FCC 09-31

Before the
Federal Communications Commission

In the Matter of	)	
	)	
A National Broadband Policy for Our Future	)	GN Docket No. 09-51

Notice of Inquiry

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

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EMR POLICY INSTITUTE COMMENT

INTRODUCTION

The FCC repeatedly states that the primary goal in this Notice Of Inquiry (NOI) on A National Broadband Plan for Our Future (Broadband Plan) is "broadband access for all Americans." Achieving

that goal should not come at the cost of human health and lives. It should not force people to move from their homes or cause them to cease being able to work. Broadband access should not violate constitutional rights of citizens. There are ways to deliver broadband without radiating people.

The goal of the Broadband Plan must only be met with fiberoptic and other hard-wired, non-radiating infrastructure options. Constantly exposing everyone everywhere to unprecedented levels and frequencies of electromagnetic radiation with wireless signals is a dangerous, unsanctioned, mass experiment that must not occur. Imposing widespread broadband electromagnetic radiation on everyone everywhere has never before occurred in human history.

> **"We know of no other instance where a device, chemical or drug …would be imposed on the public without proof of its safety."**[1]

If the electromagnetic radiation were a drug, increasing the dose and type would not be allowed without thorough evaluation of safety. Electromagnetic radiation, like drugs, can induce changes in the biology of the body. **"Everything is a poison. It is just a question of dose,"** Theodore Litovitz, Ph.D, reminded Congressional staffers when speaking as a renowned expert on the numerous health hazards posed by levels of electromagnetic radiation below FCC limits that prematurely age humans and predispose them to degenerative diseases. **Exhibit 1** is PowerPoint Dr. Litovitz used in his oral presentation " Biological Effects of Electromagnetic Fields,"at the July 12, 2001 Congressional Staff Briefing "Wireless Telecommunications – Impacts at the Local Level." hosted by Senators Leahy (V-D) and Jeffords (VT-I) and Congressmen Sanders (VT-I) and Tancredo (CO-R). (http://video.google.com/videoplay?docid=7498052433339986964&hl=en)

Risks to human health from RF radiation exposure, particularly to children and persons with disabilities, at levels below the current FCC limits are summarized in the review articles published in the March 2009 issue of Pathophysiology (**Exhibit 2**) that are based on *The BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF) (The BioInitiative Report)* (www.bioinitiative.org).

In 2007, an international working group of scientists, researchers and public health policy professionals (The BioInitiative Working Group) released a major report on electromagnetic fields (EMF) and health. It raises serious concern about the safety of existing public limits that regulate how much EMF is allowable from power lines (extremely low-frequency, i.e., ELF) , cell phones (radiofrequency, i.e., RF), and many other sources of EMF exposure in daily life. *The BioInitiative*

[1] University of Colorado Health Sciences Department of Radiation Oncology letter in opposition to increasing electromagnetic radiation to a population. Carney Affidavit…….. http://www.emrpolicy.org/litigation/case_law/care/cu_oncologists_%20letter.ppt

Report provides detailed scientific information on health impacts when people are exposed to electromagnetic radiation hundreds or even thousands of times below limits currently established by the FCC and International Commission for Non-Ionizing Radiation Protection in Europe (ICNIRP). The authors reviewed more than 2000 scientific studies and reviews, and concluded that the existing public safety limits are inadequate to protect public health. The Report concludes that, from a public health policy standpoint, new public safety limits, and limits on further deployment of risky technologies are warranted based on the total weight of scientific evidence.

EMR POLICY INSTITUTE STANDING

The EMR Policy Institute, www.emrpolicy.org, is both a nonprofit stakeholder and an authorized voice for other stakeholders such as an ever-increasing number of people disabled by electrohypersensitivity from the ever-increasing electromagnetic radiation authorized by the FCC.

The Mission Statement of The EMR Policy Institute (EMRPI) is:

> 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.

If the FCC is to be believed, EMR has standing to make comments that will be heeded;

> We seek comment in this Notice from all interested parties on the elements that should go into a national broadband plan. Our plan must reflect an understanding of the problem, clear goals for the future, a route to those goals, and benchmarks along the way . . . And our plan must reflect the input of all stakeholders –…(including) non-profits; and disabilities communities. p.3 ¶ 8. see also p. 40 ¶ 123, p. 37 ¶ 112

Over forty individuals have submitted affidavits that authorize EMRPI to speak in this proceeding on their behalf and describe concrete and particular harms such as pain, disability, electrohypersensitivity (EHS), fear of harm, concern for their children's health and safety, and compromise to their immune systems that they have encountered from existing levels of

electromagnetic radiation and/or harms they will encounter if wireless broadband is initiated everywhere. **Exhibits 3-43.** Highlights of some of these experiences are detailed in the section, "Personal Injuries from Electromagnetic Radiation."

The Vice President of the EMR Policy Institute (EMRPI), Deborah Carney, is both an attorney who has filed numerous petitions with the FCC to address blanketing interference, proliferation of EMR devices in her community, opposition to FCC preemption of local authority, EMRPI challenges to the FCC and a resident who has been a research subject on the impact of RF radiation and has had to install shielding to protect her family in their home from the high-powered TV/FM broadcast radiation from nearby TV towers. (**Exhibit 9**)

PERSONAL INJURIES FROM ELECTROMAGNETIC RADIATION

As discussed in *The BioInitative Report,* the adverse health effects drive the need for immediate action in lowering EMR exposure include cancer and neurodegenerative diseases. Leukemia appears the cancer of greatest concern when the exposure to either ELF or RF EMR is over the whole body, as is the case with most ELF exposures and exposures from RF towers/antennas.

Recently, a new category of persons with a functional impairment has been described in the scientific literature, i.e., electrohypersensitifity (EHS). A working definition of EHS from Berquist *et al*. (1997) is:

> *A phenomenon where individuals experience adverse health effects while using or being in the vicinity of devices emanating electric, magnetic, or electromagnetic fields (EMFs).*

Stenberg (2004) distinguishes between two groups: those who experience facial skin symptoms in connection with video display terminal (VDT) work (sensory sensations of the facial skin including stinging, itching, burning, erythema, roasacea) while EHS symptoms include these and also fatigue, headache, sleeplessness, dizziness, cardiac and cognitive problems.

In Sweden, EHS is an officially, fully-recognized functional impairment (i.e., it is not regarded

as a disease, thus no diagnosis exists. An impairment is - by definition - not defined by someone else or proven by certain tests. The impairment is always individual and develops when the impaired person is in contact with an inferior environment.

This is not exclusive to Sweden, the terms "functional impairment" and "disease" are defined according to various international documents. The challenge is for the impaired person to be able to achieve accessibility measures of various types with the sole aim to have an equal life in a society based on equality (according to the The UN 22 Standard Rules on the Equalization of Opportunities for People with Disabilities - since 2007 upgraded into The UN Convention on Human Rights for Persons with Functional Impairments. See: http://www.un.org

Survey studies show that somewhere between 230,000–290,000 Swedish men and women report a variety of symptoms when being in contact with electromagnetic field (EMF) sources. Swedish municipalities have to follow the UN 22 Standard Rules on the equalization of opportunities for people with disabilities. All people with disabilities shall, thus, be given the assistance and services they have the right to according to the Swedish Act concerning Support and Service for Persons with Certain Functional Impairments (LSS-lagen) and the Swedish Social Services Act (Socialtjänstlagen).

AFFIDAVITS OF INJURY

Dr. Donald Hillman, Professor Emeritus at Michigan State Universitythe , has studied impacts on dairy cattle milk production at levels below the 1-Volt threshold erroneously considered safe by utility experts. He scientifically documents health injury caused by EMF generated by AC/DC switch mode devices from cellular telephone antennas that travels on the neutral wires and radiates into homes, schools, and workplaces:

> I measured electric and magnetic fields: milligauss [mG], current, and frequencies of voltage from the neutral-to-ground wire of a Nextel cellular telephone relay station mounted on and under the East Lansing City water tank, as permitted by the Federal Communications Act of 1996. Radiofrequency currents were recorded from the ground wire that was bonded to the city water system and transferred onto water pipes bonded to the ground wire in our home and the homes of ten neighbors. Utility engineers from Lansing Board of Water and Light confirmed my measurements, recorded the magnetic field radiated from the ground wire into the living room of our home for 24-hour periods on two occasions. The magnetic field ranged from 0-320 mG and averaged 97 mG (standard deviation 37.9 mG).
>
> During five test experiments, while I was sitting on the sofa in our living room, my heart rate and blood pressure increased linearly as the magnetic field (mG) in the room, and

radiated current (amperes) increased as recorded with ammeter from my body acting as antenna. Our findings concur with reports of radiated electrical energy resulting in cardiovascular effects on humans and animals found in some 25 credible bioelectric and medical journals. A full report is available at your request.

The Federal Communications Act of 1996 and local promoters of the cell-phone tower failed to disclose that EMF generated by AC/DC switch mode devices from cellular telephone towers appear on the neutral wires and radiate into homes, schools, and workplaces .

Four residents living within 100 meters of the cell-phone tower in our neighborhood have arrhythmic hearts, two have pacemakers, and one has a defibrillator attached to his heart, while another suffers from non-Hodgkins lymphoma; not coincidental. Electromagnetic contamination of the living environment from electronic devices may account for the increased hypertension of citizens at every age from 20-85 years, with unknown cause as reported by the American Heart Association.

Further investigations must consider neuroendocrine effects of EMF on secretions of all glands that control physiological functions of human and animal bodies. The permeability of biological tissue, (e.g. cattle and humans) to magnetic fields is essentially the same as air; therefore, assumptions of resistance based on specific absorption rate (SAR) of a gram of fat have little relevance for estimating the effects of electromagnetic fields on the health of living specimens. I recommend that the FCC reevaluate effects of exposure to uncontrolled radiofrequency currents from all sources on human and animal health before promoting or permitting any further wireless EMF saturation of the living environment.

The Federal Communication Commissioners must weigh the cost of radiofrequency electropathic stress to human suffering, additional medical and hospital insurance costs, and damage to the animal industry economy versus further uncontrolled expansion of Broadband until the financially vested interests have proven the safety of the product they wish to impose on an unsuspecting public**. Exhibit 3**

Lisa Tully, Ph.D. in Pharmacology and Toxicology, is so concerned from her literature review by the inadequacy of the FCC limits that she is involved in developing a diagnostic test for electrohypersensitivity. "More and more people are becoming sick, some are being severely debilitated." **Exhibit 4**

John Schou, Ph.D., Biochemist and research scientist, instructor in Army Reserves Chemical-Biological Radiology, measured RF and studied how the RF impacted his wife and himself after cell tower was built near their farm in Iowa. **Exhibit 5**

Diane Schou, Ph.D., Industrial Technology, developed sleep loss, hair loss, changes in vision so severe that she was unable to read, fatigue, rash, nausea, thyroid problems, mental clouding, chest pain and headache. Occupational and Environmental Health physician, Grace Ziem, M.D., evaluated Diane Schou verifying that a number of conditions, including vision, worsened with RF and that her very

significant disability from RF prevents Diane from working. Two other physicians confirmed Diane's health problems from the RF. **Exhibit 6-B** Spectrum analyzers document that she now shows reactions to cell towers even 10 miles away. As RF increases, both Mr. and Mrs. Schou's blood sugar levels go up. Mr. Schou's symptoms of sleep apnea, eye floaters, tinnitus, and hair loss reduce as he is away from RF environments. Diane Schou traveled to Norway, Arizona and other places searching for a place she could live. RF levels drove her from her home and career in 2003. Diane Schou has only returned home for 20 minutes since. She has to remain away from most electricity in a radio quiet zone in West Virginia even when John returns to the farm back in Iowa because her EHS is so severe. Diane now gets a headache when wireless internet is turned on. When people bring cell phones and turn them on, she is injured. Recovery may take minutes to weeks. The financial impact has been significant. **Exhibit 6**

> To be forced to live in a Faraday cage, a shield from wireless communication that ¶people cannot turn off, is inhumane. **Exhibit 6-F** But worse yet, deterioration of health, from unnatural electromagnetic radiation is torture. ¶ 78
>
> To be unable to return home without being harmed and without anywhere to go, and not knowing where or when you can sleep that is safe I call homeless. ¶ 83
>
> Government agencies are not protecting me. Economics and industry seems to have priority over health and life. Don't I have the right to life, the right to live without the invasion of invisible electromagnetic radiation, the right to a future? ¶ 88
>
> Electromagnetic radiation injuries/sensitivities/health effects appear to be on the rise and ignored by the FCC. ¶ 90

John Schou recommends measurements that be made of the intensities of the fields and trained personnel look at the problems.

