

**A Primer on Adverse Health Effects
and
Industrial Wind Turbines**

March, 2010

Prepared by the Society for Wind Vigilance

www.windvigilance.com

Signed by (Alphabetical order)

Robert McMurtry, M.D., F.R.C.S. (C), F.A.C.S, Chair

Christopher Hanning, M.D., M.B

Beth Harrington, B.MUS, Communications Director

John Harrison, Ph.D.

Brett Horner BA, CMA

Richard James, INCE

Roy D. Jeffery, M.D., F.C.F.P. (Can).

Carmen Krogh, B.Sc. (Pharm.)

Michael A. Nissenbaum, M.D.

David L. White, EET, CMBB

**A Primer on Industrial Wind Turbines
and
Adverse Health Effects
March, 2010**

The American Wind Energy Association and Canadian Wind Energy Association sponsored report entitled “Wind Turbine Sound and Health Effects” (A/CanWEA Panel Review) concludes that “sound from wind turbines does not pose a risk of hearing loss or any other adverse health effect in humans.”¹ This denial does not withstand scrutiny.

On January 11, 2010 The Society for Wind Vigilance released a critique of the A/CanWEA Panel Review and concluded that it was “...neither authoritative nor convincing..” and “...independent third party studies must be undertaken to establish the incidence and prevalence of adverse health effects relating to wind turbines. Beyond that a deeper understanding of the potential mechanisms for the impacts must be elucidated in order to define the mechanisms by which the sleep disturbance, stress and psychological distress occur.”²

On January 19, 2010 The UK National Health Service (NHS) released an independent critique of the A/CanWEA Panel Review and concluded “The link between psychological distress and physical symptoms has not been explored by this report. The acknowledgment that some people exposed to wind turbine noise suffer annoyance suggests that monitoring and maximum permitted levels need to be considered carefully in areas where turbines are planned. Overall, this review will probably not resolve this controversy as there was a lack of high-level evidence on which to base any solid conclusions. What is now needed are studies that compare people exposed to turbine noise with well-matched control subjects who have not had that exposure.”³

The NHS critique is based on “the best scientific knowledge currently available”.

To read the NHS editorial policy visit.

<http://www.nhs.uk/aboutNHSCoices/aboutnhscoices/Aboutus/Pages/Editorialpolicy.aspx>

Two independent critiques of the same industry sponsored report have come to remarkably similar conclusions.

¹ W. David Colby, M.D et al., Wind Turbine Sound and Health Effects, An Expert Panel Review 2009, Prepared for American Wind Energy Association and Canadian Wind Energy Association

² The Society for Wind Vigilance, Wind Energy Industry Acknowledgement of Adverse Health Effects, An Analysis of the American/Canadian Wind Energy Association sponsored “Wind Turbine Sound and Health Effects An Expert Panel Review, December 2009”, 2010 http://windvigilance.com/awea_media.aspx

³ UK National Health Service, Wind turbine sound ‘needs research’, Thursday January 28, 2010, <http://www.nhs.uk/news/2010/01January/Pages/Wind-turbine-sound-and-health.aspx>

Paradoxically the conclusions of the A/CanWEA Panel Review are not supported by its own contents in that it acknowledges wind turbine noise may cause annoyance, stress and sleep disturbance and as a result people may experience adverse physiological and psychological symptoms.⁴

In a radio interview one of the authors of the A/CanWEA Panel Review W. David Colby, M.D. stated:

“We’re not denying that there are people annoyed and that maybe some of them are getting stressed out enough about being annoyed that they’re getting sick.”⁵

The Ontario Ministry of Health and Long Term Care also acknowledge wind turbines may cause annoyance, stress and sleep disturbance.⁶

The A/CanWEA Panel Review acknowledges wind turbine noise induced symptoms may include palpitations, insomnia, nose bleeds, dizziness, nausea, eye strain, feeling vibration and headache.⁷

In 2010 Geoff Leventhall an author of the A/CanWEA Panel Review is quoted as stating “... there was no doubt people living near the turbines suffered a range of symptoms, including abnormal heart beats, sleep disturbance, headaches, tinnitus, nausea, visual blurring, panic attacks and general irritability....it’s ruining their lives – and it’s genuine...”⁸

“Health Canada advises...that there are peer-reviewed scientific articles indicating that wind turbines may have an adverse impact on human health.”⁹

Peer reviewed studies of European industrial wind turbine facilities have documented high annoyance and sleep disturbance in respondents.^{10, 11, 12}

⁴ W. David Colby, M.D et al., Wind Turbine Sound and Health Effects, An Expert Panel Review 2009, Prepared for American Wind Energy Association and Canadian Wind Energy Association

⁵ W. David Colby, M.D., Sounding Board, 97.9 FM The Beach December 17, 2009

⁶ Arlene King M.D., Ontario Ministry of Health and Long Term Care Memorandum, October 21, 2009, http://windvigilance.com/primer_ah.aspx

⁷ W. David Colby, M.D et al., Wind Turbine Sound and Health Effects, An Expert Panel Review 2009, Prepared for American Wind Energy Association and Canadian Wind Energy Association

⁸ Countryside News, Wind turbines set to get bigger, January 28 2010

<http://www.walesonline.co.uk/countryside-farming-news/countryside-news/2010/01/28/wind-turbines-set-to-get-bigger-91466-25701853/>

⁹ Safe Environs Program, Health Canada Environmental Assessment Nova Scotia, August 6, 2009, http://windvigilance.com/primer_ah.aspx

¹⁰ Pedersen, E. and K. Persson Waye. 2004. Perception and annoyance due to wind turbine noise: A dose-response relationship, Journal of the Acoustical Society of America 116: 3460–3470.

