

D Barry Kirkham, QC\*  
Josephine M Nadel\*  
Allison R Kuchta\*  
Christopher P Weafer\*  
Gregory J Tucker\*  
Terence W Yu\*  
James H McBeath\*  
Susan C Gilchrist  
George J Roper

Robin C Macfarlane\*  
James D Burns\*  
Daniel W Burnett\*  
Paul J Brown\*  
Karen S Thompson\*  
Harley J Harris\*  
Paul A Brackstone\*  
Edith A Ryan  
Daniel H Coles

J David Dunn\*  
Duncan J Manson\*  
Harvey S Delaney\*  
Patrick J Haberl\*  
Gary M Yaffe\*  
Jonathan L Williams\*  
Scott H Stephens\*  
James W Zaitsoff  
Jocelyn M Le Dressay

Douglas R Johnson\*  
Alan A Frydenlund\*\*  
James L Carpick\*  
Michael P Vaughan  
Heather E Maconachie  
Michael F Robson\*  
Zachary J Ansley  
Pamela E Sheppard

OWEN BIRD  
LAW CORPORATION

PO Box 49130  
Three Bentall Centre  
2900-595 Burrard Street  
Vancouver, BC  
Canada V7X 1J5

Telephone 604 688-0401  
Fax 604 688-2827  
Website [www.owenbird.com](http://www.owenbird.com)

Direct Line: 604 691-7557  
Direct Fax: 604 632-4482  
E-mail: [cweafer@owenbird.com](mailto:cweafer@owenbird.com)  
Our File: 23841/0079

Carl J Pines, Associate Counsel\*  
R Keith Thompson, Associate Counsel\*  
Rose-Mary L Basham, QC, Associate Counsel\*

Hon Walter S Owen, OC, QC, LLD (1981)  
John I Bird, QC (2005)

\* Law Corporation  
\*\* Also of the Yukon Bar

February 7, 2013

**VIA ELECTRONIC MAIL**

British Columbia Utilities Commission  
6<sup>th</sup> Floor, 900 Howe Street  
Vancouver, B.C.  
V6Z 2N3

**Attention: Erica M. Hamilton, Commission Secretary**

Dear Sirs/Mesdames:

**Re: FortisBC Inc. Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project ~ Project No. 3698682**

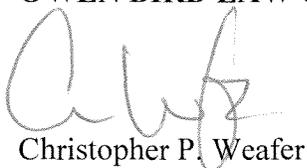
We are counsel for the Commercial Energy Consumers Association of British Columbia (CEC). Attached please find the CEC's Information Requests on the filed evidence of Dr. Karl H. Maret pertaining to the above-noted matter.

A copy of this letter and attached Information Requests has also been forwarded to FortisBC and registered interveners by e-mail.

If you have any questions regarding the foregoing, please do not hesitate to contact the undersigned.

Yours truly,

**OWEN BIRD LAW CORPORATION**



Christopher P. Weafer  
CPW/jlb  
cc: CEC  
cc: FortisBC Inc.  
cc: Registered Intervenors

Commercial Energy Consumers Association of BC

Information Request # 1

For Dr. Karl H. Maret

1. Exhibit C9-8, 5C Maret Commentary

The transmissions are specified to be variable in duty cycle depending on the demand of the mesh network. They state that the duty cycle will not exceed a maximum of 5% (86,400 seconds/day x 0.05 = around 72 minutes transmission time per day maximally).

- 1.1. Please confirm that Karl Maret is aware that virtually all Smart Meters in the system will be operating with duty cycles substantially less than this maximum calculation and that the usual operation for almost all meters will be more than an order of magnitude below this calculation on an ongoing basis.

2. Exhibit C9-8, 5C Maret Commentary

When meters operating at a maximal 5% duty cycle, they will have an averaged power density of 0.011 mW/cm<sup>2</sup> or 11 µW/cm<sup>2</sup> which is the value that will be used for comparison in the following section describing biological effects and health implications at low power density levels.

