

TO: Mr. James J. Eldred,
Environmental Analyst 625 Broadway,
Albany, New York 12233-1750
James.eldred@dec.ny.gov
Segra617@dec.ny.gov
FROM: Deborah Kopald

May 18, 2017

RE: **NO** to changes to **6 NYCRR Part 617**

I am opposed to changes to 6 NYCRR Part 617 which would move certain Unlisted Actions to Type II. NYSDEC should not strip municipalities (and by extension, their citizens) of the power of discretionary review. In particular, the conditions created by new 5G small cells and solar installations are begging for SEQR review.

1. THE PROPOSED RULEMAKING CHANGES EXEMPT PROJECTS ON ANY EXISTING STRUCTURE FROM ENVIRONMENTAL REVIEW, EVEN IF SAID STRUCTURE DOES NOT CURRENTLY HAVE A CELL TRANSMITTER ON IT.

NYSDEC/ Governor Cuomo propose offering up on a silver platter to the wireless industry much more than it was granted under the Middle Class Tax Relief and Job Creation Act of 2012, Section 6409(a)¹ (now codified as 47 U.S.C. § 1455(a)) which promoted collocation of antennae on existing cell sites by saying that state and local government shall approve modifications of wireless facilities which do not substantially change their physical dimensions. The FCC emphasized this in a 2013 Public Notice that reiterates that Section 6408(a) refers to existing cell sites only².

NYSDEC, perhaps with the encouragement of industry, proposes to exempt environmental review of *any* cell transmitter or solar array that is going on any existing structure, not just existing structures with transmitters or solar arrays already on them!

3.2.9 Preliminary Text Amendment: • Installation of rooftop solar energy arrays on an existing structure that is not listed on the National or State Register of Historic Places or determined by the Commissioner of the Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places, or installation of less than 25 megawatts of solar energy arrays on closed sanitary landfills.

3.2.10 Preliminary Text Amendment: • Installation of cellular antennas or repeaters on an existing structure that is not listed on the National or State Register of Historic Places or determined by the Commissioner of the Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places.

¹ This article in Municipal Lawyer, "Section 6409(a) of the Middle Class Tax Relief Act is Unconstitutional" by John Pestle, Esq. suggests that Congress overstepped its authority under the Commerce Clause of the Constitution and that this provision is unconstitutional. <http://www.varnumlaw.com/blogs/cell-phone-tower/section-6409a-of-the-middle-class-tax-relief-act-is-unconstitutional/>

² "Wireless Telecommunications Bureau Offers Guidance on Interpretation of Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012", January 25, 2013. https://apps.fcc.gov/edocs_public/attachmatch/DA-12-2047A1_Rcd.pdf

These existing structures include any structure in the environment- a utility pole, a flagpole, a billboard, a church steeple, even potentially a tree!

Why do NYSDEC/Governor Cuomo propose giving a wider berth to these companies to exempt themselves from SEQR review by setting up an express lane for cell or solar arrays on any existing structure? This can only be because they are doing the bidding of industry, which wants what Congress would not give it. This certainly does not serve the people of New York who would live with these consequences near their homes, parks, schools, scenic, cultural and historic areas.

2. THE IDEA THAT 5G SMALL CELLS ARE “SMALL” AND WILL NOT CREATE SAME ENVIRONMENTAL ISSUES AS CELL TOWERS, WHICH NOW ARE SUBJECT TO DISCRETIONARY SEQRA REVIEW, IS FALSE.

5G small cells are not merely little devices going on utility poles. They come with cooling fans³ and other accoutrements which create noise (and run the risk of falling and/or leaking), and may require so-called soil sterilization⁴, utilize hazardous batteries⁵ which can leak chemicals creating a hazmat situation, and are high enough to mar an historic or other scenic view or a neighborhood. 5G small cells bring industrial equipment closer into areas that people inhabit. Discretionary review of these structures should be maintained; this right certainly should not be taken away, and should in fact be mandated via Type 1 given the issues at play.

