THREAT OF HARMFUL EFFECTS

ON HUMAN HEALTH AND PUBLIC SAFETY

FROM PROPOSED BEEBE HILL CELL TOWER

Statement Submitted to

Connecticut Siting Council

At Public Hearing

October 12, 2006

By

Janet Newton

President of The EMR Policy Institute

A non-profit educational organization

506 Thistle Hill Road, Marshfield, VT 05658

Introduction

1. I am President of The EMR Policy Institute, Inc., an independent non-profit educational organization whose headquarters are located at 506 Thistle Hill Road, Marshfield VT. This statement is submitted pursuant to the stated mission of The EMR Policy Institute:

   The EMR Policy Institute Mission Statement

   > We believe that the unfettered use of electromagnetic radiation (EMR) — radiofrequency/microwave radiation (RF/MW) present in all wireless and communications technologies, as well as the extremely low frequencies (ELF) present in power-line supplies — is ill advised given research that has accumulated over the last two decades. The Mission of The EMR Policy Institute is to foster a better understanding of the environmental and human biological effects from such exposures. Our goal is to work at the federal, state and international levels to foster appropriate, unbiased research and to create better cooperation between federal regulatory agencies with a responsibility for public health in order to mitigate unnecessary exposures that may be deemed to be hazardous.

   To implement its Mission, The EMR Policy Institute maintains a public website [www.emrpolicy.org] where it posts studies and reports from around the worked on the biological effects of low-intensity RF radiation. The EMR Policy Institute also provides technical assistance to individuals and local groups. It has provided such assistance to this property owner and offers to provide the same to the Connecticut Siting Council and to other persons interested in the cell tower issues in this proceeding. Our goal is to encourage the fullest possible public disclosure and understanding of the biological effects of RF radiation from wireless and communications technologies and to encourage federal research into those effects.

2. The purpose of this statement is to call the Siting Council's attention to various scientific studies published in scholarly periodicals and other materials relating to biological and other physical effects caused by low-power density signals transmitted by cell towers, and in particular as proposed to be transmitted from the Beebe Hill Cell Tower, which is the subject of this hearing. To avoid duplication, the statement refers to studies already marked as exhibits by the Petitioner (many of which were supplied by The EMR Policy Institute as part of its technical assistance)..

3. This statement focuses on biological effects relating to human health. The Telecommunications Act of 1996 ordinarily preempts state regulation of cell towers based on human health considerations. However, this information is provided here not for purposes of state regulation but in support of the right of this property owner to refuse to permit the erection of a cell tower on (or near) his property.

4. In addition, the Selectmen of the Town of Canaan, where the proposed cell tower is located, have submitted a statement to the Connecticut Siting Council expressing their support of the cell tower in the interest of "public safety." The studies and sworn

testimony demonstrate that tower radiation poses a potential health threat to the safety of town residents, particularly children. One of the health exhibits specifically addresses health risks to firemen.

Radiofrequency Radiation Power Density Calculations for Beebe Hill Tower Site

5. Attention is directed to the radiofrequency radiation power density calculations compiled by Alfred R. Hislop, MSEE[1] at the request of The EMR Policy Institute (Attachment "A") which show power densities at various distances from the Beebe Hill Cell Tower, based on the specifications in Petition 701, approved by the Connecticut Siting Council in January, 2005.

6. Based on measurements made on the current USGS topographic map for the South Canaan Quadrangle (Exhibit 15d), the distances from the proposed Beebe Hill Cell Tower together with the calculated RF radiation power densities for the following locations are:

Location	Distance in meters (m)	Power Density in μw/cm2 (microwatts/centimeter squared)
Bornemann Home	225	0.864
Kellogg Elementary School	700	0.082
Hunt Library Children's Room	750	0.012
Proposed New Firehouse	600	0.111

Published Scientific Studies Relating to Biological Effects from Exposure to Low Intensity Radiofrequency Radiation

7. Exhibit 28, a 2005 study from Austria, shows that regular exposure to cell tower radiation at low power densities between 0.1 and 0.5 μw/cm2 produces headaches, loss of energy, fatigue, and difficulties in concentration. Compare those tower densities to the table above.

