

Case Number 21-02623 – Village of Cambridge LED Lighting: Public Comment

June 3, 2022

Dear Sir and Madam,

MarieAnn and Richard Cherry recently made me aware of the hazard that the LED lights pose to MarieAnn and the difficulties others are experiencing in response to the installation of LED street lights by the Village of Cambridge.

The actions of the local officials are not just unconscionable, they are against the law. In accordance with its duties under The Americans with Disabilities Act the New York State Department of Public Service MUST require the Village of Cambridge to replace the LED lighting that is causing seizures for MarieAnn and disability and health problems for other residents of the village with other lighting that is not disabling and access blocking.

Photosensitive epilepsy is recognized in the medical literature. LED lighting as a source of epileptic seizures is also recognized in the literature (LED Lighting Flicker and Potential Health Concerns: IEEE Standard PAR1789 Update, attached). This paper discusses LED light engineering methods that are known to cause the flicker that can cause seizures.

National Grid and the Village of Cambridge are opening themselves to serious liability by installing a model of light that is now known to cause seizures in at least one photosensitive epileptic. Photosensitive epilepsy is relatively common (1/4,000 people) and five times more common in children. Health effects go beyond epilepsy - “The health effects of flicker can be divided into those that are the immediate result of a few seconds’ exposure, such as epileptic seizures, and those that are the less obvious result of long-term exposure, such as malaise, headaches and impaired visual performance.” (IEEE 2010)

Street lights that cause epilepsy are clearly access blocking and the Village of Cambridge, NYS PS, and U.S. Department of Housing and Urban Development (HUD) are required by law to stop their installation and require their removal, especially in the face of such a dramatic and dangerous effect.

Installation should never have been allowed once the Village board was made aware of the adverse effect the LED lights would have on a known photosensitive epileptic. The decision to install the lights anyway is astounding in its callousness and in the clear potential for liability. Photosensitive epilepsy can be life-threatening due to its instantaneous epileptic effect upon exposure and it also clearly compromises quality of life.

Recently the Coast Guard issued a Marine Safety Alert about certain LED lighting:

“The U.S. Coast Guard has received reports from crews, ship owners, inspectors and other mariners regarding poor reception on VHF frequencies used for radiotelephone, digital selective calling (DSC) and automatic identification systems (AIS) when in the vicinity of light

emitting diode (LED) lighting on-board ships (e.g., navigation lights, searchlights and floodlights, interior and exterior lights, adornment).

Radio frequency interference caused by these LED lamps were found to create potential safety hazards.”

This is important because it may offer an additional explanation for the adverse reactions these LED street lights are causing.

Epilepsy is often caused by changes in activity of voltage-gated ion channels (Oyler et al 2017). RF/MW can inappropriately activate voltage-gated ion channels and may delay inactivation as well. In short, RF/MW can functionally induce channelopathies and certain channelopathies have been implicated in seizures. Thus, an individual with epilepsy caused by inappropriate activation or delayed deactivation of voltage-gated ion channels would find their threshold for seizure induction would be lowered by RF/MW exposure.

LED lights with high RF/MW emissions are likely also to be a strong source of “dirty” electricity a.k.a. electrical pollution, another source of RF/MW exposure. LED lights that generate strong RF/MW emissions and “dirty” electricity due to poor engineering would potentially be even more seizure inductive than an LED light that has low RF/MW emissions and contributes little “dirty” electricity. The additional combination of RF/MW emissions and “dirty” electricity generated by the LED lights that are causing MarieAnn’s seizures may explain why she and her husband still experience significant symptoms despite installing blinds. Blinds would not block RF/MW emissions nor would they prevent “dirty” electricity caused by the LEDs from entering their home.

The role of these three facets of the LED lights in inducing epilepsy could carefully and conclusively be teased out by a neurologist using controlled exposures and EEG monitoring.

Despite the law requiring the city to remove these lights, no doubt the argument will be made that it shouldn’t have to change for just one person. Flicker may not trigger seizures for other village residents, but the paper makes clear that many others will experience headache and decreased visual/cognitive performance. Additionally, LED street lights emitting RF/MW radiation and causing “dirty” electricity pose a clear health hazard. Since street lights are on at night, if they are poorly engineered and emit RF/MW at night, they can interfere with sleep quality by blocking production and action of melatonin. Poor sleep is clearly tied to negative health outcomes. The oxidative stress and inappropriate voltage-gated ion channel activation caused by RF/MW exposure can have serious implications for public health. Please watch this presentation on RF/MW health effects https://www.youtube.com/watch?time_continue=3174&v=faSSMkA6jUo&feature=emb_logo and read the appended discussion below).

