthermore, this cost is borne equitably by all energy consumers, which disproves the assertion that "city-based" people do not share in its cost, or that it absorbs government money.

Conclusion

We are very enthusiastic for the prospects for wind energy generation in Australia. This country has strong wind resources and many areas of open land. It also has growing electricity demand and recognises the need to develop a cleaner, less carbon-polluting economy. This is essential to Australia maintaining its international competitiveness and doing its share for sustainability.

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[35] Spanish Wind Energy Association (AEE): *Wind Power Observatory 2010*.
[36] Global Wind Energy Council (March 2010): *Global Wind 2009 Report*. Available at www.gwec.net.
[37] Department of Climate Change (February 2010): *Enhanced Renewable Energy Target* factsheet.
[38] ROAM Consulting (25 May 2010): *The true costs and benefits of the enhanced RET*.

ACCIONA Energy is very proud to be part of this movement. We operate with care and respect for the stakeholders in our projects and overall, with the belief that wind energy generation makes a very large and positive contribution to society. In this spirit, we would be pleased to present to the Senate Inquiry in person, or alternatively to provide further written input if necessary.

Sincerely,

Tricia Kent
Director - Communications
ACCIONA Energy Oceania Pty Ltd

CURRICULUM VITAE

NAME: Gary Allen WITTERT, MBBch, MD, FRACP, FRCP

DATE OF BIRTH: 20 September, 1959, Johannesburg, South Africa

QUALIFICATIONS: MB Bch (with distinction), University of Witwatersrand 1983
FRACP, 1992
MD, University of Otago 1994

ADDRESS: Home 39a Anglesey Avenue, St Georges, SA 5064
Work Level 6 Eleanor Harrald Building, Royal Adelaide Hospital, Adelaide, SA 5000

EMAIL: gary.wittert@adelaide.edu.au

CURRENT APPOINTMENTS:

Professor of Medicine, University of Adelaide (Personal Chair)
Mortlock Professor and Head, Discpline of Medicine, University of Adelaide
Founding Member, Freemasons Centre for Men's Health
Member, Hanson Research Insitute
Senior Consultant Endocrinologist, Royal Adelaide Hospital
Co-ordinator, Endocrine Test Unit, Royal Adelaide Hospital
Co-ordinator Obesity Clinic, Royal Adelaide Hospital

PREVIOUS APPOINTMENTS AND PROFESSIONAL EXPERIENCE:

1984	Intern, Johannesburg Hospital, Johannesburg, South Africa
1985	Senior House Officer, Hillbrow Hospital, Johannesburg, South Africa
1985	House Officer, Waikato Hospital, Hamilton New Zealand
1986	Medical Registrar, Waikato Hospital, Hamilton, New Zealand
1987	General Practitioner, Oxford, New Zealand.
1988	Medical Registrar, Christchurch, New Zealand.
1989-1990	Senior Registrar, Endocrinology Unit, The Princess Margaret Hospital, Christchurch, New Zealand
1991	Locum Lecturer in Medicine, University of Otago, Christchurch Clinical School, Christchurch, New Zealand
1991-1993	Research Fellow of the Fogarty International Centre, Childrens Hospital of Boston and Harvard Medical School
1993-1994	Clinical and Research Fellow, Oregon Health Sciences University, and Vollum Institute of Advanced Biomedical Research, Portland Oregon
1994 – 1999	Senior Lecturer in Medicine, University of Adelaide.
2000 – 2004	Associate Professor Department of Medicine, University of Adelaide
2004/2005/2006	Acting Dean – Faculty of Health Science – April, September 2004, January, July 2005, June 2006.
2006-2009	Head, School of Medicine, University of Adelaide

AWARDS AND DISTINCTIONS:

Undergraduate

1982	Kurt Gillis Award for Psychiatry
1983	David Lurie Memorial Medal for Surgery
	Abelheim Medal and Prize for Obstetrics
	Medical Association Medal for the most distinguished graduand

Postgraduate

1991	Fogarty Fellowship, National Institute of Health, USA
1994	RACP Pharmacia Research Fellowship
2004	Florey Lecture, University of Adelaide
2008	Finalist – South Australian Science Award for Public Good.
2008	ARI – Research Accolade Award
2009	Elected to Fellowship of the Royal College of Physicians, London.

CURRENT REGISTRATIONS/ MEMBERSHIP OF PROFESSIONAL ORGANISATIONS:

1993 -	US Endocrine Society
1993 -	American Diabetes Association
1994 -	Medical Board of South Australia
1994 -	Royal Australasian College of Physicians
1996 -	Australian Society for the Study of Obesity.
2009 -	Royal College of Physicians, London.

LEADERSHIP DEVELOPMENT

2005	Harvard Macy Residential Development Program for Academic Leaders
2008	Heads of Schools Leadership Program – Palm Consulting.

COMMITTEE AND OTHER APPOINTMENTS:

1995-1996.	Secretary, General Medicine Committee RAH
1995-1996.	Member, Human Ethics Committee, University of South Australia
1996-1999.	Chair, Organising Committee, Endocrine Society of Australia, Postgraduate Seminar.
1996-2001	Convenor, Clinical Years Management Committee, University of Adelaide
1996-2001	Curriculum Committee
1997-1998	Curriculum Review Committee
1999-2000	Medical School Accreditation Task Force.
1999-2000	Convenor, Internal Medicine Service Bed Structure Committee
1999- 2002	Treasurer, Australian Society for the Study of Obesity
1999-2003	Roche Obesity Educational Advisory Board
2000-	Australian Advisory Board on Mens Health – Committee On Androgen Function in Men

2001-2003	Medical Advisor - Endocrine Nurses Society of Australia Inc.
2002-2003	Department of Health and Aged Care, Medical Services Advisory Committee on Laparascopic Adjustable Gastric Banding
2002	NH&MRC project grants – Committee 3c
2002-2006	Programme organising committee – International Congress on Obesity, Sydney 2006.
2003-2005	President Australasian Society for the Study of Obesity.
2003	Member Level D Promotions Committee, University of Adelaide
2003-2004	Member Curriculum Resourcing Review Committee – Faculty of Heath Sciences, University of Adelaide.
2004	Department of Education Science and Training. Co-operative Research Centres 2004 Round Panel Member
2004 -2005	Deputy Chair/Chair Standing Committee To Adise the DVC(R) On Clinical Trials Management.
2004 -2007	Co-Leader of Ageing Research Cluster – University of Adelaide.
2004	Expert Advisory Group of key investigators conducting longitudinal research relevant to ageing. – Australian Institute of Health and Welfare.
2004 -2007	Board Member – Centre for Reproduction and Development, University of Adelaide.
2004	Member of Organising Committee – Cottrell Conference 2004. Royal Australasian College of Physicians.
2004 -	Chair, Projects Grants Committee, RAH/IMVS Research Committee
2005-2007	Member of Health Ministers task force for Development of a Men's Health Strategy.
2005	Central and Northern Adelaide Health Service Research Strategy Think Tank.
2005-2006	Member National Obesity Task Force Scientific Reference Group.
2005	Member Level E Promotions Committee
2006	Chair South Australian Dept Health Men's Health Task Force Operations Group
2006 -	Chair, Board of Examiners MBBS Course -Year 3.
2006	Member NHMRC Grant Review Panel
2006 -	Vice President – Asian Oceania Society for the Study of Obesity
2007	Chair – Infant and Early Childhood Working Group. Childhood Obesity Forum – Senator Guy Barnetts' Obesity forum, Canberra, 6 June 2007
2007	Member faculty of Health Sciences Level B and C promotions committee
2007 -	Member faculty of Health Sciences Level E promotion committee
2007 -	Advisor to the Centre of Military of Veterans Health, Brisbane: Obesity in the armed forces and of admission criteria relating to weight and body composition that regulate entry to the ADF.
2008 -	Independent Chair of the Weight Management Council of Australia.
2008	Invited Participant Kevin Rudd's 2020 Summit.
2008	Member NH&MRC Grant Review Panel Selector Committee B.

2008 -	SA Health Research Reform Implementation Group and Analysis Working Group
2008 - 2010	NH&MRC Centres of Clinical Research Excellence Grant Review Panel
2009	Expert Review – NH&MRC guidelines on the management of type 2 diabete mellitus
2009	Council of Australian Governments – Healthy Communities Initiative Quality Assurance Workshop.
2009	Inivited member of External Review and Advisory group for Diabetes CCRE.
2009	Member Scientific Advisory Council – International Obesity Task Force.
2009 -	Member, Human Research Ethics Committee CSIRO Nutritional Sciences.
2010 -	Andrology Australia Men's Health Curriculum Development Working Group.
2010 -	Member of the Advisory Board of National Diabetes, Obesity and Cholesterol Disorders Foundation, India.
2010 -	Food Standards Australia New Zealand Epidemiology Scientific Advisory Group on Conjugated Linoleic Acid

INVITED LECTURES:

Local:
Departments of Zoology, Pharmacology, Medicine, Obstetrics and Gynaecology, Psychiatry, University of Adelaide. Modbury Hospital, Royal Adelaide Hospital, Queen Elizabeth Hospital, Adelaide Clinical Endocrine Society. South Australian Society for Post Graduate Medical Education. Institute of Medical and Veterinary Science, Royal Adelaide Hospital, Hanson Institute, Marsupial Biology Group, Numerous talks for Endocrinologists, Cardiologists, Renal Physicians, General Physicians and General Practitioners.

National:
Florey Centenary - Adelaide, 1998

Sir John Hunter Hospital, Newcastle, Medical Grand Round, 1998

Hanson Symposium - Adelaide, 1998

Australian Menopause Society –Hormonal regulation of Leptin Annual Conference, 1999

Australian Endocrine Society – Satellite Symposium, Melbourne 1999

5th Annual General Practitioner Conference, Sydney, May 2000.

ustralasian Society for Biological Psychiatry – Plenary lecture "Neurobiology of Obesity, December 2000.

Royal Australasian College of Physicians – Annual meeting 2001 – "Pathogenesis and Management of Obesity"

National Workshops on Obesity for GP's and Physicians – Pfizer and Roche 1999, 2000, 2001.

Rheumatological Society of Australia – National Meeting, "glucocorticoids and the cardiovascular system" Adelaide 2001.

Royal Australasian College of Surgeons. "The Role of Surgery in the Management of Obesity", Adelaide, 2002.

Post-graduate weekend for Physician Trainees – Astra Zeneca. "The Management of Obesity" – Coolum, 2002.

Australian Gastroenterology Week. "Obesity – the way out". Adelaide 2002

Update for Physicians "Workshop on the Metabolic Syndrome" Sanctuary Cove, February 2003.

Australasian Society for the Study of Obesity. Dietary fat and the management of Obesity" Newcastle, September 2003.

Australasian College of Sexual Health Medicine. "Androgens and the Aging Male: Myths. Mysteries and Mischief". Sydney, March 4, 2004.

Pfizer Regional Specialists Meeting, Aging and Hormones in Men. Novotel Barossa, April 14-18, 2004.

Nutrition Research Foundation University of Sydney. "Will we ever get it right – diet for a new millennium" April 22, 2004.

SAWA Cardiology Meeting. Obesity and Cardiovascular Risk. Glenelg, May 8 2004
Royal Australasian College of Physicians. Medical Approaches for The Management of Obesity. Canberra. May 17 2004.

Annual Florey Lecturer, University of Adelaide, and Florey Foundation October, 2004.

Endocine Society of Australia Seminar Meeting, Sebel Yarra Valley, April 16-19 2005.

The National Centre for Functional Foods Symposium. The Value and Benefits of Glycaemic index and Glycaemic Load. Wollongong, June 2005.

Australasian Society for the Study of Obesity Annual Conference, Obesity in the Elderly, Adelaide, October 2005.

New South Wales Diabetes Summitt. Obesity and Diabetes Mellitus. Sydney, April 2006

Central and Northern Adelaide Health Service, The Obesity Epidemic, What Should We Do? Adelaide, June 2006.

Prostate Cancer Foundation of Australia. Public Health Promotion Forum. Preventing Diabetes Mellitus. Melbourne, 12 August 2006.

Jewish Family and Community Services Annual Lecture. The Obesity Epidemic – An Intergenerational Problem: Causes and Consequences. Adelaide. October 29, 2006.

South Australian Diabetes Educators Refresher Day. Plenary Lecure - Metabolic Syndrome a risk for the Heart. Adelaide. 24 November 2006.

Friends of the Hebrew University of Jerusalem. Ethics of Embryonic Stem Cells and Related Technologies. Adelaide. 4 February 2007.

International Diabetes Institute. A weight based approach for the management of Type 2 diabetes Mellitus. Melbourne 6 Feburary 2007.

Astra Zeneca Cardiovascular Symposium. Workshops on Obesity Management. Sanctuary Cover 2-4 March, 2007.

Conference on Gender and Ageing. Plenary lecture. The Florey Adelaide Male Ageing Study. Newcastle, NSW, Australia, July 9-10 2007.

Diabetes ACT. Obesity and Men's Health –Opportunities and Challenges, Canberra, August 2, 2007.

7th National Men's Health Conference. Keynote Speaker. Adelaide Convention Centre, Adelaide 3-5 October 2007.

Research Tuesday, University of Adelaide. Obesity, Physical, Psychological and Sexual Well-being: Implications for Ageing Men. University of Adelaide, 11 March, 2008.

How to Implement a Lifestyle Management Program. GSK Gold Program for GPs and Specialists, Sydney May17-18, 2008.

Cardiac Society of Australia and New Zealand. Obesity and Heart Disease, August 7-10, Adelaide 2008.

Australian Health and Medical Research Conference. Obesity and Sexual Function in Men. November 19-21, Brisbane 2008.

Cardiovascular Specialist Symposium. Workshop on Obesity Management: February 27- March 01, 2009.

Southern Area Health Research Week. Testosterone and Cardio Metabolic Risk in the Ageing Male Melbourne May 5, 2009.

Healthy Male Forum. Gonadal Steroids, Diabetes and Cardiovascular risk. Gold Coast June 19-21, 2009.

Sansom Institute, University of South Australia. Ageing, Sex Steroids and Cardio-Metabolic Risk. July 16, 2009.

Building a clinical Research Community. CRX09, MCG, Melbourne, August 20, 2009.
Australian Diabetes Society. Bariatric Surgery for the Management of the Obese Type 2 Diabetic – A Debate. Adelaide, August 2009.

Uroscience Forum. Obesity Sleep and Androgens. Melbourne, Sept 5, 2009.

Uroscience Forum. Debate: AGAINST: The hypogonadal man – testosterone therapy or not, Melbourne, Sept 2009.

Novo Nordisk VIC/TAS Endocrine Weekend Meeting. Adrenal/pituitary Steroid Replacement. Creswick Novotel Hotel, Creswick,17-18 July 2010.

Pfizer Cardiovascular Forum. Obesity, Diabetes Mellitus and Cardiovascular Disease in Children. August 14 2010.

ANZ Society for Geriatric Medicine. Key Note Speaker: Management of Obesity In The Elderly: For Whom, When and How or If at all. September 11-12, 2010.

Fertility Society of Australia. Medical and Other Disorders in Klinefelters Syndrome. Adelaide Convention Centre from 10 - 13 October 2010.

International:
Rowett Institute, Aberdeen, Scotland, 1996

Obesity Reseach Centre, VA Medical Centre, Minneapolis, Minnesota, 1997

Endocrine Society of India Annual Conference, Plenary speaker: Leptin Physiology in humans. Lucknow 1997.

International Congress on Sports Science, Sports Medicine and Physical Education – Invited to present a lecture in a symposium on "Macronutrient Regulation of Food Intake – Lessons From Human and Animal Studies. Brisbane, September 2000.

New Zealand Endocrine Society – Invited Speaker: Androgen Function in Aging Men, Wellington, April 2001.

International Conference on Obesity – Invited symposium participant – Obesity in Aging Adults, Sao Paulo Brazil, August 2002.

Indonesian Obesity Society/Roche Indonesia – Management of Obesity – Jakarta - June 2003.

Eli Lilly Symposium. Androgens and the Aging Male. Auckland, August 2003.

Indian Obesity Society/Abbott India – Causes and Management of Obesity - Delhi, Mumbai, Chennai, Bangalore – September 2003.

Asia Pacific Heart Network – Obesity, a global problem. Singapore, January 2004.

3rd International Academy on Nutrition and Aging. The problem of obesity in the elderly. St. Louis Missouri May 6-8, 2005.
European Obesity Meeting. Effect of Orlistat on Obesity Co-morbidities. Roche Symposium, Athens, June 1, 2005.

Childhood Nutrition Research Institute. Baylor College of Medicine, Houston, Texas. Dietary approaches for the management of obesity: Is there an optimal macronutrient composition? June 9, 2005.

Combined Scientific Meeting of Singapore Health and National University of Singapore. Invited Plenary Lecture. Ageing Frail or Ageing Robust – Determinants and Interventions. Raffles City Convention Centre, Sinagpore, November 4-6 2005.

5th Congress of Asian Pacific Society of Atherosclerosis and Vascular Diseases, Novel pharmacologic approaches to diabetes management. 12-15 April, 2006 Jeju, Korea.

10th International Conference on Obesity. Invited Symposium: Clinical Effectiveness of Weight Management Drugs, Sydney Convention Centre, September 3, 2006.

Annual Scientific Meeting of the National Heart Association of Malaysia, Integrating Adiposity As A Target In Global Cardiometabolic Risk Reduction. Hilton KL/ Le-Meridien Sentral, 13th – 15th April 2007.

Korean Diabetes Association, 20th Spring Congress. Endocannabinoids for the treatment of Obesity and Metabolic Syndrome. Seoul, May 10-12, 2007.

International Academy for Ageing and Nutrition, Body composition, nutrition and activity in older men. Adelaide Convention Centre 5-8 September 2007.

International Association for Ageing and Nutrition. Management of Morbid Obesity. Adelaide Convention Centre 5-8 September 2007.

6th World Congress of the Ageing Male. Tampa, Florida, USA. "Epidemiology of Ageing Males in Australia". February 21-23rd, 2008

6th World Congress of the Ageing Male. Tampa, Florida, "Obesity in the Older Male". USA. February 21-23rd, 2008

Hypertension, Diabetes and Lipid Symposium, 2008. Shanghai, China, "Metabolic Syndrome and Sexual Dysfunction in Men: Implications for the Cardiovascular System" and "Type II Diabetes Mellitus: Emerging Treatment Strategies and Concepts" July 16-21, 2008.

15th International Congress 2008 on Dietitics, Yokohama, Japan, Inivited Symposium – "Obesity and the Metabolic Syndrome", Sept 8-10, 2008.

Asia Oceania Association for the Study of Obesity. Sleep restriction, obesity and metabolic syndrome., February 5-8, Mumbai, India 2009
Australasian Conference on Obesity. Management of Obesity: Prioritising the Options in a Patient Centred Approach. Auckland, 4 December 2009.

Fatty acids and the regulation of energy metabolism. Childhood Nutrition Research Institute, Baylor University. Houston, 15 April 2010.

Testosterone, Sexual and Lower Urinary Tract Function in Men: Effects of Obesity and Diet-Induced Weight Loss. Boston University Medical Centre. 10 May 2010.

2010 Australian-Canadian Prostate Cancer Research Alliance Symposium. Metabolic Syndrome and Prostate Cancer. Gold Cost, August 8th 2010.

SUPERVISION OF HONOURS STUDENTS

1996.	Ms R Willis (Honours IIa)
1997	Ms Fiona Clements (Honours IIa)
	Ms Rosalie Vozzo (Honours IIa)
1998	Ms Clarice Chian (Honours I)
2000	Mr Matthew Haren – Honours I
2000	Ms Zoe Holthouse – Honours I
2000	Ms Jane Mudge – Honours IIa
2003	Mr Darren Roffey – Honours I
2005	Mr Paul Cavuoto – Honours IIa.

SUPERVISION OF HIGHER DEGREE STUDENTS:

1995-1998	Ms P Hope, (PhD awarded 1999), prize for best abstract Australian Society for Comparative Physiology and Biochemistry 1998.
1998-1999	Mr Chris Barton (MMsc awarded 2000)
1998-2001	Ms Rosalie Vozzo PhD candidate (Joint with Dr Ian Chapman)
1998-2002	Ms Natalie Luscombe PhD candidate (Joint with Dr P Clifton CSIRO) Award for best poster International Congress on Sports Science, Sports Medicine and Physical Education, Brisbane, 2000, Award for best oral presentation Australasian Society for the Study of Obesity, Gold Coast, September 9-11, 2001, Young investigator of the year, Australasian Society for the Study of Obesity.2003.
2001-2004	Mr Matthew Haren - PhD
2001 2004	Dr Stephen Nicolls – PhD (Joint with Prof P Barter).
2004-2007	Mr Dominik Kaczorowski – PhD with Dr Greg Goodall.
2004-2010	Mr James Smith – PhD (Joint with Prof Janet Hiller and Dr Megan Warin)
2004-2007	Ms Eleanor Need – PhD (joint with Prof Wyne Tilley, Dr Peter O'Loughlin)
2004-2007	Dr Cynthia Piantadosi –PhD (joint with Prof Stephen Worthley)

2004-2007	Mr Donel Martin – PhD (joint with Dr Nick Burns).
2005-2009	Ms Julie Franzon – PhD (joint with Prof Graham Hugo)
2005-2008	Ms Kirsten Dunn – PhD (joint with Dr Carlene Wilson and Dr Phil Mohr)
2005-2009	Ms Emily Brindal – PhD (joint with Dr Phil Mohr and Dr Carlene Wilson)
2006-2009	Ms Yan Lam, PhD (Joint with Dr Andrew McAinch and Dr Alena Janovska)
2006-2010	Mr Paul Cavuoto (Joint with Dr Andrew McAinch and Dr Alena Janovska)
2007-	Ms Lisa Philip (Joint with A/Prof Graeme Mayrhofer and Dr Alena Janovska)
2008-	Mr Sean Martin (Joint with Prof Wayne Tilley and Prof Richard Ivell).
2008-	Ms Eva Pedersen (Joint with Prof Peter Clifton and A/Prof Manny Noakes)
2008-	Mr Andrew Trotta (Joint with Prof V Marshall, Dr Grant Buchanan and Dr Eleanor Need.
2009-	Mr Hany Dimitri (Joint with Prof Prash Sanders)
2009-	Mr Brett Scholz (Joint with Dr Shona Bass and Dr Evan Atlantis)
2010-	Ms Nadja Klafka (Joint with Dr Jaklin Elliott and Prof Ian Olver).

FINANCIAL SUPPORT FOR RESEARCH (1994-PRESENT):

1994	University of Adelaide B3 grant	$10,000
1994	Ramaciotti Foundation	$10,000
1994	RACP Pharmacia Research Fellowship	$40,000
1995	RAH/IMVS Research Review Committee	$20,000
1995	ARC small grant	$16,000
1996	ARC small grant	$10,000
1996	RAH special purposes fund	$20,000
1997-1999	ARC large grant	~$156,000
1998	Ramaciotti Foundation	$10,000
1998-2000	Veterans affairs	~$240,000
1999	University of Adelaide B3 grant	$10,000
1999	University of Adelaide Nutrition Trust	$20,000
1999-	Dairy Development Research Corporation	$44,000
1999	Organon	$70,000
2000	Bayer $40,000	
2000	ARC small grant	$10,000
2000	B1 Grant	$10,000
2000	Analytica	$20,000
2001-2003	NH&MRC Project Grant	$204,000
2001	ARC small grant	$10,000
2002	ARC small grant	$10,000
2002	Silhouette Medical	$120,000
2003	University of Adelaide Grant	$10,000

2003-2006	Florey Foundation: The Florey Adelaide Male Ageing Study: promoting health wellbeing and utilisation of health services by middle aged and older men	$450,000
2003	University of Adelaide	$100,000
2005-2008	Linkage Grant Linkage: Obesity, health, social disadvantage an environment in Australia: relations and policy implications. ARC	$1.4 Million
2004	NHMRC equipment grant	$63,000
2005-2006	Dietary interventions for overweight/obese women prior to pregnancy – safety and efficacy of low calorie and low carbohydrate diets Noakes M, Brinkworth G, McMillen C, Clifton P, Norman R, Wittert G. Brailsford Roberston Grant	$200,000
2005	Faculty Small Grant	$21,000
2006-2008	The Florey Adelaide Male Ageing Study: promoting health wellbeing and utilisation of health services by middle aged and older men Premiers Science Research Council	$300,000
2007-2008	Impact of nutrition, including long-chain Omega-3 polyunsaturated fatty acids on cognition and functional ageing Danthiir V, Wilson C, Nettelbeck T, Wittert G Brailsford Robertson Award:	$200,000
2007-2009	Discovery Grant Declining mental efficiency, cognitive performance and individual differences in aged function Nettelbeck TJ, Burns NR, Wittert GA ARC DP0772346:	$240,000
2007-2011	NH&MRC Clinical Centre of Research Excelllence-Nutritional Physiology, Interventions and Outcomes Horowitz M, Clifton PM, Wittert GA, Chapman I, Fraser RJ, Rayner CK, Feinle-Bisset C, Jones KL NHMRC 453557:	$2 Million
2007	Building a fit and healthy Australia. Premiers Science Research Council	$1.4 Million

2007	Socio-economic status and overweight/obesity: supply of and access to (un)healthy food . Strategic Health Research Program South Australian Health Dept	$200,000
2007	Automated image analysis system for the high throughput immunohistochemical analysis of clinical and experimental samples Tilley W, Owens J, Norman R, Findlay D, Rodgers R, Roberts C, Wittert G, Ricciardelli C et al NHMRC Equipment Grant 467207:	$100,695
2007-2009	The safety and efficacy of rapid weight-loss using a modified very low calorie diet, followed by a weight maintenance strategy, on cardiovascular risk factors, vascular and ventricular structure and function in obesity and obesity related cardiovascular disease – ['Healthy Weight for Life Project']. Wittert G, Worthley S, Piantadosi C, McAinch A MBF Foundation Ltd:	$146,955
2008-2010	Project Grant: Limiting weight gain in overweight and obese women during pregnancy to improve health outcomes – a randomised trial Dodd J, Turnbull D, McPhee A, Wittert G, Robinson J NHMRC 519240:	$1,466,625
2008-2010	GPCRP: Better outcomes for obese children in general practice: randomised control trial of a new shared-care-model vs usual care Wake M, Gunn J, Gibbson K, Wittert G, Gold L NHMRC 491212:	$640,000
2008-2009	Cardiovascular and Inflammatory Effects of Dietary Intervention in Obesity Worthley S, Wittert GA, Worthley M et al National Heart Foundation	$120,000
2008	Healthy Ageing Research Cluster (HARC) Wittert G, Mayrhofer G, Ward L, Musgrave I, Gravier S University of Adelaide Research Committee (URC):	$100,000
2008	Equipment for concurrent impedance, manometry and barostat recordings in nutritional physiology studies C Rayner, R Fraser, M Horowitz, G Wittert, C Feinle-Bisset, K Jones, P Clifton National Health and Medical Research Council Equipment Grant	$52,000

2008	Distiller image analysis software and server, Tilley W, et al. NHMRC equipment grant	$52,000
2009-2011	Australia's baby boomer generation, obesity and work – patterns, causes and implications Hugo GJ, Wittert GA, Adams RJ, Cobiac L, Daniel M, Findlay CC, Taylor AW, Wilson DH, Winefield HR, Woollacott AL, Ruffin R ARC Linkage project: 2009 $221,000; 2010 $207,000; $2011 $213,000	
2009 – 2011	Effects of acute and longer-term dietary changes on gut function and appetite in lean and obese subjects Feinle-Bisset C, Clifton PM, Horowitz M, Jones KL, Wittert G. $713,333	
2009-2011	Dr Amanda J Page, Prof L Ashley Blackshaw, Prof Gary A Wittert NH&MRC Project Grant 565186 Gastric hormones and vagal afferent satiety signals 2009-2011 $529,500	
2010-2012	Wittert GA, Wilson DH, Adams RJ, Travison T, Taylor A, McKinlay J, Atlantis E. NH&MRC Project Grant 627227. Effect of sex steroids, inflammation, environmental and biopsychosocial factors on cardiometabolic disease risk in men. $1,763,03.	

EDITORIAL BOARDS AND JOURNAL REVIEWS

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PATIENT MANAGEMENT SOFTWARE AND EDUCATIONAL AIDS:
OBEMAN™ - Interactive, Obesity Management Software

HopSCOTCH – Software for the shared management of childhood obesity by hospital specialists and general practitioners.

PATENTS:
The use of AOD 9604 to treat depression – International Patent. #WO 03/09272 5 A1

PUBLICATIONS :

1. Wittert G.A., Donald R.A., Espiner E.A., Livesey J.H. The hormonal effects of pituitary surgery and irradiation: A review of 59 cases. New Zealand Medical Journal 1985, 98: 93-97

2. Wittert G.A., Joffe B., Shires R., Panz V., Seftel H. Clonidine has no effect on serum potassium changes during exercise. New England Journal of Medicine 1985, 5: 327

3. Wittert G.A., Joffe B., Shires R., Panz V., Baker S.G., Seftel H. Hypoglycaemic glucose counter-regulation in healthy subjects pre-treated with oral clonidine. Journal of Endocrinological Investigation 1987, 10: 621-622.

4. Wittert G.A., Espiner E.A., Donald R.A. Arginine Vasopressin in Cushings Disease. Lancet 1990, 335: 991-994.

5. Wittert G.A., Stewart D.E., Graves M.P., Ellis M.J., Evans M.J., Wells J.E., Donald R.A. and Espiner E.A. The plasma vasopressin (AVP) and Corticotrophin Releasing Factor (CRF) responses to intense exercise in athletes. Clinical Endocrinology 1991, 35:311-7.

6. Richards A.M., Wittert G.A., Espiner E.A., Yandle T.G., Frampton C. and Ikram H. EC 24.11 Inhibition in man alters clearance and bioactivity of atrial peptide. Journal of Clinical Endocrinology and Metabolism. 1991; 71:1317

7. Richards A.M., Wittert G.A., Espiner E.A., Yandle T.G., Frampton C. and Ikram H. Prolonged inhibition of endopeptidase 24.11 in normal man: Renal, Endocrine and Hemodynamic effects. Journal of Hypertension 1991; 91:1-8.

8. Richards A.M., Wittert G.A., Espiner E.A., Yandle T.G., Ikram H., and Frampton C. Effect of inhibition of endopeptidase 24.11 on responses to angiotensin II in human volunteers. Circulation Research. 1992; 71(6): 1501-7

9. Wittert G.A. and McKellar K. Thiazide induced hyponatraemia. New Ethicals, January 1992.

10. Wittert G.A., Or K.H., Livesey J.L., Richards A.M., Donald R.A., Espiner E.A. Vasopressin, corticotrophin releasing factor, atrial natriuretic factor, and pituitary adrenal responses to acute cold stress in humans. Journal of Clinical Endocrinology and Metabolism. 1992; 75:750-755.

11. Clyde J.W., Wittert G.A. Gilchrist N.L., Turner J.G., Donald R.A., Espiner E.A. The effect of parathyroidectomy on bone mineral density in primary hyperparathyroidism. New Zealand Medical Journal 1992; 105:71-2.

12. Wittert G.A., Livesey J.H., Or H.K., Donald R.A., Espiner E.A. Elevated corticotrophin secretion in Addisons disease is independent of change in plasma arginine vasopressin and corticotrophin releasing factor. Journal of Clinical Endocrinology and Metabolism. 1993; 76:192-196

13. Wittert G.A, Espiner E.A, Richards A.M, Donald R.A, Yandle T.G. Atrial natriuretic factor reduces vasopressin and angiotensin II, but not the ACTH response to acute hypoglycaemic stress in normal man. Clinical Endocrinology. 1993; 38:183-189.

14. Richards A.M., Wittert G.A., Crozier I.G., Espiner E.A., Frampton C. and Ikram H. Chronic inhibition of endopeptidase 24.11 in essential hypertension: evidence for enhanced atrial natriuretic peptide and angiotensin II. J Hypertension 1993; 11:407-416

15. Donald RA, Perry EG, Wittert GA, Chapman M, Livesey JH, Ellis MJ, Yandle T, Espiner EA. The plasma ACTH, AVP, CRH and catecholamine responses to conventional and laparascopic cholecystectomy. Clinical Endocrinology. 1993; 38:609-615.

16. Majzoub J.A., Emanuel R.L., Adler G.K., Martinez C., Robinson B., Wittert G. Second messenger regulation of mRNA for corticotropin releasing factor. Chadwick DJ, Marsh J, Ackrill (eds), Corticotropin releasing factor, John Wiley & Sons 1993; Ciba Symposium 172:30-43.

17. Florkowski C.M., Wittert G.A., Lewis, J.G., Donald R.A., Espiner E.A. Glucocorticoid responsive ACTH secreting bronchial carcinoid tumours contain high concentrations of glucocorticoid receptors. Clinical Endocrinology, 1994;40:269-274.

18. Wittert G.A., and Loriaux D.L. Functioning disorders of the adrenal gland: A symptomatic approach. Comprehensive Therapy, 1994;20:358-362.

19. Wittert G., Hope P., Pyle D. Tissue distribution of opioid receptor gene expression in the rat. Biochem Biophys Res Commun. 1996, 218: 877-881.

20. Lavin J., Wittert G., Sun W-M., Horowitz M., Morley J.E., Read N.W. Appetite regulation by carbohydrate: Role of blood glucose and gastrointestinal hormones. Am J Physiol-Endo Metab. 1996 34:E209-214.

21. Yeap B.B., Russo A., Fraser R.J., Wittert G.A., Horowitz M. Hyperglycaemia affects cardiovascular autonomic nerve function in normal subjects. Diabetes Care. 1996, 19:880-882.