8. Exhibit 29 is a 2003 study from France, also showing that long-term exposure to cell tower radiation produces headaches, fatigue, sleep and memory disturbances, with the highest occurrences affecting those living within 200 m – 300 m of the antenna site (here including the Bornemann home and near neighbors along Beebe Hill Road).

9. Exhibit 30 is an open letter written in 2005 from a group of physicians in Germany to the president of Bavaria urging that local health surveys be made of all residents living near cell tower antenna base stations. The request resulted from physicians' findings of: sleep disturbances, tiredness, headache, restlessness, lethargy, irritability, inability to concentrate, forgetfulness, trouble finding words, depressive tendency, noises in the ears, impaired hearing, dizziness, nosebleeds, visual disturbances, frequent infections,

[1] Mr. Hislop is an electronics engineer with more than 30 years of experience in microwave and millimeter wave technologies. He has designed and patented components that are currently is use sending signals back from deepest space in order to map the universe. See attached *curriculum vitae.*

sinusitis, joint and muscle pains, feeling deaf, palpitations, increased blood pressure, hormone disturbances, gaining weight, hair loss, nocturnal sweating, nausea.

10. Exhibit 31 is a 2003 study from The Netherlands which set out to establish whether there was any relationship between electromagnetic fields and brain functions in people living close to cell towers ["base stations"]. The study concluded that under controlled study conditions there is a statistically significant relationship between exposure to low power density fields and physical well being.

11. Exhibit 32 is a 2003 study from Spain which concludes that persons exposed to power densities averaging as low as 0.11μw/cm2 experienced fatigue, irritability, headaches, nausea, appetite loss, sleep disturbances, depression, difficulty in concentration, memory loss and other symptoms, while persons exposed to far lower power densities of 0.01μw/cm2 also experienced many of these same symptoms, although to a lesser degree.

    As in Germany, the researchers urge that "public health surveys of people living in the vicinity of cell site BSs [base stations] be carried out immediately . . ." The researchers further observed, "Prompt effects such as miscarriage, cardiac disruption, sleep disturbance, and chronic fatigue could well be early indicators of adverse health effects."

12. Exhibit 33 is a 2004 study from Sweden reporting the sharp increase in fatal melanomas in relation to the arrival of FM and TV broadcast antennas operating at full-body resonant frequencies [i.e., frequencies with half-wavelengths of approximately 1.5 meters, equal to 59.06 inches, about 5 feet]. The study concludes that the resonance of this radiation in human beings results in damage to cell repair mechanisms that are designed to protect against sun damage:

    > *We believe this environmental factor to be radiofrequency electromagnetic radiation, which is capable of (RF) affecting the proper function of cell repair and auto-immune system mechanisms in the human body. This conclusion is supported by other studies pointing at the effects that RF EMF may have on the immune defense system, cell repair, and apoptosis mechanisms.*

13. Exhibit 34 consists of two public education leaflets issued in 2000 by the Department of Health in Great Britain acknowledging "gaps in scientific knowledge on the effects of cell towers" and recommending "a precautionary approach" until more research findings become available. The second leaflet, concerning mobile [cell] phones states:

    > *Because the head and nervous system are still developing into the teenage years, the expert group considered that if there are any unrecognized health risks from mobile phone use, then children and young people might be more vulnerable than adults.*

14. Exhibit 35 is a 2004 public information press release from The EMR Policy Institute reporting that the International Association of Fire Fighters has called for a moratorium on placing new cell towers on fire stations until their health effects can be studied. The sponsor of the resolution is quoted as saying:

    > *Some firefighters with cell towers currently located on their stations are experiencing symptoms that put our first responders at risk. It is important to be*

sure we understand what effects these towers may have on the firefighters living in these stations. . . If the jakes in the firehouse are suffering from headaches, can't respond quickly and their ability to make decisions is clouded by a sort of brain fog, then entire communities they are protecting will clearly be at risk. No one wants the guys responding to their family emergency to be functioning at anything less than 100 percent capacity.

