association to protect
AMHERST ISLAND

PO Box 6, 5695 Front Road,
Stella, ON K0H2S0.

January 6th, 2015

Ms. Agatha Garcia-Wright, Director
Environmental Approvals Branch,
Ministry of the Environment and Climate Change,
2, St. Clair Avenue West, Floor 12A,
Toronto, ON M4V 1L5

Without Prejudice to All of Our Rights

Dear Ms. Garcia-Wright,

As you are aware, APAI received a letter signed by Minister Glen Murray, dated Dec 23 2014 acknowledging that you have released draft approval conditions to Algonquin Power for the Windlectric proposed development on Amherst Island. This confirmed what APAI had learned from Algonquin Power's Q3 Financial Report dated November 14, 2014. This new letter from the Minister reiterates what you had written in previous correspondence that the REA process is iterative. In light of this principle, the purpose of this letter is to bring to your attention new material that substantiates our claim that the Hatch noise assessment is inadequate and needs to be revisited.

First, though, I will summarize previously provided information detailing how the Windlectric Noise Assessment Reports do not meet the Ministry's published guidelines:

- The 40 dBA sound pressure level predictions made by Hatch for the Windlectric development do not represent the worst case scenario demanded by the 2008 Ontario noise regulations for wind turbine noise.
- The sound power used by Hatch does not include an allowance for the uncertainty in the test measurement, as specified by IEC 61400-14.
- Hatch worked with an out-dated 2002 version of IEC 61400-11. There have been two revisions (2006 and 2012).
- The Hatch noise assessment did not include a measurement of the wind shear coefficient and made no correction to the Siemens' turbine noise specifications for the wind shear coefficient that Hatch pulled out of the air!

We have previously provided the following information as to why the MOECC 2008 Noise Guidelines for Wind Farms do not provide accurate noise assessments:

- The use of IEC TS 61400-11 and ISO-9613-2 does not capture the worst case scenario. Missing are real parameters such as variations of inflow angle caused by turbulence, wind shear and changes of wind speed, the "hard ground" of the winter months, refraction

arising from wind shear and temperature inversion, and the reality of amplitude modulation.

- Use of ISO-9613-2 should include the uncertainty that is an integral part of the international standard.
- The 40 dBA noise limit is inadequate. European field studies have demonstrated the about 20% of residents subject to 40 dBA of turbine noise are "very annoyed". A similar correlation between annoyance and turbine noise has now been seen in both the University of Waterloo and the Health Canada studies.

The reasons for bringing the noise assessment back to the attention of the Technical Review Committee are several: matters that have only recently come to light.

Institute of Acoustics Study

Towards the end of 2014, the UK Department of the Environment and Climate Change (DECC) acknowledged the annoyance of amplitude modulation and the "thumping" associated with near-stalling conditions due to inflow angle changes. DECC has granted a contract to the Institute of Acoustics to study and report on amplitude modulation and other turbine noise problems[1]. The Institute of Acoustics is a professional body with members drawn from acoustics consultants among others.

In a quote from a spokesman for DECC, the Telegraph reports:
"This review should empower local people to stop disruptive wind farms and make sure local authorities have all the information they need before giving a planning application the green light."

Renewable Energy UK, the lobby group equivalent of the Canadian Wind Energy Association, has also acknowledged the thumping problem and has devised ways of tackling it. The Telegraph article quotes Gemma Grimes, the group's Director of Onshore Renewables: Independent research published last year had helped
"to pinpoint when, where and how this sound varies. We found that this can be addressed by using computer software to adjust the way turbines operate, changing the angle of the blades to minimise the sound levels."

Ontario as you well know has a general 5 dBA penalty for amplitude modulation and sounds of an impulsive character but this penalty was specifically excluded by your Ministry from the 2008 Noise Guidelines for Wind Turbine Noise.

