PHYSICIANS FOR SAFE TECHNOLOGY

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From: Dr. Cindy Russell,
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Re: Casa Grande High School -Cell Tower Proposed on School Property

Date: 1/28/24

Dear Board of Education, Petaluma City Schools:

We understand that there is a proposal to place a cell tower on the Petaluma City Schools grounds at Casa Grande High School.

We advise you to rescind or reject this proposal immediately for the health, safety and wellbeing of the children and staff at this school. You have an obligation to safeguard the learning environment. We feel that placing a cell tower on the school premises creates significant health risks to students as well as nearby neighbors. The money you receive from the cell tower will be a fraction of the indirect costs to health, safety and school liability in the short and long term. You have the power to stop this installation. Fiberoptic cable is the wise choice for the long run.

Science Points to No Cell Towers on or Near Schools or Hospitals
Our group, Physicians for Safe Technology, has looked extensively at the science of wireless technology, including the newly introduced 5G millimeter wave technology. The scientific evidence indicates cell towers of any generation should not be placed near schools, hospitals or homes. A minimum separation distance of at least 1640 feet should be given to avoid the worst symptoms from any cell tower (Pearce 2019). We also feel there should be a moratorium on all 5G cell towers due to the lack of safety studies, juxtaposed with an abundance of science showing biologic and cellular harm from 2G, 3G, and 4G cell towers that will accompany 5G towers.

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The Santa Clara County Medical Association in March 2023 passed the **SCCMA Best Practices for Safe Technology in Schools Recommendations** (reference below) . This document provides ample evidence that wireless radiation from cell towers and other wireless devices act as a toxicant and may be harmful, especially for children, with long term exposure. A precautionary approach is warranted. Policy recommendation #15 is "Consider a policy to restrict installation of cell towers on school property. The recommendation is at least 1640 feet (500meters) distance from a cell tower to a school. (Balmori 2022; Pearce 2020)"

In 2023 the Maryland Children's Environmental Health and Protection Advisory Council developed guidelines to reduce electromagnetic field radiation as well. (reference below)

In 2011 the European Council passed Resolution 1815 on "The potential dangers of electromagnetic fields and their effect on the environment." They recommend concerning the protection of children: 8.3.1. develop within different ministries (education, environment and health) targeted information campaigns aimed at teachers, parents and children to alert them to the specific risks of early, ill-considered and prolonged use of mobiles and other devices emitting microwaves; 8.3.2. for children in general, and particularly in schools and classrooms, give preference to wired Internet connections, and strictly regulate the use of mobile phones by schoolchildren on school premises;

We believe that today the scientific evidence strongly suggests long term risks for cancers, neurological harm, reproductive harm and biochemical harm for both children and adults from overexposure to wireless radiofrequency radiation. The development or exacerbation of electromagnetic hypersensitivity is also a concern with increasing levels of exposure to wireless radiation that cannot be mitigated from a cell tower which cannot be removed or shut off and operates 24/7 affecting the school and surrounding community.

An Abundance of Science

In the last 10 years, as technology use has mushroomed, physicians and scientists, have examined the growing body of basic scientific research, epidemiologic studies and case control studies showing adverse effects of wireless technology on our cellular biological processes. The mechanism is similar to other toxic exposures with oxidation being a common point of injury to cell membranes, proteins, DNA, sperm, stem cells, embryos and mitochondria (our cellular energy power plants). **Radiofrequency radiation (RFR) is an environmental toxicant which like many other toxins is inadequately studied, monitored or regulated**. Because one cannot feel it, see it or hear it, RFR is among the many other toxic exposures silently and slowly affecting our basic biology, genetic structures and that of our environment. This causes a silent decline in our health and that of the environment. FCC limits are based on heat not biological harm, thus inadequate to protect the public. Precaution in use is critical.

Children are more vulnerable

Children are more vulnerable to wireless radiation's adverse neurological effects due to their thinner skulls and developmentally immature brains. (Morgan 2014; Fernandez 2018; Gandhi 2012). Pregnant women are also at risk due to the vulnerability of the developing fetus (Li 2017) with associations found in animal and epidemiologic studies between prenatal exposures and ADHD and behavior. Humans are now exposed from pregnancy to childhood and through adulthood, a full lifetime of exposure.