> I have missed living with my wife while I need to work in Iowa for an income on our research operations there and my wife needs to be protected and lives in the radio quiet zone of West Virginia. This separation for a major part of the year does affects our lives in many ways and causes hardships when we need to work together on projects and be together for social and personal companionship.
>
> My concerns are that exposure levels are far too high and everyone is affected and only those with sensitized systems are showing the most visible effects now. In other words they are the canaries in the coalmine showing the first visible symptoms of major problems for all.
>
> People who have symptoms need safe areas to retreat to and live in. **Exhibit 5**

William J. Bruno, Ph.D. in Physics, with years of experience in the Los Alamos National Laboratory, suffers from neurological problems such as insomnia, tinnitus, and memory problems linked to electromagnetic radiation. WiFi, cordless phones, microwave ovens, computers and other emitters caused him physical problems. Dr. Burno cites a number of published reports that document that a significantly increased fraction of people who claim sensitivity can detect smaller currents in their skin compared to most people. This includes biological effects at low levels of exposure, and documented links between Alzheimer's and living near extra-high voltage power lines. "The incidence of Alzheimer's went up nearly ten-fold in the late 1970's and early 1980's, just after microwave ovens (which all leak) became common. His comments have been filed with the National Academies of Science Committee on Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication Devices. Dr. Bruno endorses the Benevento Resolution of the International Commission for Electromagnetic Safety signed by more than 30 researchers in the field of biological effects of electromagnetic fields that calls for wireless-free zones in cities, public buildings and transit, and promotes wired alternatives to wireless networks. **Exhibit 7**

Janet Dauble, who founded a support group for people with chemical, food, mold, dust and electrical sensitivities, is very concerned for the suffering her members will endure from Wireless Broadband. Members' health complaints about electromagnetic/radiofrequency/microwave sensitivity have greatly increased over the last 10 years. Members are selling homes and suffering reactions due to neighbors' WiFi. **Exhibit 8**

Deborah Carney, J.D., B.A. in Human Biology from Stanford University, has been the Vice President of the EMR Policy Institute since its inception. She lives on Lookout Mountain, Colorado within a mile of high-powered digital TV antennas. Her community has elevated brain tumor rates. Every resident with a brain tumor had a clear view to the towers. The Colorado Department of Public Health and the Environment has twice found statistically-significant elevated numbers of brain tumors exist in residents near the broadcast antenna towers atop Lookout Mountain. Community electrical engineers repeatedly measured RF in levels above the FCC limits. The FCC almost entirely relies on broadcasters and other emitters to self police and self report.

Ms. Carney has invested hundreds of hours studying the evolution of the FCC RF standards and current medical research on the subject. She observed, heard and concurs with the sworn testimony of the following physicians, scientists and experts to the Jefferson County (Colorado) Commissioners concerning the proposed rezoning of land for a high powered digital TV broadcast supertower for ABC, NBC, CBS and Twenver stations here. These witnesses

document that the FCC RF standards do not adequately protect humans. (District Court, Jefferson County Colorado, 99 CV 2007. *Lake Cedar Group, LLC, v Board of County Commissioners of Jefferson County and Canyon Area Residents for the Environment, a Colorado nonprofit, Defendants-Intervenors.* 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.*)

NAME	TITLE	SPECIALTY	TOPIC	Hyperlink and CITATION
KELLY, Cindy	**M. D.**	**Orthopedic Oncologist**	**Examination of Health Risks Electromagnetic Radiation**	**http://www.emrpolicy.org/litigation/case_law/care/kelly.ppt ; http://www.emrpolicy.org/litigation/case_law/care/kelley_03.pdf http://www.emrpolicy.org/litigation/case_law/care/kelly_27apr99.pdf 2003 R5608-26, 11729-36**
FRANKEL, Stephen	**M.D.**	**Internal, Pulmonary, Critical Care –Cell Biology & Cell Signal Transaction**	**Effects of RF Radiation on Human Health and Disease**	**http://www.emrpolicy.org/litigation/case_law/care/frankel_03.pdf; http://www.emrpolicy.org/litigation/case_law/care/Frankel,MD.ppt 2003 R 5583, 11711-23**
WILKINS, Ross	**M.D.**	**Orthopedic Oncologist Pres. Musculoskeletal Tumor Society**	**Epidemiology slow to react to evidence of harm-AIDS example**	**http://www.emrpolicy.org/litigation/case_law/care/wilkins_1jul03.pdf 2003 R 11659**
GOLD-SMITH	**M. D.**	**Epidemiologist**	**The End of Innocence regarding RF**	**http://www.emrpolicy.org/litigation/case_law/care/goldsmith_1jul03.pdf 2003 R 11660-1**
HOONTRAKOON, Raweewan	**M. D.**	**Pediatrician & Allergy**	**RF should be treated like vaccine preservative, if potential hazard avoid.**	**http://www.emrpolicy.org/litigation/case_law/care/hoontrakoon_03.pdf 2003 R 11931-2**
GRABOWSKI, Steven	**M.D. M.P.H.**	**Public Health Preventative Medicine**	**Do No Harm-Medical Code of Ethics should be followed here**	**http://www.emrpolicy.org/litigation/case_law/care/grabowski_03.pdf 2003 R 11922-32**
PARDOS, George	**M.D.**	**Ophthalmology**	**" Increased Sensitivity of Non Human Primate Eye to**	**http://www.emrpolicy.org/litigation/case_law/care/Pardos.ppt http://www.emrpolicy.org/litigation/cas**

			Microwave Radiation Following Ophthalmic Drug Pre-Treatment" by Henry A. Kues, Bioelectromagnetics 13:379-393 (1992)	**e_law/care/pardos_27may99.pdf 1999 R 6094-9**
POLAK, Paul	**M.D.**	**Psychiatry**	**RF harms include severe sleep disturbance**	**http://www.emrpolicy.org/litigation/case_law/care/polak_27apr99.pdf 1999 R 6045-50**
REIF, John	**D.V. M.**	**Principal Investigator of CSU Study of Lookout Mountain**	**Health Effects Associated with Human Exposure to RF and 3 papers on the Lookout Mountain study**	**http://www.emrpolicy.org/litigation/case_law/care/Reif.ppt http://www.emrpolicy.org/litigation/case_law/care/reif_27may99.pdf 1999 R 6100-8**
LAI, Henry	**Ph.D.**	**Bio-Engineering-U.W.**	**Biological/Health Effects of RF from RF Towers**	**http://www.emrpolicy.org/litigation/case_law/care/lai_27may99.pdf 1999 R 6090-3**
WITWER, John	**M. D.**	**Radiology & State Rep.**	**An Increase in RF on Lookout Mountain should not be allowed**	**http://www.emrpolicy.org/litigation/case_law/care/witwer_27apr99.pdf 1999 R 6058-60**
LITOVITZ, Theodore	**Ph.D.**	**Physics**	**Health Effects of RF at Levels below FCC Limits**	**http://www.emrpolicy.org/litigation/case_law/care/litovitz_1jul03.pdf ; http://www.emrpolicy.org/litigation/case_law/care/LitovitzCVFeb02.doc 1999 R 1162-3**
HOFFMAN	**M. D.**	**Chief Medical Officer-Colo. Health Dept.**	**FCC RF limits do not protect from adverse consequences of long term exposure**	**http://www.emrpolicy.org/litigation/case_law/care/hoffman_27apr99.pdf 1999 R 6025-31**
MATTSON, Roger	**Ph.D.**	**Former director EPA Non Ionizing**	**No branch of government is watching**	**http://www.emrpolicy.org/litigation/case_law/care/mattson_27may99.pdf ; http://www.emrpolicy.org/litigation/cas**

		Division	**out for RF hazards. EPA funding cut to $25,000 for last 5 years**	**e_law/care/mattson_03.pdf http://www.emrpolicy.org/litigation/case_law/care/mattson_jeffco_7.01.03.ppt 2003 R 1178-84 1999 R 6176-84**
OLINGER, Shirley		**Nuclear Engineer**	**RF Health Hazards**	**http://www.emrpolicy.org/litigation/case_law/care/olinger_27may99.pdf 1999 R 6172-5**
WYNES, Murry	**Ph. D.**	**Immunology**	**RF Health Hazards and CSU study shows that white cell counts increase with RF at levels below FCC limits**	**http://www.emrpolicy.org/litigation/case_law/care/wynes_03.pdf 2003 R 11868-9 Affidavit- Jan. 26, 2007**
NOUFI, Rommel	**Ph. D.**	**Physics and Chemistry**	**Does not allow any RF exposure to staff at National Renewable Energy**	**http://www.emrpolicy.org/litigation/case_law/care/noufi_29jun99.pdf 1999 R 6270-4**
CLARKE, Penny	**Ph. D.**	**Electro Biologist and Health Physician**	**U. of C. Oncologists & Scientists see adverse health effects from broadcast RF with potential to cause cancer.**	**http://www.emrpolicy.org/litigation/case_law/care/cu_oncologists_%20letter.ppt http://www.emrpolicy.org/litigation/case_law/care/clarke_03.pdf 2003 R 11866-7**
MALLER, Jim	**Ph. D.**	**Pharmacology**	**Low Frequency RF produces DNA breaks that lead to cancer.**	**http://www.emrpolicy.org/litigation/case_law/care/maller_03.pdf 2003 R 11820-1**
MARTIN, Jim		**Electrical Engineer**	**Children at Higher Risk from RF Radiation**	**http://www.emrpolicy.org/litigation/case_law/care/martin.ppt http://www.emrpolicy.org/litigation/case_law/care/martin_29jun99.pdf http://www.emrpolicy.org/litigation/case_law/care/martin_03.pdf**

				2003 R 11863-5

In the middle of the night in the last minutes of the 107th session, Congress voted in a "hot-lined" bill that took away her zoning rights on Lookout Mountain. This supertower is now broadcasting radiation into her home at levels that these experts testified was unsafe.

Ms. Carney has been a study subject in research on 300 residents in her community on the health effects of the Lookout Mountain broadcast antennas funded by the National Institute of Health. Several findings of significance are that as the amounts of electromagnetic radiation increase, the amounts of the subjects' white blood cells (T-Cells) increase as do estrogen levels in post-menopausal women, even at levels 100 times under the FCC limits for broadcast radiation. Homes with wireless internet had elevated RF levels inside.

> **"Radio frequency nonionizing radiation in a community exposed to radio and television broadcasting."** Burch JB, Clark M, Yost MG, Fitzpatrick CT, Bach and AM, Ramaprasad J, Reif JS. *Environ Health Perspect*. 2006 Feb;114(2):248-53..
>
> **"Biomonitoring of Estrogen and Melatonin Metabolites Among Women Residing Near Radio and Television Broadcasting Transmitters."** Clark M:*L Journal of Occupational & Environmental Medicine.* 2007 Oct: 1149-1156**.**
>
> **"Human Responses to Residential RF Exposure"** Reif, J.S., Burch, James, *et al* 2 *ROI* ES0008117-04 2005 Aug. "Human Responses to Residential RF Exposure." John S. Reif, James B. Burch, Michael Yost Annette Bach and, Maggie Clark. August 23, 2005

Ms. Carney met with the EPA and asked the EPA officials why the EPA is not taking action to protect human health and investigated why the EPA shut down its office of Nonionizing Radiation. The Broadcast industry's members pushed hard for the elimination of this office. The EPA's funding for non-ionizing radiation has been virtually eliminated. The EPA will not act unless the FCC specifically requests the EPA opinion on the safety of non-ionizing radiation. The FCC refuses to request that the EPA evaluate RF safety.

Ms. Carney has represented her community of 9,000 residents through CARE (Canyon Area Residents for the Environment www.c-a-r-e.org) in lawsuits, petitions and meetings with the FCC opposing further licensing and permitting of high-powered antennas in her community for over 10 years. Her extensive first hand experience with the FCC has led her to conclude that the FCC knows little and cares nothing about human health or biology. The FCC seldom monitors the amount of RF being generated, and acts only to promote the expansion of RF technology, and is strongly biased

towards industry desires. "Hear no evil, See no evil, Speak no evil" aptly describes the FCC consideration of the health impact of RF on any living creature, and the FCC's failure to inquire into this area. Her community's petitions to the FCC to stop licensing high-powered antennas, for relief from blanketing interference and against Federal preemption of local zoning were ignored. The FCC did, however, launch a strike force against her community's efforts opposing high-powered digital TV antennas with "Operation Buffalo Chips" where the FCC worked behind the scenes with the broadcasters to conceal from the community all the violations of Federal laws.