[1] The terms of reference can be found at: http://www.ioa.org.uk/sites/default/files/AMworkingparty-termsofreference_0.pdf
The scope of the work can be found at: http://www.ioa.org.uk/sites/default/files/AMworkingparty-scopeofwork.pdf
Background can be found at: http://www.telegraph.co.uk/news/earth/energy/windpower/11262781/Noisy-wind-farms-face-ban-as-ministers-launch-review-into-annoying-sound-levels.html

Vestas Turbines at Falmouth, MA.
This is an issue that dates back to 2010 but that has only recently come to light. It is a very serious admission from the wind industry and deserves immediate attention from your Ministry. The turbines at the Falmouth waste-water plant have been the poster-child for the annoyance caused by wind turbine noise. After the first was constructed there were numerous noise complaints from residents within 800 metres and more. Before Vestas would supply the second turbine it requested confirmation, via the project manager Mr. Bruce Mabbott (Solaya Energy), that the Town of Falmouth *"understands that they are fully responsible for the site selection of the turbine and shall bear all responsibilities to address any mitigation needs of the neighbours".* Mr. Mabbott wrote that: *"The town had previously been provided with octave-band data/sound performance showing the turbine normally operates at 103.2 decibels but that it can produce up to 110 decibels under certain circumstances.*"[2] This is an 8 dBA enhancement.

You will recall that our acoustics consultant, Mr. Rick James, asserted that under the worst case scenario 8 dBA should be added to all of the noise assessments presented by Hatch in their REA report.

Bavaria's Regulations
The Landtag (State) of Bavaria in Germany, recognizing the need to separate wind turbines from residents, has very recently (November 2014) enacted a law with a new setback regulation of 10x the overall height of the turbine.[3] For the proposed Windlectric development this would be over 1500 metres. This is just the latest of various jurisdictions increasing setbacks from residences.

In addition, Bavaria has a penalty of 3 dBA for pulsed noise. *"The decision of the Bavarian Higher Regional Court in Munich about the wind turbine in Kienberg points out that the Enercon E 82 turbine emits pulsed noise. Therefore to any actually measured sound level three decibels would have to be added."* The decision was challenged to a higher level of jurisdiction. *"The Federal Court of Justice has rejected the ENERCON case. The Federal Court of Justice is the highest Court for such cases in Germany, so Enercon has no possibility to go further in this case. The 3 dB addition for pulsed noise for the E82 is official."* [4]

The reality is that turbine noise is annoying, the amplitude modulation contributes to the annoyance and slowly this is being recognized by the wind industry and the courts. How long can the Ontario MOECC hide from this reality?

Summary
The earlier APAI submissions criticising the inadequacies of the Hatch noise assessment report are fully supported by the recent information that has come to light. The Windlectric site plan leaves no room for uncertainty in the sound power test measurements, for uncertainty in the sound pressure level predictions, for the added annoyance from amplitude modulation, and for

[2] A copy of the letter from Mr. Abbott is attached to this letter. Mr. Abbott is now a math teacher.
[3] See https://www.verkuendung-bayern.de/gvbcial/jahrgang:2014/heftnummer:19/seite:478 An official translation of the law is not available. Attached to this letter is a google translation.
[4] See http://www.windwahn.de/index.php/news/gerichte/enercon-e-82-pulsed-noise

the worst case atmospheric conditions such as turbulence, wind speed gradient and temperature inversion. This skating on thin ice is demonstrated in the by-now well-known Hatch 40 dBA contour map for the Windlectric development, repeated below. With assurance I predict non-compliance with the 2008 noise regulation at a large number of Amherst Island homes.

Regardless of where the approval process is we urge you to reject the proposal until a realistic site plan and noise assessment is prepared by Algonquin Power.

I will finish by noting that several requests have been made to your Ministry and no answers have been provided:

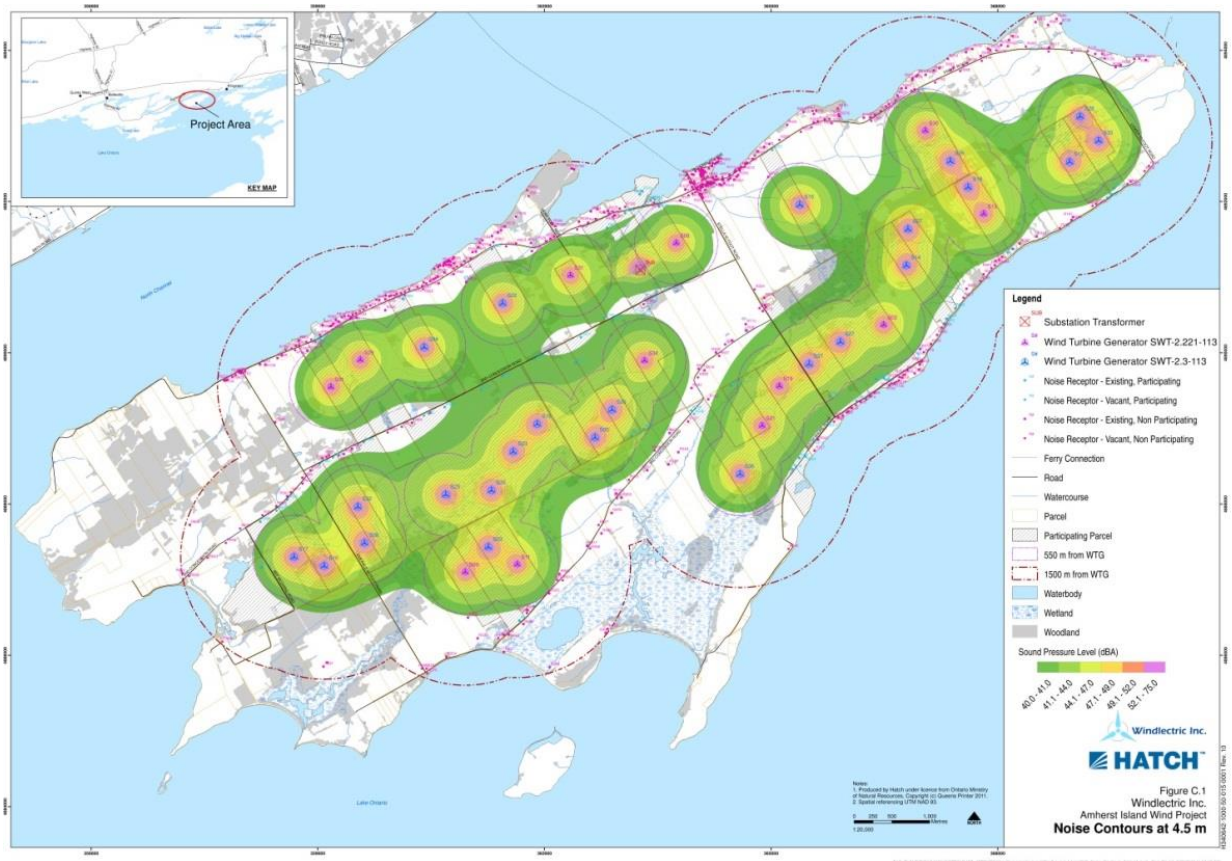
- I asked to receive a copy of the DANAK test report on the sound power of the Siemens 2.3-113 turbines.
- IEC 61400 makes reference to the apparent and declared apparent sound power. I asked that MOECC relate the "warranted" sound power in the Marcucci letter to the apparent and declared apparent sound power. Could you please respond?
- Why has MOECC not required Algonquin Power to present a summer night-time wind-speed gradient coefficient and to make it public as required in the 2008 regulations?
- Why did Hatch revert to sound power in dB rather than dBA in the Mod2 report?
- Why is MOECC allowing Hatch to proceed without converting the sound power levels to a summer night-time wind-speed gradient?
- Why is MOECC allowing Hatch to proceed with an out-dated version of IEC 61400-11?

Yours faithfully

John Harrison, Vice-President, APAI
harrisjp@physics.queensu.ca

cc: Dr. Vic Schroter, Technical Review Team
Minister Glen Murray
Mr. Jonathan Espie, Chief of Staff
Deputy Minister Paul Evans
Ms. Susanne Edwards, Technical Review Team

Encl: Abbott Letter
Bavaria Setback Regulation


Project Area
KEY MAP
Legend
Substation Transformer
Wind Turbine Generator SWT-2.221-113
Wind Turbine Generator SWT-2.3-113
Noise Receptor - Existing, Participating
Noise Receptor - Vacant, Participating
Noise Receptor - Existing, Non Participating
Noise Receptor - Vacant, Non Participating
Ferry Connection
Road
Watercourse
Parcel
Participating Parcel
550 m from WTG
1500 m from WTG
Waterbody
Wetland
Woodland
Sound Pressure Level (dBA)
40.0 - 41.0
41.1 - 44.0
44.1 - 47.0
47.1 - 49.0
49.1 - 52.0
52.1 - 75.0
Windlectric Inc.
HATCH
Figure C.1
Windlectric Inc.
Amherst Island Wind Project
Noise Contours at 4.5 m