¹¹ Pedersen, E. and K. Persson Waye. 2007. Wind turbine noise, annoyance and self-reported health and well being in different living environments

¹² Pedersen et al., 2008, Project WINDFARM perception Visual and acoustic impact of wind turbine farms on residents

World Health Organization recognizes annoyance and sleep disturbance as adverse health effects.¹³

In 2009 World Health Organization released a 184 page peer reviewed summary of research regarding the risks to human health from noise induced sleep disturbance. Some of the adverse health effect documented in the report include poor performance at work, fatigue, memory difficulties, concentration problems, motor vehicle accidents, mood disorders (depression, anxiety), alcohol and other substance abuse, cardiovascular, respiratory, renal, gastrointestinal, musculoskeletal disorders, obesity, impaired immune system function and a reported increased risk of mortality.¹⁴

The A/CanWEA Panel Review acknowledges that wind turbine low frequency noise may cause annoyance.¹⁵

Some of the documented effects of low frequency noise induced annoyance include task performance deterioration, reduced wakefulness, sleep disturbance, headaches, and irritation.¹⁶

“Unlike higher frequency noise issues, LFN is very difficult to suppress. Closing doors and windows in an attempt to diminish the effects sometimes makes it worse because of the propagation characteristics and the low-pass filtering effect of structures. Individuals often become irrational and anxious as attempts to control LFN fail, serving only to increase the individual’s awareness of the noise, accelerating the above symptoms”¹⁷

The NASA Technical paper “Wind Turbine Acoustics” states “People who are exposed to wind turbine noise inside buildings experience a much different acoustic environment than do those outside....They may actually be more disturbed by the noise inside their homes than they would be outside....One of the common ways that a person might sense the noise-induced excitation of a house is through structural vibrations. This mode of observation is particularly significant at low frequencies, below the threshold of normal hearing.”¹⁸

¹³World Health Organization, Guidelines for Community Noise,1999
http://www.euro.who.int/mediacentre/PR/2009/20091008_1

¹⁴ World Health Organization, Night Noise Guidelines for Europe, 2009
http://www.euro.who.int/InformationSources/Publications/Catalogue/20090904_12

¹⁵ W. David Colby, M.D et al., Wind Turbine Sound and Health Effects, An Expert Panel Review 2009, Prepared for American Wind Energy Association and Canadian Wind Energy Association

¹⁶ DeGagne et al., Incorporating Low Frequency Noise Legislation for the Energy Industry in Alberta, Canada Source: Journal of Low Frequency Noise, Vibration and Active Control, Volume 27, Number 2, September 2008 , pp. 105-120(16)

¹⁷ DeGagne et al., Incorporating Low Frequency Noise Legislation for the Energy Industry in Alberta, Canada Source: Journal of Low Frequency Noise, Vibration and Active Control, Volume 27, Number 2, September 2008 , pp. 105-120(16)

¹⁸ Harvey Hubbard et al, NASA Technical Document, Wind Turbine Acoustics, 1990

Geoff Leventhall one of the authors of the A/CanWEA Panel Review acknowledges the serious nature of low frequency noise induced annoyance by asserting “The claim that their "lives have been ruined" by the noise is not an exaggeration...”¹⁹

In a 2009 article the UK National Health Service stated “...it is physically and biologically plausible that low frequency noise generated by wind turbines can affect people...”²⁰

The Canadian Wind Energy Association claims that wind turbine “installations meet strict government regulations with respect to sound”²¹ but at the same time acknowledges that noise modelling typically used does not purport to consider the worst case and that actual noise levels may exceed that predicted.²²

According to the Ontario Ministry of Environment “There is currently no scientifically accepted field methodology to measure wind turbine noise to determine compliance or non compliance with a Certificate of Approval limits.”²³

In most jurisdictions there is no requirement for the wind energy industry to monitor or address for wind turbine low frequency noise.

The World Health Organization states:

“The precautionary principle. In all cases noise should be reduced to the lowest level achievable in a particular situation. When there is a reasonable possibility that the public health will be endangered, even though scientific proof may be lacking, action should be take to protect the public health, without awaiting the full scientific proof.”²⁴

To learn more visit The Society for Wind Vigilance at www.windvigilance.com

¹⁹ Leventhall HG. Low frequency noise and annoyance. Noise Health [serial online] 2004 [cited 2009 Dec 31];6:59-72. Available from: <http://www.noiseandhealth.org/text.asp?2004/6/23/59/31663>

²⁰ UK National Health Service, Are wind farms a health risk? Monday August 3 2009, <http://www.nhs.uk/news/2009/08august/Pages/Arewindfarmsahealthrisk.aspx>

²¹ CanWEA Paper Addressing Concerns With Wind Turbines And Human Health, January 2009

²² Howe Gastmeier Chapnik Limited, Wind Turbines And Sound: Review And Best Practice Guidelines, Submitted To: CanWEA Canadian Wind Energy Association, February 15, 2007

²³ Correspondence from Ministry of Environment September 30, 2009 ENV1283MC2009-4305, http://windvigilance.com/primer_ahc.aspx

²⁴ World Health Organization, Guidelines for Community Noise,1999 http://www.euro.who.int/mediacentre/PR/2009/20091008_1