After learning how careless the FCC has been about the health impacts of high-powered RF, Ms. Carney has become increasingly alarmed about the expansion of wireless technologies using more and more frequencies and power, heedless of long-term health impacts because no Federal agency is acting to protect human health. She is concerned that she may be becoming electro-hypersensitive. At the current build out, there may soon be no place for the electro-hypersensitive to live away from wireless RF. She has installed shielding in her home and avoids using wireless technology whenever possible.

Ms. Carney has presented the concerns of her community at two Congressional Staff Briefings and the Presidents' Cancer Panel. Her presentation from the May 2007 Congressional Staff Meeting was submitted to the National Academies of Science Committee on Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communications Devices. The DVD of her briefing presentation was both shown and placed into the record of the August 2007 Washington DC NAS Workshop on this proceeding. **Exhibit 9**

Nicols Fox, a journalist with publications in *The Economist*, *The Washington Post* and *The New York Times*, sets forth such a moving account of her suffering that it should be read verbatim. Her severe electro-hypersensitivity began as a sunburn-like rash on one side of her body then progressed to tingling, shooting pains, burning and fatigue. The growing RF from WiFi forced her to move from Maine to West Virginia. Monitors have confirmed that WiFi causes her heartbeat to slow to 38 beats per minute and she has attached research that correlates this symptom. Her health, career and finances are ruined.

> I do not know when the land I have bought will be "invaded" by cell towers or wireless. …The future looks grim and as frightening as any I could imagine. I am a refugee running from an invisible enemy that could attack at any moment.

As RF has increased, Ms. Fox's world, her social life, her hopes have shrunk. She now lives without TV, radio and most electric conveniences. "I should not have to face pain, discomfort, and health effects that could be life threatening while doing ordinary activities because FCC's current exposure guidelines are inadequate in light of the findings of current science." **Exhibit 10**

Catherine and Daniel Kleiber discovered that they were exposed on their Wisconsin farm to "dirty" power on their wires and plumbing that led to Catherine developing radiowave sickness with heart palpitations, pain, sluggishness, poor depth perception, muscle weakness, lactic acid buildup, poor sleep, fatigue, night sweats, poor circulation in extremities, reflux, difficulty thinking and concentrating, inability to make decisions, low-grade fever and chills, headaches and sore throat. They remedied the dirty power but when she goes to town or other places and is exposed, she gets sick again. Daniel discovered that RF dramatically adversely affected the control of his Type 1 diabetes by elevating his sugar levels while blocking the effectiveness of insulin. When he goes into stores his blood sugar often goes up. He gets headaches and nausea.

> I am concerned that expansion of wireless broadband would endanger my health by making my blood sugar harder to control. P 5…….

Both of the Kleibers' young children become poor sleepers, sick, hyperactive, less able to think logically and control their behavior in the presence of high frequencies. The parents are home schooling their children due to the WiFi and high RF levels at the school. Numerous scientific articles documenting adverse health effects of humans and insects are attached to their affidavits. Catherine makes much additional research on RF health affects available on the website www.electicalpolluton.com which she maintains. **Exhibits 11 and 12**

Evelyn Savarin developed disturbed sleep and rapid heartbeat that lessened when she moved away from high RF environments.

> The growth of radio/microwave radiation in our ambient environment has increasingly marginalized my life, both in the type of working environments I can handle and the places I can live that allow me to sleep and focus well. When I find a living situation that works well for me, the continued build out of antennas and personal wireless devices resurrects the severity of my symptoms. I then must find another place to live, or a way to shield my environment….My living options have become so few and very expensive. **Exhibit 13-A ¶¶** 5, 6.

When Ms. Savarin moved into a basement apartment that she thought had low RF, she developed sleep problems and learned that the landlord upstairs had DECT phones and a baby monitors. The landlord was unaware that these devices emitted RF. When these devices were turned off not only did she sleep better, but as the affidavit of the landlord, Alex Gherzi, affirms, once he turned those devices off, his youngest son began sleeping through the night. He is worried that he unknowingly exposed them to RF that hurt them. **Exhibit 13-B**

Ronald Hurston MD, decries the siting of cell towers near his home, schools, and conservation land he donated money to purchase.

> …numerous small studies done in many different locations suggest and even report an association between chronic exposure to such radiation and significant adverse consequences to human health.
>
> …it was and remains an imprudent decision to expose the general population including children and seniors, to such a risk. It invites potentially tragic public health consequences in the future.
>
> I find the decisions to place these towers in close proximity to areas where people spend long periods of time (such as residential, neighborhood, and industrial areas) to be an outrage. The short-range financial goals of large corporations have once again taken priority over the well being of the general public, and it will be the general public who will have to bear the personal consequences and foot the financial expenses years later of such irresponsible corporate and public planning.

The additional presence of wireless transmission for internet purposes will further increase the population's exposure. **Exhibit 14**

Dr. Hurston's neighbor, Margaret Patton, a two-time cancer survivor from Wayland, Massachusetts, has struggled to protect herself from the invasion of wireless radiation. She details her community's and local government's fruitless efforts to try to protect residents from wireless radiation. When she sued to try to prevent this radiation, AT& T demanded monetary sanctions against her.

> The carriers are unable to demonstrate that the radio frequencies they produce are safe for human health and hid behind woefully inadequate and obsolete FCC "safety" standards as their warrant for inflicting uninvited harm in residential areas. Right now a fifth carrier is building antennas on the tower regardless of a lawsuit in Concord District Court by neighbors and concerned citizens.
>
> I was in the court room in New York City and heard at least two of the three United States Court of Appeals judges for the Second Circuit ask the FCC lawyers if they had looked at any biological research before the FCC released the wireless licenses. The answer was "No Sir" each time.
>
> As the wireless build-out increases daily, none of us are safe in our homes. We effectively have no rights as homeowners to protect ourselves from invasive pulse-digital microwave radiation from close-by microwave antennas.

The legal system is failing to protect Ms. Patton's rights. Many judges hold stock in telecom companies, the companies use the FCC "safety" standards as a shield, the FCC waves the sword that it has preempted the field and both the FCC and industry assert that no one has standing to challenge the siting of antennas. Margaret Patton now suffers sleepless nights from a cell phone antenna close to her home. **Exhibit 15** Her neighbor, Judith Ide, who now lives 300 feet from a cell tower, also expresses these concerns. **Exhibit 16**

Linda Lettieri, a kidney cancer survivor, resigned after 15 years of work as a computer programmer because of construction of a cell tower near her job in Pleasantville, New York, rather than risk being further radiated. It would be unbearable to her if there were widespread construction of wireless networks increased RF in her home. **Exhibit 17**

Beverly Pape from Dallas has breast cancer and has developed electrohypersensitivity. Telephone calls cause her blood pressure to spike. Exposure clouds her thinking, causes headaches and general malaise. She calls on the United States Government to "withhold permission for moving forward with present plans to increase low-intensity RF/radiation with the installation of WiMax and other such systems." She considers this radiation an immune system stressor, a hazard that no one can afford. **Exhibit 18**

Valetta Kayda survived the removal of a brain tumor three decades ago. She sustained WiFi exposure for years while worked at a school. She developed another brain tumor and then became severely electro-hypersensitive after surgery using gamma knife radiation to remove her second brain tumor and then has been driven from one home and then another as cell phone towers were installed nearby and neighbors began using WiFi. The diary of her debilitating injuries from the RF was compiled with the help of her child, who also comments on her mother's decline. **Exhibit 19** Her electro-hypersensitivity profoundly impacts her elderly parents and her children.

> I have grave concerns for my own safety and for the safety of others exposed to the electromagnetic radiation in the environment. I do not wish for anyone else to have their life turned upside down like mine has been. I also fear that I may not survive the changes that are proposed for providing high-speed internet service throughout the country.
>
> I feel I have already lost my health, my apartment, my home and my job. If this national wireless system goes through will I lose my country too? I fear I will. I also fear it will go worldwide and then I will have no escape.
>
> I think as a citizen of the United States I should have the right to choose whether or not I live, work and play in WiFi environments. I should not have them forced on me unvoluntarily, against my will.

Katie Singer, an author on reproductive health, is alarmed that 25% of the women of childbearing age who take her classes do not ovulate. She believes the increasing elevations in EMFs and microwaves are environmental toxins disrupting reproduction.

> The human body has no defense against microwaves. Installing a national broadband system jeopardizes everyone's health and that of the next generation.
>
> I urge the FCC to value human health above convenience.

Ms. Singer has become electrosensitive to the point that her vision is impaired and her ears ring. Her students report that since installing WiFi, they have developed insomnia and debilitating PMS to the point that they cannot work. **Exhibit 20**

Jo-Tina DiGennaro was surprised to discover that cell phone antennas had been installed on the water tower a block from her home in Bayville, New York. She chronicles residents' futile attempts to stop the proliferation of antennas, her concern for her child, the financial stress and the outbreak of prostrate cancer in men near the tower, including her husband. An abnormally-high level of children nearby have developed leukemia and brain cancer. Her son is in remission. "We should not have to wait for the body count, or cause needless illness and suffering… Who is being protected here - the Telecommunications Industry or the general population affected by this infrastructure?" **Exhibit 21**

Madeline Perrin, also from Bayville, New York, has two very young daughters in elementary school 50 feet from the water tower with cell 52 antennas. She is very concerned for their health but has been unable to enroll her daughters in other schools away from the radiation of these antennas. **Exhibit 22**

Marian and James Rollans live in Mt. Ulla, North Carolina. Only one tower was visible when Marian and James Rollans moved to their farm 39 years ago. Now there are 7 towers. Headaches, eye aches and a piercing sensation going into her ears are symptoms of her electrohypersensitivity. They have been fighting the addition of more RF in their area by cell towers and digital TV for years.

> The amount of power these telecommunication companies have over individual's' health, safety, and welfare is appalling. If another tower goes in within ¾ mile from my house I suppose I will have to move because of my sensitivity to EMR radiation. Where do an individual's rights fit into the picture?
>
> Our family, in concert with our community, has spent money and hundreds of hours of study and preparation to oppose the permitting of a large radio broadcast tower on property that joins our farm. …it is safe to say that the issue has consumed our lives for the past six years.
>
> With the increased number of signals in the airways across the spectrum of cell phones, radio waves, broadband TV, etc., how are we the public to know that safe levels of EMR have not been exceeded?
>
> Without monitoring of the accumulative effects of EMR emissions, we the American public are at the mercy of a giant telecommunications industry with their powerful lobbying groups.

> …we are very concerned that the monitoring of existing and cumulative EMR levels be established, funded and carried out on a continuing schedule by a division that is independent from the division that has the authority to permit.
>
> …we want the assurance that demand for expanded wireless services will not receive precedence over the public necessity to feel and be safe from the dangers of this unseen health threat. **Exhibit 23**

Betsy Webster, neighbor of Marian and James Rollans, has been fighting the ever-increasing number of broadcast antennas and towers by her home on Mount Ulla, North Carolina, because she is concerned about the health effects of long-term continuous exposure to one or many signals. **Exhibit 24**

Ruth Davis details similar injuries from RF.

> I am extremely hypersensitive to all Electro-Magnetic Fields. Being around any source of EMF causes me **severe disruption of sleep function, headaches, body pains, short-term memory loss, arthritic flare-ups, 'brain fog', loss of the ability to concentrate,** and more.
>
> Due to this sensitivity, I have lost home, job, life savings, family and friends, and must, in order to survive, live in very remote locations, with no electricity, free from all sources of electro-magnetic radiation...including that from cell phone towers. I do this on both public and private lands, seeking out safe havens where I can live in relative health and free of pain. **Exhibit 25** (notarized signature to follow)

Katherine Hinson noticed that when her family moved away from cell phone towers in Atlanta, Georgia, their health improved dramatically. When they travel to areas with heavy cell phone coverage, their health deteriorates and the symptoms are difficult to treat. Her 13- and 15 year-old sons are so electrohypersensitive that they now suffer severe nervous system derangement from even computer or television proximity. These symptoms get worse when they visit buildings with WiFi, such as the library. **Exhibit 26**

Kristin Russo, her husband and three children moved from Stoneham, Massachusetts because of the proliferation of antennas. Though they searched for a “safe” place, they are now finding cell phone antennas installed on the water tower by their children’s schools. She is not comfortable with the level of RF her family is currently experiencing and very concerned about an increase. She has watched communities struggle to protect themselves to no avail. **Exhibit 27**

> I am troubled by the amount of input the wireless industry was allowed to have in creating the laws that govern its own practices. I am further disillusioned by the fact that the rights of citizens are overshadowed by the financial and business interests of the wireless industry. I urge this committee to learn from the history of prior industries

> (such as tobacco), where public policy took far too long to catch up to the pressures and the powers of big business.