15. Exhibit 37 is a 2006 resolution adopted by an international group of scientists who met in Benevento, Italy in February of this year confirming the existence of biologic effects caused by cell tower radiation and calling for the "Precautionary Principle" to minimize exposure to radiofrequency radiation:

    4. *Arguments that weak (low intensity) EMF* [electromagnetic fields] *cannot affect biological systems do not represent the current spectrum of scientific opinion.*
    5. *Based on our review of the science, biological effects can occur from exposures to both extremely low frequency fields (ELF EMF) and radiation frequency fields (RF EMF). Epidemiological and* in vivo *as well as* in vitro *experimental evidence demonstrates that exposure to some ELF EMF can increase cancer risk in children and induce other health problems in both children and adults. Further, there is accumulating epidemiological evidence indicating an increased brain tumor risk from long term use of mobile phones, the first RF EMF that has started to be comprehensively studied. Epidemiological and laboratory studies that show increased risks for cancers and other diseases from occupational exposures to EMF cannot be ignored.*

Sworn Testimony of Practicing Physicians and Research Scientists

16. To read the complete transcript of the sworn testimony cited here of practicing physicians and research scientists on the potential health effects of low-intensity of radiofrequency radiation found in the record of two Colorado tower permit court cases, the Siting Council is referred to The EMR Policy Institute website Case Law page:

    1999 testimony of Roger Mattson, PhD, former director of the US Environmental Protection Agency's (EPA) non-ionizing radiation standards activities from 1980-81, "District Court, Jefferson County Colorado, *Lake Cedar Group, LLC, v Board of County Commissioners of Jefferson County and Canyon Area Residents for the Environment, a Colorado nonprofit, Defendants-Intervener",* R6176-86.

    2003 testimony of John Goldsmith, MD, internationally renowned epidemiologist, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11660-61.

    2003 testimony of Theodore Litovitz, PhD, Professor Emeritus of Physics, Catholic University of America, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11661-63.

    1999 testimony of Paul Polak, MD, preventive medicine and medical research, "District Court, Jefferson County Colorado, *Lake Cedar Group, LLC, v Board of County Commissioners of Jefferson County and Canyon Area Residents for the Environment, a Colorado nonprofit, Defendants-Intervener",* R6045-50.

1999 testimony of Cindy Kelly, MD, orthopedic oncologist, "District Court, Jefferson County Colorado, *Lake Cedar Group, LLC, v Board of County Commissioners of Jefferson County and Canyon Area Residents for the Environment, a Colorado nonprofit, Defendants-Interveners,* R6050-58.

2003 testimony of Stephen Frankel, MD, triple board certified in Internal Medicine, Pulmonary Medicine and Critical Care Medicine, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11711-22.

2003 testimony of Cindy Kelly, MD, orthopedic oncologist, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11729-36.

2003 testimony of Penny Clarke, PhD, electrobiologist and health physician, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11866-67.

2003 letter referenced in the Penny Clarke testimony from the University of Colorado Health Sciences Center Department of Radiation Oncology cancer experts, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R3837.

2003 Murray Wynes, PhD in immunology, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11868-69.

2003 testimony of Steve Grabowski, MD, MPH, board certified in public health and preventive medicine, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11922-24.

2003 testimony of Raweewan Hoontrakoon, MD, pediatrician and allergist, "District Court, Jefferson County Colorado 03-CV-3045", *City of Golden, CARE, et al v Jefferson County Board of County Commissioners and Lake Cedar Group, LLC,* R11931-32.