The NYS PS cannot assume FDA or FCC have ensured that these lights are safe in the face of obvious evidence to the contrary. The D.C. Circuit Court of Appeals [decision](#) found the “[Federal Communications] Commission’s order arbitrary and capricious in its failure to respond to record evidence that exposure to RF [radiofrequency] radiation at levels below the

Commission’s current limits may cause negative health effects unrelated to cancer.” The FCC regulates other RF/MW emitters beyond wireless technology (including lighting) and none of them comply with biologically-based safety limits. FCC safety limits are thermally-based or are based on preventing device interference with other devices. The Amicus Brief (attached) our family filed in the aforementioned court case clearly shows that FCC limits provide no protection from biological effects or harm for any of the devices that they regulate. Thus, compliance would provide no biological protection or safety assurances for the individuals submitting this complaint due to disability and health effects caused by the lights.

The FDA’s negligent failure to develop biologically-based population-protective safety standards for radiofrequency/microwave exposures from electronic products as required by statute in Section 360kk is directly responsible for many people getting radiofrequency/microwave (RF/MW) sickness. Radiofrequency/microwave sickness is a known entity and occurs when an individual is over-exposed to radiofrequencies or microwaves (Dodge, [https://ecfsapi.fcc.gov / file/7520941877.pdf](https://ecfsapi.fcc.gov/file/7520941877.pdf)). A summary of more recent research showing serious biological effects resulting from non-thermal RF/MW exposures is appended to this comment. Their regulatory failure has resulted in many people becoming over-exposed due to detrimental biologically-active ambient RF/MW exposure occurring due to FCC’s negligence.

[American’s for Responsible Technology](#) have filed a Citizen’s Petition with the U.S. Food and Drug Administration (FDA) requesting the agency to Declare an Imminent Hazard with regard to the absence of biologically-protective radiofrequency/microwave (RF/MW) exposure standards. (See attached press release)

The FDA’s negligent failure to establish safety standards for electronic product radiation by 1970, as required by statute has resulted in real harm for many people, including the people filing this complaint. (See attached press release)

As the Court decision and the Citizen’s Petition make clear, neither the FCC nor the FDA can be relied on to have ensured the safety of electronic devices or RF/MW emitters at this time. Thus, in the face of clear evidence of disability, accessibility limitations, and health problems, the NYS PS is clearly legally bound to require removal of the hazardous lights and replacement with lights that do not cause disability, limit accessibility, and cause health problems.

Sincerely,

Catherine Kleiber

Overview of Some Important Research

The literature reviews of the Soviet RF/MW research make it very clear that the other biological effects of RF/MW are far more important than cancer. Depression, anxiety, irritability, poor sleep, lowered pain threshold, and cognitive, cardiac and neurological effects are all causally supported as resulting from RF/MW exposure. These all have clear public health implications when exposure becomes society-wide and ubiquitous, as it has already. The above listed symptoms are also already common. Thus, it is likely that we are already experiencing serious

harm to public health as a result of RF/MW exposure - all the above listed symptoms clearly relate to health issues that have become increasingly common, expensive, and problematic as RF/MW exposure has become more common.

More recent research provides a grim, but probably incomplete, outline of the very serious public health effects radiation from wireless technology is already having. Studies have shown that RF/MW disrupts endocrine function, including effects on thyroid hormones, TSH, ACTH, cortisol, prolactin in females, and testosterone in males. Changes in adrenaline, noradrenaline, dopamine, and phenylethylamine levels were found in response to an increase in ambient RF/MW levels. A mouse study found that changes in cardiac function and structure can be caused by exposure to radiation from wireless technology, probably at least in part due to changes in electrolyte balance, since that same study found that renin levels were elevated. This would be consistent with RF/MW exposure affecting voltage-gated ion channels and with findings in humans that RF/MW exposure causes cardiac arrhythmia. Case studies document RF/MW effects on blood glucose levels and insulin sensitivity.