Gayle Clark and her family moved to rural Kansas to avoid the downside of "modernization". Now a cell tower is going up 350 feet from their property line. Her health concerns are amplified by her discovery that insurance companies are refusing to cover damages caused by cell tower "pollution", comparing RF to the next "asbestos" claim run. Cell towers devalue nearby homes by 21%. **Exhibit 28**

Lucy Hackett worked near cell towers and developed fatigue, tingles, heart palpitations, inability to focus, dizziness, headaches, nausea and hearing a high frequency. She cites numerous studies detailing the link between RF and health problems. "The realization of what was happening to my body has caused me a great deal of emotional stress along with the physical." She is unable to work effectively in the Film and Television industry because of the high RF. When Lucy moves away from high RF areas, her symptoms lesson. Her husband, who had lived near cell towers, also developed symptoms. Dr. William Lyden observes that Lucy Hackett has significant symptoms consistent with health effects due to electromagnetic stress which is one of four major areas of stress that contribute to health conditions. (Dr. Lyden has found in his 20 years of practice that 25 % of his patients have EMR stress that affects their health.) **Exhibit 29**

Ruth Danner filed an appeal against the granting of a cell permit in Juneau, Alaska. She was not allowed to argue that the public concern over the emissions should carry any weight even though that was the primary concern of the citizens. The requirement of compliance with FCC limits has no teeth because the applicant refused to provide anything in writing about the radiation.

> The Commission made no attempt to seek ongoing evidence of compliance as the facility ages, equipment is modified, or standards change.
> The assumption seems to be that the Feds have it under control, but very little evidence in life says that the government has ANYTHING entirely under control.

Regulations should err on the side of caution. **Exhibit 30**

Michelle Bubnis is currently 30% impaired from toxic encephalopathy associated with electromagnetic and chemical sensitivity as diagnosed by Board Certified Neurologist, Johnathan Walker, M.D. (**Exhibit 31 at C**). She suffers headaches and burning sensations when near devices emitting electromagnetic radiation such as the cell towers near her home. These sensations are painful enough that Ms. Bubnis cannot use two rooms and a bathroom in her home due to her neighbor's WiFi, has ceased walking the trail near her home by the tower and attending her church with an antenna located above. She describes in detail the numerous steps she has been forced to take in order to

function that have completely changed her lifestyle. The economic costs of the medical bills and impairment in the ability to work are substantial. She concludes that her health has been severely compromised because the lax FCC standards failed to protect her from existing levels and fears for her future with the deployment of more RF. "Austin, Texas is canopied in electro-smog. There is no "safe" place for me." **Exhibit 31**

Corina Zack fears the impact the approval of a cellular antenna in the church across the street will have on her family in Arlington Heights, Illinois. Like so many others she states, "We have a right to be safe in our homes and our schools and workplaces, and we have a right to proper safety standards based on current science." **Exhibit 32**

Sarah Reilly has experienced very painful burning all over her body for the last five years in response to wireless technology. She moved to Las Vegas in 2002. When a cell tower was placed near her bedroom window she not only experienced the burning, but also heart palpitations and blood pressure drops. Wireless internet caused "fireworks all over my body." By 2005, she fled to an isolated part of Northern California for 2.5 years to recover from her electrohypersensitivity symptoms caused by this radiation. She now avoids libraries, malls, wireless cafes and areas with cell towers. **Exhibit 33**

> The burning in my body, the weakness and severe headaches in response to those technologies limits my accessibility to public areas, especially as society becomes more saturated with wireless and cell towers/antennas.

Two thousand studies document that these frequencies are harmful to biological systems. Ms. Reilly has lost her career, her livelihood, and her savings. She and her parents are very concerned for her future.

Maria Frumberg had to drop her wireless TV because it caused her atrial fibrillation and muscle pain. She is worried because the city of Plano, Texas has admitted to her that wireless will increase. **Exhibit 34**

Kimberly Ordagne, also of Plano, Texas, is very concerned about the proposed expansion of wireless broadband. Going into her dwelling now that a wireless antenna was recently installed nearby or businesses with WiFi triggers headaches, nausea and dizziness. Her freedom to be "out and about" has been limited by these antennas. When she told the City of Plano her problems, the Deputy City Manager confirmed that they detected no less than 12 WiFi devices emitting signals in her neighborhood in the "unlicensed 2.4 GHz frequency" but there was nothing they could do about them. William Rea, M.D. wrote:

> Kimberly Ordogne, who is currently living at Marcia Frumberg's house, is unable to tolerate watching television with wireless reception technology as provided by your company. She suffers from Electromagnetic Frequency Sensitivity as a result from environmental illness. Watching television with wireless technology gives her painful headaches, where as she is able to tolerate satellite reception through a cable. **Exhibit 35**

Elizabeth Feudal developed electromagnetic sensitivities following radiation by several nearby cell towers in Allentown, Pennsylvania. She believes the new WiMax technology will kill her. **Exhibit 36**

> When exposed to signals emanating from the various wireless systems that we encounter on a daily basis, my symptoms can be mild to life-threatening including, but not limited to the following: heart palpitations, difficulty breathing, vertigo, severe migraine, stomach distress, fainting and seizure and I know without a doubt that the inability to escape these signals as in the proposed blanketing of cities and towns with the new WiMax technology will result in an immediate worsening of my already compromised health and ultimately result in my death.

Her home is the only safe haven where she can protect herself, but even that will disappear.

Veronica Olson and Howard Hillman, also of Plano, Texas, express their concern about the effect of the continuous radiation emissions comin from the newly-activated citywide WiFi in Plano on the children and the immuno-comprised individuals in their community. This exposure is without consent. "I must seriously consider selling my home and locating to a safer region," says Mr. Hillman. **Exhibit 37 Exhibit 38**

Angela Flynn details how her exposures to RF at work, school and her home resulted in her inability to sleep more than four hours a night; memory loss and an inability to spell common words; a whole-body muscle ache; creaky joints; irritability and inability to tolerate proximity to WiFi, DECT and cell phones, all at levels well below the FCC "safety" standard. When she left her home and moved to another location, she was able to sleep and most of her symptoms eased. She cites studies documenting harm from radiation the FCC asserts is safe. She feels that her ability to work, live and feel safe have been greatly infringed upon. "I do not consent to the government-sanctioned rollout of new technologies with insufficient safety standards and the apparent lack of knowledge of the current science on this matter." **Exhibit 39**

Kyrie Lizik struggles with existing EMF in Wisconsin and urges that broadband not expose citizens to more radiofrequency.

> I am electrosensitive, and had a terrible time trying to live with the imposed Smart Meter which has been placed on my home by the power company. I have headaches,

> dizziness, and other unpleasant sensations in certain electro-magnetic fields, and cannot attend the public library in town because of the wireless signal in there.

She is very concerned that nationwide broadband will expose her to more radiation. **Exhibit 40**

Elizabeth Barris became electrohypersensitive following an MRI and now experiences painful reactions in highly charged areas such as portions of airports and the local shopping area.

> It is physically offensive and makes me angry that people can't even go to court if their child gets leukemia from being exposed to WiFi in school all day because it is all within the FCC's regulations who ultimately relied upon industry to tell them what the safe levels of radiation were, not to mention their regulation are based on heating, an obsolete theory when it comes to health effects and non-ionizing radiation. It is disgraceful and shameful.

She concludes that people will be angry when they realize that this technology has hurt them. "…some of them will also unfortunately be sick." **Exhibit 41**

JeanMarie Avola is very concerned about the inadequacy of the FCC standards, the violations of the rights of the citizens by the wireless industry and the exposure of her children at school. She has studied the literature and concluded that this technology is dangerous, industry has used its power to halt research in the U.S and that the U.S. is far behind other countries in protecting its citizens. She does not allow her children to use cell phones. **Exhibit 42**

Elizabeth A. Kelley, her husband and son have lived in Tucson, Arizona for 6 years in a planned urban ecological community development of twenty-eight two-story town homes that are in a cluster arrangement in groups of two, three and four. She maintains a low or non-toxic home as much as possible and this includes low-emf design, appliances and personal habits; - no cordless phones; very limited cell phone use; filters on the electrical outlets to filter out high frequencies on the electrical wiring, incandescent lighting, no Wi-Fi systems, etc., because of her knowledge and experience on the hazards of this form of radiation.

> I am a member of the Bioelectromagnetics Society - www.bioelectromagnetics.org and attend their meetings whenever possible. I review scientific papers and reviews regularly and have coauthored two papers that will be published in an upcoming ICEMs publication. One of those papers is on national and international EMF human exposure standards. I am especially concerned for the health of children, for seniors and for those with disabilities, including electrical hypersensitivity as the proliferation of wireless technologies makes it increasingly difficult to navigate in cities and towns across the US on a daily basis without moving though the radiation patterns created by wireless transmitters of all kinds, including second hand cell phone radiation, from others while they are using wireless devices at sports events, concerts, in stores, classrooms and workplaces.

> I have studied the scientific research and other evidence conducted over the past five decades on electromagnetic fields and health. I recognize that there are potential health risks associated with human exposure to electromagnetic fields and that the human body and all living matter in fact can be bioactivated by these frequencies and power levels. I have been responsible for the content management of the International Commission for Electromagnetic Safety website - www.icems.eu and was one of the authors of the Benevento and Venice Resolutions. I have read the *Biolnitiative Repor*t - www.bioinitiative.org.

Despite her precautions, Ms. Kelley detected wireless digital signals in the microwave band coming from at least 22 individual WiFi networks located in our neighbor's homes and we found that the signal coverage of each WiFi network extended several hundred feet, over many neighboring homes, throughout the outdoor common areas, like pathways and community gathering nodes and inside the community house. She identified the strongest signal entering our home in January to be coming through the common walls we shared with our closest neighbor. The microwave signals were transmitting at the highest power level through our home - all five bars were on constantly. Her husband, son and Libby were independently having trouble sleeping, some memory and concentration problems. Once she convinced her neighbor to remove the WiFi system, the symptoms left. Concerns remain.

> Our son attends a wireless school all day where he is exposed to WiFi in the classroom, cell towers on or right adjacent to the school property. Licensed carriers include a T-Mobile West Corporation tower and Verizon Wireless antennas. My son is exposed daily indoors and outdoors to high levels of "second-hand" cell phone signals all day long from his classmates and school personnel as the operation of wireless devices is not closely regulated by the school administration. The students use their cell phones for voice/text messaging constantly and increasingly, they are using the new I-Phones and Blackberry's as they are attracted to the many features they offer. The emissions from the newer "smart" phones are greater as they involve more data transmission.
>
> Because of our concerns, we allow our son to use a cell phone, but his use of it is restricted to limited texting and emergencies only. It is turned off when it not in use and it is kept near the front door at night not in his bedroom. Because of the number of cell service carriers and WiFi networks operating in our area, we know there are many overlapping signals and are concerned that there are insufficient safety standards to manage the exposure of our family to these signals. We have not given our permission to be in the experimental groups for a government-sanctioned study on the long-term health effects of wireless technologies and believe the current human exposure guidelines are inadequate to protect our health.

Ms. Kelley fears the hazards could affect her family's health from this constant low-level radiation over time without strong, protective FCC standards, supported by routine monitoring and enforcement

of such standards, and the creation of safe zones around homes, schools, health care facilities and senior centers. They do not want to live in their home and be electronically trespassed against. These signals are a continuing abatable nuisance. **Exhibit 43**

UNITED STATES FEDERAL GOVERNMENT FAILURE TO PROTECT THE PUBLIC FROM NONIONIZING RADIATION

The FCC guidelines are already 13 years old and grossly inadequate. During the drafting and consideration of the Telecommunications Act (TCA) of 1996 (TCA) the House Committee on Commerce declared that it is the FCC's responsibility under the TCA to adopt "uniform, consistent requirements, with adequate safeguards of the public health and safety," and that these were, and are, to be "established as soon as possible." (H.R. Report No. 104-204, p. 94) (Emphasis added.)

