Human Health and the Environment  
Assessment and Management of Chronic Complex Conditions  
13069 Keele Street  
King City, Ontario  
L7B 1G1  

Premier Hon. Doug Ford, Etobicoke North Premier's Office, Room 281, Queen's Park, Toronto, ON M7A 1A1, doug.fordco@pc.ola.org  
Hon. Toby Barrett, Haldimand-Norfolk, Minister of Natural Resources and Forestry, Whitney Block, Room 6522, Toronto, ON M7A 1W3, toby.barrett@pc.ola.org  
Hon. Raymond Sung Joon Cho, Scarborough North, Minister for Seniors and Accessibility  
Frost Building South, 6th Floor - 7 Queen's Park Cres., Toronto, ON M7A 1Y7, raymond.choco@pc.ola.org  
Hon. Christine Elliott, Newmarket—Aurora, Minister of Health and Long-Term Care,  
Hepburn Block, 10th Floor 80 Grosvenor St., Toronto, ON M7A 1E9, christine.elliott@pc.ola.org  
Hon. Ernie Hardeman—Oxford, Minister of Agriculture, Food and Rural Affairs, 11th Floor, 77 Grenville St., Toronto, ON M5S 1B3, ernie.hardemanco@pc.ola.org  
Hon. Monte McNaughton Lambton—Kent—Middlesex, Minister of Infrastructure  
Hearst Block 8th Floor, 900 Bay St., Toronto, ON M7A 2E1, monte.mcnaughtonco@pc.ola.org  
Hon. Rod Phillips Ajax, Minister of Environment, Conservation and Parks  
Ferguson Block. 11th Floor, 77 Wellesley St. W, Toronto, ON M7A 2T5, rod.phillips@pc.ola.org  
Hon. Greg Rickford Kenora—Rainy River, Minister of Energy, Northern Development and Mines  
Whitney Block, 5th Floor. 99 Wellesley St. W., Toronto, ON M7A 1W1, greg.rickford@pc.ola.org  
Hon. Todd Smith, Bay of Quinte, Minister of Government and Consumer Services  
Mowat Block, 6th Floor, 900 Bay St., Toronto, ON M7A 1L2, todd.smithco@pc.ola.org  
Hon. Bill Walker, Bruce—Grey—Owen Sound, Government Caucus Office,  
Room 251 Main Legislative Building, Queen's Park, Toronto, ON M7A 1A4, bill.walkerco@pc.ola.org  
Hon. Sam Oosterhoff, Niagara West, Parliamentary Assistant to the Minister of Education  
Mowat Block, 22nd Floor, 900 Bay St., Toronto, ON M7A 1L2, sam.oosterhoffco@pc.ola.org  
Hon. Rick Nicholls, Chatham-Kent—Leamington, Deputy Speaker Room 440,Main Legislative Building,  
Queen's Park,Toronto, ON M7A 1A8, rick.nicholls@pc.ola.org  
Dr. David Williams, BSc., MD, MHSc, FRCPS, Chief Medical Officer of Health, 5775 Yonge Street - 16th Floor, Toronto ON M7A 2E5 Canada, infoline.moh@ontario.ca  

Date: November 28th, 2018
Dear Honourable Mr. Ford, Ministers, and MPPs, colleagues,

I am writing to express concern about the potential for harm for human health represented by Ontario’s Industrial Wind Turbines (IWTs) and their supporting infrastructure.

Research has demonstrated how various forms of pollutant from IWTs can adversely affect human health.1 These include noise, infra-sound, dirty electricity, and ground current which can each, along with shadow flicker, contribute to ill-health among those who live near wind turbines.2

Havas and Colling’s research draw on Frey and Hadden’s work to note that “most people who live near wind turbines and complain of ill effects blame the effects on the noise generated by the turbines.”3 Indeed, research globally has suggested that noise from turbines does indeed contribute to ill-health, and the literature suggests best practices for IWT placement to avoid noise issues.4 5

