

**A Global Guideline for the Minimum Siting Distance
of Industrial Wind Turbines**

The Society for Wind Vigilance

April 4, 2012

The Society for Wind Vigilance hereby issues a *Global Guideline for the Minimum Siting Distance of Industrial Wind Turbines* to protect the health and well-being of those living in proximity to wind energy facilities.

An Ontario Environmental Review Tribunal (ERT) Decision stated:

“This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”¹

Industrial wind turbines sited in proximity to humans has resulted in complaints and reports of adverse health effects² including annoyance and / or sleep disturbance and / or stress related health impacts and / or reduced quality of life.^{3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

The American Wind Energy Association and Canadian Wind Energy Association funded a panel literature review which determined documented symptoms (i.e. sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep are symptoms) “are not new and have been published previously in the context of “annoyance”” and are the “well-known stress effects of exposure to noise”.¹³

Industrial wind turbine noise is perceived to be more annoying than transportation noise or industrial noise at comparable sound pressure levels.¹⁴

Setbacks must ensure humans are protected from the negative effects of industrial wind turbine noise and visual impacts.

Industrial wind turbine noise levels deemed “safe” by developers and regulators are commonly based on outdated recommendations; and / or poor understanding of the effects of noise on human subjects; and / or assumptions that wind turbine noise can be equated with other sources of environmental noise; and / or and a desire to encourage the development of wind power.¹⁵

Industrial wind turbine noise guidelines in most jurisdictions are typically based on an averaged “A”-weighted metric which is inappropriate for cyclical amplitude modulation, low frequency and tonal noise emitted from industrial wind turbines. Most noise guidelines do not address the lack of industrial wind turbine noise night time abatement.

Furthermore industrial wind turbine noise levels are difficult to predict fully in advance.¹⁶ Predictive computer-generated noise modeling is typically based on standards never designed for turbine noise and do not represent worst case scenarios.^{17, 18} A safety margin must be incorporated at the planning stage in order to guarantee that the actual erected turbines will comply with noise limits.¹⁹

Based on a review of the evidence, the Society for Wind Vigilance is satisfied that there is a significant probability of adverse health effects for human subjects living within 2.0 km of land based industrial wind turbines. The Society for Wind Vigilance recognizes the urgent need for further human health research to finalize guidelines for siting and noise levels that will protect human health. In the interim the Society for Wind Vigilance recommends that land based industrial wind turbines be sited a minimum of 2 km from the property line of non-participating residents. Distances greater than 2 km will typically be required for special terrain such as turbines on ridges²⁰ and offshore turbines.²¹

The Society for Wind Vigilance recognizes that this guideline may not protect everyone and is considered an interim recommendation.

The Society for Wind Vigilance will monitor and revise its position on setbacks as new information becomes available.

For more information on industrial wind turbines and health visit www.windvigilance.com

¹ Erickson v. Director. (2011). Ministry of the Environment, Environmental Decision Case Nos. 10-121 and 10-122. Retrieved from <http://www.ert.gov.on.ca/english/decisions/index.htm>

² Hanning, C., & Evans, A. (2012). Wind turbine noise, *British Medical Journal*, BM J2012;344:e 1527

³ Pedersen, E., & Persson Waye, K. (2004). Perception and annoyance due to wind turbine noise—A dose response relationship. *Journal of the Acoustical Society of America*, 116, 3460-3470.

⁴ Pedersen, E., & Persson Waye, K. (2007). Wind turbine noise, annoyance and self-reported health and well being in different living environments. *Occupational and Environmental Medicine*, 64,480-486. doi:10.1136/oem.2006.031039

⁵ Harry, A. (2007, February). Wind turbines, noise and health. Retrieved from <http://www.wind-watch.org/documents/windturbines-noise-and-health/>

⁶ Phipps, R., Amati, M., McCoard, S., & Fisher, R. (2007). Visual and noise effects reported by residents living close to Manawatu wind farms: Preliminary survey results. Retrieved from <http://www.wind-watch.org/documents/visual-and-noise-effects-reportedby-residents-living-close-to-manawatu-wind-farms-preliminarysurvey-results/>

⁷ van den Berg, F., Pedersen, E., Bouma, J., & Bakker, R. (2008). Project WINDFARM perception: Visual and acoustic impact of wind turbine farms on residents (Final Report FP6-2005-Science-and-Society-20, Specific Support Action, Project no. 044628). Groningen, Netherlands: University of Groningen and the University of Gothenburg.

⁸ Pierpont, N. (2009). *Wind turbine syndrome: A report on a natural experiment*. Santa Fe, NM: K-Selected Books.

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- ⁹ Nissenbaum, M, Aramini J , Hanning C. (2011, July) Adverse health effects of industrial wind turbines: a preliminary report, 10th International Congress on Noise as a Public Health Problem (ICBEN) 2011, London, UK. Retrieved from <http://www.windvigilance.com/about-adverse-health-effects/resource-centre>
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- ¹¹ Krogh, C. (2011). Industrial Wind Turbine Development and Loss of Social Justice? *Bulletin of Science Technology & Society*, 31, 321-333.
- ¹² Shepherd D, McBride D, Welch D, Dirks KN, Hill EM. Evaluating the impact of wind turbine noise on health-related quality of life. *Noise Health* 2011;13:333-9.
- ¹³ Colby, W. D., Dobie, R., Leventhall, G., Lipscomb, D. M., McCunney, R. J., Seilo, M. T., & Søndergaard, B. (2009, December). Wind turbine sound and health effects: An expert panel review. Washington, DC: American Wind Energy Association and Canadian Wind Energy Association. Retrieved from http://www.canwea.ca/pdf/talkwind/Wind_Turbine_Sound_and_Health_Effects.pdf
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- ¹⁵ Shepherd, D and Billington, R. Mitigating the Acoustic Impacts of Modern Technologies: Acoustic, Health, and Psychosocial Factors Informing Wind Farm Placement *Bulletin of Science Technology & Society* 2011 31: 389, DOI: 10.1177/0270467611417841 <http://bst.sagepub.com/content/31/5/389>
- ¹⁶ DeGagne D.C. and Lewis A.; Development of Regulatory Requirements for Wind Turbines in Alberta; Alberta Energy and Utilities Board; *Journal of the Canadian Acoustical Association*; V34,N2; June 2006,
- ¹⁷ Harrison, John P. Wind Turbine Noise *Bulletin of Science Technology & Society* 2011 31: 256, DOI: 10.1177/0270467611412549, <http://bst.sagepub.com/content/31/4/256>
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