22. Wittert G.A., Livesey J., Espiner E.A., Donald R.A. Adaptation of the hypothalamo-pituitary adrenal axis to chronic exercise stress. Medicine and Science in Sports and Exercise 1996, 28:1015-1019.

23. Yeap Bu B, Burnet RB, Scroop G, Chatterton BE, Gaffney RD, Wittert GA. Chronic fatigue syndrome: is total body potassium important? Med J Aust 164(March):384 1996.

24. Nordin BE, Burnet RB, Wittert G, Fitzgerald S, Drummin L. Which bone to measure. Australian Prescriber 20(S3): 74-78, 1997.

25. Hope P.J., Wittert G.A., Horowitz M., Morley J.E. Feeding patterns of S. crassicaudata (Marsupalia: Dasyuridae): The role of gender, photoperiod and fat stores. Am J Physiol.1997, 272: R78-R83.

26. Perry III H.M., Morley J.E., Horowitz M.H., Kaiser F.E., Miller D.K., Wittert G.A. Leptin, Body composition and Age in African American Women. Metabolism, 46: 1399-1405, 1997.

27. Chapman I.M., Wittert G.A., Norman R. Circulating plasma leptin concentrations in polycystic ovarian disease. Clinical Endocrinology 1997, 46:175-181

28. Hope PJ, Pyle D, Daniels CB, Chapman I, Horowitz M, Morley JE, Trayhurn P, Kumuratilake J, Wittert GA. Identification of brown fat and a novel mechanism for energy conservation in the marsupial Sminthopsis crassicaudata. Am J Physiol - Regulatory, Integrative and Comparative Physiology 42(1): R161- R 167, 1997.

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MR HENRY CALLS

+GARY ALLEN WITTERT AFFIRMED

PROFESSOR OF MEDICINE AND ENDOCRINOLOGIST

+EXAMINATION BY MR MANOS

Q. Looking at MFI Exhibit Y produced, is the document that's just now been proposed - shown to you, is that the statement of evidence that you prepared relevant to this matter.

A. Yes, it is.

Q. Including a number of annexures.

A. Yes, it is.

Q. Before we tender it, at para.27 you reference, 27D, you reference a paper that document is the accepted process of evaluation of a public health risk. But I think that the attachment, No. 11, is in fact the wrong document, is that correct.

A. Yeah, that's correct. That refers to the additional attachment that was provided and the attachment that's referred to is attachment 11 relating to landfall, it relates to a subsequent statement indicating that other environmental developments could provide similar adverse effects and that is -

MR HENRY: Your Honour, have I provided to the court a flurry of paperwork - I'm not quite sure, 1.20 'Risk Assessment'?

HIS HONOUR: Yes.

MR HENRY: Could the spare copy of that be shown to Professor Wittert. I'm not sure that's been tendered.

CONTINUED

HIS HONOUR: No, it came to us as part of an email and to be I'm not sure.

MR HENRY: A spare copy might not have been printed off. Perhaps I'll just invite the court to produce this to the witness.

XN

Q. Is this the document that you had intended to reference in para.27(d).

A. Yes. The document that was there referenced relates to point 38.3 but no matter.

MR HENRY: So I tender that document. That's the risk assessment document.

HIS HONOUR: Now do you want that to be part of Exhibit Y or do you want it separate?

MR HENRY: Probably best to be a separate exhibit because attachment 11 in fact serves a legitimate but different purpose within the statement.

EXHIBIT #AA 1.20 RISK ASSESSMENT TENDERED BY MR HENRY. ADMITTED.

XN

Q. I wonder if you would take us briefly to those passages in that exhibit which you say demonstrates the accepted process of evaluation of a public health risk in particular.

A. So the relevant material can be found on table which is labelled fig.2 and below table 3 and that's found on p.458 and there's a graphical representation of that process which precedes it which is fig.1 which is found on p.453.

Q. Again briefly are you able to describe for us in summary form what that accepted process of evaluation of a public health risk is just in abbreviated form.

A. Sure. So the paper refers to toxicology but I don't think it matters what the environmental or chemical stimulus happens to be the process would be exactly the same. It would require identification of a hazard and then a plausible set of exposure assessments and risk

characterisation including dose response assessments to allow some opinion to be made about cause and effect relationships. The detail of how that process may proceed might include a number of independent studies with consistent results as opposed to a single study. It may include analyses across a single site of different species or in the case of toxicology using structural analogues and again you're looking for consistency rather than inconsistency, multiple observations of different sites, different species within sectors and then severity and progression. So this is dose response relationships. Root of administration is not relevant here because it's consistent.

Q. Are you saying that nothing of that nature has been done to date in respect of the asserted health impacts said to arise from wind farms.

A. The asserted impacts are as described both in my statement and in Dr Laurie's evidence are not disagreed on. That's an observation that I would dispute that there's any clear evidence of cause and effect and that there are no sufficient analyses that have provided any form of assessment as to whether alternative causes could account for those that allows an appropriate conclusion to be made. In the case control study which I don't have access to the details of and can't be evaluated and has to be considered therefore suspicious in terms of whether there are confounders or biases both in terms of the selection of the subjects as you alluded to in your cross-examination or in terms of the way the assessments were made as to whether there are any confounds. Prior psychological history may be one, attitudes to life, marital status, marital stress, financial difficulties, obesity and obstructive sleep apnoea as we've heard may all be others. So that in a case control study unless all of those factors are carefully considered then it's quite possible to make erroneous conclusions and indeed the literature is

littered with case control studies that have misled public health in that context and it highlights the rigour that when an observation is made and no-one is doubting the nature of the symptoms experienced but I would sincerely question whether the case has been made that there are cause and effect relationships. Indeed when I've been provided with objective data and one of the ways that case control studies propose to overcome this issue of confounding and bias is to find an objective measure. Measurements of blood pressure are not perfect but they're not a bad objective measure and I was pleased to have received the work that Dr Laurie provided and the effort that was put into it by the individuals concerned of collecting their blood pressures because that formed the level of objectivity that demonstrated quite clearly to me just with a very simple spreadsheet and analytical process that in fact when the turbines were off the blood pressures were just as high if not higher than when the turbines were on. Now -

Q. We'll come to that in a moment in more detail. But for present purposes as far as what you say in para.27(d) is concerned you've taken us to the risk assessment reference which is Exhibit AA. Effectively you're telling us that the data that's been collected and the work that's been done so far has not identified a risk which calls for further investigation.

A. No, and there's no fundamental epidemiological signal. In countries where there are dense concentrations of wind farm like in the rest of Europe the prevalence of hypertension if anything is falling according to the most recent surveillance data which is very well kept by the EU and World Health Organisation. So there's no signal of an ecological effect.

Q. So that deals with 27(d). Can I ask you before I tender your statement to turn to para.28 of your statement. You deal there with certain aspects of potential effects on domestic animals and livestock.

Now what aspect of your qualifications and experience do you draw upon in presenting the information in para.28.

A. There's two reasons for presenting information in para.28.

HIS HONOUR: Before you continue, professor. Mr Henry, I think this may be a bit difficult for you might it not. I've already said that we don't propose to draw any inference one way or another about this sort of evidence. I don't know where this is going but having said that yesterday and even though it's not objected to -

MR HENRY: That's the reason for me asking these questions prior to tendering the report is that it's important for Professor Wittert to spell out the chain of reasoning that he has adopted in respect to the material that he's presented in para.28.

HIS HONOUR: Very well.

MR HENRY: It's best for him to give that evidence rather than me summarise it I would respectfully submit.

A. Thank you, your Honour, I'll deal with the second point first. Considerable amount of the work that I do relates to experimentation in animals like it or not and that includes a range of physiological responses from reproduction to food intake and a whole bunch of complex behaviours in between. The species of animals include sheep, rats, mice and small native marsupials and therefore I believe that I have sufficient detailed knowledge of animal physiology to at least use the example to assess the literature for credible evidence of animal effects which one might like to see if there were the levels of infrasound being described and indeed the level of health effects being described and also to deal with this issue of anecdotal report where it depends on who you ask and what you see. So the notion of pulling something out of a blog says well one person says and the other people say, so therefore

there's no credible evidence of an effect of animals and I believe that I'm sufficiently qualified to comment.

CONTINUED

Q. And as far as where the material in para.28 fits into your analysis, do you say that if wind farms were causing physiological impacts on human beings, you would expect also to find some evidence of physiological impact on animals.

A. Yes, I would. And that would include things that affected sensitive processes linked to reproduction and/or food intake. Therefore you would expect to see dairy production drop dramatically, or you would expect to see significant effects on animal reproduction. I've scoured the literature using just about every data base I can find, and I cannot find any information that primary production in Europe has been affected by the presence of wind farms - and I use Europe as the example because of the densest concentration of wind farms.

Q. Is this the case - your reasoning as far as para.28 is concerned is that there's an absence in the published data of any reference to adverse effects on animals -

A. Yes.

Q. - and that informs your reasoning about the likelihood of physiological effects on human beings.

A. Yes, it does.

MR HENRY: I tender the statement.

HIS HONOUR: Mr Manos?

MR MANOS: There are a number of documents which we received and are not particularly relevant - and your Honour's allowed the evidence in relation to the animals - I didn't object initially because I want to ask the witness some questions about it as well.

HIS HONOUR: I understood the reason it's only marked for identification is that you wanted to object to it? I'm not inviting you to do it, but -

MR MANOS: No, there was a document I had some objection to and I can't remember which one it is now, but I don't think we need to waste any more time on it.

EXHIBIT #Y MFI Y REPORT OF PROFESSOR WITTERT AND ATTACHMENTS TENDERED BY MR HENRY. ADMITTED.

XN

Q. Your CV appears at tab 1 and it's 28 pages long. Can I ask you to briefly identify the aspects of your qualifications and experience which are of particular relevance to the subject matter of the material that you've presented.

A. The first is - apart from being a registered medical practitioner and a trained physician is that I've worked in rural general practice, I did so in the rural south island area of New Zealand - that's for 12 months. I understand rural communities and I understand rural general practice. The second is, I have expertise in endocrinology - the issue of endocrinology and stress effects, with a subject of my MD at the University of Otago - and subsequent post doctoral work in the United States. And specifically looking at the effects of various physiological stresses and cortisol production and the mechanisms of cortisol regulation. A considerable amount of work that I do over the past several years relates to epidemiology and investigation of large cohorts. This includes an extensive analysis of biopsychosocial factors and their effects on health. I have an interest in and have published on the relationship between depression and stress and health outcomes. I have an ongoing interest, right from the early days of my training, in hypertension - and have published reasonably extensively on hypertension in various contexts. And on an ongoing basis we have been conducting home sleep studies for the purposes of analysis of effects on health in the Florey Adelaide Male Aging Study.

Q. You've heard Dr Laurie's evidence.

A. I have.

Q. I want to ask you some questions about paras.36 and 37

of your statement. They deal with somatoform disorders and the nocebo effect. Before we come to what Dr Laurie said, can I just get you to amplify, as it were by way of explanation, what a somatoform disorder is.

A. Somatoform disorder refers to a physical problem where the cause of that physical problem relates from some input into the psychological state of the central nervous system. So perception of how things are for you may lead to some disease states. Now there is no assertion in my evidence - at least I hope it's not interpreted that way, that these are not real physical problems - these are indeed, to the individuals who experience them, very real physical problems and often associated with objective measures of disorder. It simply says there's a mind/body connection and that one cannot separate what happens in the mind from what happens in the body. That's the basis for a somatoform disorder.

Q. And the nocebo effect.

A. The nocebo effect most simply is the opposite of a placebo effect. In studies, for example, of erectile dysfunction - which seems to be a rather definitive state for the people so effected, up to 30% of people given a placebo tablet will report an improvement in their erectile function. The nocebo effect is the opposite and it's interesting to hear Dr Laurie acknowledge the point that if you generate anxiety in people they become unwell, that's the nocebo effect.

Q. And you heard her evidence, she asserted that she'd seen no evidence of a nocebo effect or indeed a somatoform disorder in the people she'd seen at Waubra. Are you able to make any comment about what she said there.

A. I can't comment on the accuracy or otherwise, but I see no evidence that such possibility is considered.

Q. In the data that she's provided or the -

A. It's not possible to make an assessment of my own based

on the data that's provided as the extent to which this may or may not be a somatoform. What's interesting is having been told that some of these effects are durable in terms of extending beyond the terms that the turbine is on and then to see that when someone moves away from the personal diary within hours of driving out of Waubra they seem to be cured. It seems to be inconsistent with this durability of effect and makes one wonder about the mind/body connection for some of these things. So I don't doubt that if you don't like what you fancy you feel in a particular environment and you change environments you'll feel better - and that's not uncommon.

Q. Can I ask you to turn to p.8 of your statement. In para.33 you reference a publication by the National Health and Medical Research Council.

A. Yes.

Q. Can you explain for us the role and the function of that body.

A. The National Health and Medical Research Council is the peak body in Australia constituted by the Federal Government and reporting to the minister, that is charged with the conduct of health and medical research - as well as providing advice that would help form the basis of health policy and evidence based practice guidelines.

Q. And the document at attachment 14 is referred to as a rapid review. Can you tell us what term means in respect of the document.

A. Yes, it means that a review has been commissioned and the terms of reference require it to be completed within six months.

Q. As opposed to a lengthier period, which other references might call for.

A. Correct, and I believe this may have been done given the urgency that the NH&MRC felt in providing some advice.

Q. Does the rapidity of the response call into question the quality of the response.

A. I do not believe so.

Q. At the end of the day then, is it the position that peak Federal body concerned with medical research has concluded that there is insufficient basis for further research into the questions that we are concerned with here.

A. Well, they have certainly concluded that there is insufficient evidence to be concerned about a significant health effect on wind farms, and I can't see that, based on the information that I have had access to, that a case can be made for any kind of research that can be done in a rapid form as Dr Laurie asserts.

Q. I might turn next then to the work you did -

HIS HONOUR: Before you do, Mr Henry -

HIS HONOUR

Q. As I understood the criticism by Dr Laurie of that review, it was that there wasn't the personal input from those who complained of problems living next to or nearby to wind farms. Do you have any comment to make about that.

A. The way that an evidence-based review would be conducted is based on published literature, so the reliance would be almost entirely on that, as opposed to the inquiry that is currently being run by the Federal government, which would take submissions from members of the public that felt affected. So if someone had done a case control study or a epidemiological or ecological study of some sort and published it, then the NH&MRC would have considered that document, but not invited individuals or spoken to individuals.

Q. Well, I appreciate that, but that's Dr Laurie's criticism. Do you agree with that, that the absence of that sort of material detracts from the force of the conclusions or not.

A. Well, I think it would confound the confusion, because my contention is, and I believe the contention from the NH&MRC, of that sort of evidence, is that it's anecdotal and conclusions cannot be made, other than to generate anxiety.

Q. So does it follow from that that were there to be a significant epidemiological study, that would find its way into, or in all likelihood, the review and would have been considered as a -

A. That is correct.

Q. - as a study.

A. That is correct.

XN

Q. Now, I think you started to touch on this, but Exhibit Z is a summary of some work that you did in analysing the blood pressure data from three of the subjects that Professor Laurie has referenced. I'll just get you to turn to that, have you copy of it?

A. No.

Q. Now, looking now at Exhibit Z, the way in which this material has been brought about, Exhibit A24 is the raw data for your work in Exhibit Z, is that correct.

A. Yes.

Q. They are the journal entries for five subjects, AR, GW, BMJ, RB and GB.

A. Correct.

Q. You have analysed three of them.

A. Correct.

Q. But not analysed the other two.

A. Correct.

Q. The reason why you haven't analysed the other two.

A. There's two reasons, the one is because it got very late at night and I did it just after I got back from a holiday, but I identified those two that I didn't analyse as being normotensive. Therefore, the issue was moot and I was interested in the three where there was clear evidence of elevated blood pressure.

Q. Elevated blood pressure, for your purposes, is

something over 140/90.

A. I took systolic at 140 and a diastolic as 90 being reflective of levels that I would generally consider treatment.

Q. The two subjects that you didn't plot graphs for in fact didn't have blood pressures over those trigger points.

A. Correct.

Q. Is it the case that in the data that you have presented graphically in Exhibit Z, you have simply taken the data from Dr Laurie's journals.

A. I did. The process was since Dr Laurie's instruction to the people who participated in the study did try to find some evidence of approval by an ethics committee but was unable to locate that, but assuming that informed consent had been given, there was an instruction to record blood pressure first thing in the morning, on waking and before eating, and therefore, what I did was tabulated into a spreadsheet separately the systolic and diastolic blood pressure which was the first morning pressure that I could find.
Concurrently, and I could only do all of the information for AR, I recorded when there was symptoms being experienced, I could do symptoms for everybody, I could do audibility of the turbines for AR, and I also recorded wind direction and where it was - the information was available, I recorded wind intensity, and I then created a column which I could only do from the dates that information was available, which was mostly, I guess, November, for the most part, record the average nocturnal output from the wind turbines.

Q. You have taken that data, as I understand it, from the material at tab 6 in Exhibit A24.

A. That is correct.

Q. So time being short, I'll just see if I can take you to a handful of these graphic presentations on the - will you go to the data for AR and then to graph 2.2 for me.

A. Yes.

Q. That deals with the waking systolic.
A. That's correct.
Q. And mean overnight turbine power. Is this correct, where you have identified that overnight turbine power was zero, you found four reported waking systolic values.
A. Correct.
Q. You have plotted them against the zero overnight turbine power.
A. Correct, so the initial plotting was of the blood pressure, and then when I could find overnight turbine powers, I have created a last column where that was included, and also a column with comments. So the information was consistently documented in the spreadsheet as instructed for the participants to record by Dr Laurie and then I took average turbine power overnight. Now, where I have recorded zero, that had to be zero for the entire night, so if there were any portion of the night that was zero and other portions of the night that there was turbine output, then it was recorded as the average, not zero.
Q. So what we get is a scattering of waking systolic values which are arranged by reference to overnight turbine power.
A. Correct.
Q. The purpose of doing that.
A. The purpose of doing that is what is known as a correlation analysis or a dot plot in the case of a graph, is to look at the relationship between two variables. Since it has been asserted that there is a relationship between turbine output, whether that is infrasound or noise or some other phenomenon from the turbine with blood pressure, I was interested to see without simply eyeballing the data but actually looking at it properly graphically represented, what was happening when the turbines were off as opposed to when the turbines were on, and when the turbines were on at various intensity, this goes to the issue of dose-

response relationships, and what I find is, if anything, blood pressure tends to be a little bit higher when the turbines are off. What is interesting about this is the consistency of effect across the individuals.

Q. Just looking at graph 2.2, were you able to find any consistency in the relationship between turbine power and waking systolic.

A. No, I was not. There were random effects other than the fact that there was this tail up when the turbines were off. The cynic would interpret this as being that having turbines running is good for your blood pressure as an alternative explanation. The interesting thing with AR in the journal is that the highest blood pressures were recorded on the last two days of recording, which reached quite extraordinarily high levels, and they resulted from an altercation at a polling booth with a proponent from a wind farm, indicating just how strongly just stress and interpersonal interaction can affect blood pressure.

CONTINUED

Q. We'll deal quickly then with chart 2.3, that's the same as 2.2 but it deals with diastolic rather than systolic.

A. Correct. And that's essentially a horizontal line.

Q. You've included as part of that graph an R-squared linear of 0.003, what does that mean.

A. That means it's approximately a horizontal line. So the R-squared value will increase as the slope increases.

Q. Essentially do we see the same presentation of data for GW.

A. Yes.

Q. And BMJ/BJ.

A. Yes.

Q. In other words, no relationship between output and blood pressure.

A. No. And in fact, again the trend in fig.4.2, the systolic blood pressure for BMJ is the similar trend for the blood pressure to be higher when the turbines are off.

Q. Yes.

A. And lowest when the output is maximum; again, suggesting to the cynic that having turbines on may be good for your blood pressure.

Q. You draw no such conclusion though.

A. I draw no such conclusion. I would also add that in fig.2.4 that does not look at the relationship with mean turbine power but it looks at the relationship to audibility of the turbine. And because of the scale it's difficult to see but the little blips up on the line at the bottom, that's represented as a zero, one or two, two being when the turbines are said to be very loud, one is loud and zero when they're inaudible. So where you see those blips up it's turbine audibility and again there's no consistent relationship between turbine audibility and blood pressure. Or indeed, might I say, symptoms or anything else.

Q. The next issue, Exhibit A21 was tendered, that's a

document comprising an email from Dr Laurie to Mr Manos with some particulars, a summary of process, I think, and transcript taken by Dr Laurie; you've seen that.

A. I have.

Q. And my question is what do you say about the utility of those case histories in forming opinions about cause and effect.

A. So the - not all of the details requested were provided and I guess that's probably because they could not all be provided. Dr Laurie's acknowledged that they were not full case histories, they were not complete documents but I guess rapid assessment of phenomena from individuals who were either contacting her therefore specifically complaining of. So therefore they're anecdotal evidence and it's hard to know, other than the fact that these people quite obviously are having significant problems which I acknowledge and there's no question about the accuracy of the information elicited, what's in question is cause and effect relationships and it cannot be used to ascribe any assertion that these are necessarily due to the wind farm even if they abate when moving away. Because if you're anxious about the wind farm or your neighbour's been complaining about the wind farm and generates your anxiety and so on, then it's hard to know what that means. It's also hard to know what it means in a context of other things going on in your life as has been clearly demonstrated from those studies looking at road traffic noise and other forms of ecological effects. Much the same has been documented with EMF or with mobile phone towers, with landfill and so on you see exactly the same phenomena.

Q. Did you hear the evidence of Dr Laurie when she first gave evidence about certain changes to the data in Exhibit 21, perhaps the most significant of it was that subject 20 seems to have elevated nocturnal blood pressure but not elevated day time blood pressure. You would have heard that for the first time I think when

Dr Laurie gave her evidence.

A. Yeah, I mean I assumed, reading the case report, that blood pressure was elevated during the day because there had been this clear indication with symptomatic elevations of blood pressure during the day. It's not entirely clear to me what is meant by hypertensive crises or whether these acute hypertensive crises were confirmed as such or simply marked elevations of blood pressure in the context of some other symptom complex but let's assume that they were just that. It seems reasonable that there are a number of possibilities that this sort of spiking elevation in blood pressure can occur. So for example, one of the possibilities has been looked at and the person's general practitioner appropriately looked for pheochromocytoma which is a tumour of the adrenal glands. So these are small glands which sit above the kidneys, they produce adrenalin and noradrenalin which are stress hormones and surges of these stress hormones can produce a symptom complex that produces this kind of picture with headache, nausea, jitteriness, palpitations and so on but so can acute stress, so can panic attacks and it doesn't need to be any overt stimulus for a panic attack to occur. The question about obstructive sleep apnoea would have been one that was appropriately raised. Obstructive sleep apnoea is extremely prevalent in the male population in particular; we find roughly 20% of men in our cohort have a very high probability of having obstructive sleep apnoea so this is the age group where you'd see an effect likely to occur. Clearly an astute general practitioner who's thinking about these various things and doing the appropriate investigations, it's not clear whether this was a home sleep study or an in-lab sleep study, what the quality was, it's not clear whether weight has changed up or down since these things were done. And again, we're living in a - we're looking at an age group where there's very likely to be a hypertension

occurring, we just don't know enough to say that it's not hypertension during the day either on an intermittent basis associated with anxiety or panic attacks and I'm not even sure that I know enough about the exclusion of the pheochromocytoma to be sure that that's excluded or any other significant disease process although I assume that the cardiologist has been involved, this has been adequately looked at.

Q. Do you agree, in effect, with what Dr Laurie said about subject 20, that there might be plausible medical explanations for elevated nocturnal blood pressure but not elevated day time blood pressure which have nothing to do with the wind farm.

A. Correct.

ADJOURNED 1.03 P.M.

TRANSCRIPT CONTINUED BY REPORTER

RESUMING 2.18 P.M.

Q. I want to ask you some questions about Dr Nissenbaum's study which we find in Exhibit A22, attachment A; do you have that.

A. Yes, I do.

Q. As I understand it Dr Nissenbaum said this was the best research available on the questions that we are concerned with; you would have heard her say that.

A. Yes.

Q. And I think she said that, at least in part, because it is a case control study.

A. Yes.

Q. Can you tell us, firstly, what a case control study is, as distinguished from other forms of research.

A. So there are a number of types of observational studies and one type of observational study is called a case control study, and this is one where people with a specific disease match people who do not have the disease and who then determine controls. You match people with a specific exposure and those who do not have an exposure, but ordinarily it is done with or without disease. I think it is relevant to say that it was case controlled type methodology that first led Pitot to very strongly make the association between smoking and lung cancer.

HIS HONOUR

Q. Who was that.

A. Richard Pitot in the UK. So the origins of this as a rigorous methodology are quite clear but that does not mean it is without problems. What is critical is that data are collected from the individuals of the groups in order to allow you to control for all of the characteristics except the exposure in question. So if you were wanting to link, for example, smoking to a disease process then you would want a control for everything else except the smoking: toxicity potential, asbestos, environments, where they worked, how they lived etc., family histories. So that there are a

number of errors that may creep into a case control study. Bias is one of the big problems and this has been defined as any systematic error in the design, conduct or analysis of a study that results in a mistaken estimate of the exposure's effect on the risk of disease, and there are a number of sources of bias. So one type of bias is recall bias. So that is the propensity of diseased subjects, or cases, or individuals as they may be termed, depending on circumstances when interviewed to scrutinise their memory and report more accurately than a non-exposed and non-diseased group. So recall bias may be acuity bias, in other words you may highlight one set of symptoms more than another. So it's bias in reporting. Bias may also occur in the selection of cases and controls. So that how you select individuals to a particular group or case is appropriately selected, or are your controls appropriately selected or are they cases that volunteer themselves to you, and so on. And there are also issues where strong personal feelings may be involved may lead to a source of bias because of the specific nature of the questions that are used or the way they are framed. Confounding refers to an extraneous variable that satisfies both of two conditions. So it's risk factor for the disease being studied but it is associated with exposure being studied. So in the case we have been talking about anxiety may be a risk factor for stress related disease but it may also be a consequence of exposure to a wind farm for whatever reason. So it is not a consequence of the exposure but it's an effect, ameliorating effect within the study. And it's the major potential problem with any observational study where the factors are not fully described in the data in which case they cannot be accounted for in the analyses. And there are a variety of types of confounding that can be controlled for provided they are adequately identified. In addition in the case of control study it may be difficult to separate the chooser from the

choice. For example, studies of road accident victims find that those wearing seatbelts were 80% less likely to suffer serious injury or death in a collision, but data comparing rates for those collisions involving two front seat occupants of a vehicle, one belted and one unbelted, showed a measured efficacy of only around half that. That may be considered a form of ascertainment bias, I guess. A further problem is you have to depend on correct and honest reporting of the risk factor which may be many years in the past or, in the case of long-term prior exposure, as maybe asbestos, or the exposure may be seen as socially undesirable, epidemiological studies or observational studies of sexually transmitted diseases and certain behaviours. And case control studies can be by assessed if the risk factor is incorrectly reported for whatever reason, intentionally or unintentionally. For example, when we maintain diet diaries and appetite studies it is well known that obese people don't report their intake. That is part of the disease process whatever it happens to be, but it is a well-known and documented offence. You could conclude from that that obese people eat less and they have a different metabolic rate but that would be a wrong conclusion.

Q. Are case controls studies therefore a useful tool.

A. They are and that's why I began with the example of smoke and lung cancer. So providing all of these methodological difficulties are accounted for and this is where peer review comes in to ensure that that is the case and I would have to say that over the years the rigour with which case controlled studies are done and evaluated has increased significantly. And unless these things are adequately attended to most major journals will not accept them for publication.

HIS HONOUR

Q. And is the numbers in the study important.

A. The numbers in the study may or may not be important. So where the intensity of the exposure or the effect

size is large, then you would need fewer people to be studied. So that is the concept of power, where you are talking about a small effect size and large variances then you may need many more people. A classic example that has been in the media of a fluid case control study, whatever the motivation may be for that, was the MMR vaccination issue that has been in the media lately. That is an example of the case controlled study fluid in its design and execution, which for whatever reason happened to motivate that process.

XN

Q. Bearing in mind what you have said about case control studies so far. If we go to the material which is now attributed to Dr Nissenbaum at tab 8 of Exhibit A22, you will see there, firstly, an abstract, secondly a bio, and then you will see a table, which we now know is Dr Lawrie's work, and there is then a paper headed 'Wind turbines ... and Value List'. And as I understand Dr Lawrie's evidence it's that paper which she says comprises the best evidence about health effects and wind turbines. Do you have any comment to make about the reliability of the paper and the rigour with which the research was undertaken.

A. It's almost impossible to evaluate the data for accuracy because the methodology is not sufficiently - not presented with any clarity or at all for that matter. The most clarity you can get out of the this was 22 of about 30 adults. I have never seen any kind of scientific documentation that would document 'about', it's either a certain number of subjects or it isn't. Why is it 22? How are your cases and control selected etc. etc. other than, say, similar age and occupation and living about three miles away and then defined as not exposed? What we don't know is intensity of exposure. There is no corroboration of the various issues; there are a lot of suppositions, there is a lot of reference back to a paper that will soon be completed and the fact that this is a preliminary study. I think

this is unassessable and unless you ring up your mates and ask them to review it as peer review you will not pass muster in a journal. I edited the Journal of Obesity Research and Clinical Practice, we receive a large number of papers each week and I would have to say that I wouldn't even send a paper of this sort out for review, it isn't sufficient information.

Q. Do you believe then that the material which is attributed to Dr Nissenbaum at tab 8 is a basis for a moratorium on further wind farm developments pending further research.

A. The issue as I'm hearing it put says, we need more research. In order to justify research you need a rationale that is of sufficiently convincing magnitude to argue with funding agencies that they should part with dollars that someone else thinks are more important to have. I can't see and, as stated in my witness statement a rationale in the evidence that I have available to me for further study to be done. Now that doesn't mean there isn't an effect, it simply means that I can't see, based on the data, that there is sufficient evidence to attribute cause and effect.

Q. And to justify the allocation of funding to further research.

A. Funding is always good for research, I'm always a fan of research, and I would be delighted personally to get more funding for research but I would have a hard time writing a business plan if you like, which is what a grant application is, and saying that this is the basis for wanting to do further study, I don't think I would get the money to do so.

Q. The next issue I want you to comment on very quickly. Dr Lawrie yesterday made comment about one of the subjects had elevated cortisol levels. I may have pronounced that incorrectly.

A. That's correct.

Q. But is that an issue which falls within one of your specialised fields.

A. Yes, cortisol is produced by the adrenal glands, which I referred to previously as producing the hormones adrenaline and noradrenaline, which are the fight and flight hormones. Cortisol is very important in linking circadian rhythm to intermediary metabolism, which is the way that cells in the body use energy and regulate themselves. It is also important in regulating body composition and dispersing of fats and body mass. It is secreted in the cortisol itself in a pulsator manner. The pulsatility is increased in its amplitude, beginning in the early hours of the morning, and it trains itself to the normal circadian rhythm and then later in the day the pulses are smaller and the mean levels are lower, so you get this peak in the early hours of the morning which drop off late in the day. And that normal rhythm in the morning, the rhythmisticity of activity is important for health. There are many things that can disrupt that: stress, sleep disturbance, obstructive sleep apnea or if you put a broad package around disorders of sleep and sleep disorder breathing is just one of those but there are other factors. certain medications, excess alcohol consumption and many other things can affect cortisol but it is difficult to use single cortisol measures to make any kind of assessment of what is going on with a stress axis.

Q. Is there anything in what Dr Lawrie said yesterday about cortisol that would lead you to review the conclusion or the opinions or your process of reasoning as disclosed in your statement.

A. I haven't seen any data that would lead me to form any conclusion whatsoever about cortisol. I am not sure why it is mentioned.

Q. The next point, which is a brief one, I think Dr Lawrie suggested that you'd never spoken to anyone - perhaps it might not have been Dr Lawrie it might have been Mr Manos - suggesting that you'd never spoken to anyone living in the vicinity of a wind farm. Is that in fact correct.

A. No, it's not correct. I have spoken to people living and working in the vicinity of a wind farm, admittedly not huge numbers, small numbers. I have also visited a wind farm, I toured, in fact, the Waubra wind farm quite extensively, was taken wherever I chose to go on the map and speak to whoever I wished to speak to. I have not presented any of this in evidence because I don't think, on the one hand, you can criticise anecdotes and, on the other hand, use them, but I will offer the court anecdotes seeing an anecdotes are being sprinkled around deliberately. That is that I was told - hearsay but unfortunately this is what occurred - that someone working very close in the vicinity of a wind farm and whose property was very close to turbines, had a friend who had a bipolar disorder who liked to come up and stay when she was getting out of control because she found that her psychiatric state improved when she was at the wind farm. Hearsay and anecdotal.

Q. And not something on which you would place any or much reliance.

A. None whatsoever.

Q. Is it essentially for that reason that you haven't documented your personal experiences in the vicinity of the Waubra wind farm.

A. Only to say that I have visited, correct.

Q. The final topic is this. Dr Lawrie suggested that of the symptoms that she has documented in para.25 of her statement, there was then an additional symptom which she said is not to be found elsewhere or is not caused by any other known agent, and she made reference to I think vibration of the lips and the chest and stomach I think she might have mentioned as well. Did you hear her evidence about that.

A. Yes, I did.

Q. What do you say about those sorts of symptoms and whether they are associated with illness in the community.

A. If I heard Dr Lawrie correctly, and I'm happy to be

corrected if I did not, I also heard a qualifying statement that the description of this vibrating feeling was sort of like pins and needles.