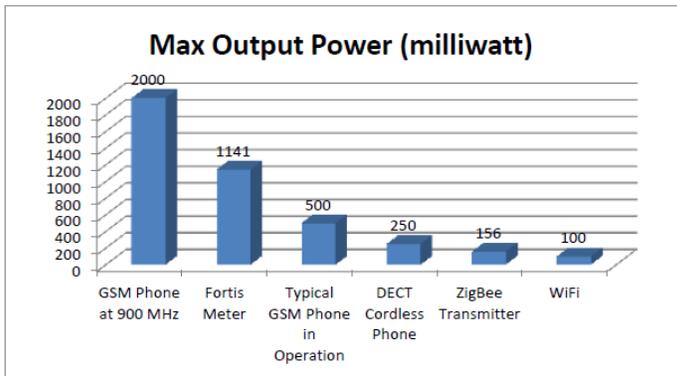
- 2.1. Please confirm that any calculation using this power density involves a distance from the Smart Meter at which virtually no one will be exposed on a continuing normal and usual operating basis.

3. Exhibit C9-8, 5C Maret Commentary

Comparisons are often made between smart meter emissions and cellular phones. This may be a poor comparison because cell phones radiate more directly into the ear and head when typically used without an earpiece, while smart meters typically irradiate the whole body and are more analogous to wireless antennas such as cordless phone base stations (DECT type) or cell tower radiations. For cell phones,

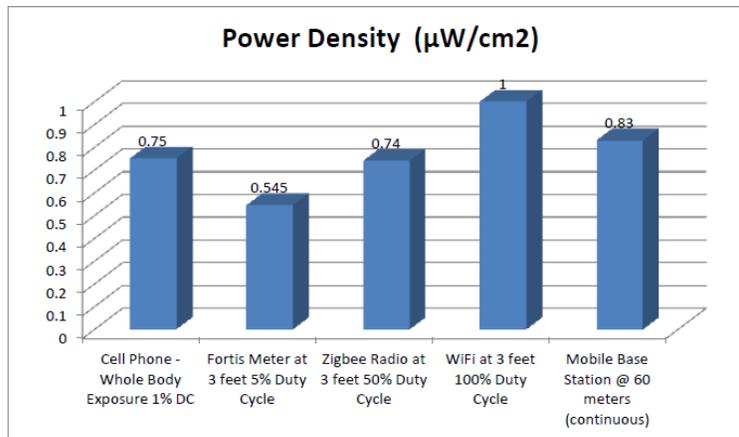
- 3.1. Please confirm that as cell phones are also used away from the head such as for texting or, as some recommend, on speakerphone setting, that they will be typically involved in irradiating the whole body similar to cordless phone base stations.

4. Exhibit C9-8, 5C Maret Commentary



4.1. Please confirm that where peak power values are extremely infrequent and distant from people they will have little relevance to assessing impact on health other than as a base from which to determine normal ongoing exposures, which will be more relevant.

5. Exhibit C9-8, 5C Maret Commentary



- 5.1. Please confirm that a 1% duty cycle for a cell phone would represent approximately 14 minutes of call time per day.
- 5.2. Please confirm that there may well be large numbers of cell phone users with normal ongoing cell phone use exceeding 14 minutes per day.
- 5.3. Please confirm that an extremely small number of people would on average live their lives at 3 feet from a Smart Meter.
- 5.4. Please confirm that an extremely small number of people would on average live their lives at 3 feet from a Zigbee Radio in the Smart Meter.

- 5.5. Please confirm that on average a very small number of people would live their lives at 3 feet from a Wi-Fi transmitter but that these would typically be located indoors where people are living, working and doing many other normal daily activities.
- 5.6. Please confirm that Karl Maret has included information in his report showing effects on people within 300 meters of a cell phone tower or mobile base station.
- 5.7. Please provide any information Karl Maret has with respect to the distribution of duty cycles for those devices which are variable and please provide any information Karl Maret has with regard to the distribution of distances the people would likely be from each of these devices
  - 5.7.1. if Karl Maret does not have such information please indicate whether he believes such information might be useful and relevant to assessing impact and the likely distribution of impacts in the population.
- 5.8. Please calculate the power density for a FortisBC meter using a duty cycle of 1% and an average distance from the meter of 10 feet.
- 5.9. Does Karl Maret agree that virtually all Smart Meters will be installed outside of homes, with a few exceptions and that in the case of apartments they will be located outside of peoples apartments.
- 5.10. Does Karl Maret agree that the backplate into which the Smart Meter plugs in fact provides a level of shielding from the RF signal coming from the meter.
- 5.11. Does Karl Maret agree that there is some attenuation of the RF signal from the meter as it moves through building materials.