One of the photos provided to the FCC in Docket # 16-421 by Omar Maisry, a city planner with the City of San Francisco, CA, of a so-called small-cell involves a utility pole that looks like the industrial equivalent of an overloaded Christmas tree and is on the next page.

Aisry speaks to the industrial character of these small cells which are not minimizing the footprint of cell towers as some people have been lead to believe:

The challenge of such facilities includes systems that are actually installed may be inappropriate, especially in residential areas or historic districts, such as large cabinets the size of a refrigerator, with noisy cooling fans (to cool the computers) mounted a few feet from a bedroom bay window in a dense area of town.

Or, ground-mounted cabinets that impede use of the sidewalk for the handicapped, and present a sight obstruction hazard for drivers backing out of their own driveway.

³ “A City Planner’s Abbreviated Response to Comments on Streamlining Deployment of Small Cell (And Not-So-Small-Cell) Infrastructure, Omar Aisry, AICP, FCC Docket #16-421. February 12, 2017, page 1:

<https://ecfsapi.fcc.gov/file/103092714627353/Mobilitie%20Proceeding%20.pdf>

⁴ City of Orlando, Staff Report, Appearance Review Board: <http://www.cityoforlando.net/greenworks/wp-content/uploads/sites/27/2015/12/ARB2015-00082report.pdf>, page 4, reference to soil sterilizer approved by City Forester.

⁵ Regulating Wireless Siting and Leasing Wireless Sites: Protecting Local Interests: Joseph Van Eaton, Esq. Gerard Lavery Lederer, Esq. Best, Best and Krieger LLP, CLE Class, Federal Bar Association.

"Small Cells"

Without collaborative City input:
"Small Cell" at
4471 Moraga Ave
Oakland →
*(bulky boxes, tacky bundles of wiring below unpainted antennas and noisy cooling fans)**

With collaborative City input:
Verizon at 1367 Jones Street
in San Francisco
(unobtrusive and noiseless)
320 built; another 200 expected for other carriers



From: "A City Planner's Abbreviated Response to Comments on Streamlining Deployment of Small Cell (And Not-So-Small-Cell) Infrastructure, Omar Aisry, AICP, FCC Docket #16-421. February 12, 2017



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This week's breaking news from Long Island is one of countless examples around New York State where people find out so-called 5G small cells are going up or have already

been installed and are deeply concerned. New Yorkers who have done their research do not consent to this; NYSDEC proposes a policy that will force more of these transmitters up and strip people like Dr. Burg and the below concerned residents of Woodbury of their property and other rights.

newyork.cbslocal.com/2017/05/11/woodbury-l-i-cellphone-repeaters/

“I could not believe this was actually happening,” Tufano said. “I said, how could the town permit this? How could they do this to us?”



Tufano and other Woodbury neighbors were fuming over the placement of the 22 cell repeaters for Verizon in front of homes. They are technically on public property, but they were mounted without notice or compensation.