A series of unmet research needs have been identified by Federal agencies and their expert consultants -- including the National Academies of Science (NAS) -- which show that the 1996 FCC regulations do not provide "adequate safeguards of the public health and safety" from RF emissions today. The FCC's persistent failure to initiate independent adequately-funded and well-conducted up-to-date research into non-thermal RF radiation effects perpetuates the lack of enlightened public policy for this ever-increasing public exposure. It is against this backdrop that the FCC is poised to encourage an exponential increase in the public's RF radiation exposure through the policy choices it makes in the Broadband Plan NOI.

Most of the existing limits on this form of radiation, including the FCC's guidelines for human exposure to RF radiation, are 1 to 4 thousand times too lenient to prudently protect humans from adverse health effects ranging from Alzheimer's and other neurodegenerative diseases, reproduction problems, sleep reduction, learning problems, memory deficits, slowed ability of the body to repair damage, interference with immune function, cancer and EHS. The increasing danger to children and the inadequacy of the FCC RF limits for long-term exposure were examined in the Sept. 25, 2008 - *US Congressional hearing - Cell Phone Use and Tumors: What the Science Says* convened by Congressman Dennis Kucinich, Chairman of the Subcommittee on Domestic Policy of the House Committee on Oversight and Government Reform.
http://domesticpolicy.oversight.house.gov/story.asp?ID=2199

FCC's Director of its Office of Engineering and Technology Julius Knapp presented written and oral testimony at the September 2008 Congressional Hearing. When asked by Chairman Kucinich if the FCC's RF safety standards are appropriate to protect children and vulnerable adults and other

cases that were the subject of the hearing, Knapp replied that, "the FCC does not have the expertise to evaluate whether the standard is appropriate." He stated that the FCC exposure standard is a "flat limit" based on RF absorption of an adult male body. He concluded his remarks by stating that the FCC, "completely supports further analysis of this issue."

Failure of FCC Guidelines to Provide "Adequate Safeguards"

The Congressional mandate to the FCC to set and to keep RF safeguard standards current is not a casual comment buried in the TCA's legislative history, but is reiterated for emphasis on page 95 of House Report 104-204:

> The Committee believes the Commission rulemaking on this issue (ET Docket 93-62) should contain adequate, appropriate and necessary levels of protection of the public, and needs to be completed expeditiously.
>
> Plainly this was intended to be a continuing responsibility.

EUROPE ACTS TO PROTECT CITIZENS

On April 2, 2009 the European Parliament passed a resolution (EU Resolution) warning of dangers to children and workers, recognizing "persons that suffer from electrohypersensitivity," and urging the adoption of stricter radiofrequency (RF) radiation exposure standards throughout Europe. http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2009-0216+0+DOC+XML+V0//EN.

Following the April 2, 2009 affirmative vote on the EU Resolution of 559-22 to adopt its report on health concerns associated with electromagnetic fields including wireless infrastructure, the American public is calling for similar action in the United States. The vote of the full Parliament of the European Union raises concerns about the exposure of children and young people to electromagnetic fields and continuing uncertainties about possible health risks. The EU Resolution calls for the establishment of setback criteria for wireless antennas, mobile phone masts and other electromagnetic emitting devices to be set within a specific distance from schools and health institutions; stricter regulations and protections for residents and consumers; and more reliable information be made available about the effects of exposure to electromagnetic fields to citizens in an

effort to prevent a "proliferation of poorly positioned masts and transmitters." American citizens are calling for parallel precautionary actions in the US.

Major Federal Action Warrants Compliance with NEPA

Providing protection for human exposure to potentially unsafe levels of RF radiation as required by the National Environmental Policy Act (NEPA) will not occur if wireless broadband is the preferred infrastructure option for the Broadband Plan. The Broadband Plan is a major federal action as described in Acting FCC Chairman Copps's Broadband Plan statement:

> *This Commission has never, I believe, received a more serious charge than the one to spearhead development of a national broadband plan. Congress has made it crystal clear that it expects the best thinking and recommendations we can put together by next February. If we do our job well, this will be the most formative—indeed transformative—proceeding ever in the Commission's history.* (Emphasis added.)

Wireless broadband deployment throughout the Nation is a major federal action that will permanently and negatively alter the human environment. If wireless infrastructure is the preferred technology resulting for this NOI there will be few places left where people who do not wish to be exposed to this form of radiation or people who cannot physically tolerate this level of RF exposure can live.

Precautionary Actions Have Been Taken in U.S. states and Cities to Challenge the RF Safety Policies Promulgated in the TCA

In 2009 U.S. states and municipalities are voicing their dissatisfaction with current FCC RF radiation safety policy especially as it applies to long-term, chronic RF radiation exposure to children and the disabled. Colorado and Connecticut, Los Angeles County and Los Angeles Unified School District, and the cities of Portland, Oregon; and Boca Raton, Florida are recognizing these impacts on their citizens and calling for awareness. These actions challenge the adequacy of the FCC's public exposure standards based upon new and emerging scientific evidence. These US states and municipalities are calling for revision of Section 704 of the TCA's preemption of consideration of the health and environmental effects of RF radiation at levels below current FCC standards in decisions involving the placement, construction and modification of wireless facilities. They also call explicitly for responsible deployment of fiberoptic broadband technology, citing its superiority to wireless technology in speed, reliability, security, durability and protections it affords people and the environment from the potential hazards of exposure to RF radiation. **Exhibit 44** is a compilation of these recent state and municipal statements and actions.

FCC Must Allow Precautionary Policies for Antenna Siting Until It Can Demonstrate with Affirmative Independent Research the Safety of Living and Working in Close Proximity to RF Radiation Emissions That Are in Compliance with Its Current RF Safety Policy

Children's Health Is a Primary Concern

Risks from wireless devices to children's health are a primary concern of EMRPI. Wireless broadband buildout on the scale contemplated in the Broadband Plan would mean that every infant, toddler and child would experience the increased radiation from the deployment of this technology. Current safety standards have been developed with a model of the "average male" and do not address these characteristics of children's anatomy and physiology:

- The absorption of the electromagnetic radiation (EMR) in a child's head and body is considerably higher than that of an adult.
- A child's brain has higher conductivity, smaller size, thinner skull bones, and a smaller distance from the antennas of wireless devices.
- A child's brain had higher sensitivity to EMR than an adult brain.
- A child's body has higher sensitivity to the accumulation of the adverse effects under conditions of chronic exposure to EMR.
- EMR affects the formation of a child's still-developing process of higher nervous activity.
- A child's cells divide much more rapidly that an adult's so cell damage is more readily replicated.
- A child's immune system in not fully developed.

The Broad Plan Should Favor Wired Infrastructure Because Public Health Is Not Protected from Broadband Radiation by FCC RF Safety Limits

Wireless broadband sends electromagnetic energy throughout an area rather than directly through a shielded wire or cable to the electronic device being used. There is no evidence to show that broadband radiation can meet levels that do not impact human health because compliance with the current FCC RF limits does not protect the public. The FCC RF limits are several thousand times too lenient to protect health from broadband radiation. Based upon the scientific evidence set forth in *The BioInitiative Report* and a large body of additional research, EMRPI finds the existing FCC standards grossly unprotective and recommends that the following limits of electromagnetic radiation should not exceed the following limits: (Areas impacted by broadband are underlined.)

I. Extremely-low frequency (ELF). Power Lines, appliances, interior electric wiring and other ELF-radiating devices

*A. Homes, schools and places where children spend large amounts of time: 1 milligauss *(1mG) for new construction; 1 milligauss (1mG) for all existing occupied space retrofitted*

over time.

B. All other construction: 2 milligauss (2mG)

**A milligauss is a measure of ELF field strength used to describe magnetic fields from appliances, power lines, interior electrical wiring,etc. A milligauss, abbreviated, is mG. Just as the power density of high frequency RF fields can be described in µW/cm2 or the corresponding electrical field in V/m, the parameter most easily measured for ELF is the magnetic field.*

II. Long-term (cumulative) Radiofrequency Radiation(RF)*

*A. Outdoor Pulsed- such as cell phone antennas, radar, TV and FM broadcast antennas, wireless internet antennas: One tenth of a microwatt per centimeter squared or 0.614 volts per meter. * (0.1 µW/cm2 or 0.614 V/m)*

B. Indoor Radiofrequency Radiation (RF) such as cell phones, wireless internet equipment and the radiation that permeates buildings from outdoor sources. One hundredth of a microwatt per centimeter squared or 0.194 volts per meter (0.01 µW/cm2 or 0.194 V/m). Typically, RF power density from higher frequency outdoor sources such as UHF television or cell phone antenna base stations drops by a factor of ten when it permeates buildings. Lower frequency signals such as lower channel VHF TV and FM are not as severely attenuated as the higher frequencies.

Future research may demonstrate that these recommended levels are not protective enough; therefore, U.S federal policy makers should remain open to lowering them as the scientific evidence accumulates.

National Academies of Science (NAS) Finds FCC Safety Standards Deficient

The findings of the January 2008 NAS Report *Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication Devices* (NAS Report) confirm and support the EMRPI position that the FCC's RF Safety Guidelines do not take into account a number of factors needed to protect health: **Exhibit 45** Pages 1-1)of the NAS Report emphasis added): http://www.nap.edu/catalog/12036.html.)

The committee judged that important research needs included, in order of appearance in the text, the following:

- *Characterization of exposure to juveniles, children, pregnant women, and fetuses from personal wireless devices and RF fields from base station antennas.*
- *Characterization of radiated electromagnetic fields for typical multiple-element base station antennas and exposures to affected individuals.*
- *Characterization of the dosimetry of evolving antenna configurations for cell phones and text messaging devices.*
- *Prospective epidemiologic cohort studies of children and pregnant women.*
- *Epidemiologic case-control studies of childhood cancers, including brain cancer.*
- *Prospective epidemiologic cohort studies of adults in a general population and retrospective cohorts with medium to high occupational exposures.*
- *Human laboratory studies that focus on possible adverse effects on electroencephalography activity and that include a sufficient number of subjects.*
- *Investigation of the effect of RF electromagnetic fields on neural networks.*
- *Evaluation of doses occurring on the microscopic level.*
- *Additional experimental research focused on the identification of potential biophysical and biochemical/molecular mechanisms of RF action.*

(Ex 45, p. 2)(Emphasis added.)

* * *

Children

1. *Prospective Cohort Studies of Pregnancy and Childhood. Children are potentially exposed from conception through maternal wireless device use and then postnatally when they themselves become users of mobile phones.*
2. *Case-control Study of Children Mobile Phone Users and Brain Cancer. Owing to widespread use of mobile phones among children and adolescents and the possibility of relatively high exposures to the brain, investigation of the potential effects of RF fields in the development of childhood brain tumors is warranted.*

(Ex.45 p.2)(Emphasis added.)

* * *

The body of the full NAS Report (included herein by reference) identifies the following issues as not being covered by existing research and therefore are not addressed in current RF safety policy:

- *Are there differences in health effects of short-term vs. long-term exposure?*
- *Are there differences between local vs. whole-body exposures?*
- *Can the knowledge of biological effects from current signal types and exposure patterns be extrapolated to emerging exposure scenarios?*
- *Are there any biological effects that are not caused by an increase in tissue temperature (nonthermal effects)?*
- *Does RF exposure alter (synergize, antagonize, or potentiate) the biological effects of other chemical or physical agents?*
- *Are there differences in risk to children?*

- *Are there differences in risk to other subpopulations such as the elderly and individuals with underlying disease states?*

(Ex. 45, pp. 11-12.)(Emphasis added.)

* * *

Laboratory Exposure Systems

Most of the present-day exposure systems used in laboratory studies focus on the exposure of the head. Though exposures to the head are relevant for most cell phone exposures, whole-body exposures due to base stations are a research need. The laboratory exposure systems also need to include ELF and pertinent modulation protocols.

(Ex.45, p. 17.) (Emphasis added.)