HIS HONOUR

Q. Tingling.

A. Tingling, thank you. That sensation is what we would call perioral paraesthesia, and it's commonly seen in people who are hyperventilating or anxious. The extent to which that is the same as the sensation of the lip vibration is difficult to say without having talked to the individuals myself, but having heard Dr Lawrie's qualification of what may be meant by lip vibration I would suggest that both nausea and lip vibration may be symptoms of anxiety and may be compatible with an anxious state as maybe acute elevations of blood pressure consistent with a panic attack which may look just like a mycetoma.

Q. So do you accept the proposition that there are symptoms being manifested in and around the Waubra wind farm which are not found anywhere else or caused by any known medical condition.

A. No, I do not accept that proposition.

+NO CROSS EXAMINATION BY MR PSALTIS

+CROSS-EXAMINATION BY MR MANOS

Q. Would I understand your evidence to this effect: if one person visits a wind farm and reports an adverse effect, that would not cause you any concern.

A. I visited the wind farm and about halfway into my visit was sneezing uncontrollably and spent the next day in bed. I would not ascribe either my hayfever attack or my cold directly to being caused by the turbines.

Q. I have provided your instructing solicitor with a copy of a written statement of Patricia Godfrey which I ask you to read, did you read that.

A. I unfortunately have not had time to read that, I apologise. Happy to look at it now.

Q. I will just read to you a paragraph. This is from Patricia Godfrey, who will give evidence next week.

Q. 'Shortly after I could hear the noise from the turbines I started suffering from disrupted sleep patterns. As I suffered from periods of broken sleep I found that the noise from the turbines seemed to affect me more. It was incessant. To drown out the turbine noise I tried sleeping with headphones on and listening to tapes but that didn't work. The nearest turbines were about 750 m away from our dwelling.' And then she comes to 'I also started to experience head pain. The pain is extremely hard to describe, it is like having a hat on and it's too tight. The pain started in the back of my head and radiated over the top. At times it would throb and the throbbing seemed to coincide with my heartbeat. At times I could feel every heartbeat pulsating in my head'. Accept that that is - again this will come from Mrs Godfrey next week - and she says elsewhere that the only change is that wind turbines were turned on. So if that is reported to you would say 'Thank you for that, next, please'.

A. In my statement, item 14, I have commented on the issue of sleep disturbance and just to remind you of what I have said 'The issue of sleep disturbance is complex since it may be a consequence of stress and anxiety and of itself and/or noise perception'. So the notion that there are some people and Mrs Godfrey quite clearly is one of them, that may be inconvenienced, distressed by noise that disrupts sleep is indisputable and at no time have I attempted to dispute that and have indeed addressed it directly within my evidence. It is also addressed directly by the papers to which I have referred as indicating that there are a certain percentage of people who will be annoyed by the noise and I think that is without doubt true. That does not stray into many of the other issues that we have studied.

Q. Perhaps I'll be more specific. Mrs Godfrey presents to you and describes those symptoms. You say 'Thank you for that'; you'll store that information in the back of your mind but you're not going to immediately ring up the NHMRC and say 'We need to do some research on this'. Would that be a fair comment.

A. If Mrs Godfrey presented to me with sleep disturbance I would want a very thorough evaluation of Mrs Godfrey and I always ask the question 'What kind of disease does this person have or complaint does this person have and what kind of person has this complaint?'. So my initial approach would be to find out firstly about Ms Godfrey, evaluate her health status in the whole as well as the environmental exposures to which she may be exposed and I would then deal with the matter as I felt appropriate. I have, as needed in the past, rung regulatory agencies about issues I felt relevant to patients. I cannot tell you how I may respond in the clinical situation with someone whom I have not had the opportunity to talk to. Would I dismiss it as trivial? I would not.

Q. I wasn't suggesting you would dismiss it as trivial I was suggesting that would be insufficient to you to initiate some research.

A. It would be insufficient for me to initiate research, it would be sufficient for me to acknowledge that she presents with a significant concern and that it may indeed relate to wind, correct.

Q. What if a second person presents similar symptoms or identical symptoms to that; that they didn't suffer - the symptoms that suddenly present after a wind farm has been turned on.

A. If there was consistency of effect and that consistency of effect was commensurate with an appropriate response and with exposures that were asserted to have occurred and history had been taken and the information had been collected with sufficient scepticism and documented in an appropriate way then yes, I would be very interested in pursuing it further but it would depend on the rigor

with which the information is collected and presented and I would wonder very much whether the deaf ears that the issue is falling on apparently worldwide relates to similar perceptions that I have about the quality of evidence.

Q. Just on that, you've read Dr Laurie's reports and you are aware of the Federal Government's inquiry.

A. Yes.

Q. Are you aware the Victorian government is also conducting an inquiry.

A. I was aware they were planning an inquiry, I'm not aware they are going ahead.

Q. Have you heard other Governments around the world are pursuing the matter at the moment.

A. New South Wales Government has already held an inquiry and reported and I'm aware there are various activities taking place in various countries and that is a perfectly reasonable approach from politicians and government agencies charged with population health, is to address the concerns that are brought to them and to determine whether the basis for those assertions are reasonable to make a recommendation. That's the public health process at work and pleased for it.

Q. Isn't that exactly what Dr Laurie is simply advocating; that there's some information that's available, as a result of that information she's formed the opinion that we need to research and she kept on repeating that, 'We need the further research'. Don't we add all the information together, the 40-odd people that transcripts we've seen - did you read the affidavits that were filed in relation to the other matter before the court in the Quinn matter.

A. Yes, I did.

Q. There's a dozen or so there, and you've heard the evidence of Dr Laurie speaking to some additional people out at Waubra and in Canada, we've got three or four governments making these inquiries, isn't that a fair basis to say we need some further research.

A. It relates to the quality of the evidence presented and at the risk of being flippant, and only because I've written it in my statement, I think there are more than 60 people that would describe consistent stories of alien abduction and indeed there are some governments that have held inquiries about the matter but I don't think we would for one minute believe in aliens on the basis of that. I'm not wishing to trivialise the issue, I'm simply wanting to highlight the problem with the anecdotes and hearsay as opposed to the way evidence should and could be documented, and reports and investigators like Dr Nissenbaum do the case no favour. Where there are assertions about turbines and blood pressure and dare I say, considerable reports in the media warning residents that they should be monitoring their blood pressure, creating what I consider to be significant anxiety among the public, only to find that when you put a careful and considered and objective evaluation to the data collected you find quite the opposite, if anything, but certainly nothing, then one has to be very sceptical about the quality of the remainder of the data.

Q. Just on the blood pressure information, Dr Laurie didn't assert there was correlation between the wind farm and the blood pressure numbers, did she.

A. I must have misunderstood; that was my impression. Perhaps I've misunderstood but that was the impression I came away with.

Q. It would be fair to say the information was presented, you inferred that there must be a relationship between the blood pressure and the output, that's why the information was put forward.

A. There was a large amount of information about wind farms causing hypertension. The postulate that appeared to be most favoured, if I recall the testimony correctly, related variably to infrasound, variably to an association with symptoms and variably to sleep disturbance. I've looked at Dr Laurie's data very

carefully and since I tabulated everything for AR, I believe was the first of the subjects who kept the most thorough and complete diaries, I can find no relevant associations between any of those things.

Q. My question is, is there any piece of information you can point to where it was asserted there was a relationship between the two.

A. I have to say that my recollection of the testimony is exactly that.

Q. Coming back to this issue, you're concerned about the quality of the research - I use that term loosely - that's insufficient basis for which funding should be available to carry out proper research. It's the chicken and the egg situation, isn't it; where do we start? You gather some information, some anecdotal evidence has been collected, to use your phrase; doesn't that prick the ears up so further investigation is warranted, isn't that the approach Dr Laurie has taken.

A. Are we suggesting the entire scientific community, take me out of the picture for a minute, because just a drop in the bucket of what's going on internationally, are we suggesting the entire world of academics is blind to the evidence, to the state that they will not or cannot embark on appropriate investigations? This is like the EMF story all over again as far as I can see.

Q. But there are symposiums being held around the world, more than one, dealing with this issue of wind turbine syndrome.

A. Symposia - no, if I may indulge the court just for a minute to take a slight left step, I work in an industry that's severely criticised for its relationship with the pharmaceutical industry who have been variably accused of many things; disease lobbying, to the effect industry-sponsored conferences are being highly regulated and support of activity by lobby groups who are active, or activists in any specific context, is viewed with some degree of scepticism. I don't say that's true for any particular lobby group, but I'm

saying lobby groups exist for a particular purpose and will hold conferences and get-togethers for a particular purpose. If the quality of the evidence that comes out of that is robust and if the debate is open and even-handed, great, but I've just spent some time reviewing Dr Nissenbaum's evidence with Mr Henry and consistent with my initial impression I've come away rather concerned with what I see and if that's the basis for which we should pursue legitimate scientific investigation using public money I'm again concerned with that assertion.

Q. What benefit is going to flow as a result of an increase in setback of wind turbines from populated areas.

A. I'm not sure that I'm on top of the reason for the question.

Q. The question was put poorly. Let me put it to you again. You used the example of pharmaceutical companies. There's a benefit that could flow if their drugs were prescribed by medical practitioners to patients. Those people who are involved in the Society For Wind Vigilance will not benefit if there is an increase in the setback distance of a wind farm from a populated area, will they.

A. That's true in the sense, if they could come up with some consensus about setback. What I've heard is 'We did our investigation at - ' was it Dr Nissenbaum did it I think at a distance which we've heard is around 5 km and that was deemed to be associated with a very low incidence of effect, assuming his case control study is accurate, and that's in question. Then I'm presented with evidence that suggests that 10 km is proposed to be reasonable and now I'm hearing that it's an open-ended question. I'm not sure that it's a case of, notwithstanding Dr Laurie's assertions, and I find Dr Laurie to have incredible passion and integrity without doubt, but the question of 'We don't actually know how far we want it back', leads to me to question do we want this at all. That may not be Dr Laurie's

view but I suspect it's very much the view of many other people.

Q. But would you agree that those who, from what your basic understanding of it is, those involved in this society or the Waubra Foundation, all they want to do is make sure there's a safe setback distance so human health is not affected; isn't that the overriding objective of those groups.

A. I don't know what the overriding objective is, I've not been briefed by the foundation on their objectives.

Q. Is there any other benefit that could flow from what you have learned today to members of the society who are advocating an increased setback in populated areas.

A. I understand your question and I'm not sure that's what I'm here to answer is the answer to your question.

HIS HONOUR: I agree with the witness, I'm not sure that his speculation on the motives for these groups will assist us.

MR MANOS: The witness introduced the pharmaceutical benefit example where there's obviously, clearly, as we understand it, connection between sponsorship and drugs being prescribed. It must be fair for me to test that view in relation to this society. There's no suggestion other than a question by Mr Henry, that some of these people may get some research, that there's going to be a benefit. The objective must be public health. This is a witness who is put forward as a public health expert.

HIS HONOUR: You talk about, in somewhat amorphous terms 'these groups'. In order for the witness to be able to give a meaningful response he would have to know about the aims and objectives of these groups. He can only speculate and his speculation is not going to assist us.

MR MANOS: He heard about the aims from Dr Laurie's evidence.

HIS HONOUR: One group.

MR MANOS: And the Waubra Foundation.

HIS HONOUR: He's spoken of those objectives but it's

an open-ended inquiry you are putting to him and he doesn't know.

MR MANOS: I'll move on.

XXN

Q. How do we get funding then for the research that Dr Laurie speaks about if you can't get to the case control study level that you're seeking. You've got to start somewhere.

A. Perhaps I need a point of clarification. I heard on many occasions an impassioned plea for research and I heard on many occasions, as we all did, a plea for independent research, but I also heard an extensive discussion about our research and my collaborators and our funding. I was left a little confused about the objective of a foundation that purports to lobby and gather funds for independent research but persists in activity that does not generate what I've seen of a good research and at various times it's called research and at various times it's called not research, and at various times it's asserted I'm a researcher, at various times it's asserted that I'm not, at other times I'm just gathering some evidence for preliminary investigation to determine what kind of research we need. Without any clarity being brought to that question I was informed yesterday by the testimony that this could be done simply and quickly but was not clear on what simply and quickly meant and anything that I've seen so far that's been done simply and quickly has been highly questionable.

Q. You criticised Dr Nissenbaum's report.

A. I did.

Q. Do you have Exhibit A22 in front of you, at Tab 8.

A. Yes, I do.

Q. You've studied the chart on the second page of that document.

A. I believe this is the one you're referring to (INDICATES).

Q. Yes.

A. Yes.
Q. Do you say that accurately reflects the text that appears at the foot of the following page, save for the use of maybe a different word here or there.
A. Yes, that's assuming without actually going through it word-by-word that it's close enough.
Q. Looking at the first page of the report in the middle of the page 'In my investigation of Mars Hill, Maine 22 out of 30 adults exposed live within about 3,500 feet' you're critical of that statement in terms of it being a case control study.
A. I'm critical of any scientific investigation that uses the word 'about'.
Q. It matters whether it's 31 people or 29 people. 22 people I would respectfully suggest have been prepared to participate in this study, that's what it says, that's what it says, '22 out of about 30 people have agreed to participate'. You can't read any more into that statement can you.
A. '22 out of about 30 adults exposed who lived, were evaluated'. It didn't say 'were prepared to participate'. I have to say I'm a little surprised that someone who is so precise with language should choose to nitpick with me over the wording that's clearly stated here when the issue at hand is scientific integrity.
Q. Is your understanding that with these case control studies you need people to voluntarily participate, you cannot compulsorily force them to do something.
A. Participation is always voluntary.
Q. So my question is a fair question, isn't it; that the only way to interpret this statement is that 22 out of about 30 people agreed to participate, or if you want to use the term used, to be evaluated, that's all that that statement says, isn't it.
A. Well it says 'were evaluated'. The interpretation that they agreed to be evaluated or the basis by which they were selected and invited to be evaluated is an inference that you are making that I'm not prepared to

make because the methodology of the study is not declared. I don't know whether the study was referred to and evaluated by an ethics committee who would have insisted that the recruitment of the subjects were done by those sorts of principles -

CONTINUED

There is no information here that allows me to infer what you're wishing me to infer from this data.

Q. What about the use of the words 'were evaluated to date'. Does that mean anything to you.

A. 'To date' says this is something I'm continuing to do.

Q. Or it means only 22 out of the 30 people have agreed to be evaluated at this point in time.

A. That's open to interpretation. When one does science one requires a level of precision that does not leave things open to interpretation.

Q. So you say, 'Well, there is insufficient information presented at the moment for me to make a proper analysis or to rely on this report'.

A. Correct.

Q. Assume for the moment, for the present purposes if you can, there were about 30 people in Maine, 22 of those people agreed to participate in a case controlled study. They lived within 3,500 feet of a wind farm. They were asked a series of questions and the same series of questions were then asked of another group of people who lived about 3 miles away. Make those assumptions. Those people then respond in a tabulated form that appears on the previous page. You say, when you read that information, making those assumptions, that that is not any basis to be alarmed that exposure to a wind farm could have an effect on a person's sleep habits or their stress or headaches. Is that what you say.

A. Mr Manos I refer you back to my - let me answer the question directly first. The answer is I don't know because I can't evaluate the evidence. Let me refer you back to the statement I made about the very recently discredited mumps, measles, Rubella study. There were a number of people who stopped vaccinating their children on the basis of that study. I am unwilling to be concerned - or let me say to be very concerned - about anything where I can not evaluate the evidence. I would want to see properly collected data. This is not properly collected data.

Q. You don't know that.

A. Well, it's not stated to me that it's properly collected data, therefore I cannot know that because it's not been declared.

Q. It could possibly be properly collected data using your test.

A. It could be but it's not declared and it would seem very odd not to declare the methodology in a scientific presentation.

Q. Let's assume the data was collected to your satisfaction -

A. If this were done to my satisfaction, yes.

HIS HONOUR

Q. Would that include knowing the nature of the questions that were asked.

A. I would have to know the nature of the questions asked. I would have to know by ascertainment - all of the issues that I raised during my preliminary comments on case controlled studies would need to have been sufficient in order to be able to comment on that data as a source of concern.

XXN

Q. I moved on to this topic because you were commenting on Dr Laurie's evidence about doing some research quite quickly. If you have a group of people who live within a certain distance of a wind farm and a group of people living outside, say 10 kilometres or 20 kilometres away from a wind farm, you could quite quickly undertake a case control study of those two groups, couldn't you.

A. Could I? What are you asking me?

Q. You or an appropriate qualified researcher, someone else. That can be done quite rapidly.

A. What are you suggesting could be done quite rapidly?

Q. The survey that would need to be done. Obviously you would need to spend some time identifying the people and matching them but, if you're dealing with a series of questions, that can be a research test that can be done fairly quickly.

A. Can I refer to my statement.

Q. Yes, but that is a fairly simple question.

A. It is a simple question, and I would like to answer precisely being an advocate of precise language. Point 41, which is p.9 of my evidence statement, I would suggest that for any research to be made as to an adverse health effect from sounds that arise from wind turbines, a direct measurement of actual sound exposure as well as perceived sound exposure over a reasonable period of time, together with an objective evaluation of potential confounders and an objective assessment of the health effects is required, in accordance with the standards of public health risk assessment. I cannot see a compelling reason to recommend that this be done on the basis of the available data.

Q. Yes, my question to you is can that research be done reasonably quickly.

A. It would depend on the resources that were available to do it. It would be dependent upon adequacy of design and the appropriate power calculations to determine the number of people that were required to participate. There would be a process of protocol development, protocols then need to be peer reviewed. The peer review process would then also require that there was reference to an appropriate ethics committee, irrespective of the nature of the survey and how invasive or uninvasive we may perceive it to be. Could that be done reasonably quickly? I believe it could but that is a matter of definition; what is the definition of 'reasonably quickly'? Are we talking weeks, months, years, half a decade? What's your definition of 'reasonably quickly' Mr Manos.

Q. I would suggest to you a period of months.

A. No, I don't believe it could be done in a period of months.

Q. All those steps are necessary in your opinion to have a proper case control study.

A. Yes, I do.

Q. Even if you're not seeking to peer review it.

A. Yes, I do. If you're not seeking peer review then, you know, one would have to question the purpose of doing it because you just get back into the cyclical argument we've been having all day.

Q. Let me put to you this proposition. Let's say you live near a wind farm with your family and, after the wind farm started operating, you and the other members of your family started to suffer from headaches, and previously hadn't suffered that. Given your background and experience, do you believe that you could quickly prepare a research approach which has characteristics of the case control study that you've just mentioned, and get that out in the community in a very short period of time.

HIS HONOUR: What does 'a very short period of time' mean? It's not going to assist us because you've put to the witness this can be done in months and he's disagreed with that.

MR MANOS: That was on his formal case control study. I'm asking if he found himself in this situation, on that assumption, could he be do it.

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Q. You could do that within a couple of weeks to a month, couldn't you.

A. You're asking me to speculate on a set of personal circumstances where emotional context would override objective judgment. Is that what you're asking me to do? Or are you asking me as a witness on scientific -

Q. I'm suggesting you and your family are exposed to headaches that you previously hadn't been exposed to. You would say in that situation you would lose your objectivity in carrying out proper research.

A. When my family are sick I take them to a medical practitioner other than myself. I seek outside opinion. I can have no objective opinion at all when it comes to my family. I reserve the right to veto but that's a different matter.

Q. I'm not asking you to treat these people. I'm simply saying myself and my family have suffered headaches, I'm suggesting you could rapidly prepare a series of questions and identify a group of people who might be asked those questions to do a bit of a case control study.

A. If I did, what validity would it have?

HIS HONOUR: You might get further if you asked him whether he was retained to conduct research because you are going to continually founder on this question of his personal -

MR MANOS: The problem with that is he has indicated that, if that were the case, he would have to go through the processes he's described, which is a lengthier process. I'm seeking to ascertain if there could be a more rapid response if the Professor was personally involved.

A. I'm delighted to debate this with Mr Manos but I think this debate would waste the court's time.

HIS HONOUR

Q. Let the court deal with that.

HIS HONOUR: I don't know that you're going to get anywhere because you're going to continually founder on the rocks with his personal involvement -

MR MANOS: I don't know whether he has answered my question about losing personal objectivity -

HIS HONOUR: He may not have said in so many words but everything is indicated to suggest to me that he couldn't approach it objectively because he's subjectively involved. I don't believe this line of inquiry is going to assist.

MR MANOS: The witness has criticised Dr Laurie saying they could get a fairly rapid response.

HIS HONOUR: There are many ways of testing that. I don't know whether the way you're doing it at the moment is going to assist.

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Q. In the material you've presented to the court there are

some documents and reports about infrasound.
A. Yes.
Q. And prior to being involved in this matter, did you have any real understanding or knowledge of infrasound.
A. I did not.
Q. Have you learnt something about that since being engaged in this matter.
A. I've learnt a great deal. Does it mean that I know anything? Probably not.
Q. It's all relative. But you acknowledge that infrasound, according to one of the papers you've presented, can have an impact on human health, on human activity.
A. I saw lots of information in those papers and there was no information that led me to the conclusion that infrasound of the levels that were being monitored in Dr Laurie's own witness statement would have an effect on human health. What I was interested in is some information I came across suggesting that infrasound, if you live near the beach, is of the order of 75 decibels. That would suggest that sleeping on the cliffs with the waves crashing below you would be devastating for your health. Anecdotally - and I can't confirm this - it's rather good for you.
Q. Do you know what frequencies that 75 decibel measurement is.
A. Under 20 hertz I gather. I can't be more precise than that but it's infrasound.
Q. To come back to my question: one of the arguments that you have attached to your statement sets out reports, does it not, of infrasound having an effect on human health.
A. I evaluated wavelengths I could find that was collected with as much objectivity as I believe the authors of those reports could generate them with, and commented on that only in the context of an evaluation of human health, not as an expert in infrasound.
Q. With respect you didn't answer my question.
A. I didn't answer your question because the information

that I presented in the report, which as I started off answering your question saying, was that based on the information that I was provided with on the measurements of infrasound, and based on the information in those reports, I could only conclude that there was no risk of infrasound to human health in the development of Waubra - or the proposed development.

Q. I'll ask the question again: one of the articles that you produced that you attached to your statement deals with infrasound. Do you agree that article provides some information to say that infrasound has an effect on human health.

HIS HONOUR: There are lots of arguments -

MR MANOS: We could be here until the cows come home -

HIS HONOUR: It would be a lot easier if you put specific articles -

MR MANOS: Well, I can but I would have thought the professor could answer that particular question. If we want to finish the witness, the witness could answer my question -

HIS HONOUR: If you are precise with your questions I think -

MR MANOS: How more precise can I be to say 'with respect to the article -'

HIS HONOUR: Get the article and put it to him.

MR MANOS: I would have thought he knew the answer.

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Q. Do you have your Exhibit Y in front of you.

A. Yes I have.

Q. Have you considered the reference of the various articles on p.11 of that report, starting with the heading 'General Toxicology', starting at p.11 of that article.

A. Is this the infrasound report dated November 2001?

Q. Yes.

A. So that's exhibit 8.

Q. 7.

A. So there is two - this is tab 7 is the Colby paper which is 'Wind Turbine Sound and Health Effects'. Tab 8 is 'Infrasound'. Which one am I directed to?

Q. I am looking at tab 7.

MR HENRY: Behind tab 7.

A. Okay, behind tab 7.

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Q. Looking at the document entitled 'Infrasound - Brief Review of Toxicological Literature', with the heading 'General Toxicology', there are a hole lot of articles commented on and a brief summary in some instances provided - a brief summary is then provided under the heading of the paper.

A. Yes.

Q. Do you agree that some of those articles summarise that there is an effect on human health caused by infrasound; for example - this is qualified - but on p.12, for example, under the heading of 'Radneva'.

A. What page are we on?

Q. P.12.

A. Yes.

Q. On p.14 under the name 'Karpova'; read that summary.

A. Yes.

Q. And at the foot of p.15, for example, under the author's name 'Slarve'.

A. Yes. The commonality of those studies, if I might comment at this point, was the intensity of the infrasound and -

Q. I understand the qualification.

HIS HONOUR: Let the witness finish the answer.

A. The intensity of the infrasound on each of those occasions is above the levels that I've been indicated occurred in Waubra and are therefore unlikely to occur at Allendale. I did hear Dr Laurie's testimony that there may be infrasound levels at a higher intensity. If levels are present, indeed, at a higher intensity, the evidence has to be looked at differently, but my statement was prepared with the evidence that I was

presented with.

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Q. I understand that. Can I take you to p.23, heading of 'Studies in Monkeys', and the author 'Swanson'.

A. Yes.

Q. Did you read that very short summary.

A. Indeed, a very short summary.

Q. Had you read that prior to -

A. I hadn't read the paper, no.

Q. Had you read the summary.

A. I had read the summary.

Q. You say that, in your workings, you do work with animals for experimentation purposes.

A. Yes, I do.

Q. And monkeys are known to be used or have been used in the past for the purpose of assisting with human health.

A. Not by me, but I know some.

Q. Taking you back to p.15, you heard the evidence about the vibrations and the tingling. There is, in a sense, a reference to that issue there at the foot of p.15, isn't there, that some people experience body vibration.

A. Yes.

Q. Do you accept that at certain infrasound levels that human health can be affected.

A. Yes, I accept that at certain sound levels there are physiological effects that have been well documented and are documented in this discussion.

Q. If Mr James who we've spoken of has measured 90 decibels of infrasound at 1500 feet which is about 450 m, could that level possibly, from what you understand, affect the human body.

A. The passage that you've just directed me to says '120 to 144'.

Q. I understand that but I'm not just asking about that particular article. I don't know how many there are. There are 20 or 30 articles summarised in this paper. What I'm putting to you is, from what you learnt in relation to infrasound in this paper and other papers,

if you had a level of 90 decibels measured at 450 m from a wind turbine, do you believe that that could have an effect on the human body.

CONTINUED

A. Based on the data that exists, if people were consistently exposed to 90 decibels of infrasound then yes, it is quite possible there would be a physiological effect.

Q. You have quoted in your report Exhibit Y, from the New South Wales Legislative Council written by Dr Diesendorf. Do you know him at all.

A. I do not.

Q. Do you know if he's a medical practitioner.

A. I do not.

Q. In your report you have provided extracts of that order. This is at tab 5, behind tab 5 in your statement.

A. Yes, which page are you referring to?

Q. That document you will see from your extracts goes up to at least p.123. Do you recall the document is in excess of 200 pages.

A. Yes, it's a long document. What is here is the decision primarily. It's the executive summary, which starts and summarises from chapter 4 onwards, talking about various aspects, but includes the environment and economical impacts etc. The relevant statement I think you are referring to appears on p.160.

Q. Yes, that is the one that you have quoted from.

A. Yes. That is 7.30.

Q. I would like to produce to you the entire chapter 7.

A. Thank you.

Q. Do you recognise that document.

A. Yes, I do.

Q. So, p.116,at 7.28.

A. Yes.

Q. 7.28, 7.29 and 730, until we get to this issue.

A. Yes.

Q. Dr Diesendorf is then quoted in para.7.30.

A. Correct.

Q. I take you back to p.114 para.7.17.

A. Yes.

Q. You are in a situation in a sense, where you were a visitor to the Waubra wind farm. Did you notice any

impacts on yourself at the time that you went there, apart from the hayfever.

A. Hay fever and a cold, yes. No.

Q. And you commented that you didn't find the farm or the turbines particularly audible.

A. No, they were audible, I videoed them extensively from multiple locations. I wore a hardhat because I was required to do so. The wind through my hardhat and my cap on subsequent occasions made a little more noise than the turbine, except in one location, where I could clearly hear the turbine.

Q. Para.7.21 'Further research by Vandenburg.

A. Can I clarify something please? Have we moved from infrasound to noise. We are still on infrasound because these paragraphs refer to audible noise. So Dr Diesendorf's statement at 7.7.30 on p.116 refers to infrasound. We appear now to be talking about audible sound.

Q. Dealing with sound, I agree this is dealing with sound generally, then there is a section more specifically about infrasound.

A. Yes.

Q. But you didn't put forward all of the document.

A. No, I put forward the section of the document that dealt with infrasound, because I, as you say, was needing to find data related to infrasound and tried to view as much evidence as I could possibly find relating to infrasound. So while I could find considerable information relating to sound, might I say it's not in dispute by myself or anyone else, that wind turbines can be audible, that is not in dispute. What is unclear is the health effect from something that can't be heard. Then I had to rely on as much evidence as I could find to form an opinion.

Q. I am conscious of the time. Can I take you to p.117. You have set out in your report at p.116 and the next page to 119, p.117 is 'Committee comment'.

A. Yes.

Q. I take it you don't claim to be an acoustician. You see in 7.37 'The committee acknowledge the evidence that demonstrates that atmospheric conditions impact on noise levels'. They are just talking about noise levels there, not a particular type of noise. Then there is a recommendation at p.117. Is there any reason why you excluded that page from your paper.

A. Which is the recommendation? Recommendation 17 at the foot of p.117. Because the question I was asked was to comment on the health effects and that statement had nothing to do with the health effects.

Q. Didn't some of Dr Laurie's material suggest this - some people were having their sleep affected.

A. I haven't disputed the fact that some people have their sleep affected. It's in my statement.

Q. Is it not relevant that this committee is dealing with the issue or has made certain recommendations about noise modelling, needs to be undertaken at night-time as well.

A. Are you wanting me to be an acoustician?

Q. No, we can reasonably assume most people sleep at night. That is a fair assumption, is it not.

A. That is a fair assumption, a small part of the community, shift-workers, but the general population will sleep at night. This committee suggests further modelling needs to take place for nighttime activity. I don't think we are in any disagreement with this court that turbines can be heard and that they are heard more by some people than others. This information is in my statement. I am not entirely sure what I am being asked to comment on. Are you asking me to specifically indicate why that statement was omitted from my testimony?

Q. In effect, I am asking why you didn't put forward that page. You put forward the preceding page and a couple of pages thereafter.

A. I was dealing with health effects, and the issue of noise was not in contention, since I had already

acknowledged that some people may have disturbed sleep than others. I see no additional benefit when I have acknowledged something, in mulling over the point. I am at a loss to understand the point you are making.

HIS HONOUR: That recommendation 17 is included in the summary of recommendations.

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Q. P.118 'Vibroacoustic Disease'. See that heading.

A. Yes, I do.

Q. Again that page has not been included in your paper.

A. Yes, because I am not clear what vibroacoustic disease is or what the relevance of vibroacoustic disease is to wind farms.

Q. Even though this council committee is considering wind farms specifically.

A. The statement, if I can refer you to .7.43. Vibroacoustics is used, something that appears with very high vibration for people who were working with special machinery, like really heavy industrial machinery and the vibrations will be so heavy their cells will be disturbed. There is no way this could be the case with wind turbines, so I did not know why this is bought up as an issue. It does not have anything to do with wind turbines, that is 7.43 and it's reference is 497.

Q. You have included in your statement at p.123 'Committee Comment' 7.67.

A. Committee comments. Yes.

Q. You are not disputing the committee's comment that there is unique sound characteristic from wind farm noise.

A. No, I have made that statement on a number of occasions.

Q. The next part of it, that there are difference influences on the perception of this noise.

A. Correct and I have made that statement.

Q. Do you also acknowledge the first part of the next sentence. 'The committee further notes noise annoyance is an adverse health effect that can result from wind farms'.

A. Correct.

Q. You say that in itself is not enough basis for you to be alarmed in conjunction with the other material that has been presented and considered by you.

A. We are hearing different bits of information, so let's keep some things separate. Let's talk about noise very separately from the issue of infrasound, because if you blur them, then it becomes very difficult to provide a concise and cogent answer to your question. What I have stated in my testimony very clearly is an acknowledgement that under certain circumstances, there will be a perception of noise by people, and that may lead to sleep disturbance, and that with or without the presence of anxiety, may lead to an adverse health effect. Whether that is annoying, doesn't matter how you operationalise that. That is true, what the data says that is true for a small percentage of people. How you link that to the sort of data I have been provided and the assertions that have been made, is to me completely unclear, because if you accept that there are certain percentage of people who will have sleep disturbances, you already have information of the health effects. You know that information has been available before the Peterson paper and has never been in any dispute. So I am not entirely clear what you are asking me because I have acknowledged where I believe there is an issue, and I have questioned where I believe the evidence is unclear and I believe I have been quite consistent with that.

Q. Well you have been. What I am putting to you is when you read that committee comment in conjunction with the other information that has been presented to you, that that doesn't cause you to form an opinion that we need to further research this issue and try to work out what is causing -

A. The issue is clear, the statement is clear, the issue is clear, it has been stated by others, it has been asserted in my testimony, it's not something I am going to state in any other way, sir.

Q. Perhaps I am not clear. When you say 'the issue is clear', what do you mean by that.

A. I am saying and I will refer back to my testimony if I may.

COMSR MOSEL: 24 and 25?

A. No, it was a statement around health effects and sleep which I had before and now I can't find it. I apologise.

HIS HONOUR: Para.14.

A. Thank you. 'The issue of sleep disturbance is complex since it may be a consequence of stress and anxiety in and of itself and/or noise perception'. At that point it's perhaps relevant for me to comment that I have no testimony today, I can't recall if it's something you read out or something I heard from Dr Laurie. I believe it was the statement from Mrs Godfrey that you read out or alluded to indicating the sleep disturbance got progressively worse. So this may well be, this interplay between sleep and anxiety, is just speculating on that. A similar circumstances may be seen in other circumstances etc. If you then refer to the paper I presented on road traffic noise, which is the attachment at the back of 10, no sleep and poor health might end the relationship between road traffic noise and cardiovascular problems, and in that analysis, which I included partly to highlight the issue, but also because I consider it to be an extremely well done study and wanted to illustrate to the court what I consider to be good science, the conclusion was that the analysis showed no relationship between noise exposure nor response to noise and cardiovascular problems. Now it's acknowledged some people would hear noise, it's acknowledged that on some occasions the noise will disrupt sleep, it's unclear to me for any one individual to be consistent, the noise is at a particular location, whether it's like a car that goes past or whether it's any different to if you sleep close to a busy motorway and there are constantly cars going past, which is often

the case obviously, there is a change of amenity which may be a consideration as far as I can see from at least the journal from AR, the comments about noise being audible in the minority at the time, so if it's noise disrupting sleep it only occurred occasionally on that case.