Sworn to before me

This _____ day October, 2006

_____ _____

Notary Public Janet Newton

Alfred R. Hislop, MSEE
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Beebe Hill Cell Tower
Calculations of Power Density and Resonance Factors
Based on Nextel Communications Petition 701
Before the Connecticut Siting Council

Power Density Levels Calculated from Beebe Hill Cell Tower Site

Exhibit "D" to Nextel Petition 701 specifies an Effective Radiated Power (ERP) of 1200 watts at a frequency of 851MHz. Based on these specifications, at the following distances from the Beebe Hill cell tower, power densities in the main beam of the antenna would be:

Distances in meters from the tower	Power Density in microwatts/cm squared
100 meters	4.0
200 meters	1.0
300 meters	.445
400 meters	.251
488 meters	.168
500 meters	.160
600 meters	.111
700 meters	.082
800 meters	.063
900 meters	.049
1000 meters	.040
1609 meters (1.0 miles)	.015
2414 meters (1.5 miles)	.007
3219 meters (2.0 miles)	.004

Resonance Factors Generated from the Beebe Hill Cell Tower

The wavelength for 851 MHz radiofrequency radiation is 13.879 inches. One-half wavelength at this frequency is 6.94 inches. Resonating objects measuring one full wavelength would develop two "hot spots", each at about one fourth of the distance from each end (about 3.5 inches). Resonating objects measuring one-half wavelength would develop one "hot spot" in the center (about 3.5 inches).

Prepared by:

A. R. Hislop

Alfred R. Hislop
Date: September 20, 2006

Attachments: 1. Exhibit D to Nextel Petition 2. Alfred R. Hislop *Curriculum vitae*

ATTACHMENT "A"

PACIFIC
MILLIMETER
PRODUCTS

The formula used to calculate RF power densities is taken from FCC OET Bulletin 65, and is

$$S = \frac{33.4 \times ERP}{R^2}$$

Where
S is power density in microwatts/centimeter squared
ERP is effective radiated power in watts
R is distance from antenna in meters

A. R. Hislop September 20, 2006
Alfred R. Hislop

PACIFIC MILLIMETER PRODUCTS
64 LOOKOUT MOUNTAIN CIRCLE, GOLDEN, CO. 80401
TEL (303) 526-7866 FAX (303) 526-7865

Canaan, CT (145 Beebe Hill Rd.) CT3667 - CT Siting Council Power Density Calculations

Nextel Directional Antennas ESMR - 851 MHz at centerline 120' AGL ***

Only 120' centerline will be used for worst case purposes

Note: Power densities are in mW/ cm²

Transmitters:	Frequency in MHz	CT Standard mW/ cm²	Number of Channels	ERP (W) per channel	Centerline of Tx antennas AGL (ft.)	Power density calculated at base of tower	% of CT Standard
Nextel Digital ESMR	851	0.5673	12	100	114	0.033185596	5.8494%
** Nextel antenna centerline is 120' adjusted to 114' per OET 65 Bulliten for 6' average head height.							
Total % of CT Standard							5.8494%

EXHIBIT D

Alfred R. Hislop

BSEE California Polytechnic College, Pomona, 1971

MSEE University of California, Irvine, 1973

Engineer, Naval Ocean Systems Center, San Diego, CA. 1972-1987

UHF Technology Group: Designed spread spectrum communications systems.

Microwave and Antennas Group: Designed and developed microwave antennas and radar systems, including three dimensional high resolution imaging radars.

Millimeter Wave Technology Group: Designed and developed millimeter wave components, radars, surveillance receivers and communications systems.

1984-present: Owner, Pacific Millimeter Products.

Design millimeter wave components for use in ground and space based radio astronomy, test instrumentation, communication systems, anti-collision radar and fusion plasma diagnostics.

Patents:

4,286,229	Multiple Frequency Oscillator
4,433,314	Millimeter Wave Multiplexer
4,492,960	Switching Mixer
4,873,501	Transmission Line Notch Filter Element

Publications:

"A Broadband 40-60 GHz Balanced Mixer," IEEE Transactions on Microwave Theory and Techniques, Volume 24, No. 1, pp 63 & 64, January, 1976.

"An 88-100 GHz Receiver Front-End," IEEE 1979 International Symposium on Microwave Theory and techniques, digest pp 222 & 223.

"Millimeter Wave Coupled Line Filters," Microwave Journal, October, 1980, pp 67-78.

"Suspended Substrate Ka Band Multiplexer," Microwave Journal, June, 1981, pp 73-77.

"A Compact, Low-Cost 60 GHz Communicator," IEEE 1982 International Symposium on Microwave Theory and Techniques, digest pp 231 & 232.