The NAS performs an unparalleled public service by bringing together committees of experts in all areas of scientific and technological endeavor. These experts serve *pro bono* to address critical national issues and give advice to the federal government and the public. Since its creation in 1863, the nation's leaders have often turned to the NAS for advice on the scientific and technological issues that frequently pervade policy decisions. See: www.nationalacademies.org/about/history.html

FDA Nominated Wireless RF for Toxicological Studies

The FDA nominated RF radiation emissions of wireless communication devices to the National Toxicology Program (NTP) for Toxicological Studies ten years ago because of "widespread consumer and worker exposure" and because "the available data is inadequate to properly assess safety." FDA explains its nomination entitled: "Radiofrequency Radiation Emissions of Wireless Communication Devices," (**Exhibit 46**) with the following statements:

Executive Summary

Over 80 million Americans currently use wireless communications devices (e.g., cellular phones) with about 25 thousand news users daily. This translates into a potentially significant public health problem should the use of these devices even slightly increase the risk of adverse health effects. Currently cellular phones and other wireless communication devices are required to meet the radiofrequency radiation (RFR) exposure guidelines of the Federal Communications Commission (FCC), which were most recently revised in August 1996. The existing exposure guidelines are based on protection from acute injury from thermal effects of RFR exposure, and may not be protective against any non-thermal effects of chronic exposure. Animal exposure research reported in the literature suggests that low level exposures may increase the risk of cancer by mechanisms yet to be elucidated, but the data is conflicting and most of this research was not conducted with actual cellular phone radiation . . . There is currently insufficient scientific basis for concluding either that wireless communication technologies are safe or that they pose a risk to millions of users. A significant research effort,

involving large well-planned animal experiments is needed to provide the basis to assess the risk to human health of wireless communications devices.

(Ex. 46 , p. 1) (Emphasis added.)

* * *

B. Physical Properties of Wireless Radiation

. . . Thermal effects are well established and form the biological basis for restricting exposure to RF fields. In contrast, non-thermal effects are not well established and, currently, do not form a scientifically acceptable basis for restricting human exposure to microwave radiation at those frequencies used by hand-held cellular telephones . . . It is not scientifically possible to guarantee those non-thermal levels of microwave radiation, which do not cause deleterious effects for relatively short exposure, will not cause long-term adverse health effects.

(Ex.46, p. 2) (Emphasis added.)

D. Regulatory Status

. . . Currently cellular phones and other wireless communication devices are required to meet the RFR exposure guidelines of the Federal Communications Commission (FCC), which were most recently revised in August 1996. . the FCC is not a health agency. These exposure guidelines . .. are subject to continuing review and revision as new scientific information which could define a better basis for such exposure guidelines becomes available. As noted above, the existing exposure guidelines are based entirely on protection from acute injury from thermal effects of RF exposure, and may not be protective against any non-thermal effects of chronic exposures.

(Ex. 46, p. 4) *(*Emphasis added.)

*** * ***

National Toxicology Program (NTP) Fact Sheet

The NTP Fact Sheet describing the FDA nominated RF radiation study entitled: "Studies on Radiofrequency Radiation Emitted by Cellular Phones - Year 2005" (**Exhibit 47**) makes the following statements about the research upon which the current FCC Radiofrequency Radiation exposure guidelines is based:

. . . The existing exposure guidelines are based on protection from acute injury from thermal effects of RFR exposure. Current data are insufficient to draw definitive conclusions concerning the adequacy of these guidelines to be protective against any non-thermal effects of chronic exposures.

What is the NTP Doing?

The Food and Drug Administration (FDA) nominated RFR emissions of wireless communication devices to the [NTP] *for toxicology and carcinogenicity testing. The NTP has carefully evaluated the efforts underway and concluded that while they have an excellent probability of producing high quality results, additional studies may be warranted to more clearly define any potential hazards to the U.S. population.*

(Ex. 47, p1) (Emphasis added.)

*** * ***

Recommendations of The BioInitiative Report

The August 2007 *BioInitiative Report* sets forth significant recent scientific evidence that public health is not protected by the "RF Safety" Guidelines relied upon by the FCC. The complete report is hereto incorporated by reference as **Exhibit 48** and is found at www.bioinitiative.org .

In July 2008, the peer-reviewed journal *Reviews in Environmental Health* published a synopsis of *The BioInitiative Repor*t authored by its coeditors David O. Carpenter MD, and Cindy Sage MA entitled, "Setting Prudent Public Health Policy for Electromagnetic Field Exposures," and is incorporated hereto it its entirety by reference as **Exhibit 49**. Pages 1 and 110-112 are attached hereto as **Exhibit 50** and are the passage in which the authors identify why the approach to protecting public health demonstrated by FCC and other regulatory agencies lags behind current scientific evidence (emphasis added):

> *The basis on which most standard setting agencies justify their failure to set new safety limits for ELF and RF is nearly always that no certain proof of harm from exposure and no known mechanism of action have been presented. A demand for a causal level of evidence and scientific certainty is implicit in nearly all discussion on what are the appropriate safely standards for ELF and RF. This demand, however, runs counter to both the existing scientific evidence and good public health practice.*
>
> *Two obvious factors work against governments taking action to set exposure guidelines based on current scientific evidence of risk:*
>
> - *Contemporary societies are very dependent upon electricity usage and RF communications, and anything that restricts current and future usage potentially has serious economic consequences.*
> - *Power and communications industries have enormous political clout, and even provide support for a significant fraction of the research done on EMF.*
>
> *This state of affairs results in legislation that protects the status quo and scientific publications whose conclusions are not always based only on the observations of the research. This situation also hinders wise public health policy actions and the implementation of prevention strategies because of the huge financial investments already made in these technologies. Huss et al. /120/ analyzed 59 studies of the health effects of cell phone use and found that studies funded exclusively by industry were least likely to report a statistically significant result . . .*

. . . Uncertainty about how low such standards might have to go to be prudent from a public health standpoint should not prevent reasonable efforts to respond to the information at hand. No lower limits for bio-effects and adverse health effects from RF have been established, and no assertion of safety at any level of wireless exposure (chronic exposure) can be made at this time. A major concern is the exposure of children. We strongly recommend that wired alternatives to WI-FI be implemented particularly in schools and libraries so that children will not be subjected to elevated RF levels until more is understood about possible health impacts.

The Bioinitiative Report /121/ presents a much more extensive and exhaustive discussion of the literature on health effects of both ELF and RF EMF than can be presented here. The Report contains a recommendation of an RF standard of 0.1 µW/cm^2, but with the full knowledge that hazards may be associated with even lower exposures.

The evidence for hazards to human health from both ELF and RF EMF is sufficiently strong as to merit immediate steps to reduce exposure. Such a reduction can best be achieved by setting exposure goals that are lower than levels known to be associated with disease, even while understanding that these exposure goals are significantly lower than many current exposures. A reasonable approach would be a 1 mG (0.1 µT) planning limit for structures adjacent to all new or upgraded power lines, and for occupied space that affects sensitive receptors (homes, schools, day-care, pre-school, etc.), and targets not to exceed 2 mG (0.2 µT) for all other occupied new construction. Although reconstructing all existing electrical distributions systems is not realistic, steps to reduce exposure from these existing systems should be encouraged. For RF EMF, setting a level with certainty is difficult. A precautionary action level would reasonably be 0.1 µW/cm2.

The proposals presented here reflect the evidence that a positive assertion of safety cannot be made with respect to chronic exposure to low-intensity levels of ELF and RF radiation.

(Ex. 48pp.110-112) (Emphasis added.)

Study Conducted at the Request of Germany's Federal Agency for Radiation Protection

Wolfram König, President of Germany's Bundesamt für Strahlenschutz, put out a call to all doctors of medicine to collaborate actively in the assessment of the risk posed by the radiofrequency radiation employed in mobile phone transmissions. The study entitled, "The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer," by authors Horst Eger, Klaus Uwe Hagen, Birgitt Lucas, Peter Vogel, and Helmut Voit was published in *Umwelt·Medizin·Gesellschaft* 17,4 2004, in response to this call. **Exhibit 51** In it these practicing physicians evaluated the personal data of almost 1,000 patients. The aim of the study was to examine whether people living close to mobile phone transmitter antennas were exposed to a heightened risk of taking ill with malignant tumors:

The result of the study shows that the proportion of newly developing cancer cases was

significantly higher among those patients who had lived during the past ten years at a distance of up to 400 metres from the cellular transmitter site, which has been in operation since 1993, compared to those patients living further away, and that the patients fell ill on average 8 years earlier.

In the years 1999-2004, i.e., after five years' operation of the transmitting installation, the relative risk of getting cancer had trebled for the residents of the area in the proximity of the installation compared to the inhabitants of Naila [village studied] *outside the area.*

Ex. 50 (p.1)(Emphasis added.)

School Buffer Zones

The Broadband Plan NOI seeks comment on how broadband can contribute to improving American libraries, schools and education system. Such statements are found at (emphasis added):

> p. 32 ¶ 88 The Recovery Act directs the Commission to include in its national broadband plan "a plan for use of broadband infrastructure and services in advancing education." We seek comment on how to interpret and implement this portion of the Act.
>
> p. 32 ¶ 89 It has been said that education is the key to our future economic success. What role can broadband play in boosting the quality of American schools? Can the availability of broadband be used to encourage more technology partnerships between schools and businesses? In what ways does broadband access allow children and adults with disabilities to participate more fully in schools and other educational activities? What is the role of this country's libraries in marshalling broadband access to advance education?
>
> p. 32 ¶ 91 In recent years, broadband access has allowed schools, parents, teachers, and students to communicate and share valuable information online. How many parents, teachers, and students are missing out on these benefits because of a lack of computers, computer literacy, or access to broadband? What other barriers are there to bringing the benefits of broadband into the classroom, and what can be done about them?

Throughout America school communities have debated whether school grounds should be kept free of antenna sites despite the promise of income from renting such sites to wireless providers. The same debate has taken place when the choice is between wireless internet networks for computer labs that are cheaper and faster to install, and hard-wired alternatives that cost more, are less flexible, but assure that vulnerable students and staff will not spend their school careers chronically exposed to RF radiation. Full, meaningful discussion of the potential for adverse health impacts has been thwarted by the TCA's preemption of local authority to base such decisions on the "environmental effects" of RF emissions "to the extent that" the emissions comply with FCC RF safety limits.

Parents and school personnel are aware of studies and statements published by scientists of international stature that warn of the potential health consequences for many students and staff if

wireless technologies are deployed in their workplaces. **Exhibit 52** is a compilation of several of these statements and studies.

One such statement is, "Electromagnetic Fields and the Public: EMF Standards and Estimation of Risk" presented in London in 2007 at an international forum by Prof. Yuri Grigoriev, Chairman of the Russian National Committee on Non-Ionizing Radiation Protection and EMF RF Standards. Grigoriev gives specific emphasis to RF exposure to "the next generation." Ex.51 (emphasis added):

> *1. The present scientific thinking and basis used in many instances for developing suitable RF-EMF standards does not correspond realistically to modern conditions of RF-EMF exposure as experienced by members of the public (both through generalised exposures and through direct use of mobile communication systems).*
> *2. From what we now know existing safety standards (both foreign and Russian) have become outdated. Modern accumulative RF-EMF exposures have also increased considerably from that found in the past, thereby increasing likely risk.*
> 1. *The existing standards cannot guarantee the safe, healthy development of the next generation.*
>
> **It is necessary:**
> *1. To accumulate suitable knowledge for preparing proper precautionary standards based on the best available scientific evidence. To carry out appropriate research, for example, to study the possible effects of repeated RF-EMF exposures from mobile phone use over periods of several years on the brains of child, teenage and adult users from the age of seven onwards.*
> *2. To develop and undertake new long-term standardization measures, including measures related directly to suitable exposure levels for children. To put forward more rigid requirements for industries using technologies operating over such frequency ranges.*
> 2. To actively introduce the precautionary principle. The thesis held by some that the present forms of mobile communication are absolutely safe is both premature and potentially dangerous. It is necessary to educate scientists, politicians, industries and the general public, including parents and children, that mobile communication devices are not toys, and should be used carefully in a responsible manner.

Why did Congress choose to add the statutory phrase "to the extent that" in defining the preemptive effect of FCC safety standards under Section 332(c)(7)(B)(iv of the TCA)? The answer is found in House Report No. 104-204, in the discussion in Section 107 at page 94 on "Facilities Siting."