CONTINUED

The extent to which sleep may be disrupted because of noise for any one individual on a persistent basis is unclear to me. So, on the one hand I am acknowledging this issue, on the other hand I am indicating that careful studies of the relationship between these various factors have been done in the context of audible sound, and what we haven't got clear is this murky business of infrasound, because there now seems to be some dispute about the measured level of infrasound.

Q. But there is a difference between road traffic noise or aircraft noise or -

A. Aircraft noise is much louder.

Q. But one of the other studies talks about aircraft, road transport and rail noise.

A. Aircraft noise is very loud.

Q. But it's not continuous 24/7, is it.

A. Well, I'm not sure there is an assertion that necessarily for all people turbine noise is continuous 24/7.

Q. But you understand that if the wind is blowing, a turbine might operate 24/7.

A. It might be, and I've also heard testimony that it depends on the direction.

Q. But let's assume it's operating 24/7. You've heard the sound, you hear a whoosh every less than a second. You've experienced it yourself, haven't you.

A. Yes. I find it quite relaxing.

Q. That wasn't my question. You've experienced it.

A. I've experienced it.

Q. So it is a continuous cycle, potentially 24/7.

A. Again, I can't answer the question, because I'm not an acoustician, about where you can hear it, but I will make the point that, for the most part, I couldn't hear it, other than standing under the turbine in one other location.

Q. But the committee here, on p.123, acknowledges that noise annoyance is an adverse health effect that can result from wind farms. You acknowledge that as well.

A. Yes.

Q. That can lead to sleep disturbance and sleep disturbance can have an adverse effect on one's wellbeing.

A. That's correct, although it is interesting to see the evidence tendered to the court about the relationship between adverse effects on blood pressure and turbine output and I've found none.

Q. For three people.

A. Well, I didn't produce the data. I was given the data, with an assertion that this was demonstrable evidence of how terrible this is.

Q. With respect, there was never such an assertion. You, I suggest, have read that into the information.

A. I did read it into the information from about three or four different news reports, including on ABC. I found it hard to escape that information.

Q. But your position is that you've read the affidavits in the Quinn matter, you've read the transcripts Dr Laurie has provided, let's say 50 to 60-odd people. You are not prepared to rely on those but you are prepared to rely on three blood pressure analyses to say positively that there is no correlation between wind turbine output and blood pressure.

A. Well, you are asking me to comment on the objectivity of one set of data and not the other.

Q. I'm just asking you, in bare numbers, it seems odd that you are seeking to rely on three numbers, but when there's 50 samples provided, you don't want to rely on those.

A. I was provided with data that I could objectively evaluate. I objectively evaluated the data I was provided.

Q. Turning to the last page of the document that I provided to you, p.125, you see a heading 'Committee Comment', para.7.79. In your statement you've touched on the issue of emotional effects. Have you read that paragraph 7.79 prior to today.

A. Yes.

Q. You didn't think it was important to include that in your attachment.

A. I have already included that in my attachment. I have indicated at point 12 'The anecdotal evidence that some people living in the vicinity of wind farms', etc., that is quite clearly stated. I've talked again about the issue in point 14 which addresses it. I'm not sure how more explicit you would wish me to be.

Q. You would agree that if someone suffers depression from whatever cause, as a result of living near or adjacent to a wind farm, that that is an issue that needs to be addressed.

A. If you're attributing cause and effect and you're saying that the depression is due to loss of amenity, or are you saying that the depression is due to infrasound, or are you saying the depression is due to audible sound? You know, there are many, many issues that colour this, and I think we've been through all of that with the evidence from the paper from Dr Peterson, which is not in dispute, with the evidence relating to other developments of a similar type that have environmental impact, that's not in dispute. These are phenomenon that are broadly associated with many different things. I'm not sure they can be directly ascribed in a cause and effect basis to sound from a wind turbine. So there are some things that, although I wish I could comment on with better clarity, I can't, because the information that I have been provided with is vague, in the sense that there is no sufficient dissection of cause and effect relationships. Does that constitute a need for additional research? I don't think so, because I think there is sufficient clarity around what already exists, and the issue then comes down to public health risk assessment, and that's a matter for the court to decide in the planning context.

Q. What I am putting to you at the moment in relation to this passage is that the emotional response is a factor that needs to be considered and, if that leads to

depression, that is an adverse health effect.

A. The emotional response to anything needs to be considered and is always in the context of many other factors that occur in people's lives.

Q. You touched on the nocebo effect in your statement. In your discussions with people in Waubra, did you form any opinion that anyone was suffering from that effect.

A. I did not.

Q. How many people did you speak to in Waubra.

A. Probably half a dozen.

Q. Who live near or adjacent to the wind farm.

A. Yes.

Q. Did any of them report any adverse effects to you.

A. No.

Q. Any adverse health effects.

A. No. The only anecdote that was reported to me was of someone's relative, or friend, I should correct myself, who had bipolar disorder and, when feeling particularly fragile, found that being on the wind farm improved that situation.

Q. What if 10 people reported that to you.

A. That they felt better?

Q. Yes, if they had bipolar and they went near a wind farm.

A. To be honest, it is an anecdote, and I wouldn't know whether it is the country air, the removal of city-related stress, seeing a friend. It is an anecdote and it doesn't appear in my testimony because it is an anecdote and I highlight it only to say I am not willing to rely on anecdotes.

Q. My question is: say you had reports of 10 people who experienced those phenomenon, undertook that self-treatment, that when they are on the edge of their psychological condition, they go to the wind farm for self-treatment, would you report that back to your colleagues in that relevant area.

A. I would be very sceptical and let me tell you why. When I worked in general practice in New Zealand, my colleague was doing chelation therapy. It is a

discredited form of treatment for cardiovascular disease. It is based on running a chemical called EDTA through a drip into the veins and it's meant to leach out all the plaque and cholesterol, and of course it leaches out a whole lot of other stuff, so they run that in through another drip. There was this very firm belief, because he had seen two or three people improve, that this must be a good treatment, but subjected to proper study, it is not a good treatment and, in fact, it is associated with significant harm in a number of circumstances. The point is that you can believe your own publicity if you're not maintaining a high level of scepticism and objectivity in your evaluation of data.

EXHIBIT #A25 CHAPTER 7 OF THE GENERAL PURPOSE STANDING COMMITTEE NO.5 TENDERED BY MR MANOS. ADMITTED.

Q. As I understood your evidence-in-chief, you have an interest and expertise in relation to sleep disturbance.

A. We are conducting a study at present which involves home sleep studies.

Q. Without breaching your client confidentiality, do you have any patients who are exposed to noise 24/7, if I can use that term again.

A. Yes. The interesting question, to which I don't know the answer as yet: in the study, we have a series of questionnaires that deal with the issue of noise. We also have the capacity in the agreement to do geographical mapping, which would give us an idea of traffic density at any particular locality. We also ask people about shiftwork, which of course is important in circadian rhythm, day/night shifts. The sort of issues are: what time do people go to bed at night; what time do they wake up in the morning; how much coffee do they drink before they go to sleep; how much alcohol do they drink; have they had a fight with their wife or partner or kids or neighbour or so on. They will all have an effect. A bad day at work, and the many other vicissitudes of life will affect sleep, including

medication use and a multitude of factors. We try and ask about all of these, including, as I say, the issue of shiftwork, and in the most recent version we are trying to incorporate some issues of noise exposure, although it's very difficult, unless you've got an objective measure of noise, as well as a perceived measure of noise - and this is a debate that now goes backwards and forwards - but in as much as we can objectify by GIS mapping, we will have that data. I don't know that I can tell you any more than that yet.

Q. But your report at least is considering road traffic noise, and that, I would suggest, is unlikely to be operating 24/7.

A. Well, I can't tell you which of these people have airconditioners running in their house at night, who can hear the refrigerator, the neighbour's airconditioning unit running, I can't tell you who's got ceiling fans going, I can't tell you who's got those fancy rotary watering thingies going out in a paddock that can make a noise. I can't tell you all of the sources. There are many sources of noise, like dogs bark, birds, crickets. Some of these noises are appealing, some of them are unappealing, and I guess the definition of noise is 'I don't like what I hear'.

Q. You mentioned airconditioning. Do you recall that in the affidavits in the Quinn matter, a number of people said they turned on their airconditioners to drown out the sound of the wind turbines.

A. I can't give you a number.

Q. But you recall reading that some people said that.

A. Yes.

Q. Did you read into that that they were seeking to get a continuous sound, rather than hearing the whoosh every one or two seconds.

A. I interpreted that as people who are very annoyed with the sound of the wind turbine and preferred one form of noise over another. I sometimes prefer listening to music to hearing the dog bark.

Q. Do you say that's a good analogy, do you.

A. It's not a good analogy. It's an analogy. I don't comment on the quality of it.

Q. Do you agree, from your knowledge and understanding of sleep disturbance, that continuous noise may have less impact and disturbance than a noise which is cyclical, like the whoosh of a wind turbine.

A. I think that that is an interesting question, and the question to which people may or may not accommodate to a specific type of noise - and I've raised that issue in my statement - which is about sensory integration, is an open question, and I've acknowledged and mentioned that sensory integration may be one of the mechanisms. So I've not ignored that at all.

Q. You haven't ignored it, but you haven't also answered my question.

A. Perhaps because I didn't follow it clearly enough. Maybe I should have asked again.

Q. What I was putting to you was that, with your experience and background and understanding of sleep disturbance, continuous noise may have less interruption on your sleep patterns than a cyclical noise of a whoosh of a wind turbine every second or whatever period of time it takes.

A. And what I answered was that the notion that that may be the case was presented in my evidence, that the inability to accommodate the intermittent noise may be more difficult than continuous noise, that's the sensory integration. That was in my statement, Mr Manos. I'm pleased for the opportunity to clarify that for you.

Q. You've also attached behind tag 4 a report from the English Wind Energy Association, and the first page of that is a chart, which I think is prepared by others, and that just gives some indicative noise levels. Would you agree that generally the noises that have been generated by the types of activities are likely to be intermittent noises, not 24/7 noises.

A. I think that would probably be true for everything

there.

Q. A busy general office, I mean, people don't work 24 hours a day, but that could be a continuous noise.

A. I'll make the statement again: I think that would be true for everything on the list.

Q. It's not really fair to therefore compare the wind turbine noise which might operate 24/7 with those sorts of activity/noise sources.

A. I believe I'm hearing an assertion that I haven't been able to verify in the diaries, for example, that I was given that the wind is audible 24/7, and also I was under the impression that, depending on the wind direction - I heard this from Dr Laurie - that there was some intermittency and some remission from the sound of the turbines depending on environmental circumstances. So I believe that intermittency, as in periodic let's say, may well be a characteristic of all of these.

Q. Say you're at home for an entire week, you live on your farm, and the wind farm adjacent, 500 m away or 800 m away, is operating 24/7 for that entire week. The circumstances of that are going to be different to the examples that are set out of the various noise levels at tab 4. Would you agree with that.

A. What is the assumption I am to be making: that I can hear it; that at a distance I can hear it; that I am not at work during the day? I am not sure what you are asking me to assume.

CONTINUED

Q. I said you are there 7 days, the entire time you work on the farm.

A. Okay.

Q. And you can hear the wind farm.

A. Okay. Look, I know what you are getting at and it's a contributory negligence question. I don't know the answer to the question because when you work on the farm there are many other sources of noise, including the things that go touk, touk, touk round and round watering, which to my mind makes as much noise and as a irritating as a turbine. The extent to which someone might be irritated and annoyed and therefore upset and affected by the noise of the turbines as opposed to the myriad of other noises you get on the farm, the harvester, the tractor, the birds the crickets, the wind, I am sorry I can't answer that question.

Q. But none of those other noises, again, are ever going to be intermittent, they are not there 24/7 and whoosh every one second.

A. I believe I have indicated - I am also uncertain that your assertion that the turbine noise is there 24/7 is capable of being substantiated because that is not what I have taken away from the evidence to date.

Q. How long did you spend near or adjacent to the Waubra wind farm.

A. I was there for a day.

Q. I don't assume you were there for 24 hours.

A. I'm talking about the evidence in court, not my experiences at Waubra. The assertion has been made that it will depend on environmental conditions and quite clearly in many of the statements it says the wind, the noise is not always present. So, you know, on the one hand I'm perfectly willing to acknowledge all of the issues you raise but you are trying to push me into a corner to acknowledge something here which I think is not consistent with the evidence I have heard to date and I am finding this distinctly uncomfortable.

Q. During the time that you were at Waubra do you

understand that the wind turbines were turning.

A. The wind turbines were turning, I could see it.

Q. Looking at Exhibit A24, which is the document which is the personal journals of Dr Lawrie, behind the last tab of the power outputs. Just turn to 13 November 2010. Do you read that graph to indicate that the wind turbines were operating 24/7 or, I should say, 24 hours.

A. On that particular date?

Q. Yes.

A. Yes.

Q. If we go to 24 November, they are obviously off for a substantial period of the day.

A. Yes, may I ask you a question?

Q. No. With his Honour's permission you might.

A. May I ask a question?

HIS HONOUR

Q. If you are not sure of what he is getting at that's fine but if you don't understand the question -

A. I'm not sure what he is getting at in the context of the relationship between the graph which demonstrates power output and audibility, which is what the question relates to, and therefore I'm unsure as to what I'm answering.

Q. I think you can say you are unsure as to what you are answering and if Mr Manos wants to pursue it he can pursue it.

XXN

Q. Do you understand that an operating wind turbine generates noise.

A. I understand that an operating wind turbine generates noise, I also understand that the noise and the intensity of the noise varies according to climatic and environmental conditions and also the position in which the noise is measured.

Q. On 13 November 2010 the turbines seem to have been turning the entire 24 hours.

A. Yes.

Q. I suggest to you there is every possibility that at

least one property would have been exposed to continuous noise during that period of time, and that property would have heard the noise and would have heard the whoosh every second or so.

A. On 13 November there is no record of individual AR in diary having heard the noise. Which individual are you referring to?

HIS HONOUR

Q. Maybe we can short-circuit this. If you were invited to arrive at an assumption contrary to your understanding of the evidence, that assumption being that unlike road traffic noise, unlike some of the other noises, the wind turbine noise was constant for every hour of every day over lengthy periods of time, would that situation, if you were asked to assume that, and the quality of the wind turbine noise cause you to see that that noise would be different from road traffic noise and other noises in terms of its annoyance.

A. The short answer is I can only speculate on that, I can't give you an answer with any degree of certainty or knowledge, but I can say that if you had to think it through from first principles, a noise that was constant that didn't have any intermittency about it that was highly predictable in its constancy may well cognate to better than if the noise came and went. So one can speculate on these things in different directions, it is quite clear that the presence of the noise, and the acceptability of the noise are going to be variables which will impact on any individual's experience and if that individual's experience is adverse then it is adverse for them, there is no debating that.

XXN

Q. And we at least in relation to some of the people in the Howard area that that noise impact is averse and hence they turn on their air-conditioner.

A. That is clearly stated in some of the testimonials, that is correct.

Q. And what I'm putting to you and his Honour's question,

what that all means is, that can really impact on sleep patterns and result in sleep disturbance. Sleep disturbance can have a negative health impact on a human.

A. That's correct and this is what I've acknowledged. So that I will refer you back to statement 14.

Q. I understand that. If, in addition to the audible noise from the turbines that are operating 24 hours, in the example you used and the assumption you are making, there is also infrasound, say at 90 decibels, would you agree that that also could potentially affect one's sleep.

A. You are asking me to speculate on the conformance of infrasound and audible sound. I can speculate on infrasound at 75 decibels when it comes from the intermittent crash of waves on the beach doesn't appear to have an adverse effect, if we talk about a variance of 15 decibels of infrasound I honestly do not know. I can't even begin to speculate on that matter.

Q. But you acknowledged earlier that at 90 decibels infrasound could have an adverse effect on the human body.

A. Yes, and the question did not relate to sleep. The question related to the adverse effects that were among those listed and the statement I believe at the time were physiological effects or effects on physiology, and it's an open question as to what those are.

Q. So you can't assist the court as to whether or not if we got audible sound in addition to, say, infrasound at 90, that that may also be another factor that affects one's sleep pattern.

A. If you have audible sound and infrasound at 75, which is the intermittent crashing of waves, which is the closest I can get to this, it appears not to have any adverse effect. Now that's the only way I can conceptualise this because that's the only term of reference I have.

Q. In your experience with waves do they come in as frequently as the whoosh say - I'm talking about

different concepts here - with a wave is the audible part, you hear the crashing of the wave every few seconds, whatever, it is not as frequent -

A. It depends a bit on the rides and the weather, I suppose.

Q. But have you ever experienced waves that come in every one second.

A. I think I have certainly been at the beach where the waves have come in quite frequently.

Q. Not every second.

A. I can't tell you because usually I'm asleep.

Q. Early in your evidence - I didn't fully understand it and that's a failing of myself - you made some comments about a person who is coming and going, that the symptoms seem to go when they leave. You recall that evidence.

A. Yes, it's based on the information in the journal which Dr Lawrie has referred to.

Q. AR, for example, was at Philip Island and there was some changes in the cognition. But you have heard it reported that people who are affected by wind turbines their symptoms can dissipate or disappear if they move away from the wind turbines. You understand that that is what people are reporting.

A. People are moving away from their lives there, whether it's specifically - I mean we get back to cause and effect relationships. You know, you are wanting me to speculate that - implying that it is cause and effect from the turbines, insofar as the turbines are the source of their distress and whether that's because they are there and everything that's associated with their lives there and the conflict and the entire issue. Frankly, when I get away from work and everywhere my blood pressure goes down quite significantly, I'm sure yours is much lower at the cricket other than when Australia is losing and I'm sorry about that, but I think that there are many, many, many factors that affect blood pressure and to assert that when you move

environment that it can be directly attributed to the turbine is a bit of a stretch. Now that's not to say it is or it's not to say it isn't, it's just to say one can't be sure.

Q. If you have an adverse reaction to something, moving away from the source can benefit you can't it. I give you a simple example, there is a putrid smell, if you are nauseous your response is to move away and hopefully that nausea will pass quickly. Why is that different to, let's say, let's assume that some people suffer headache when turbines are operating, when they move away from the vicinity of the wind turbines their headaches disappear, why is that different.

A. So the issue is cause and effect relationship. So do I have a headache because I'm stressed by the turbine or do I have a headache because I've got sleep disturbance from the turbine?

Q. Or the turbine, for whatever reason, has caused the headache.

A. You know, if it's 'for whatever reason' then you get into the murky territory of is it because of the sound, is it because of the infrasound, or is it because I don't like what I see and hear? Other than that is it because I've been involved in some community action order or are there other aspects of my life that are made difficult by this, because of this or in association with this? I think if the evidence was bringing out the consistency of the issues and they were dissected through in that manner, I think you would find people around the world would be far more convinced about the matter than what I have presented in my testimony, which is to say that I find the anecdotal reports to be difficult to hang my hat on as meaning anything specific other than the fact that there are a group of people who feel unwell, but I cannot ascribe cause and effect to that with any degree of certainty.

Q. If, say, a person was suffering vibrations when wind turbines were operating, they move away and the

vibrations go; do you imagine vibrations can be, for want of a better word, started by the human mind.

A. Yes, I do. In fact just recently in one of the medical journals, and I can't remember which one but it was one of the kind of premier ones in the top tier, reported a syndrome which is phantom vibrator syndrome where you artificially feel your telephone or your pager vibrating in your pocket. Now I get that.

Q. I get that too, what does that mean.

CONTINUED

A. You tell me.
Q. You read the article.
A. It means that there's this mind/body connection and you can fantasise things that aren't really there; you get that, I get that. Does it mean the vibrator was in the pocket at the time?
Q. You're saying that you think there is a possibility that the human mind can cause one's lips to vibrate.
A. Absolutely.
Q. And chest vibrations.
A. Absolutely. When I get anxious before exams I get twitching of my eyelid.
Q. But if these symptoms are only occurring when the wind turbines are operating is there any cause and effect relationship there.
A. We don't know. We've just been through an agonising analysis of the blood pressure trying to point out whether the turbines are on or off the blood pressure can be equally high.
Q. That's a different issue.
A. Why is it a different issue?
Q. You have pointed to an article about road traffic noise not having any impact on the cardiovascular system in general terms is the summary.
A. The point is the same, the point is there is a mind/body connection and when you account for that you don't find the effect of the road traffic noise.
Q. And there's anecdotal evidence to say when wind turbines are operating people suffer headaches or vibrations or chest tightness.
A. I don't think the anecdotal evidence that's the case has been presented with sufficient clarity or rigor that satisfies at least my analysis of it that that's the case.
Q. Could it be that the infrasound is the root cause of these problems.
A. You're asking me to speculate on infrasound.
HIS HONOUR: The professor has been at pains to tell

us he's not an expert in intra sound.

MR MANOS: He's learned a lot but learned nothing I think he said.

HIS HONOUR: I'm not sure that asking him to speculate that infrasound can be the root of the cause is really going to help us.

MR MANOS: Let me ask a different question.

XXN

Q. The ear picks up audible sounds, sounds are vibrations are they not.

A. Sounds are vibrations, yes.

Q. And the infrasound is at frequencies from 0-20 Hz which the ear doesn't detect as an audible sound.

A. Correct.

Q. When I say 'the ear', the brain doesn't pick up the audibility of that sound.

A. Correct.

Q. But any noise that has been generated results in a vibration which is then picked up by the ear. Could it be that infrasound, being present the whole time, is causing a continuous vibration which then can affect - creates a vibration in the head which then causes the brain to vibrate giving rise to the headaches.

OBJECTION: MR HENRY OBJECTS

MR HENRY: That's just an invitation for speculation and it doesn't seem to be -

OBJECTION UPHELD

MR MANOS: Because it's beyond the witness's expertise?

HIS HONOUR: For the very reasons that I said in the previous interchange; that this witness has taken us as far as he can with respect to his knowledge of infrasound and asking him to speculate, from a medical point of view, based upon what infrasound may or may not do is not going to help us.

MR MANOS: I would have thought it might be a key to the whole matter.

HIS HONOUR: I've ruled on the question and it's not

going to assist your case for you to debate it any further.

XXN

Q. In your workings more as an academic have you had cause to adopt the precautionary principle that you've seen some information, if you like, research, which is setting alarm bells ringing and you then implemented a process where steps should be taken fairly quickly to deal with that issue.

A. I do not believe so.

NO RE-EXAMINATION

NO FURTHER QUESTIONS

WITNESS RELEASED

+THE WITNESS WITHDREW

HIS HONOUR: Where do we go from here?

MR MANOS: You will be pleased to know that I didn't ask Professor Wittert any questions about animals even though I had some questions. I'm assuming I'm going to be commencing on Monday with my lay witnesses again.

HIS HONOUR: Who are?

MR MANOS: Mrs Godfrey, Mr Stepnell and Mr Manning.

HIS HONOUR: And that will complete your case?

MR MANOS: I wish I could say yes.

HIS HONOUR: Why can't you?

MR MANOS: Because there's an issue that was raised with me at lunchtime that we need to investigate.

HIS HONOUR: I think it would be fair to all the parties, and indeed the court, if we are let into this issue.

MR MANOS: I would be happy to discuss it with you in chambers with counsel but I don't wish to make it public.

HIS HONOUR: When we rise we will see counsel in chambers because I don't want to leave without having some idea where we are going.

MR MANOS: But subject to that that would be my case.

HIS HONOUR: Given that you will be needing to raise

MR MANOS CALLS

+SARAH ELISABETH LAURIE SWORN

MEDICAL DIRECTOR, WALKER FOUNDATION

+EXAMINATION BY MR MANOS

Q. I think you were engaged to assist in relation to the proposed wind farm by Acciona in Allendale East.

A. That's correct.

Q. You have volunteered your services in that regard I think.

A. That's correct.

Q. You're not being paid anything.

A. No, not at the moment.

Q. I think you've prepared an initial report for the purpose of the court hearing.

A. Yes, that's correct.

Q. Looking at the document now prepared, is that a copy of the document.

A. Yes, that's a copy of the document.

Q. And you have signed that document.

A. Yes, I have.

Q. You've made a declaration on p.11 in relation to the matter.

A. Yes, I have.

Q. And I think you were provided with a copy of the declaration in the usual form but you wished to modify that declaration at the time you prepared this document.

A. Yes, that's correct.

Q. Can you just explain why you slightly modified that declaration.

A. Yes, I will. I was concerned that my position in terms of being an expert witness was going to be compromised because of the fact there's a proposed development near my home and because of that, I would be perceived to be lacking in independence. Whilst I am actually keen to find out the truth of these issues in terms of the health effects of wind turbines I also didn't feel it was realistic to put myself forward as an expert witness for that reason.

Q. That document still sets out your opinions in relation to the matter.

A. Yes, it does.

Q. There were a couple of changes, additions that I wanted to make as an update, if you could tell the court about those.

A. On p.9, in the first paragraph where it refers to Dr Jason Cruickshank. Dr Cruickshank Isn"t yet collecting data on the patients with stories of acute hypertensive crisis. That's on hold for now, the only other date is that the one of the sleep position in Ballarat is collecting data and participating in the study. So that was the only addition to that document.

Q. I tender that document.

EXHIBIT #A20 REPORT OF DR LAURIE TENDERED BY MR MANOS. ADMITTED.

Q. You were then asked to respond to some information that the solicitor has taken on behalf of what Acciona had posed. I think you provided that information by way of email response to me dated 7 December 2010.

A. Yes.

Q. Looking at the copy produced to you, is that a copy of your email to me, responding to that request.

A. Yes, it is.

Q. There is an attachment to that document.

A. There is.

Q. Entitled 'Transcript taken by Dr Sarah Laurie'.

A. Yes, that's it.

Q. That forms part of the email.

A. It does.

Q. I think you have got some little changes that you would like to make to the transcripts.

A. Yes, there are. The first one was an inadvertent error. I just made a mistake in terms of the subject number reference. Subject No.20 'Parents' which are referred to, if you look under subject No.20 at the end I've referred to his elderly parents as being subjects 19 and

20 in my original transcript. That is incorrect. They are subjects Nos.24 and 25. The other changes: subject No.39, an update to this, this was a patient who had a history suggestive of an acute hypertensive crisis, I was able to obtain her medical records with her consent and it showed that in fact she didn't have an episode of an acute hypertensive crisis on that occasion.

Q. So you would strike out the fourth sentence.

A. Yes.

Q. That's what we should do.

A. Yes, that's correct.

Q. Are they the only changes to the transcript.

A. No, there's one more, which is an addition, subject No.20. About halfway through it refers to the fact that he was having cardiac investigations done. I've received confirmation from his GP and from him that he had a 24-hour halter monitor test done just prior to Christmas, which included blood pressure measurement and that result, I haven't seen the reported result, however his GP and the patient both told me that his nocturnal blood pressure at night apparently when he was asleep was markedly elevated.

Q. You said a halter measurement.

A. Halter, blood pressure halter monitor test.

Q. What is that in layman's terms.

A. A halter monitor test is a continuous ECG trace of your heart rate. It's not something that a patient measures themselves. It's something that a technician or doctor would fit you with and information about your heart rate and your blood pressure is transmitted into a little device that you wear on your belt or in a pocket and then it's read by a technician cardiologist later. As a result of that test his GP is so concerned about the level of his blood pressure being so high despite having normal blood pressure during consultation in the doctor's rooms and also when he was measuring it at home, that she started him on antihypotensive medication and he's reported me in the last few days that he's now

getting dizzy during the day.

Q. You make those additional comments in relation to subject No.20.

A. That's right.

MR MANOS: I tender that email and the transcripts.

EXHIBIT #A21 EMAIL AND ATTACHED TRANSCRIPTS TENDERED BY MR MANOS. ADMITTED.

HIS HONOUR: I'm admitting all these documents because I don't hear anything to the contrary from the respondent. I assume that's the case.

ADJOURNED 1.05 P.M.

RESUMING 2.19 P.M.

Q. Before lunch we were considering some of the documents you presented. The next document I think you prepared is an addendum to your original report, which is exhibit A20. Looking at the report entitled 'Addendum of Dr Sarah Laurie' dated 7 December 2010, attachments under tag 1, is that your addendum report.

A. Yes, it is.

Q. That addendum I think largely reports on a conference that you attended in late October in Canada.

A. Yes, that is correct.

Q. You attached to that report some extracts from I think some of the papers that were presented at that conference.

A. That is correct.

MR MANOS APPLIES TO TENDER DOCUMENT

OBJECTION: MR HENRY OBJECTS

MR HENRY: I have got an objection to some of the material in the addendum report.

HIS HONOUR: I thought you might.

MR HENRY: Particularly at p.4 of the addendum report, which is at tab 1. The addendum report dated 7 December 2010, p.4 there is a heading 'Other information from Canada animal/insect observations made by residents'. Leaving aside the whole question about the hearsay nature of the material which is being discussed, these passages, particularly the first and second paragraphs, seem to be directed to the question of whether there might be adverse effects on animals and whatever Dr Laurie's qualifications might be, as I understand them they don't extend to matters of veterinary science.

HIS HONOUR: What do you say about that, Mr Manos?

MR MANOS: I don't think it has been put forward on the basis that the discussion is seeking to prove that the wind farms are causing injury, if you like, to animals but rather Dr Laurie's reporting on the discussions that she had which arose during the course

of her attendance at a conference specifically about wind farms. In my submission, they are generally relevant.

HIS HONOUR: On what basis?

MR MANOS: Just in relation to her reports of what she was informed about when she was in Canada. Professor Whitham in his report, which is not before the court yet, makes reference to low lambing rates at Waubra. So there is a connection back, if you like, to animals generally. So, I don't think what is being put forward by Dr Laurie is seeking to prove the truth of any impact on animals rather than simply reporting what she has been told.

HIS HONOUR: Let's assume, to take a silly example, that she was told that these turbines cause earth quakes. It wouldn't be relevant, would it, if there is no foundation for it for us to receive wildly exaggerated claims. So, generally speaking the fact that she is told things doesn't take it anywhere. It has still got to be relevant, doesn't it?

MR MANOS: We are dealing with a wind farm that is proposed in an area where clearly there are animals. It is a matter that the court needs to consider in a general sense.

HIS HONOUR: Why?

MR MANOS: Because the circumstances of the land in which the wind farm is proposed is such that it's primary production land effectively zoned that way, largely used that way, and issues of animal behaviour -

HIS HONOUR: What are we to make of it though? Because it is the subject of expertise, isn't it? If there was to be a suggestion that these turbines cause problems with animals, as I recall this is one of the things that Mr Henry raised before we arose on the last occasion, namely that if you were proposing to call a farmer from the South East or wherever who was going to talk about health effects with respect to animals, he would be objecting because it was the subject of

expertise. Now, isn't this just another way of getting this sort of evidence in?

MR MANOS: No. Given the circumstances of the land say used for primary production purposes in a general sense surrounding the area of the wind farm, it is a relevant consideration that there had been some reports about impacts on health. That is not to prove that there is a link. It is simply a report that that is what has been told to Dr Laurie. It is not seeking to prove the truth of it. If this wind farm was proposed in the middle of the CBD then we probably couldn't care too much about what the worms are doing or otherwise which is commented on as well but it is just a general issue that is reported and, therefore, affects the knowledge of this witness and this witness has come forward and identified that information. Can I just say, from my discussion with Dr Laurie if she had been told that a wind turbine could create or have an impact, likely to have an impact on an earth quake, I believe she would put that forward. She is reporting to her all information that she has received in relation to wind farming.

HIS HONOUR: She is giving evidence as an expert in matters of human health, not animal health. I uphold Mr Henry's objection and the court will disregard the references to animal/insect observations.

OBJECTION UPHELD

EXHIBIT #A22 ADDENDUM TO REPORT OF DR LAURIE DATED 7/12/2010 TENDERED BY MR MANOS. ADMITTED.

XN

Q. The next document I produce to you is a document called 'Further articles and information considered by Dr Laurie'. Looking at the document now produced to you, is that booklet a series of articles that you have had regard to in your consideration of the matters in both your original report and the addendum.

A. Yes, that's correct.

MR MANOS APPLIES TO TENDER DOCUMENT

OBJECTION: MR HENRY OBJECTS

MR HENRY: I object in particular to the document at tab 3 which seems to be a statement of evidence prepared by one Daniel Shepherd for a New Zealand court appeal concerned with a particular proposal for a wind farm. It deals with acoustic issues. This is not a learned article. It is not an article published in a peer review journal. It is simply a piece of evidence which has been drafted for a particular purpose by a particular expert in respect of a particular proposal. The difficulty with this matter going in is that these documents are generally understood only when there has been an opportunity for and, indeed, the fact of a cross-examination on the document itself. Ordinarily you don't cross-examine the author of a peer reviewed article in a journal but we know that often shades of meaning arise from appeal statements and only in cross-examination. It would be inappropriate for the court to receive Mr Shepherd's statement of evidence which was clearly tendered in a contested court matter in New Zealand.

HIS HONOUR: Did that preclude the reception of any of it?

MR HENRY: I would object to it all being received unless there is some further explanation as to which parts of it have been relied upon and in what way. I would object to the totality of it.

