

**Subject:** Infra sound research  
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Wednesday, September 28, 2016

Jane Wilson  
Wind Concerns Ontario

Dear Jane:

My name is Richard Mann and I am a professor at the University of Waterloo.

I am writing to bring you up to date on research I am doing on infrasound generated by Industrial Wind Turbines and its potential health effect on humans.

I first became aware of this issue after reading a paper by Carmen Krogh dealing with adverse health effects caused by Industrial Wind Turbines in Canadian Family Physician journal in May 2013. (Link: <http://www.cfp.ca/content/59/5/473.full>)

While I have not been involved in research driven by surveys, interviews, anecdotal data and demographics, I feel this data may have some value in broadening the knowledge base. I do believe, however, that this research alone is not able to directly link IWT's to health issues.

What has been needed is a way to actually test humans by exposing them to infrasound in a lab setting and scientifically document the effects of this exposure.

I started my research by working to develop the best infrasound recording method possible.

In partnership with Professor John Vanderkooy (Physics, University of Waterloo), we developed a method of measuring infrasound from a single turbine, thereby isolating our results from the "clutter" of other turbines, wind noise, and other "pollutants".

We published our work and our paper was presented at Wind Turbine Noise 2015, INCE/EUROPE, in Glasgow, Scotland in April of this year. A copy of the paper is available on my web page. (Link: <http://www.cs.uwaterloo.ca/~mannr/WTN2015.pdf>)

The next step was to design and build a method of producing infrasound in a lab setting. To be a useful research tool this infrasound needed to be identical to that produced by IWT's.

This required the mathematical and computational research necessary to generate Sound Wave output to an exact duplicate of input data, namely actual turbine recordings previously captured.

This would finally allow others at the university, with appropriate medical training and ethics approval, to scientifically test and document the effects of infrasound produced by IWT's on humans.

In October of 2015, I received a combination of funding for my research from both my department and the Office of Research. This has allowed me to proceed with the design, building, and testing of equipment germane to the above goals.

Prototype #1 was a small chamber, proof of concept device, that was able to produce infrasound to a mirror of input commands.

Prototype #2 is a four-fold scaled up chamber version, incorporating method and design changes learned from the first effort. Prototype # 2 is currently producing infrasound as low as 0.25 HZ and responds to input commands in the full HZ range of IWT output, a region where we will need to be doing our research and testing.

Prototype # 3, a full scale chamber version, capable of accommodating a human subject, is currently in process. Work has started on the mechanical components and I will soon be engaging those to be involved in subject testing, for their input on chamber design, functionality and other requirements.

I am excited by and committed to this project. I am confident that we are now getting close to being able to scientifically research the link between IWT's and human health effects. I will keep you updated as progress unfolds.

On a personal note, I complement you on the incredible results you have achieved for the cause.

We all contribute according to our individual strengths and abilities. Your hard work, effort, and leadership skills are appreciated by many.

Dr. Richard Mann, Associate Professor  
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Faculty of Mathematics  
University of Waterloo