THREAT OF HARMFUL EFFECTS

ON MIGRATORY BIRDS AND ENDANGERED SPECIES

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 in accordance with 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 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 Institsute as part of its technical assistance).

3. This statement focuses on biological effects relating to migratory birds and endangered species.

Radiofrequency Radiation Power Density Calculations for Beebe Hill Tower Site

4. Attention is directed to the radiofrequency radiation power density calculations compiled by Alfred R. Hislop, MSEE[1] in Attachment "A", which show power densities at various distances from the

[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.*

Beebe Hill Cell Tower, based on the specifications in Petition 701 approved by the Connecticut Siting Council in January, 2005.

Biological Effects on Wildlife from Exposure to Low Intensity Radiofrequency Radiation

5. The proposed Beebe Hill cell tower threatens to destroy wildlife habitats; kill large numbers of nesting and migratory birds; disrupt natural food chains; and jeopardize frogs, other amphibians, and rare plants in Connecticut's most unique inland wetland.

6. Scientific studies from nations around the world establish beyond any reasonable doubt that low-power cell tower high frequency radiation, comparable to the specifications for the proposed cell tower on Beebe Hill, has produced many of these biological results in carefully monitored field studies.

7. People everywhere have witnessed in despair the wholesale disappearance and deformity of frogs and many other wildlife species. While all of the causes are not yet known, there is powerful evidence that the proliferation of wireless telecommunications is a least one of the causes of this tragic phenomenon with transmitters operating from towers just like this one with no precautions of any kind to minimize impacts on the environment.

8. The record before the Siting Council in this proceeding contains the proof that supports this conclusion. The starting point is Attachment A, containing expert projections of the power density levels at various distances from the Beebe Hill cell tower. These power density levels can easily be compared to the power densities observed in the existing studies of adverse effects from prolonged exposure of birds and wildlife at exactly these same power densities.

9. Comparing these calculations to the scientific study of irreversible infertility in mice in Thessalonika, Greece caused by radiofrequency radiation shows that the same power densities that caused this result will extend 488 meters out from the Beebe hill cell tower –- the equivalent of five football fields long – destroying a major food supply for several species of endangered and migratory birds. (See Exhibit 13A.)

10. Similarly, comparing these projected power densities to the scientific study of infertility among nesting white storks in Valladolid, Spain, shows that this same infertility for nesting birds can be expected within 300 meters of the Beebe Hill tower. (Exhibit 13; Attachment "B")

11. By making similar comparisons of power densities to the power levels in other studies, the conclusion is inescapable that the Beebe Hill cell tower will potentially have the following harmful effects on the wildlife and endangered species in that area:

Harm to Migratory Birds

12. More than two hundred species of migratory birds use the Beebe Hill area as a flyway to feeding grounds in the Hollenbeck River watershed and Robbins Swamp in their annual trips from Central and South America and the Southern United States. The Beebe Hill cell tower is located near the center of this flyway and will produce significant tower kills

of these birds by disorienting birds in their flight patterns, especially at night, through disruption of neurons in the brain and by creating a false magnetic field. (Exhibits 10, 11, 11A and 17B.)

Harm to Nesting Birds

13. As noted, scientific studies in Spain have demonstrated the destructive effects of cell tower radiation on the reproduction of offspring by nesting birds. (Exhibits 12 and 13).

Harm to Food Supplies

14. We have also pointed out the destructive effects on mice of cell tower radiation at very low power densities. There are also studies of impacts on insects, another major food source for birds and various other species of wildlife. (Exhibit 13A).

Harm to Frogs and Other Amphibians

15. No one has established for certain why so many deformed frogs have appeared in recent years, or why there has been a sharp worldwide decline in frogs, but there is a reasonable basis for concluding that the cause may be resonance arising from constant cell tower radiation. Creatures, objects, and physical cavities measuring one-half of any radiofrequency wavelength will resonate when bombarded by signals at that frequency. In the case of the Beebe Hill cell tower, the frequency will be 851 megahertz, with a wavelength of 13.879 inches. (Attachment "A") A half wavelength will therefore measure 6.94 inches. Any bird, frog, salamander, plant, leaf, insect, or ground creature that is approximately 7 inches long will resonate when bombarded by this tower radiation at 851 megahertz. The Wood Turtle, for example, is directly in this size range (Exhibit 23A), and Mud Puppies can reach a full wavelength (Exhibit 22A).The resonance effect builds up a "hot spot" of substantially increased power (and heat) in the center of the resonating object. For birds, frogs, and salamanders this hot spot often coincides with the location of their reproductive organs, potentially causing destruction of eggs or deformities in offspring.

The Coupling Factor

16. One other negative impact from cell towers is caused by the proposed location of this telecommunications mast on top of an existing stanchion carrying power lines. These lines can serve as carriers or "wave guides" to convey the cell tower radiation a considerable distance, until they reach a bend or other obstruction. (Attachment "C") It is to be noted that there are two nearby bends in the power lines north of Beebe Hill, both over the Hollenbeck River watershed, habitat for many endangered species (Exhibit 15d).

Harm to Endangered Species

17. Harmful biological effects from the Beebe Hill cell tower are particularly significant because of the presence of large numbers of endangered species recorded by the Connecticut Department of Environmental Protection (DEP) (Exhibit 17 A). These are protected by state law which is being disregarded by the proposed erection of this tower.