One of the difficulties is that we are told that these are simply articles and information which have been considered by Dr Laurie in the formation of her opinions but it is not identified in what way they have influenced the formation of those opinions. So, we are somewhat in the dark as to what use is to be made of these documents.

HIS HONOUR: That's a different matter I guess, Mr Henry. I am sure that if this was to be admitted we would hear about the use to which we are to make of it I

guess. Whilst I can see that it may well have been prepared for a hearing, it is, in a sense, a statement of evidence. There is a lot of general material in there, is there not?

MR HENRY: That's true.

HIS HONOUR: There is reference to standards and then reference to articles and reference to studies, do they fall into the same category of needing to be read in the context of the circumstances surrounding the particular hearing or could they not stand on their own?

MR HENRY: They wouldn't necessarily stand on their own if they had been put together as part of a statement of expert evidence for the purposes of a particular appeal proceeding for a particular proposal. We don't know enough about the context of that proposal or that appeal proceeding to be confident that what is said is a complete and reliable record of the body of scientific information which is relevant to the issues before this court. That's the difficulty.

HIS HONOUR: I understand what you are saying but I just see so much of what is contained within this as being of very much a general nature and it is almost like the author of this has put his name up and then produced a whole series or referred to a whole series of studies really. The extent to which we would rely upon them might be the subject of debate but whether they are inadmissible because they have formed part of an expert statement, I am not sure that I necessarily see that.

MR HENRY: I am in the hands of the court. I have made my objection. If the matter goes to weight I will make submissions at the end of the day.

HIS HONOUR: It is a matter I think that goes to weight and we will admit it. If that is the only part that is objected to we will admit the further articles and information considered by Dr Laurie.

EXHIBIT #A23 FURTHER ARTICLES CONSIDERED BY DR LAURIE TENDERED BY MR MANOS. ADMITTED.

XN

Q. The next document is a document entitled 'Personal journals recording blood pressures etc'. Looking at this document, is this a document that you have in effect put together as following information that you have received from various persons who are identified by their initials living in the Waubra area and then attached to some power output data from the Waubra wind farm.

A. Yes, that is correct.

Q. The charts that appear under the first few tabs, are they in a form which you had some input into.

A. All I did was design the pro-forma. I had nothing to do with the material that was put in there.

Q. You designed the layout and asked these people to fill out the document.

A. Yes, that is correct.

Q. You have the names of the persons whose data is recorded.

A. I do.

Q. And would simply protect their confidentiality by simply inserting their initials.

A. Yes, that is correct.

EXHIBIT #A24 DOCUMENT ENTITLED 'PERSONAL JOURNALS RECORDING BLOOD PRESSURE ETC.' TENDERED BY MR MANOS. ADMITTED.

Q. The individuals whose details appear in Exhibit A24, they are all people you have spoken to personally.

A. Yes.

Q. In Exhibit A21, which was the email where we had the transcript where you spoke to all of those people.

A. Yes.

Q. Approximately how many people have you spoken to personally to discuss medical issues with them who live near or adjacent to a wind farm.

A. Okay, in combination with the Australian people and people that I met at the conference and people I stayed with in Ontario, it would be around 60.

Q. Have all of those people reported to you any adverse symptoms as a result of living near or adjacent to a wind farm.

A. Yes, those people have. There have been a couple who said they live adjacent to a wind farm and they have had absolutely no health problems.

CONTINUED

Q. When you say a couple, could you quantify, is it two, three, five, 10.
A. Two, three, yeah.
Q. I think you've also read the affidavits that were prepared and filed in another court proceedings.
A. Yes, that's correct.
Q. Looking at the bundle of documents now produced to you, is that the bundle of affidavits that you have also had regard to.
A. Yes, that's correct.
Q. Have you spoken to any of the deponents to those affidavits personally.
A. Yes, I have spoken to a couple of them.
Q. In person or by telephone.
A. In person. In person with three I think and by telephone with one. Let me just double-check. Yes, two in person and one by phone.
Q. Can you indicate from -
A. Sorry about that. It's three in person and one by phone.
Q. Would you be in any breach of any confidentiality if you were to identify who those people are.
A. No, I don't think so. I have spoken in person with Eileen Quinn, Graham Andrew Thomas, Robin Anne Thomas and I've spoken by phone with Paul Jeffrey Wedding.
Q. Did you discuss with them matters that are deposed to in their affidavits in terms of their experience in living near or adjacent to the wind farm.
A. Yes, I did. I did not discuss the contents of their affidavits. I just asked them what had changed for them since the turbines had started.
Q. So that's information you have taken into account in terms of preparing for today's hearing.
A. I didn't take the contents of the affidavits to put in the transcript. The transcript's contents is purely what I obtained from them personally but I am aware of this, yes (INDICATES).
Q. For the purpose of giving your evidence today, you've

considered that material.

A. This material, yes, I have (INDICATES).

MR MANOS: On that basis I seek to tender that bundle of documents.

MR HENRY: In my submission, that's an insufficient basis on which to tender a bundle of documents. Simply to say, presumably this is post the preparation of the formal report and the addendum, it seems that the witness has now been given a series of affidavits that were tendered in the other matter, the matter of Quinn, and said 'Have you read these before you came along to give evidence'.

No question has been asked as to what effect the affidavits might have had on the opinion or the evidence that is to be given and to simply tender them on that basis, in my submission, is an insufficient basis on which the court would receive them.

We are not dealing here with a peer-reviewed journal article. We are not dealing with some expert report. We are dealing with a series of factual allegations and I'm conscious that your Honour might not have seen this document but the two commissioners might have because it's material that was tendered in the matter of Quinn v AGL.

HIS HONOUR: I'm aware of it because we discussed this earlier on in the hearing during the evidence of Mr Quinn when it was sought to tender these affidavits and I ruled that we wouldn't receive them for some of the reasons you are probably now going into, namely, that I am not privy to the information that surrounded the hearing of that matter, whilst my colleagues may be, and that I think I indicated to Mr Manos at the time that I thought that, rather than assisting me, it may give me a distorted picture of the matter because I didn't understand the full import of the evidence because I wasn't in the case.

MR HENRY: The other difficulty is that there were a number of other witnesses who gave oral evidence in the

AGL case which rather gives a different complexion to the whole thing. If Dr Laurie has looked at half the evidence in the Quinn mater but not the other half and is now going to be invited to comment on the effect of that half of the evidence, then, in my submission, that's simply an unsatisfactory way in which to proceed. I can say no more than that.

HIS HONOUR: Mr Manos, bear in mind - and I refer to p.341 of the transcript - that I've already ruled in relation to these affidavits.

MR MANOS: The affidavits are, again, part of the knowledge basis that the witness relies on. I'll be asking the court to take notice of the approach that Dr Laurie has had in relation to speaking to people personally in seeking to ascertain the personal circumstances of people who live near or adjacent to wind farms, as opposed to the approach of Professor Wittert who does not seem to have spoken to anyone who lives near or adjacent to the wind farm.

In terms of what you may have ruled, probably can I say my understanding of these 13 affidavits, that Mr James Thomas and Mr Paul Wedding gave evidence in person, so their affidavits were supplemented by their oral evidence. As I commented last time and I understand your Honour's position, but the other members of the court have had the benefit of considering this material before. As I understand it, Mr Henry can not object to the other 11 affidavits being received. To that extent, their evidence can't be compared in a different context. They weren't asked any other questions. They simply had their affidavits tendered to the court in effect by consent or at least not opposed.

This is information that goes to the heart of the issues that we are raising in relation to the health effects of the wind turbines. If Dr Laurie has taken this material into account in the preparation for giving evidence because it's a relevant consideration, otherwise she will be cross-examined 'Where did you get

that information from? Did you just make it up?'. 'No, I've read it. I've seen the information. I've spoken to these people as well'.

HIS HONOUR: Well, the only thing I would add to what I have said, Mr Manos, is I note that the attitude of my colleagues was that they were quoting from para.99 of their decision that they were 'unable to draw any firm inferences from the anecdotal evidence before us' and that's in reference to these affidavits.

MR MANOS: I don't understand there is any medical evidence sought to be led in that matter by a qualified medical practitioner.

HIS HONOUR: No, I'm not inclined to receive these affidavits for the reasons I have already outlined, so I uphold Mr Henry's objection.

XN

Q. How many wind farms have you visited.

A. In Australia, I visited in South Australia Clements Gap, Mount Brian, Waterloo. In Victoria, I visited Cape Bridgewater, Waubra, Toora. In New South Wales, I visited Crookwell, and in Ontario, I visited wind development north of Toronto in the Shelbourne and Amaranth areas.

Q. Is that one or two.

A. Look, it's a large extended wind development that extends I think in technical terms to two different proponents. I couldn't give you the exact details.

Q. About 10 or so wind farms.

A. Yes.

Q. Have you spent much time in the area of those wind farms.

A. Yes, I have. I've spent not weeks on end but I've certainly stayed for a period of days next to the Cape Bridgewater wind development, and north of the Waubra wind development and I visited the Toora wind development for one afternoon last year. In Canada, in Ontario, I visited, over a period of a couple of days, where I was actually staying every night, it was not

next to a wind development but I spent quite a lot of time during the three days.

Q. How many nights would you have spent sleeping in premises near or adjacent to a wind farm.

A. One, two, about seven by now, yes.

Q. Have you noticed any symptoms to your health as a result of any of those stays or visits sleeping near or adjacent to wind farms.

A. Yes. I have not initially, not the first 24 hours, but after that I certainly did. There was one evening when I developed quite severe nausea quite out of the blue and I was at that stage staying in a house where I didn't know whether the turbines were operating. It was about 3 km from the nearest house. It was in a valley and you couldn't see the turbines.

Q. Was that the only symptom.

A. It was the only symptom at that stage. I have had headaches. I never get headaches but I have had headaches regularly when I've been in the vicinity of turbines when they have been operating over both night and during the day and I have recently just come back from visiting Victoria. I was at Cape Bridgewater and again, while I was there, I developed headaches and also got symptoms of the ears ringing, as they're commonly described, some ringing in the ear, some tinnitus, neither of which I've had before.

Q. So that was only as recently as, what, last week.

A. Yes.

Q. Did those symptoms pass after you leave the area of the wind farm.

A. Yes, they did. The headaches, not straightaway, it would take about half an hour but the ringing in the ears, certainly.

Q. These symptoms that you've experienced are similar to what people have reported to you.

A. Yes, they are.

Q. Now you started your interest in this matter because I think a wind farm was proposed near your own place of

residence.

A. Yes, that's correct, yes. I had no idea that there were any health concerns at all with turbines and, in fact, my son and I used to go and watch Mount Brian being built. He was two or three at the time and fascinated with big trucks, as little boys are, so we used to go and watch them being constructed and he took a great interest in what was going on and so did I.

Q. I think you have taken your children to a rally supporting green energy.

A. That's right, we did. Our family is very concerned about climate change. We've got solar panels on our roof and we have plenty of like-minded friends and neighbours in the valley and also just personal friends who are active in the green movement and very concerned about climate change and what we can do to mitigate. So when the children were four, I think it was September 2008 a friend of mine was organising a rally with Getup which is an advocacy organisation and she asked if the children would like to proceed in a rally down King William Street and they were keen to do that. So they ended up carrying a wind turbine.

Q. Were you supportive of wind turbines.

A. Absolutely, I still am but in the appropriate place.

Q. Since the turbine plans were announced to you, are you able to help the court generally as to how much time you would have spent on gleaning information, talking to people generally in relation to wind turbines.

A. Yes, certainly. I was first made aware by an Origin PR person who rang one night. I think it was March 2010. At the time it was 7 o'clock at night and I was trying to get the kids to bed and I said to this person that no, I couldn't attend a community meeting the following night because one of the children was sick and I spent a fair bit of time on my phone because my husband works away and I was very interested and he was saying there wasn't any angry health effects, 'rest assured' but just that week Dr John Carnie had brought out the press

release in Victoria to say that there were no adverse health effects, and I was reassured by that and pressed on with my life and then about a month later one of my neighbours came to me with a paper found on the Internet by Dr Amanda Harry. Dr Harry described what happened in a little village in Wales where symptoms were occurring, and she was a country GP like me, and that made me very concerned because the range of symptoms that she described did appear to have a temporal relationship with the turbines that were starting, turbines had commenced operation in her village. So the symptoms were quite worrying and I decided I needed to look into it a bit more thoroughly. I had to have some major surgery so I didn't pursue it until June, July. I was asked to speak up at a public meeting in Laura to give my opinion on what I was finding out and really, since July 18, which is the day I realised that there really were some significant and very worrying health concerns, I've spent up to 18 hours a day on this.

Q. Every day.

A. Every day.

Q. Who has been funding all of that.

A. My husband.

Q. You gave your position as a director of the Waubra Foundation; is that an unpaid position.

A. Yes, it is. The Waubra Foundation is an organisation I have helped set up the idea of. It was conceived by a Victorian man called Peter Mitchell who was concerned about, as I was, about the lack of research that had been done into the adverse health effects of wind turbines, particularly in light of these growing reports and the growing number of people experiencing health problems around the world. So he drafted up some objectives and applied to have this foundation registered but I think he was possibly waiting for someone like me to come along. Then within a couple of days of me speaking at this meeting at Laura, he rang me to ask me if I would be interested in helping to work on

this which is what I was doing anyway because I was very keen to find whether or not, indeed, these health problems people were describing were real. I found it very difficult when I started working to work out what was genuine and what wasn't and there was a lot of spin, I would call it, on the Internet from both sides, from, you know, people who I have described as climate sceptics and people within the wind industry and I was very interested in finding out what the truth was and I still am.

Q. The work that you have begun doing in Waubra which is partially recorded in those transcripts, what is the purpose of gathering that information.

A. Okay. The purpose of gathering the information is so that we can then work out what are the specific areas of research that we need to carry out in order to find the answer to the questions that we've got about what symptoms are being experienced by people and what might be causing these symptoms, the numbers of people who are affected, and the sorts of circumstances which make it more likely that some people are going to be affected and others not. So it was in the effort to carry on the research myself because I immediately identified that I would be perceived as having a conflict of interest although I have quite openly said on a number of occasions now to the proponent, Origin Energy, that I would be quite happy to have turbines up on the hills near my home providing the independent health studies are done to show that there are indeed no adverse health effects.

Q. Is that still your position today.

A. Absolutely, it is. However, I guess, as I'm getting more and more information on who are effected by turbines and fellow professionals not working in the area I am now extremely concerned and think there is an urgent need for some research to be carried out and answer these questions from everybody's interest, including the wind industry.

Q. You have referred to some government inquiries that have been undertaken. Has it been your experience that the research that needs to be done is, in fact, starting to be done.

CONTINUED

A. I understand from a colleague in Ontario, Dr Hazel Lyn who I met with when I was over there, Hazel is certainly proposing a public health study in the Gray/Bruce area. I met recently with some officers in the Victorian Department of Health. My understanding is that they are certainly going to pursue the issues of independent research.

Q. Does the Federal government have an inquiry.

A. Yes, that's correct there is currently a Federal government senate inquiry underway. Submissions close on 10 February. One of the key platforms that they are investigating is the reported adverse health effects of these turbines on people.

Q. In the various documents that the court has just received today, there are a number of articles and the court has received some articles that Professor Whittert has referred to, that is not the complete range of articles you have considered.

A. No.

Q. Were you able to help the court as to how many articles there might have been that you have considered.

A. There would be over 200, yes, it's quite an extensive range.

Q. You have read through most of those.

A. Yes, I have. I haven't got photographic memory but I can remember the gist of the more relevant ones.

Q. So the Waubra Foundation, you are gathering information seeking to identify areas where further investigation and research needs to take place.

A. That's correct.

Q. And you are hoping to have some independent research take place by people other than yourself.

A. Absolutely, who are independent of the foundation, because whilst we are wanting to act as a catalyst to get the research done, we also have an advocacy role. There is a clear conflict of interest there. I think it's really important that this research is done independently so everyone can trust it.

Q. Presumably you have a funding issue.

A. We do.

Q. Is this something that you have raised with any level of government.

A. Well, we have. We are working on some fund raising, shall we say. I guess pursuant to that one of my colleagues Dr Liz Hanna who's with the ANU Centre for Population and Health, Dr Hanna presented a paper to a giant bureaucrats meeting, environmental health meeting in Sydney on 24 and 25th November, and during that meeting this issue was raised. I am told by Dr Hanna that all present at that meeting agreed that there was a need for independent research. Yes. So it's on people's radar, put it that way. We are certainly planning some independent research ourselves in terms of, we have worked out there are certain things we need to do. There are independent researchers trying to help us on the smell of an oily rag, that include Dr Wayne Spring, a sleep physician, a solid practitioner in Ballarat and Dr Bob Thorne who is an acoustics, who has an academic position, an associate professor at Massey University in New Zealand and he has done extensive work in wind farm noise measurement and in Australia and New Zealand.

Q. Have you gathered enough information to point you into the right direction into the areas that need further research and investigation.

A. It's an ongoing matter. We have certainly got - I believe on the basis of what we have been finding that blood pressure is a real concern, and there are some endocrine issues as well that are arising.

Q. Can you be more specific.

A. Yes, I can, there are concerns about cortisole, elevated cortisole levels. There is also concerns with just disturbances to sleep patterns, so the sleep studies are also an urgent area for research.

Q. Coming back to the elevated cortisole, what impact does this have.

A. I am not an endocrinologist. I defer to my colleagues' expertise in this area. My understanding is elevated cortisole has a number of serious sequelae including cardio vascular disease, impaired immunity, diabetes, I think is another, but again I am not an expert in this area.

Q. So blood pressure, endocrine and sleep issues, are they the primary ones merging at the moment.

A. Yes, the psychiatric issues are extensive as well. There is a professor who's name just escapes me for a minute who's the head of the rural school of Melbourne university based in Ballarat. He's interested in pursuing something as well but we have only had very general discussions.

Q. So your role in the Waubra Foundation is ongoing. You continuing to gather information.

A. That's correct.

Q. I think you have seen a report and various attachments that have been prepared by Professor Whittert, you have a copy of that I think.

A. Yes, I have.

Q. I think you have made some notes on that document for your own purposes.

A. Yes, I have.

Q. You have some other notes and terms that you have prepared.

A. Yes, I have.

HIS HONOUR: If we are going to be referring to this document in any detail it's probably appropriate to tender it now.

MR HENRY: I am happy to tender it now.

MR MANOS: Can we just receive the document and I will receive objections a bit later on.

HIS HONOUR: Yes, we will mark it for identification.

MR MANOS: I think it will be received but I might object to one or two of the attachments, a bit like Mr Henry did, but I think the report and most of the attachments are going to be received.

MFI #Y REPORT OF DR WHITTERT AND ATTACHMENT MARKED FOR IDENTIFICATION.

HIS HONOUR: Something went haywire. It's probably indicative of the state of mind of all in the courtroom - I am not taking the wrap for this alone, but there is no exhibit V and no exhibit W. When we went to Exhibit X which was the New Zealand Standard of Acoustics Wind Farm Noise, I am loathe to go back.

MR HENRY: I have got a V and a W, but no X.

HIS HONOUR: Don't be difficult Mr Henry.

MR HENRY: I am happy with what I have.

XN

Q. You have read through the statement of Professor Whittert.

A. Yes, I have.

Q. And the attachments.

A. Yes, I have.

Q. As I read Professor Whittert's statement, he hasn't been able to find any correlation, if you like, between wind turbines and negative impact on human health. Putting it very generally in support of that, he's had reference to all the articles. Has that opinion or statement caused you to alter the opinions you have formed in relation to the matter thus far.

A. No.

Q. The material that Professor Whittert has referred to, is that material that you were aware of prior to presentation of his report to you.

A. Some of it I had seen. Some of it I hadn't.

Q. Some of the material has been around for 20 years.

A. Yes, some of it had been. There were some articles however I hadn't seen that I found very interesting.

Q. You have read through those.

A. Yes, I have.

Q. I think you wished to comment about various paragraphs in Exhibit Y. Can I start with para.7.

A. Yes.

Q. In a sense, does that describe your position prior to March 2010.

A. Yes, I think that is fair. I guess if anything I was probably very pro wind energy and pro renewable energy.

Q. In the next paragraph Professor Whittert says he's been engaged as an independent medical expert on the basis of his broad understanding of human health and understanding of ecological methods.' Do you claim expertise in those areas.

A. No, I don't.

Q. You claim a general understanding of those matters.

A. Yes, very general understanding. My expertise is in taking history and practising as a general practitioner so taking history, examining patients, a very basic form of medicine, I am not an academic.

Q. But ability to critically review evidence depends on how you interpret that, but that might be a reference to various papers published, articles.

A. Yes.

Q. Or people's own case histories, so to speak.

A. I can certainly critically review evidence. I am not an academic. I don't do it for a living. But I can certainly look at papers and form my own opinion about the residents and the usefulness of the data.

Q. Para.11. Professor Whittert says he's considered your report and in para.12 there is anecdotal evidence that some people living in the vicinity of wind farms etc. may present with a range of symptoms and central health defects.' I assume that is a reference back to your report, anecdotal evidence. Is that a fair comment in relation to what you have presented.

A. I think it is in relation to the material that I have presented in the transcripts, because it certainly is a collection of anecdotes, but there is some other information that is available which is certainly not anecdotal which I have referred to, which I have submitted to the court.

Q. Is the work that you have done, in a sense, at the

bottom of the food chain.

A. Yes, in terms of causality absolutely.

Q. What is at the top of the food chain.

A. In terms of the evidence that we have now Dr Michael Nissenbaum's case control study.

Q. Between what you have done and the case control study are their various different steps.

A. Yes, there are, there is a survey which Dr Amanda Harry did which was the initial paper that I was concerned about, that paper again is low down the food chain in terms of causality, but it was a very good sort of descriptive study of the sorts of symptoms that people were describing experiencing after the turbines started up in the area where they lived in Wales.

Q. So you have gathered information, there is a survey, what is the next step.

A. The next step would be a case series.

Q. What does that involve.

A. A case series is a collection of - it's a more formalised study and a collection of individuals who have experienced, you know, the symptoms of whatever it is that you are looking at in this instance.

Q. Can that be in a controlled environment.

A. It's more structured than just a survey. I guess what I am moving onto is the work by Dr Nina Pierpont which is described as a case crossover, so Dr Pierpont's study wasn't just a collection of cases, a case collection, it actually described what happened to people when they were living in their homes and then what happened when they moved away from their homes, and then what happened when they came back again. So it's not just a collection of anecdotes.

Q. But it is gathering information from a nominated group of people and gathering that information three different times, in effect.

A. That's right in a structured way with a structured questionnaire.

Q. Is the next step with Dr Nissenbaum.

A. Dr Nissenbaum took this -

Q. Sorry, what tag did you give to that.

A. Dr Nissenbaum's study?

Q. Yes.

A. The case control.

Q. Case control, thank you. What does that involve.

A. That involved initially doing a case series, interviewing with a structured questionnaire, people who lived adjacent to a wind turbine development, and then using the same questionnaire, interviewing people who didn't live adjacent to a wind turbine development and matching them for various characteristics, such as age, sex and occupation, which is what he did as best he could with that group, and he compared these two groups. So the only difference between the groups essentially was that they didn't live adjacent to wind turbines. The non-exposed group were removed from the turbines.

Q. I think you have got some of the information from Dr Niebaum's results in Exhibit A2. Did you mark your copies.

A. Yes, I will just check. Yes, that's correct. The second page in the tab 8, is the study table that I am referring to.

Q. Do I read that there were 49 people who were the subject of this case control study.

A. Yes, that's correct.

HIS HONOUR: Behind tab 8.

XN

Q. So we have got 49 people and then the chart, I think, reads for itself.

A. Yes, that's correct, so 'exposed' means exposed to turbines and 'non-exposed' means not exposed.

Q. Now it's got various topics there. In your discussion with the 60 odd people you have explained who previously lived near or adjacent to wind farms, are the symptoms they speak of similar to those listed in that chart.

A. Yes, absolutely.

Q. So if I can be basic about it, their information which

you have gleaned, is it a bit like, where there is smoke there is fire.

HIS HONOUR: Mr Manos, I mean, this is examination-in-chief. You know better than that. If you want to ask a question, elicit what this witness thinks with respect to her professional opinions. You don't need to put the words in her mouth.

MR MANOS: Thank you.

XN

Q. So coming back to Exhibit Y para.12, where we are talking about the anecdotal evidence, that comment I think is a fair comment on the information that you have presented.

A. It's a fair comment on the information that I have presented in the transcript. It was not my intention ever to purport to do a study. It was collecting field observations with which we would then inform our research direction.

Q. Then Professor Whittert goes on: 'The observation that these adverse effects have made when an affected individual moves away from the region is suggested as sufficient evidence to attribute causation.' Are you suggesting because those symptoms apparently go when people move away, that that is the cause of the ill effect, that the wind turbine is a cause of ill effect of those symptoms.

A. Cause and effect is difficult to establish in medicine. I think it's suggestive that there is an effect going on but I think there is an urgent need for more comprehensive independent research to sort this question out.

Q. Is any of the material in the personal journal relevant in terms of that topic.

A. Yes, I think it is, in the sense that there are a number of symptoms that people experience and they describe to me they experience only when turbines are operating. In four of the five subjects, from the personal injury analysis, those people tell me - I have been to their

houses and I know when they are inside their house - they can't tell whether or not the turbines are operating from seeing them because they can't see the turbines.

CONTINUED

XN

Q. They can't hear them as well.

A. In one of the houses, with certain wind conditions they can hear them but they can't see them, but only when the wind is blowing from the south-west, when the wind is blowing from the north-west, the north, and the turbines are operating they can't tell, but they still receive symptoms. In other words they can still tell from the basis of their symptoms that turbines are operating. They go outside and they can see they are on. They can be sitting in their house, on the basis of their symptoms they can tell me whether the symptoms are actually operating. In the house at Evansford the two residents are definitely blinded, they can't see them and can only hear them in very rare circumstances, they can tell me on the basis of their symptoms whether the turbines are turned on or not.

HIS HONOUR

Q. I would assume in an operating wind farm these turbines would be going most of the day and night.

A. Your Honour, they don't turn when the wind is not blowing. So when the wind is not blowing, the turbines are not operating, and the wind is not always blowing so there is a period of time, some time they are shut down for maintenance or for other reasons, so no, they are not operating the whole time.

Q. But for large periods of time I would assume they are, are they not.

A. For large periods they are.

Q. And these effects that people complain of, do they switch on and off; these symptoms that they complain of are with the movement of the turbines or do they carry over and have a lasting effect such as you describe.

A. It depend on the symptoms. The vibration symptoms that people have described in my experience absolutely relate to turbines on and turbines off. In other words, when the turbines are off they are not getting the vibration symptoms.

XN

Q. What do you mean by 'vibration symptoms'.

A. Various people have described symptoms where they have described either chest or lip vibration, the lip vibrations have been described to me as from a distance of up to 10 km away. Then I discussed it with an acoustician, who has experienced how far sound and intrasound waves can travel and they have said yes, it is possible that infrasound can travel that distance, and yes, it is possible for those symptoms to be experienced. That now has been reported to me by I think five people now at a distance of five, 10 km. The vibration systems in my experience are highly specific for the turbines operating. Things like headaches, people say yes, they certainly do get headaches when the turbines are operating, but headaches, they can be non-specific and I certainly wouldn't want to attribute all headaches to the turbines operating, so they are not - headaches are certainly an experience and people who live next to turbines describe such a marked increase in headaches, but the - when the turbines stop operating there seems to be a lag time as well with the headache going, so some symptoms yes, there is an on/off effect but others no.

HIS HONOUR

Q. I guess that's why I asked it, if the symptoms carry on, leave aside the vibration symptoms, if the symptoms carry on, how would they if the turbines were operating.

A. In those houses?

Q. Well, they can't see them.

A. That's right, they don't know.

Q. They tell you they do know. They can get in there, they drive and see. They are not far away. I'm suggesting they are in their houses, they can't see them but they know whether they are operating or not; they can't see them, getting in their car would be defeating that, wouldn't it.

A. On the basis of the symptoms they are experiencing at

the time in their house they can tell me whether or not the symptoms are operating. There is a way of telling whether or not the turbines are operating, apart from looking whether the turbines are operating, getting on the phone and telling your neighbours, that's one thing people have done.

Q. Sorry, it's my fault. If there is a lag in your symptoms, whether that be an hour or an afternoon or a day, presumably they would think the turbines are on all the time.

A. I don't think I'm quite following your question.

Q. Just that if they can tell you without looking that the turbines are operating because of their symptoms, and if their symptoms continue, as I think you have said, after the turbines stop, how would their symptoms then tell them whether the turbines are operating.

A. Okay, the symptoms I rely on for that are the ones I find to be more specific for turbine operation. For example the vibration, the tinnitus is another one or the ear pressure, that is another one that is specific for turbine operation. Other people have described chest tightness and a very thick head, a distinctive headache that they only get when the turbines are operating, they don't get that headache any other time. You're absolutely right, if there is a time lag, it - the turbines can be off and they will still have a hangover effect.

XN

Q. Talking about those persons, I think you've seen this morning a further analysis prepared by Professor Wittert.

A. Yes. This is his analysis, personal recordings.

Q. Yes. I just want to ask you some questions about that.

EXHIBIT #A20 PROFESSOR WITTERT'S ANALYSIS OF PERSONAL JOURNAL RECORDINGS TENDERED BY MR MANOS. ADMITTED.

XN

Q. I think you have had a chance to consider that exhibit

very briefly.

A. Yes, that's correct.

Q. And you haven't checked the actual plots, presumably.

A. I have had a quick look.

Q. But you haven't compared the plotting.

A. No, I haven't had time.

Q. As I understand it, the blue line in the graph, the weight consists of systolic blood pressure and the green line is.

A. Waking. Systolic blood pressure blue line and waking systolic blood pressure.

MR MANOS: Should the witness explain what they mean?

HIS HONOUR: It's your case.

XN

Q. I don't understand the term, could you quickly explain what those two terms -

A. I'll do it in layman's terms. The upper measure or the systolic blood pressure is when you're taking a patient's blood pressure you put a cuff on which occludes the blood flow to your hand, the first flow is the systolic blood pressure, when the sound goes away that means the blood vessels are completely free of occlusion, so the upper level, the systolic is when the blood starts flowing through, having been occluded and the systolic is where the sound - where there is no occlusion.

Q. So if we have 150/90, 150 is the blue line, the 90 is the green line.

A. That's correct.

Q. Professor Wittert concludes at the end of his report or analysis that the data - I'll read it 'These data are inconsistent with any assertion that the output from wind turbine has the adverse effect on blood pressure, do you agree with that comment.

A. The data that was collected in the personal journal was not complete. It was preliminary data. I agree with what Professor Wittert has said, that they have evidence

of hypotension. What I found interesting was that one of them when he went away to Phillip Island his blood pressure actually went back down to what I would describe as being within normal limits. I guess the reason that information was included was more because of the other symptoms that were then recorded as well as a particular individual with his blood pressure when he went away. But it's not the gold standard way to measure blood pressure. The best way to measure it is for a 24-hour halter monitor test. If you're doing a community measurement that's what we plan to do, because we're certainly concerned about elevated blood pressures in the morning that have been described, not just with these people but with other patients. With new onset hypotension that people describe with wind turbines operating in the air and the latest patient with hypertension, just received this morning, received a report of his halter monitor, this individual is reported to have a normal blood pressure when he's at home, normal blood pressure when he's in the doctor's room but the 24-hour halter monitor test shows he had marked elevation of his blood pressure when he's apparently sleeping - we need to repeat the sleep study to see if in fact he was sleeping but I'm told by the GP that himself it was so high that they have decided to start him on hypertension medication. What has started now is he tells me he is getting dizzy in the day. He's being treated for a condition where his blood pressure is going up at night, where his blood pressure is being operated and apparently going through his boots when he needed to do his farm work. We need to see what's going on with him and other people. I might add, this has been reported by somebody else in Ontario.

Q. Professor Wittert's report is an analysis in relation to blood pressure.

A. Yes.

Q. As said there are some other comments that appear in those personal journals as well. Just on the question

of blood pressure, were you putting forward or suggesting that the blood pressure was being elevated consistent with the output from the wind turbines.

A. Look, I'm concerned it's an effect but when I looked at this data, I didn't do the sophisticated analysis, I don't have access to that sort of programming that professor Wittert says, I don't reflect it's a suspicious area that's happening, I think it's an area we need to look at a lot further.

Q. Coming back to Exhibit Y, para.13, Professor Wittert describes certain symptoms that are said to constitute wind turbine syndrome, is that the type of symptoms that people claim to suffer.

A. No, they certainly do describe the headaches, the palpitations, we are observing elevated blood pressure, irritability and severe sleep disturbance. On my experience what people have told me is that if they are affected, they are often disturbed most nights of the week and multiple occasions, so they are chronic, severely sleep deprived. The effect on mood concentration and memory, absolutely. I agree with what Professor Wittert has said there, there are some other symptoms that do appear to be unique to wind turbine syndrome, it seems it is being called, particularly the vibration and tinnitus and the ear pressure. The symptoms that have been described on many many occasions, I'm not familiar with them being described in literature, to do with anxiety and stress.

Q. But you acknowledge there is a crossover between some of those symptoms that are spoken of and symptoms associated with anxiety and stress.

A. Absolutely.

Q. You would say there are at least those other three symptoms that are mentioned.

A. Yes, absolutely.

Q. Then Professor Wittert in para.14 talks about sleep disturbance, that's obviously a matter you've touched on as well. What do you say in relation to that

discussion. You see halfway through.