Havas and Colling also draw on existing research to note that “pressure waves at levels outside the range of human hearing can also have unpleasant side effects”. The combination of low-frequency noise and infra-sound may produce, in patients, “a set of symptoms that include depression, irritability, aggressiveness, cognitive dysfunction, sleep disorder, fatigue, chest pain/pressure, headaches, joint pain, nausea, dizziness, vertigo, tinnitus, stress, heart palpitations, and other symptoms.”6 This combination of symptoms has been described by Pierpont as ‘wind turbines syndrome’7 and elsewhere


2 Ibid


as vibroacoustic disease.\textsuperscript{8,9} They note how U.S. Military research has also demonstrated that acoustic infrasound can have dramatic and serious effects on human physiology.\textsuperscript{10} This research states that:

Acoustic, infrasound: very low frequency sound which can travel long distances and easily penetrate most buildings and vehicles. Transmission of long wave-length sound creates biophysical effects, nausea, loss of bowels, disorientation, vomiting, potential organ damage or death may occur. Superior to ultrasound because it is “inband,” meaning it does not lose its properties when it changes mediums such as air to tissue. By 1972 an infrasound generator had been built in France, which generated waves at 7Hz. When activated it made the people in range sick for hours.\textsuperscript{11}

A significant impact on human health from IWTs can also result from electromagnetic pollution. The inverters and other technologies present within the turbines generate high levels of electrical distortion on the 60HZ sine wave of electrical current put on to the electrical grid by the renewable source.\textsuperscript{12} This research around high levels of electrical distortion is confirmed by research by the Wind Plant Collector System Design Working Group, a part-industry organization, and published by the Institute of Electrical and Electronics Engineers (IEEE).\textsuperscript{13} Also resulting from power generation in IWTs are increased levels of ground current often measured as voltage and often described as ‘stray voltage.’\textsuperscript{14} The circulation of these levels of distorted high-frequency signals, also known in the vernacular as ‘dirty electricity,’ as well as ground current or stray voltage in areas extending kilometers beyond individual IWT sites can contribute to electromagnetic injury and sensitivity to electromagnetic emissions.


\textsuperscript{11} Ibid.


Sensitivity to EMF has been termed Electromagnetic Hypersensitivity (EHS).\textsuperscript{15} It is thought to occur in 3-20 per cent of our population and poses the greatest risk to patients with pre-existing cardiac, neurological, dermatological and immunological conditions.\textsuperscript{16 \textendash}20 However, healthy individuals are often affected as well and those affected complain of sleep disturbances, headaches, fatigue and difficulty concentrating. Symptoms are reduced by avoidance measures. Long-term and serious health effects can also result for those not immediately experiencing initial sensitivity.\textsuperscript{21 \textendash}22

This cumulative effect of these various health impacting factors combined with the prevalence of IWTs across the province suggest that significant steps at various levels and in various areas need to be taken to:

1) widely acknowledge the potential risks that IWTs represent
2) fully respond to the thousands of demonstrated complaints of adverse effects of IWTs across the province\textsuperscript{23}


\textsuperscript{21} Carpenter D. Human disease resulting from exposure to electromagnetic fields. \textit{Rev Environ Health} 2013; 28(4):159-172.


3) carefully measure noise, infrasound, and electromagnetic emissions in and around all of Ontario's IWT installations
4) follow mitigative steps around electromagnetic pollution (high frequency distortion, ground current/stray voltage) as suggested by the wind industry's own publications and by other non-invested experts
5) re-site IWTs to other locations without human populations when mitigation cannot be effectively undertaken

The risks for the short and long-term health of Ontarians of not undertaking such mitigating and remediating steps is significant.

Sincerely, Riina Bray

Riina Bray

Riina I. Bray BAsc, MSc, MD, FCFP, MHSc
Medical Director, Environmental Health Clinic, Women’s College Hospital
Assistant Professor, Department of Family and Community Medicine, University of Toronto
Cross-Appointment Dalla Lana School of Public Health

The author grants permission to post this letter for public viewing and sharing.

APPENDIX A

Summary of references in alphabetical order