Nervous System Effects

The brain and nervous system are considered to be a primary target of wireless non-ionizing radiation, as they function by using minute electrical signals. Effects of wireless radiation on the nervous system demonstrated in studies include DNA damage, alteration of neural functioning (cognition and learning), decrease in neurotransmitters (mood altering), oxidative nerve cell injury and inflammation, damage to hippocampus (memory center) and demyelination (disruption of the protective cells surrounding nerves). Studies of Wi Fi routers, cell phones, as well as cell towers show adverse neurologic effects including memory, behavior and

cognition. Considering schools primary objective is learning it seems wise to take a precautionary attitude with regards to cell towers, as well as other wireless devices.

Cell Tower Neurologic and Cognition Effects

Dozens of studies show neurologic and other health effects in residents who live in proximity to cell towers. The severity of health effects is dependent on the distance from the towers. The most common symptoms are fatigue followed by insomnia, headache, poor concentration, memory loss, irritability, heart palpitations and skin effects. **Santini (2002)** noted the above symptoms when cell towers were within 200-300 meters to homes. A follow up study Santini in 2003 revealed that older subjects reported more symptoms and were more sensitive. The authors noted that the duration of exposure of 1 to 5 years did not have an effect on frequency of symptoms but after 5 years there was a significant increase in irritability reported.

In an independent cell tower study from Japan, **Shinjyo and Shinjyo (2011),** looked at the health effects of residents living in a condominium complex from 1998-2009, both before and after cell towers were placed. The authors surveyed the resident's health symptoms before placement of cell towers, during cell tower functioning and after removal of different antennas on the rooftops. They found a significant development of neurologic symptoms with placement of the cell towers and a significant reduction in symptoms after removal.

Meo (2018) studied the effects of cell towers near 2 high schools and found cognitive changes after 2 years in the teenagers near the higher emitting cell antenna. This 2-year case-controlled study examined the neurologic effects of children, aged 13-16, in schools with nearby cell towers. The study revealed significant decline in cognitive scores when the radiation from the cell tower was higher but still at non-thermal levels. **All levels were below current ICNIRP exposure guidelines**. Cognitive function tasks were measured by the Cambridge Neuropsychological Test Automated Battery (CANTAB). Participants were excluded who had any confounding factors. Students in the school with higher exposure to RF-EMF produced by cell towers was associated with delayed fine and gross motor skills, spatial working memory, and attention compared to students in the school who were exposed to lower RF-EMF.

Cell Tower Hormonal Dysregulation Effects

Buchner and Eger (2004) found cell tower proximity caused dysregulation of hormonal systems and cell towers. Because of concerns with the "scientific uncertainty" of public health impacts of cell tower radiofrequency emissions, Professor Buchner and Eger performed a rather novel study over a year and a half in Bavaria in 2004. Hearing that a cell tower was to be placed in their municipality they enlisted volunteers to have their urine tested for levels of adrenaline, noradrenaline, dopamine and phenylethylamine, all stress hormones that cannot be consciously regulated. They found continued dysregulation of the catecholamine system with elevation in the stress hormones adrenaline, noradrenaline with decreases in dopamine and phenylethylamine after the tower was placed. Long term dysregulation of the catecholamine system is well known to damage human health. Another study by **Eksander (2012)** demonstrated decreases in ACTH, cortisol, thyroid hormones, prolactin and testosterone with exposure to higher but environmentally relevant levels of radiofrequency radiation over a 3-year period.

Cell Tower Cancer Effects

A 10-year study (1996-2006) by **Dode (2011)** examined the distance from cell towers and cancer clusters. He and his colleagues found a highly significant increase in cancers in those living within 500 meters of the cell tower. They noted "The largest density power was 40.78 μW/cm2, and the smallest was 0.04 μW/cm2." **The current guidelines are about 1000 μW/cm2, thus even at lower power long term effects are evident.** The

authors conclude "Measured values stay below Brazilian Federal Law limits that are the same of ICNIRP. The human exposure pattern guidelines are inadequate. **More restrictive limits must be adopted urgently."**

A study by **Wolf and Wolf (2004)** showed a significant increase in cancer in those living within 350 feet of a cell tower. **Eger (2004)** found an increase in new cancer cases within a 10-year period if residents lived within 400 meters of a cell tower. They also found that within 5 years of operation of the transmitting base station the relative risk of cancer incidence tripled in residents near the cell tower compared to resident living outside the area.

Review of Health Effects of Cell Towers

Balmori published his 2022 article, ***Evidence for a health risk by RF on humans living around mobile phone base stations: from radiofrequency sickness to cancer***, reviewing the previous studies highlighting both short-term and long-term health effects. Balmori concluded, "Overall results of this review show three types of effects by base station antennas on the health of people**: radiofrequency sickness (RS)[electromagnetic hypersensitivity], cancer (C) and changes in biochemical parameters (CBP).** Considering all the studies reviewed globally (n = 38), 73.6% (28/38) showed effects: 73.9% (17/23) for radiofrequency sickness, 76.9% (10/13) for cancer and 75.0% (6/8) for changes in biochemical parameters...Of special importance are the studies performed on animals or trees near base station antennas that cannot be aware of their proximity and to which psychosomatic effects can never be attributed."