A. Yes. Look, my experience of particularly the people that were there but particularly people in Ontario that haven't been the subject of the transcript and some of the people in South Australia in Waterloo, particularly they actually welcome the turbine into their area. The visual impact of the turbines wasn't something that worried them. What has led to their distress is the fact that they have now developed symptoms of illness, which initially they didn't attribute to the turbines. For some they became unwell straightaway, for others it took some months; for some of them it was only when they really started talking to some of their neighbours and started comparing notes and realised some of these symptoms had come on since the turbines started operating and as they went away on holidays or work and realised they felt well when they went away, they came back and started feeling unwell, that was when they realised the turbines might have had something to do with it. In fact their attitude toward the visual aspect of the turbines didn't have anything to do with it. I'm aware of the studies Professor Wittert referred to, is in the circumstance, but in my experience that has not been the effect of many of the people I've talked to.

Q. Those people are people who can't see the turbines and can't hear the turbines or both.

A. In some instances they can't see them and can only hear them on rare occasions. Some people can see them. And as I said, their visual impact was not something that was weird to them at all until they started becoming unwell, and I think now when they are feeling unwell and attributing those symptoms to the turbines the turbines have taken on a rather different picture.

Q. Those articles that, attachments that Professor Wittert refers to you, are familiar to those.

A. Yes, I am.

Q. You were familiar with those prior to considering this

report.

A. Yes.

CONTINUED

Q. In the next paragraph Professor Whittert is setting out what he is seeking to do in his statement, whether he says the statement examines the basis for direct cause and effect relationships between the symptoms and the presence of wind farm, in a sense your information gathering is related to that topic, isn't it.

A. Yes, it is. I guess what we want to do is try and understand why people are experiencing these symptoms, what are the factors that are having an impact on that and, you know, with an interest to seeing how we can ensure that humans and turbines can co-exist rather than having a situation where at the moment there is many people across the world who appear to be getting very unwell. We would like to find out why this is happening.

Q. Paras.16 of Professor Whittert's report refers to some attachments and some information he has considered about noise from wind turbines. The papers that he has referred to, attachment 4, is that a paper that you were previously aware of.

A. I wasn't aware of that one. I am aware of other papers that are similar. I have looked at it.

Q. Do you have that paper in front of you, tab 4 of Exhibit Y.

A. I haven't got Professor Whittert's attachments here.

ATTACHMENTS HANDED TO WITNESS

Q. That chart that appears on the first page, have you seen that chart before.

A. Yes, I have.

Q. In other papers.

A. Yes, similar.

Q. This is an article prepared for the British Wind Energy Association, do you know anything about that association.

A. The British Wind Energy Association I understand to be an industry, yeah, an industry group.

Q. Para.18 of Exhibit Y is entitled 'Low frequency sound and infrasound', this is an issue that I think you have

taken notice of in recent times.

A. Yes. Yes, it is indeed. My discussions with - I was intrigued by this because one of the issues that keeps coming up is whether or not infrasound is emitted from wind turbines and whether that's an issue that might be explaining some of the health problems that people are experiencing. When I spoke to Dr Thorne, who is the author of that report -

Q. When you say 'that report'.

A. I am talking about the Noise Impact Assessment Report Waubra Wind Farm.

Q. This is the report referred to in para.18 of Professor Whittert's statement.

A. That is correct and also in para.17. I asked him about this specific issue and he said that he, in fact, wasn't happy with the noise assessments with respect specifically to infrasound that had been done at Waubra. I think there was an issue of both time and money which limited what he was able to do. He was very keen to come back and do further measurements. I understand that's what he is planning to do.

Q. Did you learn anything about infrasound at the conference in Canada in October.

A. Yes, I did. It was very interesting. Mr Rick James, who is an acoustics - who has had quite a lot of experience measuring noise emissions from wind developments in Canada and North American shared some recent findings and measurements he had done at I believe it was a turbine development in Ontario. He found that using some new sound quality analysis instruments that he had actually measured infrasound to a level of 90DB, which he was quite surprised at and concerned. He has done multiple measurements I understand since then which have confirmed that in fact infrasound is emitted from modern up wind turbines and at much greater levels than anybody had thought possible. He is intending to follow this up as are a number of other acousticians.

Q. When were those measurements undertaken.
A. Prior to the conference.
Q. Obviously.
A. Sure. Look, within a couple of months. It was only within a couple of months prior to the conference.
Q. During the course of 2010.
A. Yes, it would have been. I can get the exact date if you would like me to.
Q. Some of the documents that are attached to Exhibit Y make reference to infrasound and some statement to the effect, for example, that was associated with the older technology wind turbines, do you recall reading those statements.
A. Yes, I do. Dr Diesendorf I think was one of them.
Q. Was he involved in the New South Wales government inquiry.
A. Yes, I think he said that. A number of people have asserted that. There is no doubt that there is research that I think NASA did that show that the old down wind turbines did emit plenty of infrasound. My understanding, I am not an acoustician but what I am told by acousticians with whom I work with in the industry, there has not been the comprehensive measurement of the wind turbine specific infrasound around wind developments anywhere in the world, because of that we don't know. So, when I guess I see that Dr Diesendorf has stated that infrasound is virtually undetectable at a range of 400 m I would be very interested to see what his evidence for that is.
Q. Do you know Dr Diesendorf.
A. I don't know him personally.
Q. Do you know if he is a medical doctor.
A. I have been told he is not but I don't know what his PhD is.
Q. The work that Rick James did in mid 2010 when you said he did measure up to 90DBA.
A. No, 90DB.
Q. Sorry, was that in relation to a newer style turbine or

older style turbine.

A. It was specifically in relation to modern upwind turbines.

Q. Is that the only report that you are aware of in relation to measuring infrasound associated with new modern upwind turbines.

A. It is at the moment. However, I understand that Dr Thorne is busy preparing to come and do some measurements. So, you know, I am hoping that we will have some data that we can look at.

Q. Do you know which particular wind farm he is going to be measuring.

A. I know he is planning to go back to Waubra. I believe there is other wind developments that he is looking at going to.

Q. I think various of the articles attached to Exhibit Y deal with this topic. When I say 'various', more than one of the articles deal with the issue of infrasound and I think those reports are ten or so at least in one instance old.

A. Yes. Are you referring to the National Institute of Environmental Health Sciences report, The Toxicology of Infrasound?

Q. There are so many reports I can't remember which one it is.

A. I wasn't responsible for that one, that as Professor Whittert. Attachment 7, is that the one?

Q. Yes. That is a report that you were familiar with prior to this matter.

A. Yes, it was.

Q. What you say is that -

HIS HONOUR: I don't want you to suggest what the witness will say.

XN

Q. Since November 2001 we have obviously had Dr Rick James' research.

A. Yes.

Q. That report though, does that provide any information to

you or does it assist you in relation to the effect that infrasound can have.

A. Yes, it did. In fact, there is a couple of papers that we are trying to get translation from Russian because we thought particularly given the infrasound emissions that Mr James had measured, we think they could actually be highly relevant. There is a couple of studies on rats and myself I think they were -

Q. The studies in rats is on p.24 of attachment 7.

A. Yes, that is correct. P.24, studies in rats Alekseev, Glinchikov and Usenko 1985. That study was looking at the effect of infrasound on hearts. The infrasound doses in that 4 to 6 hertz at 90 to 145DB. I guess prior to Mr James' measurements we thought that 90DB was probably not relevant but I guess now we are re-assessing that and, you know, we really urgently need to measure exactly what the infrasound - the wind turbine specific infrasound measurements are to see whether or not any of this is relevant because we suspect it might be. There was another study which I think was cited in the Nishimura.

Q. What page is that.

A. It is a very good question.

Q. I see one at the foot of p.17.

A. I believe it is in here. Yes, that's the one. Nishimura 1988, on p.17.

Q. Did you consider the comment under the heading 'General Toxicology' which starts on p.11 and the articles that were referred to there on p.12, the papers from Kuralesin.

A. Yes, we did. I mean, I have looked at those.

Q. Ranneva, on the same page.

A. Yes.

Q. Those levels of infrasound are less than what Dr Rick James has measured.

A. Yes, they are.

Q. It is reported there that infrasound can have an effect.

A. That's correct.

Q. On a person with psychosomatic complaints and sleep disturbance. So, is it your opinion that that report, in conjunction with information from Dr Rick James, means we need to have further research into this topic.

A. Yes, I believe we do.

Q. The next paragraph, Professor Whittert refers to the American Wind Energy Association and Canadian Wind Energy Association published in December 2009 regarding wind turbine sound and health effects where it is said that that report concludes there is no evidence of harmful effect of low frequency sound even if audible from time to time. Do you agree, first, that the report attachment 6 stands for that general proposition.

A. There is a bit of inconsistency in that document. That is what they conclude but there were some inconsistencies in it. However, I guess my issue with that is that there seems to be a lack of primary research evidence which really supports that, particularly given Mr James' measurements now I think, you know, we need to get some data on exactly what is being emitted from the turbines and then we can start to look critically at what is actually going on.

Q. The cover sheet of that attachment 6 identifies the authors to that paper.

A. Correct.

Q. Have those persons prepared any other reports or articles that you have considered previously.

A. Yes, they have. Dr Leventhall has prepared a number of documents or been a co-author on a number of studies. One of them was from the journal of sound of vibration, which Mr James referred to in his presentation, which is in A22, No.3.

Q. About five sheets in or so.

A. Yes, that is the one.

Q. What we knew about ILFN sick buildings, what is ILFN.

A. ILFN stands for low frequency noise.

Infra and low frequency sounds (ILFN). That's the terminology that you used. And that particular article that Leventhall was the co-author on - or paper - shows that work performance of people suggested to varying levels of infrasound, when they were given certain work tasks to do, certainly affected their ability to perform those tasks and also affected their social cooperation with each other. So in other words the low frequency sound did have an effect on people even at those levels.

Q. We've been proceeding on certain assumptions or understanding about low frequency sounds. Can you describe what you mean by that.

A. What I mean by that, my understanding is and I'm not an acoustician. I've been taught by the acousticians I work with. My understanding is that less than 20 hertz is inaudible generally to the human ear. There are apparently some people who might be able to perceive noise so it's not heard and it's often not felt.

Q. Not -

A. Not felt.

Q. What do you mean by that.

A. Well, perceived as a vibration, for example.

Q. So when Mr James recorded 90 dBA with a modern upwind turbine, that's not 90 dBA as we would generally describe.

A. No, that's correct. DBA that's used for the measure of audible sound, I'm not an acoustician but my understanding is that measurement of dBA automatically will not include measurement of infrasound.

Q. So what's your understanding of the measurement of the 90 dBA that's been mentioned.

A. My understanding is that the intensity or dose of infrasound is 90 and if it's infrasound it will be a range of frequencies potentially but less than 20 hertz.

Q. So a certain sound pressure which would still not be heard or felt.

A. Yes, that's my understanding.

Q. But this report you just took us to says that in some

circumstances infrasound can impact on someone's ability to undertake tasks.

A. Absolutely.

Q. Coming back to Exhibit Y, dealing with para.20 there, the next paragraph deals with attachment 7, infrasound in the report in 2001 and revised in 2002. You simply would repeat your evidence, what we have just been discussing, that there has been work done in mid 2010.

A. That's correct, yes. That shows that infrasound is indeed a problem requiring a lot of further study. One further comment I make about the Nice paper, that is attachment 7, I note in I think it's p.3 - I'll just get it out - in the summary, they did talk about numerous gaps in our current knowledge and I think this is just a good example of that.

Q. Sorry, where was that.

A. Sorry, p.3, the last paragraph.

Q. Of attachment -

A. This is attachment No.7 which is 'Infrasound Brief Review of Toxicological Literature', okay, so in the summary, in the last paragraph, it refers specifically to the fact that 'There are numerous gaps in our current knowledge and in particular a lack of high quality long-term experimental studies of infrasound and inadequate characteristics of environmental infrasound' and that's precisely what I'm talking about; we need to do the studies.

Q. You see on the executive summary on p.5, second last paragraph 'There is no agreement about the biological equivalent of infrasound. Recorded effects include a number of things including: vertigo; imbalance; disorientation; nausea' etc. Are those some of the symptoms that have been described to you by people living near or adjacent to wind farms.

A. Yes, they are.

Q. Para.22, is there anything you wish to add in relation to that paragraph that you haven't thus far covered.

A. No, I think we have covered it already.

Q. In para.23, the professor reaches a certain conclusion based on the report he considered and including that report from Dr Thorne, I think, to suggest that the low level of infrasound is not causally related to any adverse health effects. If say 90 dBA were measured using Rick James' testing equipment, would that lead you to form perhaps a different opinion to that.

A. Yes, I would. In fact in Dr Thorne's report he did say that there was a need to study this further. I think he made a precise reference to issues of causality and that this required further study specifically in the Dean report.

Q. On p.6, you have a heading the 'Health Effects of Noise', a reference to the World Health guidelines for night noise in Europe, attachment 9. Is that a document that you're familiar with.

A. I wasn't familiar with that particular one now but I have looked at it.

Q. Reference is made specifically there in para.25 to road traffic noise. I think you've got some documents in relation to the annoyance levels of different types of noises.

A. Yes, I have that. There was - in both Mr Rick James' attachment and I believe it was Christopher Mannings' attachment. Attachment No.7 is easier to read so -

Q. Attachment to A22.

A. To A22, that's correct.

Q. Is this about seven sheets in from the end.

A. That's correct.

Q. Sorry, five sheets from the end there is a graph. Is that what you're referring to.

A. I'm referring to that one (INDICATES) which is entitled 'Why does WTN -' meaning wind turbine noise '- affect sleep so much?'

Q. Who is the author of that graph, do you know.

A. Yes, it was taken from - it was a work by Peterson, Peter Peterson and it's referenced, I believe, in Rick James' one. It's just difficult to read.

Q. Peterson is from Sweden I think.
A. That's correct.
Q. And she is an acoustician.
A. I believe. She has certainly done a lot of work in measuring annoyance of people.
Q. But not a medical doctor.
A. No, she is not a medical. She's got a PhD but she's not a medical doctor. Yes, on p.5 of Rick James' presentation, entitled 'Annoyance of common noises versus wind turbines', this is a similar study. It refers to similar studies and it specifically refers to that study by Peterson and Waye 2004, so the bottom line which has the triangle -
Q. I'm trying to find that page.
A. It's p.5 of the presentation under attachment 3. That one (INDICATES).
Q. Is that the graph showing basically the same information as that other -
A. Yes, it just refers to a number of other studies and so there is data from a number of other studies superimposed on it but the reference to the particular work that we are referring to in Chris Hanlon's presentation is 'Wind Turbines, Peterson and Waye 2004'.
Q. To the extent that Professor Whittert is seeking to correlate road traffic noise with wind turbine noise, you say that's an inappropriate comparison.
A. Well, what has been found is that the characteristics - well, the percentage of highly annoyed people for the same sound exposure level in dBA are quite different when you compare aircraft, road traffic and railway noise to wind turbine noise.

CONTINUED

DbA by definition will not include infrasound.

Q. Stating the obvious, there is also an essential difference between those varied noises in that usually the other noises in that graph are intermittent, aren't they.

A. Yes. I guess there are particular sound characteristics, and Peterson and Waye refer to that in their article. The fact that wind turbine noise can go for much of the night, but that it's a positon noise it's a 'woosh, woosh, woosh' rather than a continuous sound. They postulated that was one reason it was particularly annoying at a lower sound exposure. Other people have postulated that perhaps it's the infrasound that makes it more annoying. We don't know. I think, Peterson and Waye also talked about, if people didn't like the look of the turbines or the fact that the turbines were there, that could be a component in why so many people became highly annoyed at a lower dBA. I think there are a number of reasons, but certainly as a result of Mr James' measurement, I guess people now are wondering if in fact the infrasound component which people don't hear might be part of it.

Q. At para.25 Professor Whittert states that they would occur, there would appear to be a 'strong independent psychological and personality factors' referring to attachment 10. Is that a report that you were previously familiar with.

A. No, I wasn't familiar with this one.

Q. You have read that report.

A. Yes, I have read it.

Q. Do you understand this report has been prepared by non-medical practitioners.

A. Yes, I hadn't actually noted that. I can't actual see their qualifications. That could well be the case.

Q. It's proposed by Susan Wakefield and Susan Elliott from the school of geology.

A. Attachment 10, was it?

Q. Sorry, I am looking at the wrong one. My apologies.

There are names that I can't pronounce there.

A. Aslack Fyhri, and Sasvang.

Q. So one is from the Institute of Transport Noway and the other one is from the Norwegian Institute of Public Health Norway. Based on that report, Professor Whittert expresses his conclusion at para.26. 'There does not appear to be a relationship between either exposure or response to road traffic noise and cardio vascular problems'. Assuming that is the case, are you aware of any cases where there is infrasound associated with road traffic noise.

A. Look, I am not. I understand infrasound can be an issue with all sorts of noise. I am not aware of any specific reports about infrasound and road traffic noise. I am aware of another study which is called - it's a hyena study, which looked at slightly different topics, but it looked at particularly night-time exposure to noise which is relevant to what we are talking about, and the hyena study reported in 2008, certainly found that with long-term noise exposure, they talk particularly about night-time air traffic, or aircraft noise and also road traffic noise did have some statistical effects on blood pressure, particularly on the night-time aircraft noise.

Q. Do you have the reference to that article.

A. Yes, I do. It's hyena study 2008. I have got the authors, Jaiupjarup Et Al Environmental Health, I can certainly get you the specific citation. They found it was. The noise certainly was associated with the increased, statistically significant increase in blood pressure. That was quite a large study. That was 8,610 people multicentre.

Q. Was that article with reference to this article in attachment 10.

A. No, I don't believe it was. I beg your pardon, yes, it is Jarrod L on p.4942. It has got the exact citation.

Q. I now come to the heading 'Effects of wind farms on health'. We were discussing the transcripts that you have prepared. A further point he makes in sub.para.(a)

is 'Anecdotal evidence is not a reliable form of evidence in trying to determine a plausible cause and effect relationship between events'. You don't quarrel with that, do you.

A. No, I agree absolutely.

Q. But what you say is given your information to date you were of the opinion that further research is necessary.

A. Absolutely.

Q. There is another way to describe the anecdotal evidence in a sense, coincidence, in this instance.

A. You could describe it as that. I think given the context of these other studies which are not anecdotes, Dr Piermount's study is a case, serious crossover study, Dr Nissenbaum study is a case control study. They are not just collections of anecdotes. They together with the data that Dr Amanda Harry, Dr David Icer, and Dr Robert McMertary collected, given there is remarkable consistency in both of the symptoms being described and the problems being identified in a multitude of different countries, I think it's a little bit more than a collection of anecdotes.

Q. In sub-para.D, Whittert then refers to attachment 11 which I think was updated overnight, so to speak. Do you have that updated attachment 11.

A. Yes, which is the 1.20 risk assessment (INDICATES). That it the one?

Q. Yes.

MR MANOS: Does the court have that.

HIS HONOUR: I do.

MR MANOS: Mr Henry provided it this morning.

XN

Q. You have had a chance to consider that document.

A. Yes, I have.

Q. What do you say in response to that document.

A. I found it very interesting.

Q. It's a document - you hadn't seen it before.

A. No, I hadn't seen it before, very interesting. I think they make some very pertinent comments on p.448 in

'Introduction'. First paragraph, general question 'Fundamental questions being addressed are simple. What specific kinds of ill effects on health is a substance capable of causing and what conditions of exposure are necessary to cause them?' I mean, in this situation they were talking about chemicals. But if we are talking about exposure, being exposure to wind turbines I think it's pretty relevant. Following on, if levels of exposure are sufficiently low, that an agent will not be expected to affect the health and wellbeing of people who are exposed'. I guess that is precisely what we are trying to do with the work of the Waubra Foundation. You know, work out what the extent of the problem is, and what the appropriate setback distance might be of people from turbines.

Q. In a sense, what is being discussed here is how many people have to be exposed or present with symptoms before you do something about it.

A. Yes.

Q. I mean, as I understand it, arsenic is quoted as a deadly poison.

A. Yes, I think so.

Q. If you inject five rats and they all die after they haven injected by arsenic do you need to go any further.

A. Probably not.

Q. If you are trialing a new cream to hide skin blemishes, you might want to have a greater sample number than 5.

A. Yes.

Q. Putting aside that the court hasn't received the affidavit in the Mount Brian case, you have read that information, have you spoken to 60 other people, that 60 includes two or three of those people as well.

A. Yes.

Q. Are you saying that from your observations that the sample of 60 or 70 is sufficient to warrant further research.

A. Yes, in my opinion, it is.

Q. Is it because of the nature of the symptoms, the effect

of the symptoms, or what is it that causes you to go advocate there should be further research.

A. I think there are a number of things, the 2 points, the nature of the symptoms, some of which are severe for some people. It's the effect that those symptoms are having on their lives. Some of the people, as I have said in my transcripts, have been forced to move out of their homes and some of those people are in a situation where they are unable to sell their homes. So they are in a particularly difficult spot. So I think the seriousness of the symptoms and the problems being described together with that, I think in terms of public health, the planned deployment of turbines across south-eastern Australia is quite significant, and those turbines, the plans are impacting on more and more communities with significant numbers of people. I think it's in everybody's interests to get some answers to these questions and find out what the extent of these problems are. We don't know how many people are affected because even basic epidemiological studies haven't yet been done anywhere in the world, and they need to be.

HIS HONOUR

Q. So, from the court's point of view, if even the basic studies have been done and we are presented with a development application or a development approval, what approach do you suggest the court takes - put things on hold until studies are done, or to set some as yet undefined setback distance, or just what.

A. Because we don't know what a safe setback distance is and given that we are people who are experiencing apparent blood pressure changes at 5 km, as in new onset of hypertension after the turbines have started operating and these situations, this most recent one where somebody has had this elevation of blood pressure overnight, there are some fairly rapid studies that could be done quite quickly if the political will was there and the funding was there. It's not going to take

long to get some of this information. I guess to answer your question we don't know what a safe distance is. My concern about recommending a set-back distance is this: We don't know. You could put a set-back distance in place. It could be wrong. It could vary depending on the terrain. It can vary, for instance, what a set-back distance at, for example Waubra should be. It may be completely different to the setback distance in other places. My understanding is you can't necessarily compare. However, if you gather information at the existing development sites in Australia now, that could certainly help inform planning and development applications down the track, and planning regulations. So I guess my position would be that things are put on a temporary hold until the information is available.

Q. Are you saying we put things on hold until there is either a benefactor, who puts the money up for a study or there is a political will to have this study, either of which are apparent to us at the moment.

CONTINUED

A. No, however there is Federal Senate inquiry submissions closing in a month. I suspect there is also going to be some increase in media about this issue, so it may well be that those current circumstances in terms of lack of funding changes.

Q. That could be looking at it realistically; that could be putting things on hold for years, couldn't it.

A. Look, that's out of my -

Q. No, but what you're suggesting to us is that the Senate inquiry, I've seen Senate inquiries, they consider their position, take a long time and there's a recommendation made and they go from there and then there may be a legislation produced, it may be amended, may not get through, the government may change; really, that's sort of out in the nether nether, in a sense, isn't it.

A. I understand that your Honour, but there certainly are clinicians who are becoming increasingly concerned about these issues and the lack of research. As I mentioned, I mean just a small study in terms of what we're planning to do in Waubra, on the smell of an oily rag, the acoustician and clinician are donating their time, it will require a small amount of money, we will require some result from that that will shed light on those issues fairly promptly. I don't think it's going to be years, certainly some decent funding will increase the quality and extent of the research. We would certainly prefer to have larger numbers, if we don't have the resources it is going to be limited.

COMSR AGNEW

Q. Did I read that you suggested there should be a separation distance of 10 km; did I read somewhere in your statement.

MR MANOS: I was going to assist the court, AD20, Dr Laurie's initial report and her opinion, has gone into bold print: about at least 10 km away.

A. Yes, I did, that was when I was, I guess, pushed for what would be a recommended safe distance, at that stage. I was actually unaware of people experiencing

symptoms at 10 km, the 10 km was 5 km plus a precautionary distance. Now that I'm now aware of people 10 km away, who were getting these specific vibration symptoms, under particular terrain, particular turbine development, I'm not saying applicable any, at two places that's been described, we definitely need to do the research.

COMSR AGNEW

Q. So you would increase that.

A. We need to do the research.

Q. So until you do the research what, you don't put a separation distance.

A. We don't know; we literally don't know.

Q. So you carry on as you are until you know, is that right.

A. I would prefer that existing and proposed turbine developments were put on hold until we did the research urgently, to find out what is a safe use, to inform us what a safe setback is in everybody's interest, then we can proceed with wind development appropriately described so it is not going to affect adversely on health.

Q. Research takes a long time, you have looked at research worldwide, information that you have examined and others have examined, now, you still, after all that research that has been done, can't reach a conclusion, and that may have been done over quite a number of years, so maybe we're looking at what, 20 years ahead.

A. With respect, no, I don't think it will take that long, I think the recent finding by Mr James that this intrasound has been found. If, you know, proper thorough acoustic measurements were done, which included infrasound, independent and in a proper scientific way, we would all get that information and try to benefit from it and proper epidemiological study that works out the extent of the population being affected, how far away from envisaging turbines they are being affected.

HIS HONOUR: The court has some commitments which

requires us to adjourn now.

MR HENRY: Can I raise the question of timing, because it seems we're probably about two-thirds of the way through examination-in-chief, based on putting Professor Wittert's statement to Dr Laurie. I'm concerned if we don't pick the pace up we're going to get to a stage where Professor Wittert isn't going to finish tomorrow. I would invite the court to consider giving fairly firm directions as to how long we should take as to questioning of these two witnesses with a view to making sure we do finish Professor Wittert's oral evidence tomorrow.

HIS HONOUR: That's a really open-ended invitation.

MR HENRY: I can have a discussion with Mr Manos in the course of the adjournment but I don't want to be in a situation where there is allegedly cross-examination of Professor Wittert only to find at 4.30, we are half complete.

HIS HONOUR: You've said it and I think we have made accommodations to all parties that they include the appellants in this case and we've said and the knowledge that Professor Wittert is here for tomorrow.

Mr Manos, you will bear in mind that we will finish with Professor Wittert tomorrow and we must look at your cross-examination with that in mind.

MR MANOS: I don't think I'll be much longer with Dr Laurie your Honour.

HIS HONOUR: Do you want to start at 9.30?

MR HENRY: I would be happy to do that.

HIS HONOUR: We'll start at 9.30 and break to deliver the ruling. We can do it earlier, but we are stuck with that now, then continue with Dr Laurie, so we'll be adjourning until 9.30 tomorrow.

ADJOURNED 4.40 P.M. TO FRIDAY, 14 JANUARY 2011 AT 9.30 A.M.

JUDGE COSTELLO

COMMISSIONERS MOSEL AND AGNEW

NO.106/2010

RICHARD PALTRIDGE AND ORS

V

DISTRICT COUNCIL OF GRANT AND ANOR

FRIDAY, 14 JANUARY 2011

RESUMING 9.36 A.M.

+SARAH ELISABETH LAURIE CONTINUING

+EXAMINATION BY MR MANOS

Q. You stated that you had briefly considered Exhibit Z, the analysis prepared by Professor Wittert. I think that overnight you have had a chance to further consider that document together with the personal journals.

A. Yes, that's correct.

Q. Did you want to add anything to the evidence you gave yesterday about your personal journals on that exhibit.

A. Yes, look, I did. Professor Wittert has commented on the blood pressure issue specifically. The reason I wanted to include the journals was partly the blood pressure issues with respect to the first person, journal of AR, just to note the difference in his blood pressure when he was away from the turbines at Phillip Island I believe, between the 18th and 20 October. But the main reason for including them was to just note the symptoms that people were recording and also one of the issues that came up yesterday was the operation of the turbines and whether or not the turbines are turning; what the graphs at the back show is the wind farm power output data which correlates directly with whether or not the wind is blowing. You will see that there are periods where the wind is not blowing or where there is no power output, and so from that there's periods of time where people describe to me that they have no

symptoms at all and that correlates with the turbines not turning and the power output not being generated, and correspondingly, particularly the symptoms that are specific for the illnesses that are being described, as in the vibration particularly, it correlates directly with the turbines operating. So, I just wanted to make that absolutely clear. I believe the blood pressure is an effect and we are going to look into that much more thoroughly and with a much better measure than self-reported intermittent blood pressure measurements.

Q. For the journal for AR, it's at TAB 1 of Exhibit A24, so that page marked ... -

A. That's correct, yes.

Q. - has got Phillip Island written on the left-hand side.

A. Yes, that's correct.

Q. Then if we go to the next sheet -

A. p.3?

Q. Yes, sorry, on 22 October, I'm just trying to read the symptoms, I think it reads 'felt very sick/', can't read the next word.

A. Yes, throbbing headache, 'strong north wind, sunny', and they are characteristic of the symptoms that people describe.

Q. Are there other entries where people complained of chest tightness and the like.

A. Yes, there are. I guess the chest tightness one was a particular concern for GW, which is No.2, and the reason I'm concerned about this is because I have had a number of people, both in Ontario and in Australia, describe to me symptoms of chest tightness which occur when the turbines are operating, which sound very like angina, and there's been a number of instances where people have in fact had a heart attack when the turbines have been operating, and I'm concerned that, if indeed infrasound is causing some physiological changes, including high blood pressure, which is what we suspect might be happening some of the time, that in patients who have got underlying ischaemic heart

disease, that in fact is going to be very detrimental to their health, and that is, I think, of extreme concern.

Q. So, if we look on the date, 23 and 24 November for GW under tab 2 and then we consider the power outputs for those two dates, do you see a correlation between the symptoms described there and the power output.

A. 22 - let me just double-check the time - I do for the 23rd; for the 22nd -

Q. Sorry, the 24th I meant.

A. Yes - 23rd and 24th, yes I do. The 22nd, 6-11 - yes, the 22nd, this person does complain of tightness in the chest, head and air pressure and tinnitus at a time when it looks as if the turbine out put has only just started. That has certainly been described to me. I guess the point that I want to make is that - I mean not all the chest tightness may be attributable to the turbines but it has certainly occurred in people when the turbines have been operating full pelt, and the link between the two I'm extremely concerned about. I'm not claiming that all the chest tightness is as a result of the turbines operating but it's certainly, I think, contributing to it, and this is one example. The other person who is blinded to the turbines operating, cannot see, cannot hear them from where they are and who does get particular symptoms of the dizziness - sorry, the vibrations - is RB, and that's No.4, and she has awful problems with vibrations, which she describes as tingling and vibrations, she also gets the nausea and from what I have looked through with her journal, it certainly does seem to correlate directly with the turbine operation. And I have also had this confirmed for me with patients in Ontario, that they are blinded as to whether or not the turbines are operating because they can't see them and can't hear them, but, you know, when they double-check they find that the symptoms do correlate with turbine output.

Q. So, is it your understanding that the journal entry was

prepared on an ongoing basis by the individual concerned, you have then obtained the power output data.

A. Independently, yes, that's correct.

Q. So, in the case of some of these people whose journal entries appear, they are blinded so to speak and they don't know what the wind farm is actually doing at that time.

A. That is absolutely correct.

Q. Yesterday, you gave some evidence about measurements of infrasound by Mr Rick James; I think that you have ascertained from Mr James the distance at which he measured that infrasound level.

A. Yes, that's correct. I emailed him to be absolutely sure and he told me it was 1500 feet that he obtained the sound pressure level of 90.

HIS HONOUR

Q. Sorry, what distance.

A. 1500 feet.

Q. 1500 feet.

A. Yes, so I guess approximately 500 m - I'm not good at the conversions.

XN

Q. Now, coming back to Professor Wittert's report, Exhibit Y, do you have that in front of you.

A. Exhibit Y? The statement?

CONTINUED

Q. So when we broke yesterday we were considering para.27.
A. Yep.
Q. The original reference in para.27(d) was to a particular attachment which has now been updated so to speak and we have that risk assessment document that you spoke of yesterday. But in that paragraph at p.6 there is reference to that landfill article. Have you considered that article.
A. Yes, I have, not in detail I must admit, yes.
Q. As I understand that article to some extent it talks about engagement that that seems to be an important part of the process as to whether or not people might object to a particular development.
A. Yes.
Q. Has that been your experience.
A. Yes. Look it has been both my personal experience with what has gone on in my home region but also from what people have said in that I guess the lack of engagement and the lack of information that is provided helps to disengage people from the process and certainly adds I believe significantly to the distress, particularly when they perceive that they can't in fact trust the information that they're being provided with from the proponents. I guess as against that I think it's really, really important to actually look at what has happened after the turbines have started operating and compare attitudes before the turbines start operating to afterwards because I think that's where you really start to get valuable information about changes in attitude which are reflective not so much of people's personal position about whether or not they like turbines but how those turbines and the operation of those turbines near their homes has actually affected them. There's a particularly good reference to that in Daniel Shepherd's paper which is - it's in the additional material which I can't locate at the moment.
Q. Exhibit A23 I think.
A. A23, yes, thank you, No.3. The particular section, I

mean there's a lot in that document that I think is particularly pertinent to the sort of points I've been bringing up. Yes, 6.7.

Q. Now the Waubra Foundation presumably has arisen because of the Waubra wind farm.

A. Yes. It's arisen really because of concern that there was a lack of credible independent research which was addressing the issues of health impacts. The reason it's been called the Waubra Foundation is because I guess that's where if you like the story got out in Australia about the fact that these people are becoming incredibly unwell and there's a lack of research and there seems to be some attempts to keep the story under the carpet so to speak.

Q. Is it your understanding that there was community consultation in relation to the Waubra wind farm.

A. There was some community consultation, yes, and my understanding from the people that I've spoken with is that the ones who are now saying to me that they are sick, and I believe that they are from my discussions with them, they see that they welcome the turbines into the area.