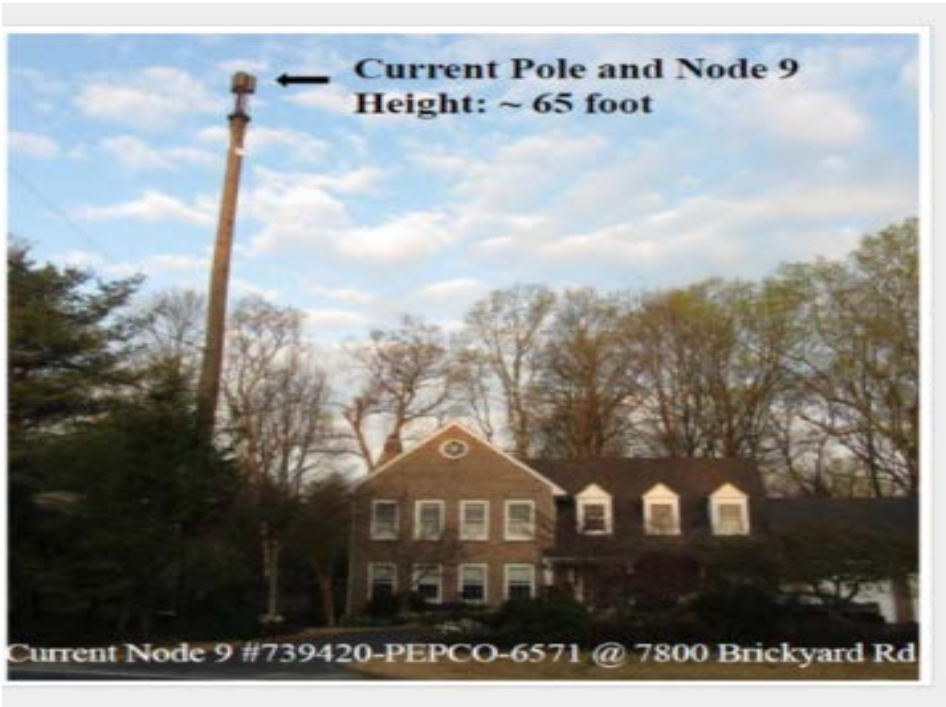
“You couldn’t give me \$10 million for this, OK?” said Dr. David Burg of Woodbury. “There are potential health risks to these. They are aesthetically not pleasing. There’s also the devaluation of our home.”

<http://newyork.cbslocal.com/2017/05/11/woodbury-l-i-cellphone-repeaters/>

City Planner Aisry goes on to make these comments about 5G installations effectively being industrial cell towers and not small unobtrusive equipment:

In some instances, carriers have proposed brand new wooden poles (30-50 feet in height) or new steel poles (up to 120 feet height – for Mobilitie) in the public right-of-way under the guise of being a Small Cell, when they appear to mimic the same negative effects of monopoles; that seems somewhat regressive in terms of the overall trend line in better designed wireless infrastructure.

This photo of a 5G monopole in Montgomery County, Maryland is a textbook example of what Aisry is talking about when he is referring to the misnomer that are “small cells”:



In addition to showing up at residences, these 5G “small cells” are marring historic views such as this one in front of the historic Williamsburg Inn in colonial Williamsburg, VA:



The Williamsburg Inn, Colonial Williamsburg, VA

A 5G “small cell” was placed in front of this historic building in Pittsburgh, PA:



In addition to historic sites, parks and other scenic areas are marred:



Figure 16. Crown Castle small facility deployed in historic district on Benjamin Parkway, Philadelphia, PA¹⁶

A close-up of the accoutrements on the pole of an installation in Palo Alto, CA shows the extent to which a simple utility pole has morphed into industrial-grade infrastructure:



The base of many of these poles looks like this:

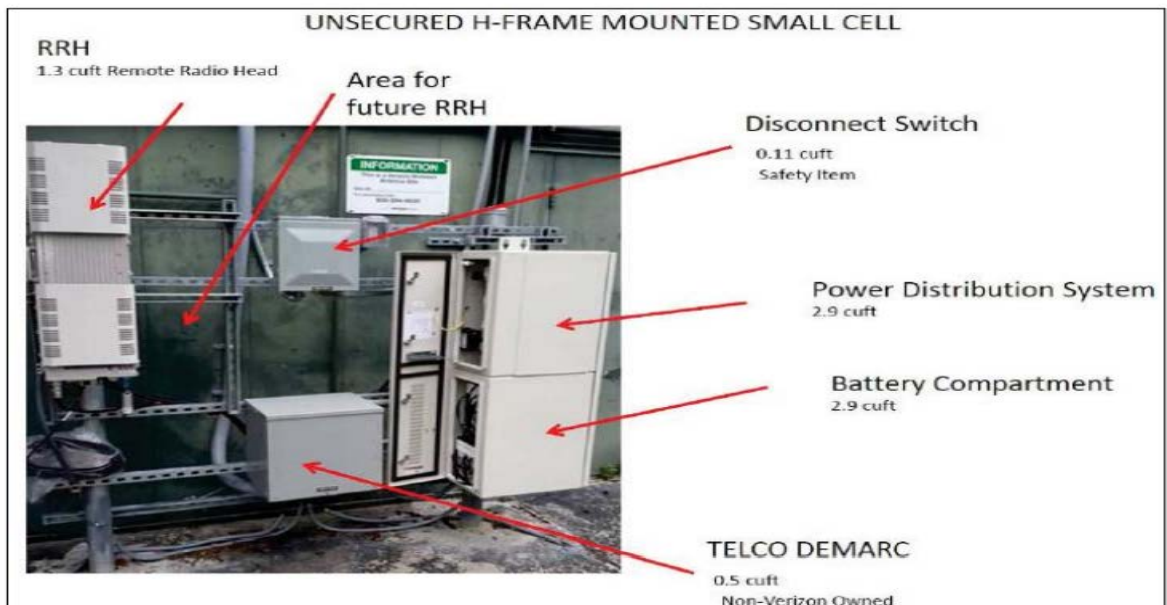


Figure 7. Verizon small cell associated equipment cabinets installed on rooftop or building side.⁷

Some of the “base” equipment is mounted on the side of buildings thus:



A close-up of the interior of a wall-mounted cabinet for a small cell looks like this:



Base station equipment, replete with radiation warning signs, at the base of a utility pole can be in a park, along a street- anywhere accessible by children.



Lafayette, CA

3. THE STATE OF NEW YORK SHOULD NOT CHANGE ANY REGULATIONS MAKING IT EASIER FOR COMPANIES TO PUT UP 5G SMALL CELLS OR SOLAR EQUIPMENT, WHICH CREATE EMF POLLUTION, WHICH IS THE SUBJECT OF THE FCC'S 2013 REQUEST FOR COMMENT ON STANDARDS, WHICH HAS NOT BEEN ADDRESSED YET.

The FCC put out a request for comment on standards in 2013. Four years later, they still have not acted on the over 900 comments⁶, many of which stated that the standards are grossly inadequate. In 2014, the Department of the Interior (DOI) wrote a letter to the National Telecommunications and Information Administration (NTIA) stating that transmitter emissions standards are “now nearly 30 years out-of-date and inapplicable today”⁷. The FCC should not be promoting any rollouts of more transmitters at this time. The State of

⁶ Link to 2013 FCC Docket 13-84: https://www.fcc.gov/ecfs/search/filings?proceedings_name=13-84&sort=date_disseminated,DESC

⁷ Willie R. Taylor, Director, Office of Environmental Policy and Compliance, United States Department of the Interior, Office of the Secretary February 7, 2014 letter to Eli Veenendaal, National Telecommunications and Information Administration: http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf, Page 5.

New York should not allow the FCC to ignore another federal agency that has indicated that the FCC is grossly derelict by changing the States' rules and regulations to promote more transmitter rollout.

By the FCC's own acknowledgment, the guidelines are only set so that people do not pass out: "The limit on specific absorption associated with the reduced averaging time is conservative relative to RF-induced unconsciousness and is well above the threshold for auditory effect."⁸ Note: the FCC does admit that some people can hear the radiation frequencies within legal thresholds, so they have long acknowledged that there is a biological effect from publicly allowable exposures. The FCC also uses standards that were set on the basis of only four studies of acute (not chronic) exposures to what appear to be rhesus, macaque and squirrel monkeys and possibly some rats. In other words, the standards were not set on the basis of chronic exposures to humans which existed in the literature at the time the standards were adopted in 1996 (and the DOI points out that they were out-of-date when adopted):

IEEE subcommittee 4 focused on evidence of behavioral disruption under acute exposures...Because the threshold for disruption in non-human primates always exceeded a whole-body SAR of 3.2 to 4 W/Kg [B15, B17, B18, B19], the latter value has again been adopted as the working threshold for unfavorable biological effects in human beings in the frequency range of 100KHz- 300 GHz.⁹

What other substance or agent under review by an agency of the federal government, would the State of New York gut its own regulations for to promote increased levels of it in public? I suggest to you that there is no other such agent or substance.