What the House Report says is this:

> *The siting of facilities cannot be denied on the basis of Radio Frequency (RF) emission levels which are in compliance with Commission RF emission regulated levels.*
> (Emphasis added.)

In short, state and local agencies are not preempted from restricting the siting of facilities on the basis of other environmental factors that are not addressed or covered by the FCC in its regulated RF emission levels.

It is undisputed that the FCC does not regulate RF emission levels based on the length of exposure, or non-thermal effects, or age or other characteristics of the persons exposed.

Until such time as the FCC regulates RF emissions based on these factors -- and others like them -- state and local agencies have a public duty to prevent harm to the public from unregulated emission levels of unknown risk of potential harm. One way to do this is through the use of setbacks or "buffer zones."

Most state and local agencies have thought their authority was limited to aesthetic issues, but the statutory language leaves open all environmental and health effects "to the extent that" they are not covered by the FCC emissions guidelines.

Nothing in the law prevents a state or local agency from protecting against other threats to public health and safety unless and until the FCC itself issues covering regulations.

A perfect example of a non-preempted restriction of wireless transmissions is the establishment of a local buffer zone -- e.g.: no tower may be built or operated closer than a certain distance (say 2500 feet) from schools, playgrounds, and residences. Until the FCC itself adopts a different buffer zone limit based on independent valid research, state and local governments are free -- nay, obligated -- to do so.

Local siting agencies may not be arbitrary or capricious; they must base their actions on substantial evidence; they must give their reasons in writing; and they must not abuse discretion -- but they are free to act "to the extent that" the FCC has not already done so. The FCC should say so, to remove all doubt.

The FCC's Admitted Disregard of the Congressional Mandate

The legislative history of the TCA shows that Congress granted preemption to the FCC's Safety Regulations on condition that the agency adopt and maintain adequate public health protection safeguards and that the agency do so "expeditiously". Congress obviously intended that the FCC would keep its safeguards up-to-date and current, based on the most recent reliable scientific research.

A close examination of the FCC's public statements on "Radio Frequency Safety" shows how far the FCC has failed to carry out this Congressional charge.

The following statements are taken directly from the FCC's own website. They appear in the FCC public information document called Frequently Asked Questions about Radio Frequency Safety. These statements demonstrate that the FCC has done nothing to update its safety guidelines since its 1996 adoption of regulations – a period of two decades of neglect:

(1) FCC has not initiated continuing scientific research into RF biological effects;

(2) FCC has not updated its guidelines based on significant findings of FDA-sponsored studies; EPA inter-agency council recommendations; or studies from European countries -- all of which show that the FCC's safety regulations are obsolete;

(3) FCC has not offset the telecom industry's domination and control of RF research in the U.S.; and

(4) FCC has not advised state and local agencies how to protect citizens against the possibility of increased cancer and other health risks for school children and persons living near tower sites.

FCCs Failure to Provide "Adequate" Safeguards for Public Health and Safety

(a) Human Health Hazards

In its RF Safety FAQs[2] the FCC asks the following question:

"WHAT BIOLOGICAL EFFECTS CAN BE CAUSED BY RF ENERGY ?"

The second half of its answer to this FAQ is this:

[2] www.fcc.gov/oet/rfsafety/rf-faqs.html

"At relatively low levels of exposure to RF radiation, i.e., levels lower than those that would produce significant heating, the evidence for production of harmful biological effects is ambiguous and unproven. Such effects have sometimes been referred to as "non-thermal" effects. Several years ago research reports began appearing in the scientific literature describing the observation of a range of low-level biological effects. However, in many cases further experimental research has been unable to reproduce these effects. Furthermore, there has been no determination that such effects constitute a human health hazard. It is generally agreed that further research is needed to determine the generality of such effects and their possible relevance, if any, to human health. In the meantime, standards-setting organizations and government agencies continue to monitor the latest experimental findings to confirm their validity and determine whether changes in safety limits are needed to protect human health."

(Emphasis added.)

"No determination" by whom? This is a matter of scientific research, not an administrative proceeding. A number of studies have found that some "non-thermal" effects do present potential human health hazards. Significantly, there has been "no determination" that non-thermal effects do not constitute a human health hazard. Until there is definitive scientific proof one way or the other, the responsible public agency response is to urge caution and to avoid unnecessary exposure of schools and homes to RF radiation from nearby cell sites.

(b) Cancer Risk

This is how the FCC deals with the public concern over RF radiation and cancer:

"CAN RADIOFREQUENCY RADIATION CAUSE CANCER?"

"Some studies have also examined the possibility of a link between RF and microwave exposure and cancer. Results to date have been inconclusive. While some experimental data have suggested a possible link between exposure and tumor formation in animals exposed under certain specific conditions, the results have not been independently replicated. In fact, other studies have failed to find evidence for a causal link to cancer or any related condition. Further research is underway in several laboratories to help resolve this question. The Food and Drug Administration has further information on this topic with respect to RF exposure from mobile phones at the following Web site: www.fda.gov/cdrh/phones/index.html."

(Emphasis added.)

“Inconclusive” is not a proper response by an agency charged with providing “adequate” safety standards. If there is any possibility that RF radiation can cause cancer, the FCC's standards must make provision to avoid that result. The findings by German doctors that cancer rates have trebled within 400 meters of a cell tower in that country certainly requires the FCC to recommend using that distance, plus an additional safety factor, as a minimum buffer zone around cell sites -- whether the

agency considers the study “inconclusive” or not -- it is a warning sign that must be heeded until disproven.

(c) Current Research

The FCC FAQs document also asks the following question:

"WHAT RESEARCH IS BEING DONE ON RF BIOLOGICAL EFFECTS?"

In response, the FCC admits that the agency itself is doing nothing, and has left the field to the telecom industry -- whose self-interests are diametrically opposed to the public interest in restricting the location of cell sites.

> "At the present time, most of the non-military research on biological effects of RF energy in the U.S. is being funded by industry organizations such as Motorola, Inc. Relatively more research is being carried out overseas, particularly in Europe."
>
> (Emphasis added.)

(d) Obsolete Guidelines

In response to this question:

"WHY HAS THE FCC ADOPTED GUIDELINES FOR RF EXPOSURE?"

The FCC avoids any mention of the Congressional requirement that the FCC maintain "adequate safeguards of the public health and safety," and that it do so "expeditiously":

> "Human exposure to RF radiation emitted by FCC-regulated transmitters is one of several factors that must be considered in such environmental evaluations. In 1996, the FCC revised its guidelines for RF exposure as a result of a multi-year proceeding and as required by the Telecommunications Act of 1996."
>
> (Emphasis added.)

(e) Cell Towers Near Homes and Schools

This is the FCC's head-in-the-sand response to the European studies recommending “prudent avoidance” when locating towers near homes and schools:

"ARE CELLULAR AND OTHER RADIO TOWERS LOCATED NEAR HOMES AND SCHOOLS SAFE FOR RESIDENTS AND STUDENTS?"

> "As discussed above, radiofrequency emissions from antennas used for wireless transmissions such as cellular and PCS signals result in exposure levels on the ground that are typically thousands of times less than safety limits. These safety limits were adopted by the FCC based on the recommendations of expert organizations and endorsed by agencies of the Federal Government responsible for health and safety. Therefore, there is **no reason** to believe that such towers could constitute a potential health hazard to nearby by residents or students."

(Emphasis added.)

This circular argument constitutes a total abandonment of agency responsibility to adopt or update "adequate" public health safetguards in the face of the overwhelming scientific evidence from other countries, combined with the statements of inadequacy of the FCC exposure levels by various responsible scientific groups.

NULLIFICATION OF FCC PREEMPTION

The consequence of the FCC's failure to maintain its Safety Regulations is to nullify their preemptive effect. The Tenth Amendment now takes over to fill the regulatory vacuum left by the FCC's failure, and state and local governments are free to make their own siting decisions on cell antennas based on their retained police power to protect the health, safety and welfare of the state's citizens against risks not addressed by the FCC's obsolete 1996 guidelines.

In Massachusetts v. E.P.A., several states petitioned the Supreme Court to review the mandate under The Clean Air Act to the E.P.A. to regulate emissions of four greenhouse gases. Among the issues presented was whether the E.P.A. had the authority to refuse to regulate the emissions based on political and other considerations unrelated to the endangerment to human health and welfare. Justice Stevens wrote for the majority that ignoring scientific findings and passing the buck would not lift the Congressional command to regulate:

> On October 20, 1999, a group of 19 pri**v**ate organizations [FN omitted] filed a rulemaking petition asking **EPA** to regulate "greenhouse gas emissions from new motor **v**ehicles under §202 of the Clean Air Act." App. 5. Petitioners maintained that 1998 was the "warmest year on record"; that carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are "heat trapping greenhouse gases"; that greenhouse gas emissions ha**v**e significantly accelerated climate change; and that the IPCC's 1995 report warned that "carbon dioxide remains the most important contributor to [man-made] forcing of climate change." *Id.*, at 13 (internal quotation marks omitted). The petition further alleged that climate change will ha**v**e serious ad**v**erse effects on human health and the en**v**ironment. *Id.*, at 22–35. * * *
>
> EPA [cannot] avoid its statutory obligation by noting the uncertainty surrounding **v**arious features of climate change and concluding that it would therefore be better not to regulate at this time. See 68 Fed. Reg. 52930–52931. If the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming, EPA must say so. That EPA would prefer not to regulate greenhouse gases because of some residual uncertainty * * * is irrelevant.

> The statutory question is whether sufficient information exists to make an endangerment finding.
>
> In short, EPA has offered no reasoned explanation for its refusal to decide whether greenhouse gases cause or contribute to climate change. Its action was therefore "arbitrary, capricious, … or otherwise not in accordance with law." 42 U. S. C. §7607(d)(9)(A). We need not and do not reach the question whether on remand EPA must make an endangerment finding, or whether policy concerns can inform EPA's actions in the event that it makes such a finding. Cf. Chevron U. S. A. Inc. v. Natural Resources Defense Council, Inc., 467 U. S. 837, 843–844 (1984). We hold only that EPA must ground its reasons for action or inaction in the statute.
>
> Massachusetts v. EPA, 549 U.S. 497 (2007)
>
> (Emphasis added.)

Where a Federal regulatory agency has refused to comply with a statutory command, especially in the arena of "public health and safety," the state itself may not shirk its duty to do so under the Tenth Amendment.

International Scieitific Publications Lead to Precautionary Actions

The FCC candidly acknowledges that more RF radiation research is being done internationally than in the U.S. Here are some of the results of recent international studies:

> In 2005, a scientific study in Austria of a random cross-section of inhabitants living near cell towers ("base stations") showed that people living for more than one year near the towers experienced headaches, vertigo, palpitations, tremors, hot flashes, sweating, loss of appetite, loss of energy, exhaustion, tiredness, difficulties in concentration, and stress.

> In 2003, a scientific study in France of a random cross-section of inhabitants living near cell towers ("base stations") showed that persons living close to cell towers experienced nausea, loss of appetite, visual disturbances and difficulty in moving. Those living within 100 meters of base stations experienced irritability, depressive tendencies, difficulties in concentration, loss of memory, dizziness, and lowering of libido. For persons living in the zone of 100 to 200 meters from base stations, the symptoms experienced included headaches, sleep disruption, feelings of discomfort and skin problems. Beyond 200 meters, the principle symptom was fatigue.
>
> A group of doctors in Bavaria, Germany, reported observations of patients living in the vicinity of cell towers ("base stations") experienced the following symptoms: sleep disturbance,

tiredness, headache, restlessness, lethargy, irritability, inability to concentrate, forgetfulness, depression, impaired hearing, dizziness, nose bleeds, visual disturbances, joint and muscle pains, palpitations, increased blood pressure, hormone disturbances, nocturnal sweating and nausea.

In 2003, a double-blind study conducted in the Netherlands of subjective complaints of persons exposed to wireless signals found a statistically significant relation between wireless signal and cognitive impairment including anxiety, inadequacy, reaction time, visual selection, and found such effects in all samples.

In 2003, a in scientific study in Spain of persons exposed to wireless signals for more than six hours a day, seven days a week, at power levels far below safety guidelines, subjects experienced symptoms such as fatigue, irritability, headache, nausea, appetite loss, discomfort, gait difficulty, sleep disturbance, depression, difficulty in concentration, memory loss, dizziness, skin alterations, visual dysfunction, auditory dysfunction and cardiovascular alterations.