Links to some important research can be found below. Several of the studies relate to the effects of ambient exposures. It is now possible, walking down a street without your own devices, to be exposed to higher levels of RF/MW than those found in the Eger study to cause cancer. In fact, those levels are now commonplace. Cancer is far from the only effect that can be related to commonly occurring ambient levels. The Eskander and Rimbach papers discuss their findings that ambient RF/MW radiation levels can cause endocrine disruption. This is very important. Endocrine related problems are becoming quite common and can have profound health effects. The dopamine effects discussed in Rimbach may be one key to the explosion in opiate addiction, in addition to the above mentioned lowering of the pain threshold. The screen effects which are covered in detail in Glow Kids by Nicholas Kardaras provide an additional explanation. As you read Glow Kids, it is important to realize that RF/MW exposure is inextricably linked to video game playing and device use from their inception because the devices themselves are RF/MW emitters, even if no wireless communication is used. Dr. Pall wrote a whole paper about the neuropsychiatric effects of RF/MW that is important to understanding what a serious public health threat ambient RF/MW radiation is. The neurological effects also support RF/MW exposure having a role in the opiate epidemic and the increase in mass shootings (other sources of RF/MW exposure likely also have a role). According to Dr. Pall, the voltage-gated calcium channels would be sensitive to RF/MW exposures into the very low microwatt range. RF/MW exposure in effect causes gain-of-function channelopathies in individuals who otherwise would not have them. Many known toxins are toxic because they have gain-of-function effects. All voltage-gated ion channels have numerous genetic variants. A few of these variants are always harmful with the rest generally being okay. However, certain variants may make individuals bearing them much more vulnerable to harm by RF/MW exposures, including pain syndromes, cardiac arrhythmias, and epilepsy.

We already know from previous toxins that oxidative damage is hazardous. It is increasingly being exposed as the root of numerous health problems. We know that non-thermal RF/MW radiation exposure causes oxidative damage, and DNA damage. Thus, RF/MW exposure is hazardous, including the ambient RF/MW radiation we are all being exposed to whether we use wireless devices or not.

“Dirty” electricity (from both electrical devices and electrical system faults) and *Incidental Radiators* and *Unintentional Radiators* are important sources of exposure to radiofrequencies (www.electricalpollution.com). That exposure often occurs through capacitive coupling, but exposure to radiated RF/MW can also occur. The FCC has several classes of RF/MW emitters (transmitters). They include *Incidental Radiators* and *Unintentional Radiators*, as well as *Unlicensed Intentional Radiators; Industrial, Scientific, and Medical (ISM) Radiators*; and *Licensed Radiators*.

- *Incidental Radiators* include electrical motors, dimmer switches, wall warts/transformers. They radiate RF/MW in the course of operation.
- *Unintentional Radiators* include devices that generate RF/MW energy for internal use, but which are not intended to emit it, like computers and other electronics and some high efficiency lights. However, often substantial RF/MW does radiate.
- *Unlicensed Intentional Radiators, ISM Radiators, and Licensed Radiators* all radiate RF/MW intentionally.

FDA MUST also establish biologically-based population-protective RF/MW limits for *Incidental Radiators* and *Unintentional Radiators*. Electronics and other electrical devices often cause symptoms associated with RF/MW exposure in individuals who have been overexposed simply because the devices themselves are sources of RF/MW exposure. See attached video demonstrating RF emissions and how simply they can be reduced. Proper engineering should be able to reduce emissions even more substantially.

Another source of exposure to RF/MW that is often not considered is RF/MW resulting from the "Rusty-Bolt" Effect (www.electricalpollution.com/RFIdetection.html). The “Rusty-Bolt Effect” is an increasingly common and powerful source of RF/MW radiation exposure. Essentially, conducted RF/MW traveling across a metal to metal junction with even a little bit of corrosion can result in the generation of a very strong RF/MW signal. This has been called the “Rusty-Bolt Effect”. Conducted RF/MW results from ambient RF/MW radiation signals being picked up on metal. These ambient RF/MW radiation signals can originate from any source of RF/MW radiation, including any wireless technology or other source of radiofrequency interference (RFI). This source of exposure is increasing rapidly.

The RF/MW transmission generated due to the "Rusty-Bolt" Effect varies with the frequency and strength of the signals coming into the metal to metal junction and some combinations are more potent than others. This is proving to be a very biologically potent source of RF/MW exposure thereby adding another mechanism through which radiation from wireless technology can cause harm and increasing the need to minimize ambient wireless radiation levels to protect public health. Increased ambient radiation levels and the "Rusty-Bolt" Effect can cause heat ducts, plumbing, wiring (even dead wiring), and any other metal to metal junctions to become strong and biologically hazardous sources of RF/MW exposure. The only practical way to address this public health threat is to minimize ambient RF/MW radiation levels.

The FDA must tighten regulations for *Incidental Radiators* and *Unintentional Radiators*, as well as *Unlicensed Intentional Radiators, Industrial, Scientific, and Medical (ISM) Radiators*, and *Licensed Radiators*.