6. Exhibit C9-8, 5C Maret Commentary

**The central question facing the current regulators of an automated metering infrastructure using microwave transmitters operating at non-thermal levels in the 900 MHz band is: Are there significant non-thermal biological or health effects over the 20 year lifespan of these RF devices? Over the last two decades there have been a large number of studies showing the biological impact of non-thermal RF radiation, including adverse health effects. The Carpenter Report for Hydro**

- 6.1. Please confirm that equally if not more important may be the question of assessing non-thermal biological effects over a person's life span assuming that the technology will continue in use and that the device will be replaced with similar function at the end of its service life, which may be assumed for this purpose to be approximately 20 years
- 6.2. Please confirm that the life span of the meter is not particularly relevant to the assessment of health effects but the term over which emissions occur in a person's life time and the nature or characteristics of the emissions would be more relevant

7. Exhibit C9-8, 5C Maret Commentary

Quebec (Carpenter 2012) gives an overview of many scientific studies demonstrating adverse biological and health effects at non-thermal exposures. Many researchers in the field of bioelectromagnetics have become convinced by looking at the data generated by thousands of studies over the last 50 years that non-thermal effects are real and potentially damaging to health (Sage and Carpenter 2009) which has been summarized in the Bioinitiative Working Group.

7.1. Does Karl Maret do scientific research in the field of bioelectromagnetic?

8. Exhibit C9-8, 5C Maret Commentary

resulting from absorption of energy during exposure to electromagnetic fields (EMFs). The ICNIRP fails to address potential long-term effects of exposure, such as an increased risk of cancer,

concluding that “available data are insufficient to provide a basis for setting exposure restrictions” (ICNIRP 1998 p.496).

8.1. Has Karl Maret reviewed the ICNIRP 2009 report and if so does he believe that ICNIRP has reviewed risks for cancer and many other risks including long-term effects of exposure to the extent that any scientific research has done so?

8.2. If Karl Maret has reviewed the ICNIRP 2009 report how does he believe it relates to the ICNIRP assessment of the currency of its guidelines?

8.3. What does Karl Maret think of the credentials of the people who conducted the reviews and wrote the chapters in the ICNIRP 2009 report? Are they competent people?

9. Exhibit C9-8, 5C Maret Commentary

As increasing numbers of studies about non-thermal RF exposure began to show significant biological and health effects, an international collaboration of scientists emerged called the BioInitiative Working Group (BWG) which issued a comprehensive report about the state of current research in this area (Sage and Carpenter 2007, 2012). Based on a scientific evaluation of over 2000 studies, this group suggested that new, lower exposure guidelines be applied that take into account long-term exposure, modulation patterns and are in alignment with the Precautionary Principle.

9.1. Could Karl Maret please comment on his understanding of Ms. Sage's credentials for writing, reviewing and editing on scientific studies in the fields discussed in the referenced report.

10. Exhibit C9-8, 5C Maret Commentary

oriented. They also recommend precautionary levels that are "as low as reasonably achievable" – the ALARA principle.

10.1. Who does Karl Maret believe should assess and determine what is reasonable and achievable

10.2. How does Karl Maret believe reasonable and achievable should be determined

10.3. Does Karl Maret agree with the following description of the ALARA principle?

*What is the ALARA principle? The International Commission on Radiological Protection (ICRP) recommends a system for limiting the doses received by persons. What are two features of the system?*

A

There are actually three features in the system of dose limitation recommended by ICRP, namely justification, optimization, and dose limitation. Justification means that any proposed activity that may cause exposure to persons should yield a sufficient benefit to society to justify the risks incurred by the radiation exposure. This feature is based on the assumption that any radiation exposure, no matter how small, carries with it a certain level of risk that is proportional to the level of exposure. This hypothesis is known as the linear, non-threshold hypothesis, or LNT. An example of an activity that was considered unjustified was the now-discontinued practice of fitting shoes to people's feet using x rays. The exposure resulting from this activity was considered to be unjustified, and the practice was discontinued. The second feature, or element, is optimization, which is also known as the practice of ALARA (as low as reasonably achievable). This means that the radiation exposures resulting from the practice must be reduced to the lowest level possible considering the cost of such a reduction in dose. Optimization, or ALARA, is required by nearly all licensing agencies, including the Nuclear Regulatory Commission. This feature is also based on the LNT. The third element is dose limitation. This involves setting upper limits on the dose that may be received by any member of the public from all man-made exposures other than medical exposures. These limits are imposed by regulatory agencies.

