

APPENDIX A: Memo From Goderich Fire Chief Steve Gardiner to Mark Becker, CAO of ACW Township. This memo was part of the agenda for the September 17, 2013 Council meeting.

**Mark Becker**

9.7

**Subject:** Wind Turbine Fire Detection & Suppression Systems By-Law

Hi Mark

As requested, here are my comments regarding wind turbines and specifically fire suppression systems and fire alarm monitoring.

The wind turbine fire we attended was called in by a resident who happened to look out a window in the middle of the night and see flames. By the time the alarm was sounded and the fire department arrived the pod and blades of the wind turbine were fully involved with burning pieces falling to the ground. Luckily, the ground was wet and there were no crops, basically a plowed field. Wind was moderate.

Under different circumstances, by the time we arrived and had there been a dry bean or wheat field under the turbine we would have had a major ground fire. In very dry conditions and with a moderate to strong wind we could have easily lost a nearby house or barn.

With automatic alarms monitored 24/7 we would have got that call much sooner and before the fire breached the pod allowing the fire department to arrive before burning debris was falling to the ground and suppress anything that did fall. A proper alarm system would have dispatched the fire department to the fire at the f "smell" of smoke. These alarms be should called in to the fire department first and not to an employee of the WT to go out and investigate which would defeat the purpose.

Automatic fire suppression systems would also be a good idea. When the fire department arrives at a WT fire our protocol is basically to protect the nearby builds and suppress any fire on the ground. This means the fire continues to grow until debris is falling thus putting firefighters and equipment at risk of injury or damage. In addition, many dollars can be saved had the fire been extinguished before becoming fully involved by saving high value equipment in the pod of WT as well as the blades.

Although WT fires are rare, we do know they can happen. I believe Automatic Alarms and Fire Suppression Systems have the ability to reduce losses and possibly prevent injury or death due to fire or falling debris.

I would support a by-law however any fire suppression system would have to be designed to extinguish the area and type of material located in the pod of a WT. I could only approve as a fire chief what an engineer said would be required. Section 7.1 of the FPPA is pretty clear about allowing municipalities to enact by-laws to prevent and protect from fire. Of course anything can be challenged.

Regards

Steve Gardiner

Fire Chief

519-525-6028

Only Working Smoke Alarms Save Lives

**GODERICH**  
Canada's Premier Town

## APPENDIX B:

### a) Excerpt from HONI Procedure Manual - Stray Voltage Test Procedure for Electrical Contractors, November 2007.



November 2007

voltage that would be required to initiate a response would be 10 volts. Lower resistances are possible but only under abnormal skin conditions such as a cut where the flesh is exposed. **Experience has shown complaints involving humans originate from customer sites where the voltage between contact points exceeded 3 volts.**

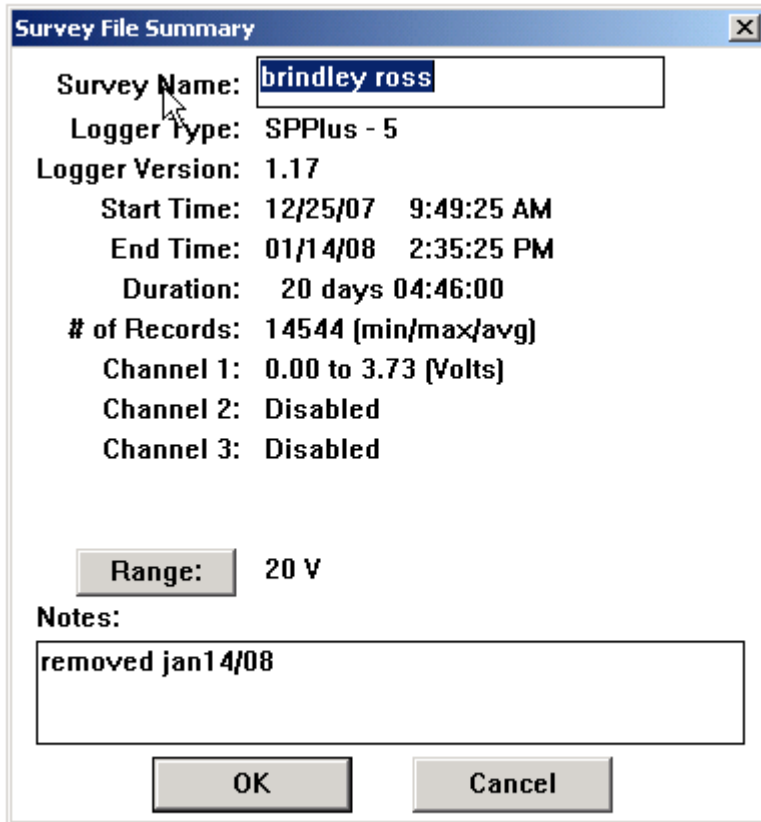
The body resistance of livestock is substantially lower than humans. According to one study, the average body resistance of a dairy cow is 359 ohms from the mouth to the all-hooves pathway. It is 738 ohms from the front to rear hooves pathway (see reference /3/). For the purpose of testing, a value of 500 ohms has emerged as a standard in Canada and the US to simulate the body resistance of an animal when making stray voltage measurements (see section 5.0 below for instruction on making voltage measurements).