500 Meter Buffer Recommended Around Schools and Hospitals to Limit Liability

Pearce (2019) looked at health effects of cell towers, publishing a peer reviewed industry paper, Limiting liability with positioning to minimize negative health effects of cellular phone towers, which recommends a 500 Meter buffer recommended around schools and hospitals to limit liability. Peace noted that current U.S. Law is Unhelpful for Preventing Future Liability.

> "Current U.S. law has created a somewhat peculiar overriding federal preemption that precludes taking the ''environmental effects'' of RFR into consideration in cell tower siting (see Section 704 of The Telecommunications Act of 1996). The current U.S. standards are based solely on thermal effects… because scientific knowledge is incomplete, a precautionary approach is better… To overcome these challenges in urban areas cellphone companies often locate cellphone base stations at schools, because the monthly rental fee (~$1500) is welcome income for economically-challenged school districts that have influence on local zoning. However, some jurisdictions have already prohibited the placement of cell phone towers near schools or hospitals because of the increased sensitivity of these populations, as in India… voluntarily restrictions can be made on the placement of cellular phone base stations within 500 m of schools and hospitals."

Electromagnetic Hypersensitivity

Electromagnetic hypersensitvity (EHS**)** to wireless radiation is increasingly recognized as a disability and environmental illness in both children and adults (Bevington 2019). Variable symptoms which occur in some individuals in the presence of wireless devices include headaches, fatigue, dizziness, nausea, and heart palpitations. Predisposing factors include chemical sensitivities, prior toxic exposures, infections, impaired immune systems and genetic variation. It is estimated that 5%-30% of the population has mild EHS and 0.65% have a severe disability and cannot work or go to school due to wireless devices and infrastructure present. A young woman, Jenny Fry, from the UK committed suicide after becoming severely electrosensitive when the new Wi Fi was placed in her school. She was not able to participate in school activities and was not given accommodation in her school. In the UK a student has recently received accommodation for their disability.

Dr. Scott Eberly, a hospice physician, developed EHS after a carbon monoxide poisoning and relates his story and how he finally figured out that he had become sensitive to his wireless devices and how disabling that had been for him. His two articles are **What's the Diagnosis Doctor?** (Eberle 2014), **An underworld journey: Learning to cope with electromagnetic hypersensitivity**. (Eberle 2017).

Hardell and Carlberg (2022) published a new case report, **The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation**, discussing two previously healthy persons who developed symptoms of EHS after installation of a 5G base station on the roof above their apartment. Their symptoms rapidly emerged after the 5G deployment and included neurological symptoms, tinnitus, fatigue, insomnia, emotional distress, skin disorders, and blood pressure variability. Measurements of the RF levels were made and when they vacated their apartment to another location with lower EMF their symptoms abated. The authors conclude, *"The RF radiation levels in the apartment were well below the limit proposed to be "safe" below which no health effects would occur, recommended by the International Commission on Non-Ionizing Radiation (ICNIRP). These now presented symptoms of the microwave syndrome were caused by non-thermal effects from RF radiation and highlight that the ICNIRP guidelines used in most countries including Sweden do not protect human health. Guidelines based on all biological negative effects from RF radiation are urgently needed, as well as monitoring human health, not the least due to rapidly increasing levels of exposure.*

Note: The ICNIRP guidelines are similar to the exposure limits adopted by the Federal Communications Commission (FCC) in the U.S.

Reproductive Organs: Infertility and Miscarriage

Damage to DNA either female or male or to the fetus in critical windows of development can not only cause infertility and miscarriage but also heritable birth defects. Recent research demonstrates that RFR is toxic to the fragile reproductive process with a distinct lack of studies showing that this technology is safe for the reproductive organs. RFR has been shown to cause injury to DNA, proteins, lipids and fragile metabolic processes. Peer reviewed research shows harm to sperm, ovaries(causing aging of ovaries) and embryos. Miscarriage is also a risk. Dr. De Kun Li performed a prospective study on pregnant women following them through their pregnancy and found that the highest levels of everyday EMF exposure were associated with a 3-fold increase in miscarriage. Cell towers may have high enough emission levels on a daily basis to contribute to miscarriage (Li 2019). Cell tower radiation could contribute to long term reproductive failure as was seen by Magras in rats exposed to cell tower radiation over 5 generations. The biological effects are silent until these students are older and ready to have a family. Only then is the harm realized.