4. THERE ARE A NUMBER OF SCENARIOS IN WHICH THE INADEQUATE FCC LIMITS CAN BE BREACHED IN PUBLIC, AND LEVELS OF RADIATION IN EXCESS OF FCC LIMITS ARE AN ENVIRONMENTAL ISSUE OVER WHICH MUNICIPALITIES DO HAVE JURISDICTION.

The Wall Street Journal reported in 2014 that 10% of cell tower sites were out of compliance¹⁰. There is no checking by the FCC; the industry is left to self-regulate when there is no local oversight. In cases of colocation (on sites with existing antennae), there needs to be a proper review conducted to make sure sites are in compliance. Levels above FCC limits are an environmental issue and are subject to SEQR review. Gutting SEQR review as this rulemaking proposes will not magically erase with the stroke of a pen the real environmental problem of 10% of cell sites breaching FCC limits (limits that the DOI and other experts have already expressed are way out of whack). NYSDEC should not abdicate the state's responsibility to allow municipalities to conduct a review, because it must stem this very serious problem. Furthermore, on an electric pole now, there are electric lines, phone lines, 5G small cells, possibly a smart meter, cooling fans, batteries and other

⁸ IEEE C95.1-1991 "Revision of ANSI C95.1.-1982" IEEE Standard for Safety Levels with Respect to Human Exposure to Radio-Frequency Electromagnetic Fields, 3KHz-300GHz, IEEE: April 27, 1992: 33-34.

⁹ Ibid., 27, 28, 46.

¹⁰ Ianthe Jeanne Dugan and Ryan Knutson, "Cell Phone Boom Spurs Antenna-Safety Worries" <https://www.wsj.com/articles/cellphone-boom-spurs-antenna-safety-worries-1412293055>

electrical equipment. What of the workers who must service any of this equipment at any given time? If the workers are breaching even the inadequate FCC limits, something that is quite possible with such close proximity and colocation, they are being set up for serious health problems. The UK health protection agency apparently has warned that firefighters could cook their eyeballs by being on a roof with cell towers blaring. Who is watching out for the phone workers, the electric line workers and those serving the 5G unit or smart meter? This responsibility is under the purview of SEQR; does NYSDEC want to pass the buck and let the injured workers or children who play too close to this equipment in public parks and public byways (see again: photo on page 9) deal with the preventable consequences later? Is this just an externality to be borne by the injured and the insurance companies when they do pay out?

5. EMF POLLUTION CREATES VIOLATIONS OF THE FAIR HOUSING ACT (FHA) AND AMERICANS WITH DISABILITIES ACT (ADA). THESE VIOLATIONS MUST BE ADDRESSED BEFORE THE EQUIPMENT IS ROLLED OUT AT WHICH POINT THERE WOULD BE LITTLE TO NO RECOURSE. MUNICIPALITIES HAVE AN OBLIGATION TO PREVENT THESE VIOLATIONS VIA A SEQR REVIEW.

The United States Access Board recognizes a population of disabled people who are sickened by levels of radiation that are created by this type of infrastructure and who are covered under the Americans with Disabilities Act (ADA)¹¹; this population with severe electromagnetic sensitivities was recognized by the California Department of Public Health as comprising 3% of the population in 2002¹². This figure was discerned 15 years ago prior to the levels created by the rollouts that have ensued since, some of which will be dwarfed by the rollout of 5G. The EU stated in a 2012 resolution¹³ that this population is growing exponentially. The cities of Boston and Philadelphia also referenced this population in their 2013 comment to the FCC and pointed out that further transmitter rollouts would create access barriers for this population.

The Telecommunications Act of 1996 does not preempt the ADA or the Fair Housing Act (FHA). People have the right to access their homes and the right to access public places. Having people shuttered in their homes and telecommuting is not reasonable when they must access critical institutions like a court or hospital or education. Getting emergency medical care cannot be done remotely if there are too many transmitters in or on the building etc. One needs to show up in person. At this point, the unfettered use of transmitters has been interfering with people's right to petition for grievance and creating gross Constitutional violations. If certain people then cannot access most neighborhoods, where will they live? How will they get access to goods and services? It is a reality already affecting many Americans today.