Earlier studies focused on defining the sensitivity of livestock resulted in recommendations for corrective action at very low voltage levels. A further understanding of tolerance levels resulting from more recent trials indicates that there is little cause for concern in the 0.5–2 volt range commonly found between surfaces contacted by livestock. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) recommends a level of 1 volt as the safe exposure limit. The vast majority of research to date supports this limit. **In many cases, this level can only be achieved and maintained by the addition of mitigating devices installed on the customer's secondary system or at the supply transformer.** For additional information on the effects of stray voltage on livestock see the OMAFRA site, [www.omafra.gov.on.ca/english/livestock/dairy/facts/strayvol.html](http://www.omafra.gov.on.ca/english/livestock/dairy/facts/strayvol.html).

### **3 0 NORMAL LEVELS OF NEV AND STRAY VOLTAGE**

The design limit for NEV on the primary distribution system for all electrical utilities in the province of Ontario is 10 volts. This limit is established by the Electrical Safety Authority (see reference /8/, Rule 75-414). On most lines the NEV peaks at less than 5 volts. Whatever the level, the primary NEV will be transferred into all electrical service panels on the site via the secondary neutral. There will also be contributions from the secondary or customer's system even with a fault free system. Levels of stray voltage above 5 volts may be an indication of a fault on the secondary customer system or the Hydro One primary distribution system.

b) Copy of HONI stray voltage recordings taken at farm of Ross & Darlene Brindley, ACW Township, from 12/25/2007 to 01/14-2008.

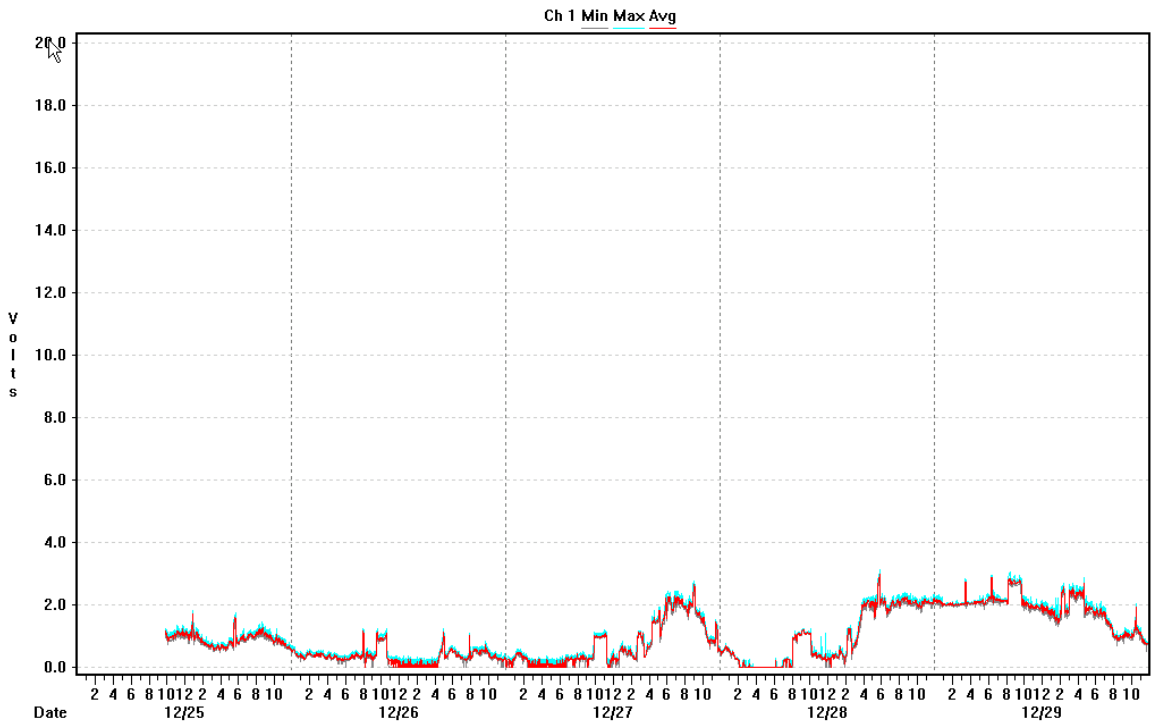


The image shows a 'Survey File Summary' dialog box with the following information:

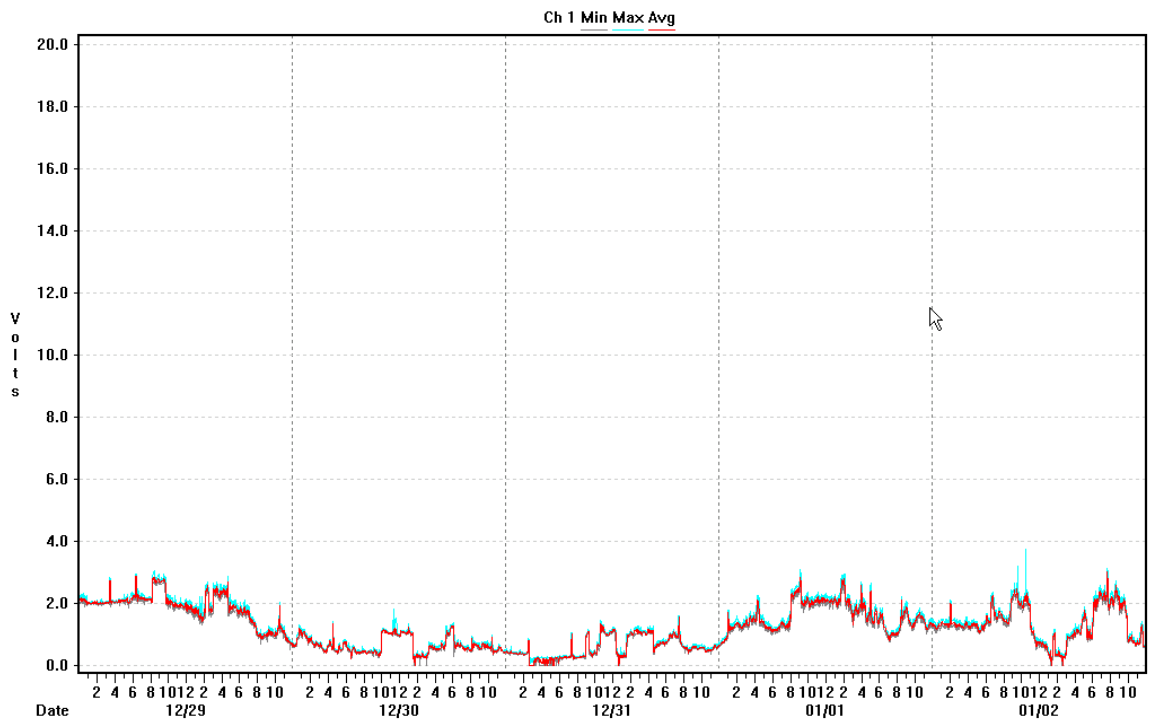
- Survey Name:** brindley ross
- Logger Type:** SPPlus - 5
- Logger Version:** 1.17
- Start Time:** 12/25/07 9:49:25 AM
- End Time:** 01/14/08 2:35:25 PM
- Duration:** 20 days 04:46:00
- # of Records:** 14544 (min/max/avg)
- Channel 1:** 0.00 to 3.73 [Volts]
- Channel 2:** Disabled
- Channel 3:** Disabled

Below the summary, there is a 'Range:' field set to '20 V' and a 'Notes:' field containing the text 'removed jan14/08'. At the bottom are 'OK' and 'Cancel' buttons.

