

## **CEAC Report 2007-04**

Report to: Mayor and Members of Council  
From: Neil Morris, Chair, Caledon Environmental Advisory Committee (CEAC)  
By: Neil Morris, on behalf of Research Sub-Group  
Date: May 31, 2007  
Re: **Radio Waves**

### **RECOMMENDATIONS**

The Caledon Environmental Advisory Committee (CEAC) recommends to the Corporation of the Town of Caledon;

1. That Council receive CEAC Report 2007-04,
2. That Council and Town Staff consider modification of the existing Protocol for Establishing Telecommunication Facilities to explicitly identify public exposure to radio waves (RF radiation) as a concern within the protocol, and to require from the proponent the demonstration of effective public protection from RF radiation; and,
3. That Council consider a request to Health Canada, perhaps through the Canadian Federation of Municipalities, for their input with respect to safe public set-backs for communication towers.

### **BACKGROUND**

In January 2007 Town Council received a public delegation regarding a proposed Cellular Tower installation in the Hamlet of Wildfield, Ontario. A specific concern raised in that delegation was the possible health and safety risks associated with the electromagnetic radiation emitted from cell towers. A package of information pertaining to the potential health effects of radio-waves was submitted to the Town clerk in support of the delegation.

Following receipt of the delegation, Council has referred the issue concerning the impact of “radio waves” to the Planning and Development staff, with input from CEAC.

The CEAC Research Subgroup has reviewed the supporting information received during the noted delegation, and also relevant documents from Health Canada and the World Health Organization. The subgroup has also reviewed the Town’s Protocol for Establishing Telecommunication Facilities.

## DISCUSSION

Radiofrequency (RF) radiation is a part of the electromagnetic spectrum that has relatively low energy. At high enough levels, RF fields can cause materials, including tissue in the human body, to heat up and possibly sustain damage. At lower levels, RF fields have previously been deemed to have insufficient energy to cause adverse effects on biological tissues. For this reason, regulations to date have been established to limit exposure to radiofrequency fields to safe levels based on the understanding of the thermal effects. However, the use of radio-communication devices (including cell phones) has greatly proliferated, and the understanding of the potential risks has been continuously updated. Various researchers and agencies have noted that the non-thermal implications of RF fields are not fully understood, and further research is required. The World Health Organization (WHO) and the International Committee on Non-Ionizing Radiation Protection (ICNIRP), among others, maintain active working groups that continue to advance the scientific understanding of RF radiation, particularly non-thermal effects, with the intent of revising existing protective standards in the near future.

In 1999, a report on the effects of electromagnetic fields<sup>1</sup>, including RF fields, was prepared for Health Canada. That report noted that members of the public in proximity to base stations operating in Canada are only exposed to very low intensity RF fields. It was concluded that “exposure of the public to RF fields emitted from wireless telecommunication base station transmitters is of sufficiently low intensity that biological or adverse health effects are not anticipated.” However, the report also noted that the understanding of low-intensity non-thermal effects was not adequate to develop protective standards for such exposure, and that additional research was required.

In a follow-up expert panel review<sup>2</sup>, it was concluded that there is no clear evidence of adverse health effects associated with RF fields from mobile phones or base stations. However, in recognizing recent studies that raised new concerns, the panel recommended that the potential health risks of RF fields should be continually reassessed as new research results become available. Further, RF exposure guidelines need to be updated as new scientific information on RF fields and health risks is generated and subject to review, such as expected from the World Health Organization (WHO). The WHO has recently initiated highly comprehensive reviews of the possible health effects from exposure to electromagnetic fields (EMF), including extremely low frequency (ELF) fields, static and ELF magnetic fields, and radiofrequency (RF) fields<sup>3</sup>. The review specific to RF fields is not yet available. It will provide an update to the original EMF Health Criterion developed almost 15 years ago<sup>4</sup>.

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<sup>1</sup> An Expert Panel Report prepared by the Royal Society of Canada for Health Canada. A review of the Potential Health Risks of Radiofrequency Fields from Wireless Telecommunication Devices, 1999.

<sup>2</sup> Recent Advances In Research On Radiofrequency Fields And Health: 2001-2003

<sup>3</sup> World Health Organization. 2006. Environmental Health Criterion 232 – Static Fields.

<sup>4</sup> World Health Organization. 1993. Environmental Health Criterion 137 – Electromagnetic Fields

Based on the 1999 Expert Panel review, Health Canada has prepared guidelines (Safety Code 6)<sup>5</sup> on the safe use of devices that emit radiofrequency radiation. Industry Canada has adopted Safety Code 6 in the licensing of radio-communication equipment and facilities. As the understanding of the potential effects of EMF and RF radiation is advanced, it is expected that these guidelines would be revised by Health Canada, as necessary.

Safety Code 6 provides guidance on the siting of communication towers and the need to direct beams away from occupied areas. Acceptable upper limits of public exposure to EMF and RF radiation of all frequencies are also provided. However, the limits are identified in terms of strength of field, which is to be measured independently and post-installation, following separate protocol. There are no limits established simply on the basis of distance that could be encompassed as part of *a priori* criteria for communication tower siting.

## CONCLUSION

As the use of cell phones and similar communication devices rapidly increases, further research is being conducted to help determine the potential adverse effects of the electromagnetic radiation that is emitted from these devices and their base stations. Health authorities and regulatory agencies have developed recommendations and protective measures that are based on the findings of research to date. This includes guidelines developed by Health Canada and adopted by Industry Canada for cell tower installations. However, Health Canada's current guidelines are based solely on thermal effects. As research regarding the non-thermal effects of RF radiation progresses, these guidelines could soon be subject to revision.

The Town's current Protocol for Establishing Telecommunication Facilities does speak to the issue of environmental protection, mainly from the perspective of protection of natural heritage. The Protocol does specifically require an applicant to submit a site selection report which identifies nearby residential and recreational land-use. However, there is no explicit requirement to demonstrate that applicants have adequately considered guidelines or criteria related to RF exposure.

CEAC has briefly reviewed key information of relevance to cell tower installations and concerns regarding RF radiation. The scientific documentation on the topic of RF radiation is vast and complex, and still subject to considerable uncertainty. It is well beyond the abilities of CEAC to reach any definitive conclusions as to what constitutes effective policy to ensure that risks associated with cell towers are acceptably low. However, it is evident that there are legitimate health concerns that warrant protective measures and also further research, as recognized by various agencies, including Health Canada. In this light, CEAC advises that Town Council and Planning and Development Staff consider modifying the existing Protocol for Establishing Telecommunication Facilities so that it specifically requires an applicant to demonstrate that any proposed

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<sup>5</sup> Health Canada. Safety Code 6 - Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz.

facility adequately considers the protection of public from RF fields. Applicants could be simply directed to describe their compliance with the existing standard of Industry Canada. Direct input from Health Canada on the issue of public protection from RF radiation may facilitate any modification of the protocol that might be considered.