¹¹ Federal Register/ Vol. 67, No. 170/ Tuesday, September 3, 2002/ Rules and Regulations, 36 CFR Part 1191 [Docket No. 98-5] RIN 3014-AA16 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Recreation Facilities; Action: Final Rule, Page 56353.)

¹² Levallois P, Neutra R, Lee G, Hristova L. Study of self-reported hypersensitivity to electromagnetic fields in California. Environ Health Perspect 2002;110 (Suppl. 4):619-23.

¹³ European Parliament Written declaration on the recognition of multiple chemical sensitivity and electrohypersensitivity in the International Statistical Classification of Diseases and Related Health Problems (ICD), 3/12/12, <http://www.europarl.europa.eu/sides/getDoc.do?type=WDECL&reference=P7-DCL-2012-0014&format=PDF&language=EN>, page 2.

5G small cells must not go near someone's home work or critical public place that must be accessed when they have a medical condition exacerbated by this radiation, including, but not limited to severe electromagnetic sensitivities; the desire to download a movie faster or connect one's appliances to a wireless network should not super-cede the rights of people to be free from ill health created by an external source. The American Academy of Environmental Medicine (AAEM) recommends¹⁴ that people with most medical conditions avoid exposure to the pulse-modulated radiation emanating from 5G small cells. A consortium of doctors and scientists including a pediatrician, an OB-GYN and an epidemiologist recommended in a 2014 NYC press conference that pregnant women avoid such exposures as well¹⁵.

When a population cannot tolerate or are supposed to avoid certain environmental conditions, the SEQR process should be used to account for and assess this reality.

The Access Board¹⁶ and the Department of Labor¹⁷ recommend turning things off to the levels at which someone with EMF sensitivity can tolerate. The Access Board also recommends meeting people outside to conduct business and the Department of Labor suggests telecommuting where appropriate. If radiation conditions are increased to the point where more people cannot even tolerate their own home and cannot go outdoors in some public places, policies promoting these conditions should be stopped, or in this case not authorized in the first place.

In the final analysis, NYSDEC and Governor Cuomo propose ignoring these inconvenient truths, offer industry a path to degrade environmental conditions for all New Yorkers as these 5G small cells are placed closer to peoples' residences, parks, offices, schools and hospitals and raise the radiation levels such that they create conditions on the street and in people's homes at levels of severe and extreme concern per the Building Biology Guidelines¹⁸.

Some version of this travesty is going on in multiple states. In California last week, the legislature entertained comment on SB 649 which proposes allowing 5G companies to bypass local zoning entirely. Nina Beety, a Californian in the population of those with severe electromagnetic sensitivities expressed this reality to California lawmakers:

My name is Nina Beety. Thank you for this disabled accommodation so I can speak.

¹⁴ The American Academy of Environmental Medicine (AAEM) "Recommendations Regarding Electromagnetic and Radiofrequency Exposure": 7/12/12: <https://www.aemonline.org/pdf/AAEMEMFmedicalconditions.pdf>; The American Academy of Environmental Medicine (AAEM) Position Paper, "Electromagnetic and Radiofrequency Fields Effect on Human Health": 4/12/12: <https://aemonline.org/pdf/emfpositionstatement.pdf>.

¹⁵ Baby Safe Project News Conference, Environmental Health Trust and Grassroots Environmental Education <http://www.babysafeproject.org/news-conference/>.

¹⁶ The United States Access Board Indoor Environmental Quality Recommendations for Accommodations for people with chemical and/or electromagnetic sensitivities. <https://www.access-board.gov/research/completed-research/indoor-environmental-quality/recommendations-for-accommodations>

¹⁷ The United States Department of Labor, Office of Disability Employment Policy, Job Accommodation Network's Accommodation Ideas for Electromagnetic: <http://askjan.org/soar/other/electrical.html>

¹⁸ IBE RF Standards: <http://hbelc.org/pdf/standards/SBM-2008C-v3.6.pdf>, page 7.