Regulation of *Incidental* or *Unintentional Radiators* was originally designed to prevent equipment from interfering with other equipment. We now know that the human body is extremely sensitive to that same interference. **Since the human body cannot be “hardened” to prevent “noise” (a source of radiofrequency exposure) from affecting it, regulations need to be tightened substantially to make electrical technology safe.**

Mechanisms by which RF/MW causes non-thermal biological effects

Contrary to industry assertions, there are several mechanisms established by research through which RF/MW exposure can cause biological effects at levels far below those required to cause tissue heating. RF/MW exposures can inappropriately activate voltage-gated ion channels and induce oxidative damage.

Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression (<http://www.sciencedirect.com/science/article/pii/S0891061815000599>)

Low Intensity Electromagnetic Fields Act via Voltage-Gated Calcium Channel (VGCC) Activation to Cause Very Early Onset Alzheimer’s Disease: 18 Distinct Types of Evidence <https://www.eurekaselect.com/article/120618>

Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/>)

Oxidative Mechanisms of Biological Activity of Low-intensity Radiofrequency Radiation (<https://www.ncbi.nlm.nih.gov/pubmed/26151230>)

Wireless communication technologies: New study findings confirm risks of nonionizing radiation (<http://bit.ly/2qX22CY>)

RF/MW causes cancer

Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer - Survey Study of People Living in the Vicinity of Cellular Phone Base Stations (http://avaate.org/IMG/pdf/20041118_naila.pdf) It is particularly important that the highly exposed group was only exposed to 2,700 to 10,000 microwatts per square meter. Exposures of this magnitude commonly occur with wireless device use or even as second-hand radiation from devices, routers, or antenna base stations.

RF/MW is an endocrine disrupter

Several of these studies relate to ambient (second-hand) RF/MW radiation exposure, suggesting that the base station infrastructure is unsafe, and implying that second-hand exposure to radiation from devices would be too.

How does long term exposure to base stations and mobile phones affect human hormone profiles? (<https://www.ncbi.nlm.nih.gov/pubmed/22138021>)

Alterations in TSH and Thyroid Hormones following Mobile Phone Use (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243874/>)

Changes of Clinically Important Neurotransmitters under the Influence of Modulated RF Fields A Long-term Study under Real-life Conditions (<https://www.avaate.org/IMG/pdf/Rimbach-Study-20112.pdf>)

Effects of acute exposure to WIFI signals (2.45 GHz) on heart variability and blood pressure in Albinos rabbit <http://dx.doi.org/10.1016/j.etap.2015.08.015>

Study of the Cardiovascular Effects of Exposure to Electromagnetic Field http://www.lifesciencesite.com/ljsj/life0801/33_4553life0801_260_274_fatma.pdf

Radiation from wireless technology elevates blood glucose and body temperature in 40-year-old type 1 diabetic male (<http://www.tandfonline.com/eprint/ZkJepCuxXFTme5AuRkyY/full>)

Cardiac effects of consumer wireless documented

Cardiovascular Disease: Time to Identify Emerging Environmental Risk Factors <http://journals.sagepub.com/doi/full/10.1177/2047487317734898>

Provocation study using heart rate variability shows microwave radiation from DECT phone affects autonomic nervous system. <http://www.magdahavas.com/wordpress/wp-content/uploads/2012/01/Havas-HRV-Ramazzini.pdf>

Replication of Heart Rate Variability Provocation Study with 2.4 GHz Cordless Phone Confirms Original Findings <http://www.ncbi.nlm.nih.gov/pubmed/23675629#>

Radiation from wireless technology affects the blood, the heart, and the autonomic nervous system <https://www.ncbi.nlm.nih.gov/pubmed/24192494>

The presence of RF/MW exposure in the public arena should be minimized to prevent harm to public health and allow access for injured individuals.

The EUROPAEM [European Academy for Environmental Medicine] EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses supports removing wireless technology from public spaces to protect public health and make them accessible to people who have already been injured by radiation from wireless technology. (<https://www.degruyter.com/view/j/reveh.ahead-of-print/reveh-2016-0011/reveh-2016-0011.xml?format=INT>) Studies have found that upwards of 5% of the population is aware of health effects, often disabling or even life-threatening, upon exposure to wireless technology. A blinded study looking at RF exposure from “dirty” electricity found that over 39% of the population experiences some symptoms from exposure.

Older literature reviews documenting serious biological health effects of RF/MW exposure

Dodge, CH. *Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields. Biological Effects and Health Implications of Microwave Radiation, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969* (BRH/DBE 70-2) (PB 193 898) (http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf)

Cherry, N. 2002 *Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz- 300 GHz)* http://www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf

Marha K, Musil J, and Tuha H. *Electromagnetic Fields and the Life Environment. Institute of Industrial Hygiene and Occupational Diseases, Prague, Czechoslovakia. English Translation 1971*

Please visit www.bioinitiative.org for a review of recent RF/MW/EMF literature.