New Hampshire 5G Commission Finds Radiofrequency Radiation Problematic

The first Commission formed in the United States to study the environmental and health effects of 5G technology released their comprehensive final report on November 1, 2020. The Commission to Study the Environmental and Health Effects of Evolving 5G Technology was mandated by HB 522 passed by the state legislature in New Hampshire. Their final report included 15 recommendations addressing the need for public education about wireless hazards, RF health studies, RF measurements, cell antenna setbacks, fiberoptic rather than wireless deployment, commercial warning signs and wildlife protection. After hearing extensive testimony in a series of 13 meetings over the course of a year and reviewing an abundance of research, the Commission highlighted the lack of a single definition for 5G, insufficient evidence of safety for 5th generation technology,

a concern that safety standards for wireless technologies have not been updated with the latest science and that 5G is largely a marketing concept. They also expressed concern that the FCC has a long history of being accountable to industry over the desires of communities and individuals.

FCC Limits: A False Sense of Security

We are told by the FCC that wireless radiation and cell towers are safe within current safety guidelines, or that we do not really know if there is harm or that the research is inconclusive or that it is not ionizing (like x-rays) so it cannot hurt us. This is similar to the dismissive and doubt creating language used by the tobacco industry and a host of other chemical companies to protect their toxic products. The studies above indicate that new standards are needed that protect humans and the environment. The FCC failed to reevaluate the standards and review new evidence and was sued.

A lawsuit against the FCC was won by Environmental Health Trust and Children's Health Defense on August 13, 2021. The Court wrote, "Under this highly deferential standard of review, we find the Commission's[FCC] order arbitrary and capricious in its failure to respond to record evidence that exposure to RF radiation at levels below the Commission's current limits may cause negative health effects unrelated to cancer… We find the Commission's order arbitrary and capricious in its complete failure to respond to comments concerning environmental harm caused by RF radiation."

Telecom Industry Promotes Wireless and Digital Technologies but the Insurance Industry Says it is a Health Risk

Industry heavily promotes the rapid adoption of new wireless and digital technologies in schools as necessary to "keep up". They profit from the data collected as well as the selling of devices and new software. The powerful telecommunications associations and the FCC, considered a captured agency, will dismiss, discredit and deride current research and researchers who want more protective standards or who ask for precaution. (Alster 2016)

Insurance companies consider wireless radiation to be similar to asbestos in long term health impacts and do not provide insurance coverage from harm for RF health effects. Insurance companies have an exclusion for radiofrequency radiation as an emerging health risk. Cities and schools are left with the liability unless they can provide special "pollution" insurance that does not exclude radiofrequency radiation.

In a 2019 report, **New Emerging Risk Insights**, by Swiss RE, the second largest reinsurance company in the world, **5G is listed as an emerging concern** in the high risk category within 3 years. Included in the high-risk trends are artificial intelligence and the existential threats of climate change. "*The top five emerging risks in our SONAR 2019 report are digital technology's clash with legacy hardware, potential threats from the spread of 5G mobile networks, increasingly limited fiscal and monetary flexibility by central banks, genetic testing's implications on life insurers, and the impact of climate change on the life and health sector.*" https://www.swissre.com/institute/research/sonar/sonar2019.html

Will you Measure Cell Tower Emissions? Will You Survey Student Health?

If you do elect to place the tower it would be important to know if you will hire a certified building biologist to monitor the radiation emissions from the tower (frequencies and power) and also provide updated health surveys and medical exams for the children. It would be the first in this nation and welcome by industry, if indeed no harm is really found. It is highly unlikely, however, that any Institutional Review Board (IRB) would grant approval for human experimentation on children in schools, yet placing a 5G cell tower on school premises is in essence an experiment without controls.

We would advise you again to rescind this decision for the wellbeing of the students and staff of your school and to prevent future liabilities. You have an obligation not only to teach, but also to protect the health and safety of the children whose parents have placed them in your trust. Several decades of research in the military

and occupational setting, as well as basic science indicates that the use of wireless technology poses a risk to the health, mental function, behavior, memory and learning of students. Considering all of the evidence, placing a cell tower directly on a school campus with a "wait and see" approach seems unwise financially and morally.
Respectfully submitted,
Cindy Russell, MD

"Waiting for high levels of scientific and clinical proof before taking action to prevent well- known risks can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco."
The European Commission

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