Q. So there was consultation as you understand it in relation to wind farms proposed there.

A. Yes.

Q. Yet in your opinion there are a number of people who are suffering following the establishment of the wind farm.

A. That's absolutely correct and absolutely confirms what Daniel Shepherd is saying he's found in this New Zealand study which he talks about in 6.7 Wilde 2008. I haven't read Wilde's study but I did read this comment of Daniel's and absolutely confirms what I found. I'll read out the pertinent piece. It says 'The same studies show that for people living within 5 km of the turbines attitudes towards the wind turbine installation appear to become more negative following the operation of the turbine. This trend was not

observed with those living between 5-15 km and one can speculate that noise was a factor in this change.' I suspect it's also other ill health that's resulted from the turbines operating.

Q. Daniel Shepherd's qualifications appear in para.1.1 of his statement.

A. Yes, that's correct. Daniel has done a lot of work in analysis of community perceptions and works closely with other colleagues at Massey University in noise measurement with his work and he's probably one of the most experienced people working in this area certainly in our part of the world at the moment. He's collaborating with us, with Bob Thorne and Wayne Spring in this study that we're planning to start.

Q. Just whilst we're talking about Waubra, I think that Professor Wittert refers to - I can't find the passage now but it will come to me in a moment - that stakeholders don't apparently appear to object or complain as much; para.31 that's discussed. Has that been your experience at Waubra.

A. No, that's not been my experience at Waubra. I think now people realise that I am trustworthy and I'm not going to - I am absolutely going to respect confidentiality. I'm finding that family members of landholders are contacting me and telling me that either they or the landholder who in fact has the turbines has become unwell and for various reasons they don't want to publicise that information but they're very concerned about that.

Q. Do you agree generally though that stakeholders don't seem to complain as much.

A. Yes, and there's published evidence that supports that.

Q. So that we're clear, stakeholders are the property owners who have allowed the turbines to be established presumably in exchange for some sort of financial compensation.

A. Yes, that's correct.

Q. So have you spoken to some stakeholders personally

yourself.

A. I haven't spoken to stakeholders who have - well no, that's not true. I have spoken to some stakeholders who are hosting turbines. I haven't asked them specifically about their health issues because I wait for people to contact me. But I guess when I hear from first degree relatives that in fact either they themselves have had health problems or their first degree relative who has signed the contract I take that seriously. There are also some reports emerging on the internet in the form of affidavits which support that. Just on that reference, the case study from south-west Scotland that Professor Wittert referred to, I was very interested to read that.

Q. That's -

A. This is the one you - yes, it's the attachment -

Q. The original attachment is it.

A. Attachment 13 'Does community ownership affect public attitudes to wind energy.'

Q. Do you understand that that report was prepared by some geographers.

A. I do understand that, yes.

Q. You've considered that document.

A. Yes, I have. I read it with interest and I think certainly community ownership of turbines is a positive move. One comment I make from reading it, when I read it it was not my impression that it was a study that was actually looking for evidence or not of people suffering the effects of wind turbine syndrome. What they were looking at was I think public perception and attitudes towards the turbines. So that was one point. Just as a bit of I guess background, from looking at the photograph in that document there were three turbines and I think the description was that they were reasonably small turbines which has an impact on how far and how much infrasound and noise is generated. There's no scale on the picture and there was no reference to it in the document but they didn't

actually say how far the turbines were away from where people were living.

CONTINUED

Q. So on p.207 of attachment 13, there's two photographs, is that what you are referring to.

A. Well, now, I'll just find it, 13. Sorry, what was the page number again?

Q. 207.

A. Yes, fig.3 I understand to be the particular turbine development that they are talking about on the island of Gigha.

Q. Just to spell that for the transcript, G-I-G-H-A.

A. Yes. It was a little bit easier to see on the electronic version, but my recollection of where the housing was is over to the right towards the coast in that photograph, which you can't really see very easily, but I guess the point I'm making is we don't know the distance, and the turbines appear to be small, and the study didn't actually specifically look for evidence or not of these illnesses.

HIS HONOUR

Q. When you say the turbines appear to be small, what are you basing that on.

A. There was a reference in there somewhere to the size of the turbines, I believe, which I remember to be 30 m. Now, I can troll through and look.

XN

Q. In the discussion immediately above the photo fig.3, there is some description of that wind farm.

A. Okay, yes, that is where I got it from, thanks.

Q. I think as you said, the three turbines, 0.7 MW windfarm, you understand that there is a correlation between the size of the - sorry, the power output of the windfarm and the size of the turbines.

A. Yes. The acousticians who I am advised by say that that is critical.

MR MANOS: Your Honour, I think it's 10 o'clock or thereabouts.

HIS HONOUR: All right, we will make the call to Mr Manning.

HIS HONOUR

Q. There is no need for you to remain in the witness box.

A. Thank you.

WITNESS STANDS DOWN

+THE WITNESS WITHDREW

ADJOURNED 9.59 A.M.

RESUMING 10.06 A.M.

XN

Q. Onto para.28 of Exhibit Y. Is there anything that you wish to comment about what's stated in that paragraph.

A. Well, yes - I mean as part of my discussion with farmers who are living next to turbines issues about animal health and associated matters have come up in those discussions. Now I'm not sure as a result of yesterday - if I can continue until I'm told that it's not relevant - certainly the farming issues that have come up, there is a lot of concern about animal health. There's been no published studies done yet. I think it's the same issue with the lag of human health.

OBJECTION: MR HENRY OBJECTS

MR HENRY: I do object to this. I think what we're getting now with anecdotal evidence about animal health issues - we're critical, and we will be critical of the evidence which is anecdotal in nature in respect of human health, but that's the nature of the beast that we're dealing with - but anecdotal evidence about animal health, in my submission, falls outside of the field of expertise of this witness and ought not to be received.

MR MANOS: Same point as yesterday, with respect. If it's all right for Professor Wittert to quote from a blog, surely it's okay for Dr Laurie to respond to that and tell the court what she's been informed - not seek to prove that there are health issues with animals, it's simply a report of what's being said. It can't sit comfortably in the mouth of Acciona to allow it's professional witness to make a comment about animals and then object when we want to respond to that.

HIS HONOUR: Well, we will not be reaching any conclusion one way or another about the impact on animal health. There's simply no evidence to support one way or another. I don't see that we're going to be assisted by Dr Laurie talking about matters well and truly outside her expertise. If she's been told things

by people - a person or persons unknown, it cannot assist this courts inquiry one iota. So we don't propose to allow that evidence.

QUESTION DISALLOWED

XN

Q. Moving to para.29, I think we touched on this report yesterday, attachment 6. Is there anything you wish to say about para.29.

A. Yes, there's a number of things. I guess I would refer your Honour and Mr Manos to Dr Daniel Shepherd's paper because in fact there is quite a significant body of evidence about direct physiological effects - and in fact Dr Shepherd talks specifically about noise sensitive people and makes it very clear that that group of people are particularly vulnerable and they include children and the elderly, and they are particularly vulnerable to noise as a physiological stressor. And I've had certainly many examples of that - which are not detailed in the transcripts because I stuck to adult evidence, but there's plenty of reports to me and also detailed particularly in Dr Nina Pierpont's study - and if the court would like to look at the raw data of Dr Pierpont's work, which is attachment 1 - in further articles and information - A23. Dr Pierpont is a paediatrician, I'm not - and she certainly discussed issues to do with children, starting with case history A3 on p.131. Her description of this child having nigh terrors has been something that has come up a number of times when I've interviewed people. Issues about speech development and - I mean she's got the expertise to discuss that, and I don't, but that's certainly something that parents have noted to me. Issues with hearing and ears - and there's numerous others, which I know time is a factor so I'm not going to sort of point them all out, but there are numerous others in that raw data section which allude to the fact that children are particularly vulnerable. So I understand also, just in terms of who

wrote that panel review, that it's not the sort of information that I would regard to be credible because it has been something that has been commissioned by the Canadian and American wind industry and I've been informed by my Canadian colleagues that Dr David Colby, who's the lead author, was actually a microbiologist and he's been apparently castigated by the Ontario physicians for his role in this review - and so much so that I believe from them -

HIS HONOUR

Q. I don't know how much further we can stray - sorry to interrupt you.

A. Yes.

Q. But this court is not bound by the rules of evidence in the way in which other courts are, but there has to be a limit to the hearsay upon hearsay upon hearsay. Now were now straying into what you understand somebody has said about another doctor. It's not going to be very helpful because we don't know the circumstances -

A. Okay.

Q. - we don't even know whether it's true or not, nor indeed do you, and I don't criticise you for raising it, but I think we are far more assisted by what we can read in these papers than by what you've heard and observed yourself then by any indirect criticisms of authors in these.

A. Yes, I guess the point I was making with that particular review is that it's been widely used, particularly by the NH&MRC rapid review of the evidence - and it's been heavily relied upon, and I find it's seriously lacking.

XN

Q. The information that you took the court to yesterday from Dr Nissenbaum, would that fit within the description of evidence that might show that there are impacts.

A. Yes, absolutely. Yes, I mean in my opinion and in others' opinion, it's the best evidence we have yet

that's been published and presented. It hasn't been published in a peer review journal, it has however been published and presented on a number of occasions.

Q. And that was, I think, called the 'Case Control Study'.

A. That's correct, yes.

Q. So that was the top of the food chain in terms of -

A. That's the top of the food chain so far. Dr Nissenbaum presented further work at the Society for Vigilance Conference in Ontario that I attended. Unfortunately that's not yet publically available because it is being submitted for publication to a peer review medical journal.

CONTINUED

HIS HONOUR

Q. What's the importance, in your mind, of material being published in peer-review journals.

A. Okay. I think the critical thing is that it's peer-reviewed. Publication in a peer-reviewed journal is important however if it's not published in a peer-review journal, that doesn't diminish the weight and the validity of the actual science that's done or the study that's done.

Q. Why wouldn't it have some impact on the weight.

A. I guess in -

Q. Isn't that the purpose of having it peer reviewed.

A. Yes, it is in that sense but it doesn't diminish the quality of the study, it just means that it hasn't been published and there are many reasons why some journal articles aren't - or some papers are not published. A PhD, for example, is a long document; it's not going to be published in a peer-reviewed journal but it is a credible body of science. The reason the Dr Pierpont study was not published in a peer-reviewed medical journal was simply that it was too long and she was of the mind, very, very firmly, that because this was a new illness and a significant illness and because there was going to be significant opposition to finding that there was this new illness, she felt it was very important that this body of work was kept together and in addition that the raw data which informed so much of that work was included in the patient's own words. Because so much of it is subjective symptom, you know, symptom description and that's why I've included it.

Q. Do you say that there is no way that Dr Pierpont would publish those findings other than by the complete body of work.

A. That's my understanding from her. She did approach a number of journals and they looked at it and found that the research was credible but they were not able to publish it because it was too long and she was unhappy to shorten it. But having said that, it has been - it

has been peer reviewed and I think it's one of the unfortunate misunderstandings that has arisen.

Q. And where has it been peer reviewed.

A. It was peer reviewed by her peers. I mean I haven't actually got a copy of the book with me but I understand Mr Manos has and I can read out the people who peer reviewed it.

MR MANOS: Can I hand to the witness a copy of the book.

XN

Q. Now you have in front of you a book.

A. That's right, the title of it is 'Wind Turbine Syndrome: A Report on a Natural Experiment' and it's by Nina Pierpont MD PhD.

Q. I think in the middle of that book is the raw data.

A. That's correct.

Q. And that is what's been reproduced in Exhibit A23.

A. Yes, that's correct, with Dr Pierpont's permission. Okay. People who have peer reviewed her work include - and I'm reading now from the last section of the book, 'Referee reports'. The first one is Jerome Haller MD, Professor of Neurology and Paediatrics, retired in 2008 from Albany Medical College, Albany, New York; Dr Haller is a member of the American Academy of Paediatrics, the American Academy of Neurology and the Child Neurology Society. They're listed in the book. I won't read them out but - another peer reviewer is Joel Lehrer, Fellow of the American College of Surgeons, Clinical Professor of Otolaryngology, the University of Medicine and Dentistry of New Jersey, formerly Professor of Otolaryngology, Mt Sinai School of Medicine, New York. Ralph Catts, DMD MPH PhD Fellow of the American College of Epidemiology, Professor and Chair Department of Epidemiology and Health Promotion, New York University, College of Dentistry, New York, New York. So - and Henry Horn PhD, Professor of Ecology and Evolutionary Biology and Associate with the Princeton Environmental Institute, Princeton

University. So it has been peer reviewed by a number of different relevant people in their field.

HIS HONOUR

Q. I suppose it really depends on what we understand or what is to be understood by the term 'peer review', I guess ... about that. Speaking for myself, I've always understood peer review is something where you present it to a recognised publication - a journal or something of that nature - it's considered by representatives and then published in that journal or whatever.

A. Yes, okay -

Q. But that's what I've always understood.

A. Sure. And Professor Phillips says otherwise. I mean there are many people who say if it's - the process of peer review is that your colleagues look at your work, critique it, make suggestions and comments on it which you may or may not adopt. The publish - you know, the fact of publication is something in addition to that.

Q. Okay, thank you.

XN

Q. Now dealing with para.30, Professor Wittert seems to acknowledge that in some circumstances there can be an annoyance for some individuals by wind farm noise then he goes on to quote some specific numbers. Does that coincide with your understanding of the published studies etc.

A. Yes, it does however I guess the - the issue that comes up and that Dr Daniel Shepherd talks about is the difficulty of using noise numbers in terms of assessing the impact of turbines on people's health. Because noise numbers alone don't actually reflect the individual experiences of that noise and the individual annoyance and I think that's a very - very important point to make.

Q. Professor Wittert refers to Dr Pedersen and I think we discussed Dr Pedersen yesterday; Dr Pedersen is a PhD in an area other than medical background.

A. Yes, that's correct.

Q. I think your attachment 7 to your addendum Exhibit A22 also deals with this topic.

A. Yes, it does and I think that we looked at this briefly yesterday and this is work from Pedersen comparing the aircraft, road traffic and railway noise to wind turbines, this graph here. And Pedersen's work certainly makes it very clear that there's something unique about wind turbine noise that a, you know, much higher percentage of people find annoying at, for example, the same sound exposure level. If you take - if you look at 42 which is 42 dB(A) which is where aircraft, road traffic and railway noise starts to climb in terms of annoying people, at the sound dB(A) - the same dB(A) level of 42, you've got upwards of 35% of people who are highly annoyed. So in other words there's something unique about wind turbine noise that cannot be compared to aircraft, road traffic or railway noise. And some of the reasons for that have been, you know, postulated to be the intermittent, the whoosh, whoosh, whoosh sound. I think Pedersen talked about -

OBJECTION: MR HENRY OBJECTS

OBJECTION UPHELD

CONTINUED

Q. Professor Wittert's discussion here is all about annoyance.

HIS HONOUR: No, I have ruled on it, Mr Manos. In any event we are going over material that we dealt with yesterday, as I recall. Given the time constraints, I don't know that it is going to help us.

MR MANOS: Thank you.

XN

Q. Para.31, I think we have dealt with the stakeholder discussion before. Para.32, we touched on yesterday, the New South Wales Legislative Council inquiry, and there is a quote there, which I think is - we have got the statement apparently made by Dr Dissendorf to that inquiry.

A. Yes, that is correct, I think.

Q. I think you said yesterday you understand that he is not a medical doctor.

A. No, that is correct.

Q. Para.33 is the National Health and Medical Research Council paper, which you commented briefly on this morning.

A. Yes.

Q. That document has been reviewed by the Wind Vigilance Council, has it not.

A. Yes, the Society for Wind Vigilance have reviewed it, and others.

Q. You have read through that NH&MRC report.

A. Yes, I have.

Q. Is that, in a sense, just an analysis of a number of articles.

A. Yes, it's a literature review. What disturbed me the most about that was the absence of primary research data. There was a lot of the references are in fact material - well, is material that originated from wind industry-sponsored, you know, surveys, reports, the Colby review, and when I read it, I realised - that was probably when I really realised that there was a significant lack of primary research data actually

examining this problem. A lot of people saying that there wasn't a problem, but not a lot of, you know, good research.

Q. But the ... inquiry that is taking place, that's going to receive personal submissions, is it not.

A. Yes, it is.

Q. That was absent from that report.

A. The NH&MRC report was a literature review, so it didn't - I mean, it wouldn't and didn't collect anecdotal data; it was specifically looking at the published evidence that there was.

Q. If you come to para.36, where Professor Wittert discusses attachment 6 again, it says that there are three possible mechanisms by which symptoms of wind turbine syndrome may originate. These are - I detail those, the nocebo effect, sensory integration dysfunction, and - I can't pronounce that - somatoform disorders. Are you familiar with each of those concepts.

A. Yes, I am.

Q. Then in para.37, there is a discussion there as well. What is your response to paras.36 and 37.

A. Well, look, I'm afraid I - from my discussions with people who have been living with wind turbines and from my reading of extensive amounts of material in the last six months, I find that there is very little evidence for the nocebo effect particularly, particularly with respect to the people that I have spoken to in Australia. To date, there are numerous people who welcomed the turbines into their area, some of whom even helped construct the turbines who have become unwell and are very distressed at what has happened, and I haven't found any evidence to support the nocebo effect. I have no doubt, though, that as publicity about the adverse health effects that are being reported by people emerges around the world that communities where turbine developments are proposed, as they become informed about these issues, do become very

concerned about the possibilities for them, and particularly as they go and do their own homework and go and visit and meet with people who are living next to turbine developments at the moment, and then when they realise the reality of the situation for those people, it certainly does cause a lot of distress. I guess the other thing I would just like to emphasise, I have a real problem with genuine psychiatric illnesses being dismissed, as I think they have been, by being called 'psychosomatic'. There is a genuine level of psychiatric distress that I have observed with people living next to turbines and I think it has been ignored for too long.

Q. In that context, Professor Wittert says in para.36 that it's possible the physical illness is as a result of the mental or emotional stress, recognition of the connection between one's mind and body. The nocebo effect, in one sense, put simply, is you're expecting there is going to be a problem because you're told there's a problem, therefore, your mind creates a problem.

A. Yes.

Q. Is that not an illness in itself, then.

A. If it results in clinical anxiety or depression, then the clinical anxiety and depression are certainly an illness.

Q. That can arise, in your experience, or has arisen, that has been reported to you.

A. There are people who are living in areas which have been subject to turbine proposals who have become aware of personal contact with people who are living adjacent to wind turbines at the moment. People go and visit, they do their homework, they find out what it's going to be like. They come back having talked to people who have lived next to turbines, done their research on the Internet, and they do now become anxious, but the people that I have spoken to who have been living next to turbines did not start out that way. As I said,

they worked on the turbines; they welcomed them into their community. Particularly in Waubra, there is no history of the particular people who are getting sick having any objections to the turbines; in fact, they have gone on the public record a number of times saying that they - you know, that they welcolmed them. So it is a complex issue and I think as information about the health effects of the turbines becomes more public, I have no doubt that that is causing some distress.

Q. I then come to the conclusion discussion. Are you able to comment about para.38.1.

A. Well, I guess the fact that infrasound has in fact been measured both by Rick James and I have become aware of a paper that was sent to me overnight that was from a German government institution, where they are charged with measuring or detecting whether or not there has been any nuclear explosions, and their instrumentation is such that they can detect the very low frequency soundwaves. This is something that was presented in -

OBJECTION: MR HENRY OBJECTS

MR HENRY: I would object to this evidence coming in at this late stage in this guise, and this paper is said to have been provided to her overnight. We have not seen it.

MR MANOS: That's not right, it was sent to you this morning.

MR HENRY: I haven't seen it, the court hasn't seen it. I'm not in a position to cross-examine on this paper, and in my respectful submission, it's simply far too late.

HIS HONOUR: We do have to bring an end to this, Mr Manos, so that the - it seems a long, long time ago that I was saying to you that even allowing Dr Laurie to be called was an indulgence. I'm not inclined to allow an exploration into this paper that we haven't seen, we haven't considered, the respondents haven't had an opportunity to consider. When I indicated before that were they to ask for an adjournment in

relation to Mr Manning's evidence, that I would favourably consider it, that was not an invitation to the parties to create situations where that would occur. I think we are trying to do fairness to all parties in this case. I think it would be unfair, given the time constraints, for us to permit you to launch into what would be, I can only imagine, a difficult area to get on top of and then cross-examine on. So I won't -

CONTINUED

MR MANOS: I've had the benefit of a brief discussion in relation to the paper. It's not that complex in terms of what it stands for. I provided it to Mr Henry and his instructors this morning. I don't expect they would have seen it.

HIS HONOUR: I accept what Mr Henry says. He hasn't seen it.

MR MANOS: No.

HIS HONOUR: It came late and it's come too late so I won't allow you to pursue it.

MR MANOS: I accept that in relation to Dr Laurie but I passed it on and said that Mr Turnbull may wish to consider this before his further cross-examination because it deals precisely with infrasound.

HIS HONOUR: It occurs to me that much of the evidence Dr Laurie has been giving in relation to infrasound is obviously beyond her expertise and a good deal of the questioning would be far better directed towards an acoustical engineer such as Mr Turnbull and I think we'd be better informed if it was. But there's been no objection in large measure so we've chosen to allow you to proceed. I think you've indicated what I think should be the outcome of it. If it's to be used at all it can be used in cross-examination of Mr Turnbull.

MR MANOS: Thank you.

XN

Q. Moving to 38.2, Professor Wittert finds that the health effects appear to be confined to a small group of the population. There is likely to be the same response wherever you put a wind farm. That suggests to me an acknowledgment by Professor Wittert that there is an issue and it doesn't matter where you put a wind farm it's not a one-off phenomenon. Has that been your experience.

A. Yes, it has been my experience where there've been large turbines and there's been homes within 5 km I guess I could accurately say. We don't know. There's not been a proper epidemiological study so we actually

don't know the numbers. My personal experience from meeting with people out at Cape Bridgewater and at Waubra particularly and at Toora is that I think the numbers will be much higher when we do do a proper thorough epidemiological study.

Q. What do you say about - you use the words 'confined to a small group of the population'.

A. We need to do the studies and in my experience I believe it will be much higher than a small group.

Q. Let me ask you this question. Let's assume for the purpose of this question there are health effects associated with wind turbine, do you say that no person should be exposed to any effect whatsoever or do you accept that it may be appropriate that there may be some impacts felt by a small number of the community.

A. I accept the latter. I do accept the latter.

Q. So if they're affected say for one hour a week or a day or a fortnight or what.

A. Look, I think we need to find out what the effects are firstly. Blood pressure seems to be emerging as a serious issue and blood pressure is often undiagnosed and undetected and blood pressure, chronic high blood pressure is a killer. So I think we need to do our research first and then work out from that with proper information you know as a public policy issue what's an appropriate percentage of people to be annoyed or level of risk or whatever.

Q. But you're not looking for total protection at all are you.

A. Absolutely not, no. I don't think that's realistic.

Q. And now I'll move to the last heading 'Concept of acceptable risk'. Have you considered that discussion.

A. Yes, I have.

Q. And that, what I just put to you in a sense comes back to this issue of about some people being affected. You don't quibble with the approach that Professor Wittert has set out there.

A. No, I don't.

Q. That's a recognised approach.

A. No, I think it's -

Q. But he concludes in para.41 there's no compelling reason to recommend that there be a further investigation so to speak. You obviously strongly disagree with that.

A. Yes, that's correct.

WITNESS SHOWN DOCUMENT

Q. You've stated that you've considered a number of documents in preparing for this matter and just having a general understanding of that. One of the documents that you've considered a report from Suzlon entitled 'Parameters influencing wind turbine noise.'

A. Yes, that's correct.

Q. Who or what is Suzlon.

A. Suzlon is a wind turbine manufacturing company.

Q. What is that document as you understand it.

A. My understanding is that is a document that was presented by one of its employees Mr Eric Sloth at a Clean Energy Council conference in May 2010 and it was sent to me by one of my acoustic colleagues who's very concerned about what's going on.

Q. Where was that conference.

A. I understand it was in Sydney.

HIS HONOUR: What is this, Mr Manos?

MR MANOS: It's another article that Dr Laurie has considered which isn't yet before the court. I was just asking some questions about it.

HIS HONOUR: But is this evidence of an expert in relation to matters of acoustics?

MR MANOS: It's a report by someone who works for a wind farm company which deals with issues of acoustics.

HIS HONOUR

Q. Somebody who works for a wind farm company.

A. Yes, that's correct.

HIS HONOUR: Well, without more how would that assist us?

MR MANOS: It was just part of the information that

has been considered and taken into account by Dr Laurie.

HIS HONOUR: I'll hear what the other parties say before we go any further.

MR HENRY: I've looked at this. It was given to me at the close of business last night. It has the hallmarks of a Power Point presentation. It certainly doesn't have the hallmarks of an article published or otherwise and it deals on my brief reading of it entirely with acoustical matters associated with wind turbines and it appears to have nothing to say at least in any meaningful sense about health issues. In my submission whether Dr Laurie has read it or taken it into account is of no moment. It's simply not something that goes to her field of expertise.

HIS HONOUR: For the reasons that I've already indicated, Mr Manos, if the documentary material that you've got is of any significance it can be placed before Mr Turnbull. Mr Turnbull can be asked to comment on it. But if we receive it we're going to receive a Power Point presentation by someone who's worked for a wind farm company, received by Dr Laurie whenever but I can't for the moment see how that's going to assist us to hear Dr Laurie's comments about that.

MR MANOS: Well, I'm not going to press it but I just say briefly Dr Laurie has obviously got a starting point when she received a lot of information and she's received information that noise is an issue.

CONTINUED

This is a document that she has taken in to consideration in forming her opinion, but I will deal with the document by Mr Turnbull. That's all that I have by way of my examination-in-chief of Dr Laurie.

HIS HONOUR: Thank you.

+NO CROSS-EXAMINATION BY MR PSALTIS

HIS HONOUR: I can indicate that we will take a short break at 11.15.

+CROSS-EXAMINATION BY MR HENRY

Q. I'll deal firstly, if I may, with your report which comprises Exhibit A20, if you just turn to that and I'll just deal with your qualifications, I'm not sure that this is contentious, but in para.2 you recite that you have the twin bachelor degrees that effectively make you a legally qualified medical practitioner.

A. Yes, that's correct. I'm just looking for my document, just bear with me, so it's A20.

Q. A20, this is your report or statement.

A. Yes.

Q. I'm not sure that it's even dated frankly.

A. Thank you, A20, yes.

Q. So you've got Bachelor of Medicine and Bachelor of Surgery.

A. That's correct.

Q. And your history in the profession has been that of a general practitioner.

A. That's correct.

Q. You don't profess to have any particular field of specialisation.

A. General practice is a specialisation.

Q. Yes.

A. And I am a specialist general practitioner.

Q. I'll put it in these terms - and no other field of specialisation other than general practice.

A. No.

Q. As I read the material that you've provided for us you don't have any experience in undertaking formal scientific research.

A. That's correct.
Q. And it would follow that you don't have any experience in undertaking formal medical research.
A. That's correct.
Q. And I think you frankly said to the court that the activities that you've undertaken so far in your role as the Medical Director of the Waubra Foundation don't amount to scientific research.
A. That's correct.
Q. Now, at the end of your statement, that's Exhibit A20, you make a particular declaration.
A. Yes.
Q. And as I understand it that declaration is a modification of the declaration referred to in the court rules.
A. Yes, that's correct.
Q. And is the effect of your modification that you weren't prepared to declare that you had made all desirable and appropriate inquiries, you were only prepared to declare that you had made certain inquiries.
A. My concern about the declaration that Mr Manos had originally asked me to sign was that I was uncomfortable with describing myself as an expert witness, Mr Henry. I have fully disclosed to the court everything which I consider to be relevant of the material that I've come across. I have not omitted material which I consider to be relevant.
Q. But what you do say by way of declaration is that you've made certain inquiries, you haven't said that you've made all of the inquiries that you think would be desirable and appropriate.
A. No, that's correct, this is a work in progress, I'm finding out new information all the time, including things like the email that was sent to me last night. It's an ongoing process.
Q. Let me turn then to the personal observations that you've made and as I understand it the effect of what you're saying is that there are some people who live

near the wind farm at Waubra who present with symptoms that you set out at para.25 of your statement.

A. You're dealing with A20 still?

Q. Yes, I'll let you know when we move from A20.

A. Okay, thank you. Para.20.

Q. 25.

A. 25, yes, okay. Yes.

Q. Effectively what you're saying - perhaps I'll repeat the proposition that - is that there is a group of some people living near the wind farm at Waubra who are presenting with the symptoms that you discuss in the body of para.25.

A. Yes, the symptoms that were described and that I've talked about there weren't confined to patients to Waubra, they were patients from a number of different wind developments across Australia.

Q. When you speak of patients they're not your patients, they're the subjects of your inquiry.

A. Affected residents.

Q. Yes, okay. So it's not just Waubra, it's in the vicinity of other wind farms in Australia and perhaps overseas, but -

A. Yes, that's correct.

Q. - the gravamen of what you're saying to the court is that this group of people that you've inquired in to is presenting with these symptoms.

A. That's correct.

Q. Those symptoms aren't unique to people living near wind farms, are they.

A. No, they're not.

Q. In fact they're symptoms -

A. With one exception. With one exception.

Q. You say that there is a symptom which is -

A. It may not have been described ... the vibration symptom is the one - is the one thing that I have not heard people describe in any other circumstance.

Q. What symptom is that that you're referring to.

A. The vibration symptom?

Q. Yes.
Q. People describe either - vibrating lips is the most common description, but vibrations in their chest is another one and some people have described vibrations in their stomach. I've not heard or read of any similar description with any condition.
Q. And are you able to tell us how many of the people that you've spoken to experienced this vibration symptom.
A. The vibrations - do you mean in total of the 60-odd people that I've spoken to or material that's specifically before the court.
Q. Well, as I understand it, you've spoken to something in the order of 60 people.
A. That's correct.
Q. They've reported to you the symptoms that you discuss at para.25.
A. Yep.
Q. You've now said that there's this additional symptom of vibrating lips, chests and stomachs and my question was; how many of the 60 people have reported that symptom to you.
A. Right, okay. There's been five, six - there would be less than 10 who have described that, but only just less than 10, I would say nine without being able to refer to my database.
Q. Yes, all right.
A. Mm.
Q. Now, and that's a symptom that you say you've not come across else where and is therefore unique to people living near wind farms.
A. That's - that's correct I believe.
Q. Leaving those symptoms to one side and dealing with the symptoms that you discuss in para.25, those symptoms that I've referred to are not unique to people living near wind farms.
A. That's correct.
Q. In fact they are symptoms that are experienced to one degree or another by people living in the general

community.

A. Yes, that's correct.

Q. Do you agree with Professor Wittert's assertion that those symptoms are stereotypical symptoms of people who are under stress.

A. Not entirely, no. I think there are particular descriptions of conditions which I've outlined in para.25, for example, the history of the acute hypertensive crisis which do not fit with a general stress reaction.

CONTINUED

Q. All right, we might be at cross-purposes. My question was just generally, in respect to the symptoms, those symptoms are generally associated with patients who are suffering from stress.

A. The sort of extreme nausea that people describe, I don't believe is associated with stress. There are particular aspects about each of those symptoms that in my experience now have led me to believe that whatever is going on adjacent to these turbines, yes, you're quite right, many of those symptoms are part of a generalised stress response, but there is a particular pattern with some of the symptoms which I believe is not just part of a generalised stress response.

Q. Perhaps if I can test my understanding of what you're saying. Let's take hypertension or high blood pressure. You accept that that symptom is generally associated with a stress response.

A. Okay, hypertension is generally asymptomatic unless it's severe, okay? Hypertension is associated with as part of a stress response, yes.

Q. But you're saying that the people that you have spoken to as part of this group of 60 people who are reporting to you hypertension, that those people are not suffering hypertension as a result of stress.

A. No.

Q. But as a result of some other agent.

A. Okay.

Q. Is that what you're saying.

A. I'm not saying - I believe it's complex. I believe there is some stress and I think stress can be induced by a number of different factors. Illness of its own account can produce stress, feelings of disempowerment can produce stress, all sorts of things can produce stress. However, I also believe that there is a direct effect associated with the operation of the turbines, and my example of this particularly is in this man who is apparently having these extremely high blood pressure episodes at night in bed asleep in his home 4

km away from the turbines at Waubra, you know, to the extent that his GP has started him on high blood pressure tablets. So this man I'm sure is subjected to stress, you know, partly because of the chronic sleep deprivation which he is suffering. So it's complex, hypertension is affected by all sorts of things, but I believe that there is an extra component.

Q. I just want to clear about what you're saying here because it's important as a distinguishing point between what you say and what Professor Wittert says. You acknowledge that the range of symptoms that you have referred to in para.25 are generally associated with a stress response, but you assert to the court that the 60 people that you have inquired into are manifesting these symptoms not because of stress but because of some other agency -

A. I'm not -

Q. - some other cause or influence.

A. I'm not asserting that stress is not part of it, but I believe there is an additional causal influence. I guess what I'm saying is that these reports are emerging and these people are getting sick and that illness is being correlated with the operation of the turbines, and they are describing to me that they are well when the turbines are not operating for a length of time and they are well when they are away from their homes. I believe there is a need for further research to establish whether in fact the turbines are doing this. I believe from the research that has been done by other clinicians who are eminently capable of doing research, which I am not, that there is a body of evidence that's emerging that shows that there is a pattern here.

Q. Yes, but it's important for us to appreciate exactly what your position is. Are you asserting positively that there is something about the windfarms that is causing these symptoms or are you asserting that there is something about the windfarms that might be causing

these symptoms that calls for further research.

A. I believe on the basis of what I have heard that there is a direct correlation, but my beliefs are irrelevant, we need to do the research.

Q. So your belief, then, tell me if I'm wrong about this, is based not on having taken an appropriate medical history of these 60 people.