I am disabled by electromagnetic sensitivities — to cell towers, cell phones, Wi-Fi, and Smart Meters. EMS is recognized by the U.S. Access Board and is a protected disabled characteristic. California's 1998 survey found 3.2% of respondents were very sensitive to electromagnetic radiation. That was 1.1 million Californians in 1998. This is not an orphan illness.

This bill does not comply with ADA. Small cell towers are an access barrier for the EMS-disabled to their homes and communities.

Since 1998, radiation levels have soared. How many more Californians have EMS? You don't know because industry is moving too fast. My symptoms include heart arrhythmia, severe sleep disruption, migraines, nausea, and loud ringing in my ears. U.S. and international experts warn about the public health cost. Other countries are taking protective steps. This bill mandates more public exposure – liability for the state. Halt this bill so you can examine these issues.

They say this bill costs California nothing. That's false.

My costs include at least \$500,000 in lost income, which costs the state in tax revenue. If 10,000 Californians are EMF-disabled with \$50,000 per year lost income, that's \$500 million dollars of economic impact including taxes.

Local economic losses to stores, restaurants, coffee shops, businesses from the \$4 coffee and \$25 meal once a month, and \$40 concert ticket three times a year I don't buy is \$568 per year. 100,000 people like me means \$56 million dollars less for local economies.

I've lost access to most of these places, too, due to their wireless.

I've also lost access to ambulance services and the hospital.

Small Cell cell phone towers as close as 10 to 20 feet from my home will be an access barrier to my home and to my community.

*There are many other unfunded costs to this bill. Please **halt SB.649 or at least delay a Senate vote until 2018** to give the California Senate enough time to first examine these important issues. Thank you.*

<http://scientists4wiredtech.com/2017/05/ca-senate-sb-649-may-15-testimony/>

NYSDEC must hear Ms. Beety's call as she speaks for a statistically significant number of people. NYSDEC's proposal isn't a casual policy proposal about tradeoffs. The Governor ignores the dire environmental issues with 5G small cells. He is wrong, this proposed rulemaking change is wrong, and the cost of being wrong means life or death for some people and at a minimum a gross deprivation of civil and human rights.

If this proposal passes, history must and will record that bureaucrats and a money-hungry, politically ambitious Governor, who takes campaign donations from industry, were so morally, ethically and legally compromised that they turned a deaf ear to people's fundamental rights to be free of avoidable illness and disease foisted on them by state policies that put money in the pockets of a greedy few at the greatest expense of the many, even while the agent in question was under review by the FCC and the subject to dire warnings by other government agencies, including, but not limited to DOI.

As Upton Sinclair said, "It is difficult to get a man to understand something, when his salary depends upon his not understanding it!"

Meanwhile, while NYSDEC is entertaining gutting 6 NYCRR Part 617, hundreds of parties weighed in in response to the 2017 FCC Docket #16-421¹⁹, which was initiated by a 5G purveyor which wants to get automatic rights of ways on utility poles and other existing structures.

The opposition to Docket # 16-421 came from doctors, people with severe electromagnetic sensitivities, even doctors with severe electromagnetic sensitivities and most note-ably from municipalities, including but not limited to the cities of New York and Austin, TX and the Connecticut Department of Transportation, which were consistent in their assertions that the demand for an express lane to put up 5G small cells and get rights of ways on utility poles would create unacceptable interference with local government functions including, but not limited to public safety (being able to control rights of way so that they facilitate the needs of the municipality first and foremost).

The proposed gutting of SEQR would make it easier for 5G small cells to go up on "existing structures" which include utility poles. While planning and zoning rules would apply (and only to new transmitter sites, not to colocations), the environmental review would be circumvented. It is needed more than ever.

6. SOLAR INSTALLATIONS ARE EMF-POLLUTING, BUT CAN BE MADE SAFE AND GREEN WITH PROPER FILTERING; SEQR REVIEW IS NECESSARY TO FACILITATE PROPER INSTALLATION OF THESE FACILITIES.