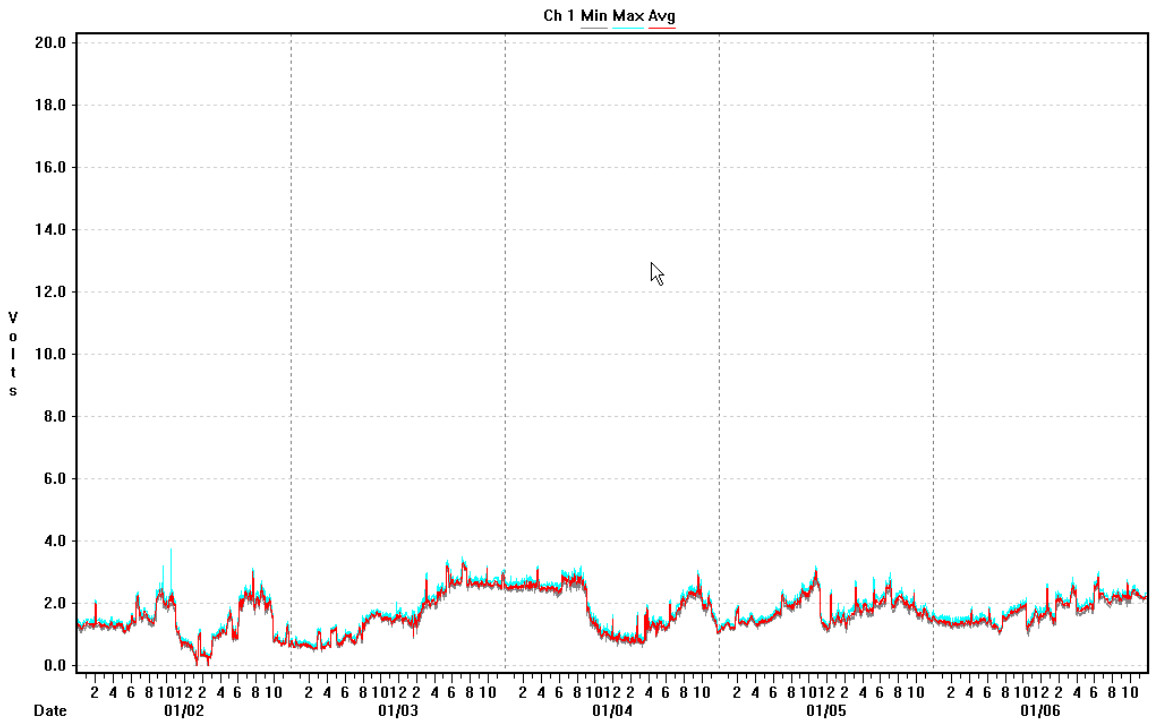
brindley ross - Ch 1: Voltage [V]



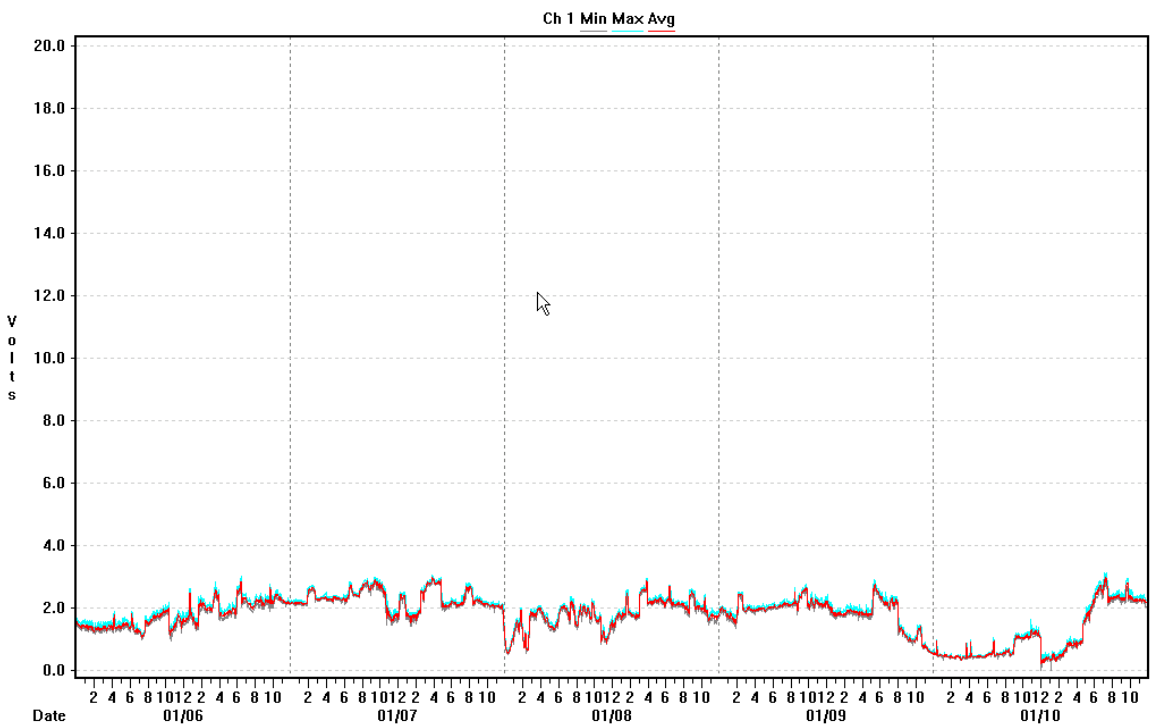
brindley ross - Ch 1: Voltage [V]



brindley ross - Ch 1: Voltage [V]



brindley ross - Ch 1: Voltage [V]



brindley ross - Ch 1: Voltage [V]