A. That's correct.

Q. You have not done that.

A. No, I haven't taken it.

Q. Nor have you attempted to undertake the sort of diagnosis of these people's condition that you would if you were their general practitioner or other treating doctor.

A. Absolutely, there is a difference, yes.

Q. So there is no history and no diagnosis.

A. No, that's not true, it's not that there's no history; it's not complete and it is not the sort of history that I would take if I was their treating doctor.

Q. But on the basis of that limited inquiry into these 60 people, you're prepared to assert positively that there is something about the windfarm which is causing their symptoms.

A. I believe there is a need for further research urgently because these people are describing symptoms which arise in conjunction with turbine operation.

Q. But it's the case, isn't it, that in most population groups that you might choose to study throughout Australia, you could expect to find one or more people with hypertension.

A. Yes, of course.

Q. And/or anxiety.

A. Yes.

Q. And/or depression.

A. Yes.

Q. And all of the other symptoms that you have identified, leaving to one side the vibration symptom that you have referred to.

A. Yes.

Q. So those symptoms occur in people who have nothing to do with windfarms and don't live anywhere near a windfarm.

A. They do.

Q. It follows, doesn't it, that the mere presence of people with those symptoms near a windfarm doesn't indicate that the windfarm has caused the symptoms.

A. That is absolutely correct, however, I would like to refer you back to Michael Nissenbaum's case-controlled table.

Q. I will come back to that. If I miss it out, then you will be entitled to pull me up. As I understand it, you have interviewed 34 people.

A. Look, it started off at 34 and then I think in the end, the transcript that I submitted included 40 case histories, yes, so it depended. When I wrote this report -

Q. It was 34.

A. - it was just before I went to Ontario, that's correct.

Q. Have you made any inquiries as to the total number of people who live in the Waubra area.

A. No, I haven't, and I am very conscious that this is not in any way a comprehensive population survey. We need to do the research.

Q. So the basic proposition is this, isn't it, that we don't know from the material that you have provided to us whether there is an elevated incidence of the symptoms that you detail in para.25 in the Waubra region compared to any other population that might be considered within Australia.

A. That research needs to be done.

Q. As a result of what you say in your statement, your conclusion, and we touched on this towards the end of yesterday, your conclusion at the time was that there should be a separation distance of 10 km. That seemed on my reading of it to be based on the proposition in the second paragraph on p.11 that there was a person, one person approximately 8 km away from turbines at Waterloo -

A. Yes.

CONTINUED

Q. - who's noticing new symptoms since the turbines commenced operations. You tell me if I'm wrong but it seemed to me that your process of reasoning was that we've got a potential connection between new symptoms that are 8 km away and therefore let's add a margin of error and require a separation of distance of 10 km, is that what you're thinking.

A. No, no, that's not what I was thinking. I was - my position at the time was that because there were numerous people 5 km away who were experiencing and describing new symptoms which had started since the turbines started operating, in conjunction with information from Dr Thorne where he said that 3.5 km was the limit of what he'd found, that they hadn't looked further than 3.5 km. At that stage I was going on a precautionary principle using that and adding an extra margin in and it was - I guess it's been heightened by my concern that there were new symptoms being experienced by this person at Waterloo which have since been described by at least five - I think six other people in the Waterloo and Mt Bryan areas. So we don't know. I mean the basic research hasn't been done and if you're - this was not as a - as a permanent setback, for example, you knot it was as a precautionary thing to do the research and find out what we're dealing with. In the context of the fact that there are so many turbine developments proposed across particularly south-eastern Australia which are going to be close to people's homes. If there is an effect - and I believe there is - we need to look into it and we need to find out what's going on so that we can work out what's safe as part of an appropriate rise assessment procedure.

Q. You actually believe that there is a health effect which is associated with wind turbine developments, don't you.

A. I do now; yes, I do.

Q. And your view is that further research should be done

in order to prove what you already believe.

A. Further independent research needs to be done to find out what the problem is. I'm not interested in proving one side or another; I want the truth, I want to find out what is actually happening. And as I have said, if there is no health affects I'm quite happy to have the turbines up on the hills near my home. But I am extremely concerned by these reports of people having to move out of their homes because of illness. And I don't want that to happen to my family, nor do I want it to happen to any other family. And because of that I've clearly got a position which many would consider to be biased and not objective and therefore I'm not an appropriate person to be doing the research.

Q. Yes but I think you've quite frankly - and very frankly and appropriately acknowledged that there is a wind farm proposal which is nearby to your home.

A. That's right.

Q. Just looking through the to see if I can find the reference.

A. I think it was in the beginning.

Q. How far away is it.

A. Look - well we're not exactly sure of the development because it hasn't been submitted but I've been told that there will be five turbines within a kilometre.

Q. Of your property.

A. Yes, of my home.

Q. And clearly if the court was to adopt the 10 km setback distance that you propose in your para.26 that would have the effect of preventing the wind farm which is proposed near you until the research that you want done is undertaken.

A. Yes, that's correct.

Q. The 10 km is not based on any scientific analysis.

A. No.

Q. As a figure.

A. Well it's based on the reports that I have heard from people in Australia and on information obtained from

overseas about the distances which people are experiencing symptoms.

Q. Even if we assume, as you believe, that there is some adverse health risk associated with windfarms, you don't know where those health risks stop, do you, in terms of the distance from the farm itself.

A. Well, we haven't done the research, so no.

Q. So it could be 10 km, it could be 20 km, or it could be 100 km, as far as you're aware.

A. Well, I understand that infrasound has been measured in Germany from this German windfarm. Infrasound has been measured specifically from the turbines - from one turbine 15 km away, and this is not - this is something which came in last night, so it's not actually in the evidence before the court. So look, my position is we don't know. I was unaware that any wind turbine-specific infrasound measurements had been done anywhere in the world and I asked the acousticians who I know to see if they could find, you know, a proper study that had been done, and this came in last night. So look, my position is we don't know, the appropriate studies haven't been done, and I think we need to find out as a matter of caution, and then if there are no problems and if I'm wrong, we can build turbines without any restriction.

Q. I want to turn now to your addendum; that's Exhibit A22. This addendum, as I read it, is essentially a report on the symposium that you went to in October.

A. Yes, that's correct.

Q. Can you tell us who organised the symposium.

A. Yes, I can, it's a group called the Society for Wind Vigilance, who are based in Ontario.

Q. Can you tell us what the objectives or purposes of that society are.

A. Well, look, I don't have their details in front of me, but my understanding is that they would like to see this current gap in the appropriate independent scientific research addressed, and they are confronted

with the situation as we are here, with people becoming unwell after turbines start operating in their area, and they would like to find out why, and find out what a safe setback distance is.

Q. But their purpose is to promote research into the same issues that the Waubra Foundation is concerned with.

A. Yes, that's correct.

Q. And to, presumably, obtain funding for that research.

A. I think it's to get the research done however it is done. Look, I'm not privy to the, you know - what their plans were.

Q. But frankly, these days, if credible scientific research is done, that costs money which has to be funded from somewhere.

A. Yes, yes, that's correct.

Q. Would it be fair to say that one of the problems with what you describe as the gap in research is that no-one so far has provided funding to undertake the research that you feel should be done.

A. I think there has also been a lack of perception of the problem.

MR HENRY: I think your Honour indicated that there would be a break?

HIS HONOUR: I did. If, however, you're in the flow, as it were, we can continue, say, till half past 11, if that is more convenient. It's just really to take a break.

MR HENRY: Yes, I'm happy to do that. I've got some further questions about the addendum. Perhaps we will take a break when I've finished those.

HIS HONOUR: Yes, certainly.

XXN

Q. Would it be fair to say that the papers that were presented at the symposium were all consistent with the objective or the purpose that you have described as being shared by the Waubra Foundation and the Society for Wind Vigilance.

A. No, I wouldn't say that.

Q. My reading of them was that they all pretty much came to the conclusion that further research ought to be done into a range of phenomena.

A. Yes, of the papers that I have included here, there were a couple of other papers that were - or not papers, they were talks, discussions, and they took a position on wind energy, which the Waubra Foundation doesn't take a position on, wind energy, either way. So -

Q. Are you talking about the social desirability of wind energy or the health impacts of wind energy, or what aspect of wind energy did they cover.

A. One of them was an economic analysis, which is way outside my expertise and that is not something - the Waubra Foundation is solely focused on researching - or on making sure that the appropriate independent research is done into the adverse health effects of wind turbines.

CONTINUED

Q. Perhaps I'll put the question in this way - did any of the papers conclude either that there is no problem or that no further research is warranted.

A. No.

Q. Do you know how the speakers at the symposium were selected by the organisers.

A. No, I don't.

Q. Would you agree with me that at least some of the speakers would have had a vested interest in arranging further funding or further research into the alleged health effects of wind farms.

A. I'm just trying to think. Dr John Harris is a professor of physics. Mr Rick James, he's - John is at Queens University, he's very concerned about what is going on in Ontario. I don't -

Q. Perhaps I'll put it this way - many of them are academics who undertake scientific research which is funded externally.

A. Dr Michael Nissenbaum is a practising radiologist, he's done his research on the smell of an oily rag, Mr Henry. He is passionate about getting answers to these questions. I'm sure he would welcome some money which would enable him to do his research, but I don't believe he's feathering his own nest - if that's the point of your question.

Q. No, I'm not putting that directly to you because you wouldn't know it. I'm satisfied with the answer.

MR HENRY: I propose then to deal ultimately with some of the material which is included in Exhibit A22, but I'll do that in the course of addressing -

HIS HONOUR: A22, which you've just been on?

MR HENRY: Yes, which I've just been on - so if that's a convenient time for the morning break.

HIS HONOUR: Certainly.

ADJOURNED 11.20 A.M.

RESUMING 11.37 A.M.

XXN

Q. I just want to ask you some questions arising from your oral evidence yesterday. You started off by giving some evidence about the subjects of your inquiries in Exhibit A21 - do you see that, it's a document that sets out the transcripts taken by yourself of the individual subject details.

A. Yes.

Q. And in respect of subject 20 I think your evidence was that that person's GP and the person him or herself was saying that there was elevated nocturnal blood pressure. Do you recall that.

A. Yes.

Q. You may have said this, but I don't recall it - is it the case that that person had, and has, normal blood pressure during the day.

A. That's correct, except he has had some episodes of what his GP and I both think are an acute hypertensive crisis. He's had five episodes of these, but the rest of the time his blood pressure has always been recorded as being less than 140 on 90 - well and truly less than 140 on 90.

Q. And that's during the time when the turbines have been in operation.

A. Yes, that's correct.

Q. And so is it the case that the issue as far as subject 20's blood pressure is concerned - that you're saying that there is some effect on his nocturnal blood pressure which has been caused by the wind farm.

A. We're not sure what's caused it, we're concerned that it is in association with wind farm activity when the turbines are turning. He has also - when I say his blood pressure is normal, as I said, he has had these episodes of documented acute hypertensive crisis - so he has had episodes of elevated blood pressure, but when his blood pressure is measured normally it is absolutely within normal limits.

Q. Are you able to even hypothesise for us a basis upon which the wind farm would be causing an elevation in subject 20's blood pressure at night, but not during the day.

A. No, it's puzzling, I don't know - but what we're planning to do is put an infrasound logger in his bedroom and do a concurrent sleep study and also check and see what his nocturnal blood pressure is doing and see what we find. I don't understand - I guess one issue is that it's the first time he's had a continuous blood pressure monitoring device. It may well be that when we measure his blood pressure - if he has a holder monitor on for a month, that we find that he is in fact having day time markedly elevated blood pressure episodes. We don't know, it's the first time he's had the 24 hour holder monitor on.

Q. And are you aware of any reasons why a person's blood pressure might be elevated at night, but not elevated during he day time.

A. I am aware there are some clinical conditions where that can happen.

Q. What are they.

A. Specifically obstructive sleep apnoea, and I'm sure there's others - I'm not an expert in this area and I would absolutely be relying on and deferring to - and consulting with colleagues who have much more experience in this area than I do. But it was such an unusual finding that it's certainly worthwhile checking out further. I understand that this man has had a sleep study in the past, but not a recent one - which is why we need to do that.

Q. So it's a realistic hypothesis that subject 20 is suffering from obstructive sleep apnoea which is causing elevated blood pressure levels at night, but not during the day.

A. On the basis of his previous sleep study - his current body habitus, and reports from his wife that he doesn't snore, I don't think it's realistic. I'm intrigued as

to what is causing this and we need to do some further research. Doing a sleep study will ensure that we find out.

HIS HONOUR

Q. Why did he have the sleep study in the past, what was the reason for doing it.

A. I understand because he had difficulty sleeping - and I don't know the date of it, I understand it was after the turbines had started operating, but I haven't been able to confirm that with a sleep physician.

XXN

Q. Mr Manos asked you some questions about the Nissenbaum paper, which we find at tab 8 in Exhibit A22. And I think you suggested that that's the top of the food chain, as it were, in terms of scientific research.

A. I said it was the best evidence we have so far. It's certainly not the best evidence that is possible, but it's the best that we have so far.

Q. And as I understand it it's the best evidence in your view because it's a case control study.

A. Yes, that's correct.

Q. You're not saying that case control studies generally are the best form of scientific research, are you.

A. No, I'm not.

Q. You're just saying that because this is a case control study it's the best evidence that we have at the moment -

A. That's correct.

Q. - in respect of the issues that you're concerned about.

A. That's correct.

Q. And what we have here is - as I understand it and you'll correct me if I'm wrong, a number of pieces of paper that were presented at the symposium in October 2010.

A. No, that's not correct. The first piece of paper was the abstract that was posted as part of the conference proceedings - and the biographical information. Dr Nissenbaum's presentation from that conference was

not part of this - it's not publically available yet because it is awaiting publication in a peer reviewed medical journal.

Q. Right.

A. The case control study results - the table was what I put together from information which is in the following document - which was a paper which Dr Nissenbaum presented.

CONTINUED

Q. Just pausing there.
A. Yes.
Q. The table that immediately follows the bio -
A. Yes.
Q. - is your work derived from Nissenbaum's paper.
A. It's a graphical representation of the information, that's right, that he described.
Q. And so then what is the status of the four page document which concludes with the words 'Michael A. Nissenbaum MD'.
A. Okay.
Q. And headed 'Wind Turbines, Health, Ridgelines and Valleys'.
A. It is a paper that he prepared for presentation to the - I understand the main medical association. It is not published in a medical journal obviously. I understand from Michael that he did get peers to review it. There is no details of that there.
Q. I'll just make a note of this, it's not published. You have been told it has been -
A. Peer reviewed.
Q. - reviewed by peers and do you know who they are.
A. No, I don't.
Q. Peers unknown and are you privy to what those peers said about the paper.
A. My understanding is that they thought the methodology was -
Q. Well, just a minute. The -
A. But this is hearsay so -
Q. Yes, the basis of your understanding is what you've been told by Dr Nissenbaum about what these unknown peers said about Nissembaum's work.
A. Yes, that's correct.
Q. You've not spoken to these peers -
A. No.
Q. - yourself.
A. No, I haven't.
Q. Thank you, and following the four pages that I've

referred to that bears Nissenbaum's name, we see then a plan or a document relating to the Deerfield Wind Project at Vermont.

A. Yes, yes.

Q. Where is that from.

A. This was all part of the collection of paper - the collection of information that was part of what Michael submitted.

Q. Yes.

A. Yes.

Q. So that's part of the article submitted to the Maine board of health.

A. That's my understanding. This whole document from 'Wind Turbines, Health, Ridgelines and Valleys' to the final page was posted on the Wind Vigilance website and that's where I obtained it from.

Q. Yes.

A. And I asked Michael about it when I met him in Canada.

Q. Okay.

A. Yes, so it's not published in a medical journal. I was told by him it was peer reviewed, but I don't have any further information.

Q. Dr Nissenbaum's field of specialisation is in radiology.

A. Yes, that's correct.

Q. And diagnostic imaging. Are you aware of why a specialist radiologist was concerned about the purported health effects arising from a wind farm at Maine.

A. Because he lives in Maine and he was concerned that people were becoming unwell and he wanted to find out why.

Q. And do you know whether he lives near a wind farm.

A. No, I don't know that.

Q. Then if we turn to the first page of what he has written, it seems at about halfway down that the analysis is in respect of 22 out of about 30 adults who live within 3500 feet of a ridgeline. Now do you know

what the total number of people living within 3500 feet of that ridgeline was.

A. No, I don't.

Q. Do you know whether the 30 adults comprised the whole of the population living within 3500 feet or whether the 30 comprised some sub-group of that population.

A. I would imagine that it was a sub-group, but I don't know.

Q. And not all of the 30 were studied, correct.

A. My understanding was that - yes, that's -

Q. Well, let me put this to you. You may know more about this than I do.

A. Yep.

Q. That paragraph reads relevantly.

A. Yes.

Q. 22 -

A. Out of the 30.

Q. - out of the 30 adults -

A. Yes, sorry, yes.

Q. - were evaluated.

A. Yep.

Q. Do you know how Dr Nissenbaum selected the 22 for evaluation.

A. No, I don't.

Q. And do you know why he didn't evaluate the other eight.

A. No, I don't. There was a comment that he hadn't interviewed children in a previous description of a case series, but no, look I can't give any comment on that.

Q. And do you know how he selected the 27 people who were said to be not exposed.

A. I do know that he chose people who were matched for age, sex and occupation as best he could and that they were not - living within whatever the distance was. I think it says three miles away, 'Compared with 27 people of otherwise similar age and occupation living about three miles away'.

Q. When you say matched, matched as a group or matched

individually.

A. My understanding was that they were matched individually, but I'm not - this is not my area of expertise and I don't - I can't give a definitive answer to that.

Q. When I say matched individually, for say in the exposed group you've got a male of 25 who works and is a particular height and weight. You would then go and find someone with those qualities or characteristics who is not exposed and put them in the not exposed group.

A. Yes, my understanding is they were matched for age and sex and occupation, not height and weight.

Q. And then your analysis as I understand it in the table is simply an interpretation of the information in the bottom paragraph of the first page of the paper.

A. Yes, that's correct. It's just a visual representation of that material.

Q. Can I ask you this, did any of the exposed individuals report no symptoms.

A. Well, I can't tell that from the table and I can't remember from the original case series. My understanding is that there were some who - not everybody reported all the symptoms.

Q. Yes, but every one of them reported one or more symptoms.

A. Okay, I can't confirm that. Yes, look, I don't know. Is that in here somewhere?

Q. No, that's what I'm putting to you.

A. Yes. Look, I can't confirm that one way or the other.

Q. That would suggest, wouldn't it, that the group of 22 were selected on the basis that they were reporting symptoms.

A. It is certainly possible. I - look, I can't answer that.

Q. And what we take from your table is that out of 20 people who were reporting symptoms -

A. Yep.

Q. - 82% of them were reporting sleep deprivation.

A. Yes.

Q. And 41% of them were reporting headaches.

A. Yes, that's correct.

Q. And 59% of them were saying they were newly stressed.

A. Yes.

CONTINUED

Q. We can't draw from your table, or from Nissenbaum's paper itself, what percentage of the total population were actually reporting those symptoms.

A. No, but that wasn't what was being asserted; we don't know, we haven't done the proper epidemiological studies.

Q. Well, the way I read your table was that it was asserted that 82% of all persons exposed had reported chronic sleep deprivation.

A. 82% of those exposed?

Q. Yes.

A. To turbines.

Q. In fact it's 82% who are complaining of symptoms, are complaining of that particular symptom.

A. Well, that's - I'm sorry, can you repeat the question?

Q. It's a fair analysis of Nissenbaum's work isn't it that the 82% who are reporting chronic sleep deprivation is 82% of a group of people who are reporting symptoms allegedly as a result of the wind farm near them.

A. Yes - well -

Q. Not 82% of everybody who lives within 3500 feet of the ridgeline of that particular wind farm.

A. No, that's correct, it doesn't purport to be a population survey, if that's -

HIS HONOUR

Q. Does it follow from what you are putting to the court in terms of a setback distance, that you disagree with Dr Nissenbaum, because he seems to be saying that the non-exposed group is 5 km away.

A. I've talked with Michael about this; I think one of the things that we're - because we haven't been aware that people further away could possibly be affected, it hasn't actually been looked at properly. Michael actually found in the subsequent work which was presented at the conference that indeed there was a dose - what we call a dose response curve - and that people that distance away from this follow-up work that he did, were affected. So, I can't present that

information to the court because it's not yet publicly available, I can only report that from the conference.

XXN

Q. One last point about this, if you turn over to the third of the unnumbered pages of the text, there's a paragraph that commences 'When pre-construction modelling fails', do you see that.

A. Yes.

Q. And there's a passage two-thirds of the way down, it says 'At Mars Hill where affected homes are present at 3500 feet, sound levels have been measured at over 52.5 dB(A), do you see that.

A. Yes.

Q. So, is it your understanding that that is part of the factual context in which Dr Nissenbaum conducted his inquiry or study.

A. Meaning that there were elevated sound levels recorded?

Q. Well, not necessarily elevated, but sound levels in the order of 52.5 dB(A).

A. Well, that's what he said there.

Q. Yes, thank you. You mentioned yesterday and today the issue of infrasound and in particular the work of a Mr James.

A. That's correct.

Q. And I think you took us to Exhibit A22, tab 3, and you said yesterday that he had measured 90 dB, then I think this morning you indicated that he had measured that distance of something like -

A. 1500 feet.

Q. - 1500 feet. I've looked through the material in the abstract and the presentation, I can't see where Mr James references the measurement of infrasound of 90 dB; can you take us to it.

A. There is not a spot where he says 90 specifically, it was part of his oral presentation and I have an email from him overnight which confirms that and I'm happy to show that to the court.

Q. So, as far as the former presentation was concerned, we

have what we have at tab 3 - in the year of the symposium, was this presented in the form of a PowerPoint presentation -

A. Yes, it was.

Q. - up on the screen.

A. Specifically on the second last page - not second last - it's on a page which is entitled 'New Insights into Modulated WTILFN. Now, it's hard to understand from this tape unfortunately, the reproduction, I have got it on my computer, what he is talking about there specifically, from my understanding, from what he said at the symposium, was measurements of infrasound and there's a couple of spectrograms that he has recorded there, the top one, this is the top right-hand side, 'Maximum equals 69.14 dB sound pressure level', the next one is hard to read, the last one 78.83. These were just examples of sound spectrographs, spectrograms, which he said he had taken adjacent to wind turbines in Ontario, okay, and it was in the context of that discussion that he said the maximum that he had measured was 90 dB, 1500 feet from a turbine.

Q. Did he provide any statistical analysis as to the average or the mean of the measurements that he had taken.

A. No, he was concerned about the peak.

Q. Did he give this information at the symposium as a result of a question or as part of his primary -

A. No, it was part of his presentation.

Q. - presentation. Are you able to tell us what frequency the 90 maximum related to - it was 20 Hz, 10 -

A. Less - well my understanding was -

Q. - 5.

A. - it was between 1 and 20 Hz, I don't know a specific frequency and -

Q. Did he nominate the frequency but you've forgotten, or did he not nominate a frequency at all.

A. I can't remember. I made a note of the 90 dB because I

was astounded at that and I distinctly remember - I mean he said it was infrasound, but -

Q. Are you able to tell us -

A. And I'm not an acoustician, I am very clear about that.

Q. Yes, but this 90 figure is an important part of your concern isn't it.

A. Yes, it is.

Q. Can you tell us how many wind turbines were part of the farm that gave rise to the 90 measurement.

A. No, I can't, because he didn't mention it.

Q. And you didn't ask him any questions about it.

A. No, this was during the presentation. I did ask him questions about it after but not that specific one.

Q. Do you know what megawatt capacity the turbines were.

A. I couldn't give you a precise answer, they were large turbines, 80, 90 m high, but I can't - yes.

Q. You don't know what the capacity was.

A. No, I don't, but I can easily find that out for the court.

Q. And this was measured I think at 1500 feet. The 90 that was measured by Mr James, did that include all of the ambient or all of the infrasound in the ambient environment including the wind farm.

A. What he said, my understanding what he said was that it was specific emissions from the wind turbine that was 90. So, I can't say anymore than what he, you know, than what he said, you know.

Q. Are you aware that infrasound is present in the natural environment.

A. Yes, of course.

Q. Do you accept that in order to determine the infrasound which is coming from a particular source 1500 feet away, it would be necessary to have some method to screen out from the analysis the infrasound which is present in the ambient environment.

A. Yes, if you were going to say that it was wind turbine specific infrasound, yes.

Q. Now do you know how he did that.

A. He told me that what he used was a new instrument called a sound quality analysis instrument. I'm not an acoustician, I'm not familiar with the technology, I rely on him. But I guess -

Q. So this is a new instrument that can tell you the infrasound coming from a wind farm and ignore the infrasound of a natural environment.

MR MANOS: I don't think the witness said that.

HIS HONOUR: Sorry, Mr Manos, if you want to object -

OBJECTION: MR MANOS OBJECTS

HIS HONOUR: On what basis do you object?

MR MANOS: Well because that's not what the witness said. Put it as the witness put the evidence.

MR HENRY: Well I'm not proposing to do that. We'd be here all day if I kept on repeating the evidence of it. What I'm putting is that the effect of the evidence is that Dr James has got a new machine which is capable of distinguishing between an infrasound that comes from a wind farm.

MR MANOS: I don't think the witness said that either with respect.

MR HENRY: That's what I'm putting to her.

HIS HONOUR: Ultimately the debate might be a barren one because I'm not sure that this witness is going to be able to take us much further.

MR HENRY: Yes, we have to move on if it pleases the court.

XXN

Q. I want to ask a question next about this infrasound business which derived from some evidence that you gave yesterday. Can I take you to Professor Wittert's statement and to attachment 7. I'll take you to p.12 for the purposes of my questions. Now you make some comment about the paper by Radneva, can you remember that.

A. No, could you remind me please?

Q. It's on p.12 halfway down with a paper by Radneva of

1997.

A. Right.

Q. My recollection of it was that you referred us to that paper or rather the abstract which is reported there as part of your concern that there are studies that show that infrasound can cause health problems.

A. Yes.

Q. Or have I got your evidence wrong.

A. No, no. Yes, that's correct.

Q. You would accept though that the Radneva study is concerned with people who are experiencing both noise levels above 60dB(A) that's audible.

A. Yes.

Q. And infrasound of 55-78.

A. Yes.

Q. There's no material at p.12 of attachment 7 which would permit us to distinguish between the health effect caused by the audible noise at 60 dB(A) and the infrasound at 55-78; that's correct isn't it.

A. No. I haven't read the primary paper so you know, no. Audible noise, I believe noise and infrasound is part of what is causing the disturbance. Just on that, one of the things that I've discovered and other people are reporting as well, when you interview people they say that there's no doubt the audible noise on occasions wakes them up. However, there's a large number of people who describe being woken up despite being unable to hear the turbines and they wake up in a panic state with sympathetic arousal, you know the sweaty palms, fast heart rate and a feeling of panic and there's no audible noise that they can hear. This is being reported across the world. So we are concerned that there is in fact an infrasound effect with these people and that part of the sleep disturbance is actually a mixed picture of both audible sound and infrasound.

Q. Now I want to take you then to Exhibit A22 which is your addendum attachment 7.

A. Yep.

Q. Which comprises the work of Dr Henning.
A. Yep.
Q. You took us to the graph headed 'Why does WTN affect sleep so much.'
A. Yes.
Q. You commented to the effect that the graph shows that noise from wind turbines is more annoying than noise from aircraft, road traffic or railways at comparable sound pressure levels; correct.
A. That's correct.
Q. That's your understanding of the message from the graph that I've referred to.
A. What is says is that the percentage of highly annoyed people at the same sound exposure level is different, quite dramatically different when you compare aircraft, road traffic and railway noise with wind turbine noise. Now my understanding of the paper from which this came is that there are a number of reasons postulated for that, one of them being the sound quality of the noise, another being possibly the visual aspect, a number of things but particularly the pulsatile nature of the noise and there is certainly a growing number of people who are wondering if in fact concurrent infrasound is part of the annoyance factor.
Q. The other reference that we saw to the dotted line on the left-hand side of that graph was in tab 3 of the same document in Mr James' work; correct.
A. Tab 3, yes, that's correct.
Q. Whichever graph we look at the source of the dotted line for wind turbines is Pederson and Waye.
A. Yes.
Q. Have you satisfied yourself that the dotted line is an accurate representation of Pederson and Waye's findings.
A. I haven't compared it to the original paper. I have relied on -
Q. The presentations that we see -
A. Yes.

Q. - in your Exhibit A22.

A. Yes, that's correct.

Q. Are you satisfied that the comparisons between wind turbines on the one hand and aircraft, road traffic and railway noise on the other hand is comparable in the sense that you're comparing apples with apples.

A. I don't believe they are.

Q. Well perhaps I'll be more specific. In terms of the measurement parameters for aircraft we're dealing with LEQs, we're dealing with peaks, are we dealing with L90s or L10s.

A. Okay, I'm not an acoustician, Mr Henry, I make it very clear.

Q. Can I put this to you. If you turn to Professor Wittert's statement and go to tab 12 you'll recognise the Pedersen and Waye article.

A. Yes.

Q. If you turn to fig.2 on p.483 you'll see the graph that compares annoyance on the left-hand side with sound pressure levels.

A. Yes.

Q. On the bottom.

A. Yes.

Q. Now I'd invite you to compare the graph which comprises the dots with the representation of that figure in the graph of Mr Henning's presentation. See the dot at 40 is at a level of say 15.

A. Yes.

Q. Whereas Henning represents the annoyance percentage as being at 35.

A. Yes.

CONTINUED

Q. In fact he's represented in his graph, hasn't he, the upper limit of the 95th - 95% confidence interval, hasn't he.

A. Yes.

Q. Is that a fair way to present Patterson's data.

A. Look, I can't comment on that, on the - I can't comment on that.

HIS HONOUR: Do you mean by 'fair', accurate?

MR HENRY: Accurate.

+RE-EXAMINATION BY MR MANOS

Q. Mr Henry asked you some questions fairly early on - taking about the precautionary approach and your 10 km setback distance and I put to you that you now believe that wind farms are creating a health effect, or you said you now believe that to be the case.

A. Yes.

Q. When did you form that belief.

A. Certainly prior to attending the conference in Canada. I was - I mean, I was initially very sceptical about this. I did not want to find that there were any health issues, both because for me and my local community it was going to create a problem, not the least of which might be that my family and myself might be personally impacted if it was true and I'm very pro green energy and wind - wind energy. So I really didn't take this issue seriously until I investigated after Dr Amanda Harry - after reading Dr Harry's survey and then reading through the National Health and Medical Research Council paper and all its source documents as best I could and really after I'd started actually speaking with people and finding out how their lives had changed since the turbines had started operating. So it took me a long time really, I wasn't - certainly was not convinced straight away. I became concerned after reading - reading the documents before I'd even spoken to someone and taking, you know, listening to affected residents has just amplified those concerns. In terms of ensuring that we get the best

quality independent research to find out what, you know, what in fact is going on.

Q. You were asked some questions about patient 20 referred to Exhibit A21 -

A. Yep.

Q. - and I just want to be clear, you said in your evidence that patient 20 had some sleep studies before.

A. My - yes, my understanding is that he'd had a sleep study done some time ago. I don't have a date.

Q. Sorry, that's what I want to ask you about, the 'some time ago' I'm not clear, did - I thought his Honour might have asked a question but I - do you understand that was before or after the wind farm was turned on.

A. I don't have that information.

Q. Thank you.

A. Yes. But the reason I bring that up is because there was an issue about whether or not - this was from his GP, whether or not he had obstructive sleep apnoea and she told me that she didn't believe he did, but that it would be a good idea to repeat the sleep study because it had been done some time before.

MR MANOS: No further questions, just a comment. The witness has indicated that she can obtain additional information from Mr James it would appear which was the subject for cross-examination, I'm in the court's hands as to whether or not we should be seeking that information. Dr Laurie can re-present if need be.

MR HENRY: I'll oppose that course of action. I didn't cross-examination on the content of this new information, I cross-examination on material that was already before the court and I can't control what the witness says in terms of what she's heard in the intervening interval, but in my respectful submission, the time's long past for the presentation of additional material, particularly of that nature.

MR MANOS: There might be a misunderstanding. What the witness was indicating, she could find out the number of wind turbines, their size, etc., that was the

question that was being posed. I seek to analysis that information with the greater detail. I'm not talking about any commentaries, simply the measurement of the wind farm and the size and output, etc.

MR HENRY: I'm not calling for that information.

HIS HONOUR: I imagine you're not. But it's arisen in cross-examination, it wasn't - and it - probably it's provoked by some of Mr Henry's questions. The difficulty I have, Mr Manos, is that, as this case has revealed, what seem to be quite confined areas of inquiry turn out to be open ended.

MR MANOS: The difficulty that I face is I can - we'll hear Mr Henry making submission that that information shouldn't be relied upon, we don't have proper information, it could be the biggest wind farm in the world for all we know, yet obviously we're at a point where - it's difficult to put it forward, but if we can find out that information readily -

HIS HONOUR: Again, the way it seems to me that it would be better dealt with, more appropriately dealt with is if Dr Laurie obtain the information then you can put that as a proposition to Mr Turnbull who's the witness I think who's far better served to deal with it and see where it goes from there.

MR MANOS: Thank you. Well, I'll pursue that course then.

HIS HONOUR: Okay. All right, Mr Henry?

MR HENRY: I've got no further submissions on the question -

HIS HONOUR: No, you may have a witness that you're happy to get in to the witness-box.

MR HENRY: Yes, I'm pretty keen about that.

NO FURTHER QUESTIONS

WITNESS RELEASED

+THE WITNESS WITHDREW