The system is actually more complicated than that. ICRP recommends that each source of exposure, such as a hospital or reactor site, be constrained to a fraction of the dose limit. For example, if the dose limit is 100 mrem/yr for members of the public, then the constraint might be set at 30 mrem/yr. This may be viewed as that site's share of the allotted exposure of 100 mrem/yr to any member of the public, some of whom may be simultaneously exposed to radiations from several facilities. Each site will then optimize its doses as far below 30 mrem/yr as possible, that is, ensure that the doses are ALARA.

In this system of dose limitation, optimization plays the central role, and dose limits play a very secondary role, mainly as guidance for setting action levels and other operating

parameters, and also as a guide for allocating dose to various sources, that is, as a guide in setting constraints.

-Sami Sherbini Senior Health Physics Advisor, NRC

11. Exhibit C9-8, 5C Maret Commentary

than others depending on the physical reactivity of specific tissues. Current safety standards do not take this issue into account and are thus inadequate in protecting the public in terms of chronic exposure to some forms of extremely low frequency (ELF) modulated RF carrier signals.

11.1. Please provide a description of the frequencies applicable for ELF.

11.2. Please provide Karl Maret's understanding of the relevance of ELF to Smart Meter RF signals.

11.3. Is the common definition of ELF being between 3 and 300 Hz what is being referred to here?

12. Exhibit C9-8, 5C Maret Commentary

may have an adverse effect on sleep cycles. Unlike the users of cellphones who do not use them during sleep, RF mesh network meters will continue to emit low levels of pulsed RF radiation intermittently all night long.

12.1. Does Karl Maret acknowledge that the FortisBC Meters will not be continuing to emit radiation all night long, and that the intermittency will involve very few very short signals during hours when people are asleep?

13. Exhibit C9-8, 5C Maret Commentary

Science does not deal with certainties but only with answering hypotheses of potentials risks. It cannot be definitively established at this point that irreversible damage to health would occur since no specific research using the unique modulation patterns emitted by these AMI meters has been carried out. However, it would be erroneous to assume that because AMI meters do not cause heating of tissues that long-term health effects could not occur or are impossible.

13.1. Does Karl Maret consider the following to be a fair statement: While we cannot, at this time, be certain that long-term health effects could not occur or are impossible, we also do not know to what degree they might occur or the potential levels at which long term damage to health would occur or what that might be or represent?

13.2. Would it be fair to say that in the face of this uncertainty and other known issues Karl Maret believes the ALARA principle should be applied?

14. Exhibit C9-8, 5C Maret Commentary

With a 1% duty cycle and a burst transmission time of 5 milliseconds, I estimate that there would be  $[0.01(\text{Duty cycle}) \times 86,400 \text{ second/day}] / 0.005 \text{ seconds (transmission time)} = 172,800$  burst transmissions during the 864 seconds or 14.4 minutes per day, for example .

With a 0.1% duty cycle and a 10 millisecond transmission time there would be 8640 burst transmissions per day for a total transmission time of  $86,400 \times 0.001 = 86.4$  seconds total.

14.1. Would a duty cycle of .1% or a little over 1 minute per day give Karl Maret significantly less concern than a duty cycle of 14 minutes per day or 72 minutes per day?

15. Exhibit C9-8, 5C Maret Commentary

By not considering any non-thermal effects and focusing only on thermal effects from averaged power density considerations, FortisBC is minimizing potential risks to sensitive utility customers who may receive their RF mesh network meters which could lead to adverse health effects becoming apparent over the 20 year life of the meter. Other aspects of this question are largely covered by the earlier responses.

15.1. Does Karl Maret believe that people and businesses should follow the infinite detail of scientific studies related to all issues regulated or should they be able to rely on the standards set by regulatory bodies charged with the responsibility of regulating the given issues?

15.2. Does Karl Maret himself follow all scientific literature pertinent to all products, systems and services he uses or does he rely on the regulatory agencies responsible to govern the issues and trust that this is being done reasonably?