18. In addition the DEP's written records of listed species, bird naturalist John McNeely has noted the presence of the following rare species within a two-mile radius form the Beebe Hill cell tower:

Sharp-shinned Hawk
Whip-poor-will
Hedge Wren
Raven
Kestrel
Snipe
Bobolink
Alder Flycatcher
Meadowlark
Henslow's Sparrow
Golden-winged Warbler

19. All of these protected species will be threatened by the constant exposure to radiation from the proposed Beebe Hill cell tower, seven days a week, 24 hours a day each day.

20. There are numerous studies documenting harmful biological effects from low power densities that will be evidenced at two miles or more from the proposed Beebe Hill cell tower: (Exhibit 36). Nothing has been proposed in this proceeding to minimize this damage to rare and endangered species.

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

Alfred R. Hislop

September 20, 2006

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%
Total % of CT Standard							5.8494%

** Nextel antenna centerline is 120' adjusted to 114' per OET 65 Bulliten for 6' average head height.

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.

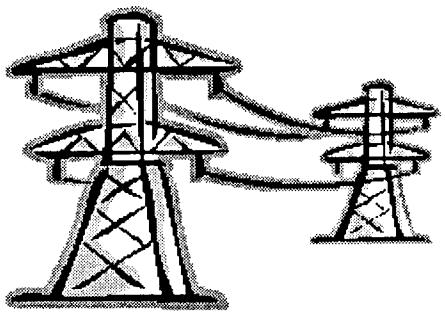
Table 1

Intensity of electric field, total and partial productivity in the nests within 200m and further than 300m to the phone mast

Nests within 200m				Nests further than 300m			
Number of Nest	young	EMF (V/m)	(uw/cm^2)	Nest	Number of young	EMF (V/m)	(uw/cm^2)
1	2	0.8	0.17	1	1	0.4	.042
2	2	0.6	.095	2	2	0.7	0.13
3	0	0.8	0.17	3	1	1.3	0.45
4	3	1.5	.597	4	1	1.1	0.32
5	1	1.7	.767	5	1	0.6	.095
6	2	2.9	2.23	6	3	0.4	.042
7	1	3.1	2.55	7	2	0.6	.095
8	1	1.3	0.45	8	2	0.7	0.13
9	1	1.3	0.45	9	3	0.6	.095
10	1	2.8	2.08	10	1	0.7	0.13
11	1	1.8	0.86	11	2	0.8	.17
12	3	3.2	2.72	12	2	0.3	.024
13	1	1.6	0.68	13	3	0.1	.003
14	0	2.7	1.93	14	1	0.6	.095
15	0	2.3	1.40	15	2	0.5	.066
16	0	2.7	1.93	16	3	0	0
17	0	2.5	1.66	17	2	0.3	.024
18	0	3.5	3.25	18	1	0.8	.17
19	0	3.5	3.25	19	2	0.2	.011
20	0	2.7	1.93	20	0	0.8	.17
21	0	2.9	2.23	21	2	0.2	.011
22	2	3.2	2.72	22	1	0.6	.095
23	0	2.5	1.66	23	1	0.5	.066
24	1	2.6	1.79	24	1	0.7	0.13
25	1	2.4	1.53	25	1	1.4	0.52
26	0	2.2	1.28	26	2	0.1	.003
27	1	2.6	1.79	27	1	0.1	.003
28	1	3.1	2.55	28	2	0.2	.011
29	1	3.1	2.55	29	1	0	0
30	0	3.0	2.39	30	1	0.6	.095

ATTACHMENT "B"

A radiating panel antenna located on a transmission pole near utility wires provides radiation and possible near field electromagnetic coupling to the horizontal utility wires through well known surface wave propagation on open wire insulated or non insulated conductors. Such surface wave propagation along the pole wires may propagate for considerable distances with the utilit wire acting essentially as a waveguide. The fields cling to the wire surface as the field propagates. Generally speaking, some radiation of electromagnetic energy may occur from the wire but the radiation pattern is in the wire direction and not broadside as i a conventional dipole antenna. When the wave hits a termination (discontinuity) or is at a bend in the wire radiation may occur in directions away from the wire. The strength or weakness of radiation field derived from the propagating wave along the outer surface of the utility wire wave is very complex. Frequencies of the radiating panel, the intensity distribution and polarization of the near field and radiation pattern of the panel antenna relative to the transmission wire locations in space dictate how strong the energy coupling may be.



The really characteristic feature of the surface wave is its non-radiating property except at bends in the wires and at connection points such as pole transformers and/or capacitors, etc. Imagine the "wings of a butterfly" as representing the radiation pattern of a conventional dipole antenna. Surface wave radiation would represent a butterfly at rest with wings tucked toward its body. The pattern of electromagnetic energy hugs the wire surface. At discontinuities, such as referenced above, the wings open up representing radiation of surface wave energy from the discontinuity.

The pole wires can be thought of conduits for the conveyance of some microwave energy from the panel antenna to end points or termination points This energy has the possibility of entering buildings that are connected to the power lines at various remote locations from the original site of the pole mounted panel antenna.

In summary, surface wave electromagnetic coupling is a definite possibility for pole mounted antennas in proximity to insulated wir transmission lines. However, the resultant radiation of this energy is weak except at wire bends and connections to other pole mounted electrical devices such as transformers and capacitors. The induced microwave currents in the lines may propagate over considerable distances without significant attenuation and represent radiofrequency interference problems with equipment such as computers or electronic control circuitry. The radiation fields from discontinuities would be significantly less, in general, than that provided by the pole mounted antenna itself.

Ray Kasevich PE.

8/21/2006

ATTACHMENT "C"