In 2004, a scientific publication in Sweden concluded that there was an increase in malignant melanomas of the skin related to pulsed signals from FM broadcasting antennas in Sweden, Norway and Denmark attributed to impairment of the skin repair mechanism by electronic radiation.

In 2000, as a result of scientific studies in the United Kingdom, the Department of Health recommended a "precautionary approach," to the placement of base stations "until more research findings become available."

In 2004, the International Association of Firefighters (IAFF) reported that some firefighters with cell towers currently located on their stations are experiencing symptoms that "put our first responders at risk." The IAFF specifically referred to headaches, slow response and clouded ability to make decisions caused by "a sort of brain fog" they attributed to the presence of these cell towers. At their 2004 annual convention, the IAFF members passed a resolution to study the health effects of cell towers on fire stations and urged a moratorium on the placement of new cell towers on fire stations until the completion of the study.

In 2006, a group of scientists meeting at Benevento, Italy adopted a resolution urging a "precautionary approach" to the exposure of people to EMF and RF radiation. The resolution specifically stated: "Based on our review of the science, biological effects can occur from exposures to both extremely low frequency fields (ELF EMF) and radiation freqency fields (RF EMF)." The scientists added that "epidemiological and laboratory studies that show increased risks for cancers and other diseases from occupational exposures to EMF cannot be ignored."

In 2007, The Sunday Times in the United Kingdom reported that a study of sites around mobile phone masts show "high incidences of cancer, brain haemorrhages, and high blood pressure within a radius of 400 yards of mobile phone masts." The news report stated "a quarter of the 30 staff at a special school within sight of the 90 ft high mast have developed tumors since 2000, while another quarter have suffered significant health problems."

In November, 2007 at a scientific conference at the Royal Society in London, scientists endorsed *The BioInitiative Report*; called for the development and implementation of biologically-based public safety limits for EMF exposure; advised that based on the Precautionary Principle, children and vulnerable groups (such as people with epilepsy and heart conditions) should not be exposed to a risk of harm; and proposed that no Wi-Fi, Wi-Max or other forms of wireless networking be placed in homes, schools, or public areas or be promoted for the use thereof.

In 2009 a study sponsored by the Swiss National Research Program completed its set of ambient RF radiation measurements, which take into account the proliferation of wireless sources. Overall, the survey found a roughly tenfold increase in overall RF exposures in Switzerland compared to the levels found in the by the EPA in the U.S. in the mid-1970s. Mobile phones and towers are major contributors to overall exposure, but so are cordless (DECT) phones, as is riding on a train or a bus. Airports may be hot zones, too. As for passive or second-hand RF exposures, their contribution can be important in confined spaces such as on public transportation.

All of these reports confirm the inadequacy of the FCC's present safety guidelines.

The Broadband NOI seeks comment on broadband policies of other countries. At p. 19 ¶ 51:

Finally, we seek comment on any national broadband policies or programs adopted by other nations or international organizations that may be useful to the Commission in this proceeding.

The German Federal Government (Bundesregierung) recommends, in general, keeping the personal radiation exposure from high frequency electromagnetic fields as low as possible, that is to say, i.e. to prefer conventional wired connections, if the use of wireless-supported solutions can be avoided. It added that it is "actively informing people about possibilities for reducing personal exposure".

France is shutting down cell phone use in its elementary schools, due to health concerns. The government ban comes after a study on mobile phone use and wi-fi radiation. Currently cell phone use is permitted on elementary school grounds, but not in classrooms. The new mandate will shut down their usage completely. Under the measure, companies will also be required to supply phones that only work with a headset, in order to reduce exposure to electromagnetic radiation.

Libraries and schools in France are removing Wi-Fi because of concern from both the scientific community and their employees and patrons.

Elementary schools in the UK and Ireland are removing WiFi systems.

The Vancouver School Board (VSB) passed a resolution in January 2005 that prohibits construction of cellular antennas within 1000 feet (305 m) from school property.

Members of the French Senate have presented a bill to restrict exposure to electromagneticfields (April 2009):

> Article 14: The Wi-Fi function of all Wi-Fi-equipped devices is deactivated by default. Instruction booklets contain clear and visible information about the health risks of using Wi-Fi and preventative measures to take when it is activated.
>
> Article 15 When possible, in public buildings wired connections will be obligatory for all new communications networks, except in special circumstances which are in the public interest. Where possible, existing Wi-Fi installations will be replaced by wired networks within 5 years of the promulgation of the present law.
>
> Article 16 WiMax roll-out is suspended for 5 years from the promulgation of the present law and will be replaced by wired broadband.

Based on studies like those outlined above and the recommendations of *The BioInitiative Report* the April 2, 2009 EU Resolution makes the following recommendations to its member countries: www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2009-0216+0+DOC+XML+V0//EN

> The Resolution recalls that wireless technology (mobile phones, Wi-Fi/WiMAX, Bluetooth, DECT landline telephones) emits EMFs that may have adverse effects on human health. Most European citizens, especially young people aged from 10 to 20, use a mobile phone, while there are continuing uncertainties about the possible health risks, particularly to young people whose brains are still developing.
>
> The Resolution Proposes that the EU's indoor air quality policy should encompass the study of "wireless" domestic appliances, which, like WiFi for Internet access and digital enhanced cordless telecommunications (DECT) telephones, have been widely adopted in recent years in public places and in the home, with the result that citizens are being continuously exposed to microwave emissions.
>
> The Resolution draws attention in this context to the appeal for caution from the coordinator of the Interphone study, Elisabeth Cardis, who, in the light of existing knowledge, recommends, as far as children are concerned, that mobile phones should not be used beyond reasonable limits and that landlines should be preferred.
>
> **Keeping certain establishments clear**: MEPs consider that it is in the general interest to encourage solutions based on negotiations involving industry stakeholders, public authorities, military authorities and residents' associations to determine the criteria for setting up new GSM

antennas or high-voltage power lines. In this context, it is important to ensure at least that **schools, crèches, retirement homes, and health care institutions** are kept clear, within a specific distance determined by scientific criteria, of facilities of this type.

The Resolution calls upon Member States to follow the example of Sweden and to recognise persons that suffer from electrohypersensitivity as being disabled so as to grant them adequate protection as well as equal opportunities.

(Underscore added.)

STATES' RIGHTS

In *New York v. United States* and *Printz v. United States* the United States Supreme Court forcefully reconfirmed the long-standing principle that "Congress may not simply 'commandeer the legislative processes of the States by directly compelling them to enact and enforce a federal regulatory program.'" 505 U.S. at 161 *quoting Hodel***,** *supra*, 452 U.S. at 288. See also *New York*, "the Constitution has never been understood to confer upon Congress the ability to require states to govern according to Congress' instruction." c*iting Coyle v. Smith*, 221 U.S. 559, 565 (1911); *Printz*, 521 U.S. at 925: " . . . the Federal Government may not compel the states to implement, by legislation or executive action, federal regulatory programs."

Commandeering the legislative power of the states to serve federal ends is antithetical to the "system of dual sovereignty" established by "the Framers, who explicitly chose a Constitution that confers upon Congress the power to regulate individuals, not states," *Printz*, 521 U.S. at 918, 920, *quoting Gregory v. Ashcroft*, 501 U.S. 452, 457 (1991); *New York, supra* 505 U.S. at 166.The historical record conclusively establishes that the Framers "designed a system in which the state and federal governments would exercise concurrent authority over the people – who were, in Hamilton's words, 'the only proper objects of government.'" *Printz*, 521 U.S. at 919-920, *quoting The Federalist No. 15; Accord, Alden, supra*, 527 U.S. at 714.

Any act which threatens to "compromise the structural framework of dual sovereignty" is "categorically" unconstitutional and "no comparative assessment of the various interests [involved] can overcome that fundamental defect." *Printz*, 521 U.S. at 932-33.

While the categorical rule may appear doctrinaire and inflexible, it serves vital constitutional purposes by preserving the accountability of elected officials to the electorate – the very basis of democratic government. As explained in *New York:*

> . . . Where the federal Government directs the States to regulate, it may be *state officials who will bear the brunt of public disapproval,* while the federal officials who devised the regulatory program may remain insulated from the electoral ramifications of their decision. (505 U.S. at 169) (Emphasis added.)

See also Printz, observing that where state governments are forced to implement a Federal program, state officials are "put in a position of taking the blame for its burdensomeness and its defects." (521 U.S. at 930, *quoting* Merritt, *Three Faces of Federalism: Finding a Formula for the Future,* 47 Vand. L. Rev. 1563, 1580, n. 65 (1994)).

The Federal Government may, of course, exercise the power to set public health standards in areas relating to interstate commerce. However, where it has defaulted on its obligation to protect public health, the Federal Government may not simultaneously *prevent the States from taking action to do so.* Such preemption would be irreconcilable with the "dignity and essential attributes inherent in" the States' status as sovereigns. *(Alden,* 527 U.S. at 714).

EIS Required If Wireless Is Considered

The Broadband Plan NOI seeks comment on what other federal statutory provisions should be in play in this proceeding. Such statements are found at (emphasis added):

> p. 35 ¶ 106 . . . While discussion in this *Inquiry* often details the policies and programs at the Commission, we ask that parties not limit the scope of their comments on the national broadband plan only to programs within the policymaking authority of the Commission.
>
> p. 36 ¶ 107 We seek comment on how the Commission's development of a national broadband plan under the Recovery Act relates to other statutory provisions.

The FCC is responsible for compliance with NEPA under the regulations issued by the President's Council on Environmental Quality (CEQ) found at 40 CFR 1500. (Emphasis added).

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> *The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government.* 40 CFR 1502.
>
> *Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment.* 40 CFR 1500.2 (e)
> 1.

The studies set forth in this EMRPI Comment demonstrate to the FCC that the use of wireless to provide high speed internet under the Broadband Plan will have very significant environmental impacts because wireless broadband would greatly expand the human-occupied areas subject to electromagnetic radiation and increase the quantity of electromagnetic radiation exposing the public. An Environmental Impact Statement is required to identify and assess reasonable alternatives to using technology that increases the electromagnetic radiation over so large an area and population

CONCLUSION

The EMRPI urges the FCC to require that the Broadband Plan expand fiberoptic and hard-wired broadband infrastructure rather than RF-emitting infrastructure options such as Broadband over Power Lines or wireless networks.

Against the existing failed research record, it is imperative that the FCC encourage state and local governments to site telecommunications base station facilities at a reasonable distance away from schools, playgrounds, workplaces, and family residences to safeguard the health and safety of American children and other vulnerable population groups. Buffer zones offer a reasonable, practical, and inexpensive way to safeguard public health and safety pending the outcome of conclusive research on RF radiation public health and safety impacts.

For the reasons delineated above and in order to meet its goal to "open the doors of opportunity for more Americans, no matter who they are, where they live, or the particular circumstances of their lives,"the Broadband Plan must favor fiberoptic, cable or wired broadband options unless and until FCC first performs a thorough review of the research and studies cited above and the preparation of an Environmental Impact Statement in full compliance with the National Environmental Policy Act.

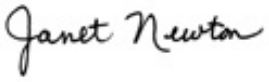
The research needs delineated in the findings of the 2008 NAS Report on adverse biological effects of wireless devices demonstrate that the FCC must revisit the research record upon which its RF safety policy is based and set RF exposure limits that are biologically based. In the interim, precautionary RF limits must be set as recommended in *The BioInitiative Report*.

If the Broadband NOI goals of open and equal participation in the process, broadband access for all Americans "no matter who they are, where they live, or the particular circumstances of their individual lives," and a full discussion of "any fact or issues not otherwise addressed in this NOI relating to the adoption or implementation of a national broadband plan," are truly to be achieved, the

need for adequate public health safeguards for human RF radiation exposure must be a pivotal consideration in this Broadband NOI proceeding.

A collateral benefit of deploying fiberoptic and hard-wired broadband infrastructure over wireless will be achieving the additional Broadband NOI goal of leveraging broadband technology to make the United States more climate-friendly. Energy consumption required to transmit data through fiberoptic cable is minimal compared to the 24-hour-a-day, high-level power consumption required to operate antennas transmitting the same data. Comparison of electric power production demands for hard-wired vs. wireless infrastructure implementation must be factored into the choice of infrastructure build out for the Broadband Plan if climate issues are truly to be addressed in this NOI.

The EMR Policy Institute



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