Dave Stetzer, Senior Member, Institute of Electrical and Electronic Engineers (IEEE) and CEO of Stetzer Electric writes,

Solar energy inverters create high frequency transients that are put onto the electrical grid and distributed throughout the electrical service area. Since the electrical grid was designed for only 60 cycles per seconds, (60 Hertz), and the solar inverters apply 20,000 Hertz transients back on the grid, the majority of these currents end up flowing uncontrolled over the earth's surface. They will flow on infrastructure like water pipes, gas pipes, phone lines, etc. There will be an issue with electrolysis that will eventually destroy this type of infrastructure. They will

¹⁹ Link to 2017 FCC Docket #16-421 https://www.fcc.gov/ecfs/search/filings?proceedings_name=16-421&sort=date_disseminated,DESC

cause transformers to overheat, reduce their life, increase copper and iron losses, insulation stress and noise. They will cause similar issues with electric motors including the ones on household appliances. They may cause circuit breakers to fail to interrupt circuits, which is a great safety issue. They also cause incorrect reading in the electric watt hour meters because the meters are calibrated for accurate operation at 60 Hertz.

These types of transients have been associated with major drops in milk production with dairy cows²⁰²¹²²²³²⁴²⁵. The results have been published in several, peer-reviewed scientific journals.

The high frequency transients created by solar inverters is no secret to the manufacturers and the engineering solutions exist to address this problem....

The issue of transients, harmonics and power quality²⁶²⁷²⁸ is a technically complex one; cell towers, smart meters and other wireless devices also put these stressors on the grid. It is a topic that NYSDEC must become familiar with; until then, it is sufficient to recognize that there are a multitude of environmental issue created by installations, including solar (and including the batteries and other accoutrements and chemicals leaching therefrom) and that it would not make sense to move solar and cell transmitters from unlisted to Type II actions.

NYSDEC now has enough information to see the various environmental ramifications of these technologies and thus should not strip the municipalities of their current discretionary review.

²⁰ Aneshansley, D. J., & Gorewit, R. C. (1999). Sensitivity of Holsteins to 60 Hz and Other Waveforms Present on Dairy Farms. *Presented at the 1999 ASAE/CSAE-SCGR International Meeting, Paper No. 993152*. 2950 Niles Rd., St. Joseph, MI 49085-9659 USA: ASAE.

²¹ Polk, C. (2001). Cows, Ground Surface Potentials and Earth Resistivity. *Bioelectromagnetics*, 22(1), 7-18.

²² Reinemann, D. J., Stetson, L., & Laughlin, N. (1994). *Effects of frequency and duration on the sensitivity of dairy cows to transient voltages (ASAE Paper No. 943597)*. Atlanta: ASAE.

²³ United States Department of Agriculture. (1991). *Effects of Electrical Voltage/Current on Farm Animals: How to Detect and Remedy Problems (Agriculture Handbook Number 696)*. Washington, D.C.: United States Government Printing Office.

²⁴ Staehle, R. W., Anderson, L. E., Dziuk, H. E., Hird, D., Liboff, A. R., Polk, C., et al. (1998). *Final Report of the Science Advisors to the Minnesota Public Utilities Commission: Research Findings and Recommendations Regarding Claims of Possible Effects of Currents in the Earth on Dairy Cow Health and Milk Production*. St. Paul: Minnesota Public Utilities Commission.

²⁵ Stetzer, D., Leavitt, A., Goeke, C., and Havas, M. (2015). *Monitoring and remediation of on-farm and off-farm ground current measured as step potential on a Wisconsin dairy farm: a case study*. *Electromagnetic Biology and Medicine*, Volume 35(4), 321-336.

²⁶ Ireland, B. (2006, September 1). Clearing up Confusion on Unwanted Voltages. *Electrical Construction and Maintenance*.

²⁷ Kavet, R. (2000). The Possible Role of Contact Current in Cancer Risk Associated With Residential Magnetic Fields. *Bioelectromagnetics*, 21:538-553.

²⁸ Ontario Hydro (Ryan, Maura C). (1998). *Power Quality Reference Guide (Third ed.)*. Toronto: Ontario Hydro.