Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Kuiper Systems, LLC	)	IBFS File No. SAT-LOA-20190704-00057
	)	
Application for Authority to Deploy and Operate a Ka-band Non-Geostationary Satellite Orbit System	)	Call Sign S3051

REQUEST FOR RECONSIDERATION AND STAY OF FCC APPROVAL OF KUIPER SYSTEMS, LLC APPLICATION OF AUTHORITY TO DEPLOY AND OPERATE A KA-BAND NON-GEOSTATIONARY SATELLITE ORBIT SYSTEM

Summary:
I request reconsideration and a stay of the FCC's decision granting a license on July 29, 2020, to Amazon or Kuiper for the Kuiper Systems LLC 3,236 satellites and request that the decision be reviewed, because the Commission did not engage in reasoned decision-making. The FCC showed no evidence of conducting a thorough and objective "public interest analysis" (eg. 21). Despite having a year to consider this license, the Commission did not review all relevant information or consult with other experts or stakeholders on this project despite the many negative potential impacts. The Commission did not discuss numerous federal rules or international conventions that protect the public interest including the Commission's own first duty required in 332(a)(1) to promote the safety of life and property. The FCC did not notify the public of this application or hold public hearings to receive comment. The FCC falsely concluded that the application "would advance the public interest" (¶ 3) and will "serve the public interest…[and] benefit American consumers (¶ 9), but the FCC specified negligible "requirements and conditions specified herein"; the Commission chiefly concerned itself with promoting wireless space-based broadband, interference between competitors, and allowing investment. The decision was not logical or rational given the potentially grave environmental impacts from these satellites and their launches and the damage they will cause to property and life.

The FCC's neglect of issues of staggering national and international importance to the American people and people of other countries shows this was no analysis at all. In this decision, the FCC violated its federal mandate and its duty.

TABLE OF CONTENTS

Table of Authorities 3

I. Narrow focus and neglect of regulatory role and duty 4

II. No evaluation of federal and state laws and international conventions that conflict 6

A. ADA, ADA Title II, FHA 7

B. Public rights of way rules and state laws 9

C. Environmental laws 10

D. International Human Rights conventions, resolutions, and laws 10

E. Other considerations and laws 12

III. No evaluation of extensive public health or environmental effects 14

A. Environmental damage – rocket launches 14

B. Interference with Earth's natural electrical circuit 16

C. Environmental and health damage to humans and Earth biology from RF-EMF 19

D. Environmental damage, property damage, and casualties from space debris and fall-out 21

E. Amazon record 22

IV. 'Taking' of the commons 22

V. Conclusion 23

Affidavit of Nina Beety 24

Exh. A Thomas Banyacya, speech to the United Nations,
Exh. B GUARDS, comments to FCC on 5, 9/28/16
Exh. C GUARDS, comments to the FCC on SpaceX, 7/28/15
Exh. D Nina Beety, comments to FCC on Google Loon, 1/13/16
Exh. E Chart: Biological Effects Of Microwaves Below U.S. & Canada's Regulatory Limits

TABLE OF AUTHORITIES

U.S. Constitution	6, 23
47 U.S.C. § 255	8, 13
47 U.S.C. § 332(a)(1)	1, 6, 13, 19
47 U.S.C. § 414	6, 7, 13
1996 Telecommunications Act, Section 601(c)(1)	6, 7, 13
51 U.S.C. § 50901(a)(7)	7
Americans with Disabilities Act (ADA), including ADA Title II	7-9
Fair Housing Act Section 3604 (42 U.S.C. § 3604) (FHA)	7-9
National Environmental Protection Act (NEPA)	10
Migratory Bird Act	10
U.S. Access Board/NIBS Indoor Environmental Quality report, 2005	8
California Constitution	7
California Environmental Quality Act	10
California Public Utilities Code Section 7901	10
European Union Resolution #2008/2211(INI)	8
U.N. Declaration of Human Rights, Article 3	10
Nuremburg Code of Ethics	11
U.N. Convention on the Rights of the Child, Articles 3, 23, and 24	11
U.N. Convention on the Rights of Persons with Disabilities, Articles 1, 3, and 15(2)	12
General Assembly Resolution 66/288 (275)	12
ITU Resolution 76	5
FCC Mitigation of Orbital Debris, Report, Order, Further NPRM	21

I. NARROW FOCUS AND NEGLECT OF REGULATORY ROLE AND DUTY

On July 29, 2020, the FCC granted a license for Kuiper Systems, LLC (Amazon or Kuiper; called here Amazon/Kuiper) to operate 3,236 satellites to provide broadband service. However, the FCC failed to support its conclusions that:

> ¶ 3. "We conclude that grant of Kuiper's application would advance the public interest by authorizing a system designed to increase the availability of high-speed broadband service to consumers, government, and businesses."
> ¶ 9 "The broadband services Kuiper proposes to provide will benefit American consumers."

The public has many vital "Interests" and priorities other than broadband internet, yet the FCC in its approval (and likely on previous ones) failed to consider these interests and priorities, did not consider conflicts between them, and did not determine whether costs could outweigh benefits.

The FCC's decision was largely limited to technical considerations -- potential for interference with other satellite systems, (eg. ¶ 13, 14 and 16 "protect GSO networks" from non-interference) and ¶ 50(m) "harmful interference" with federal facilities – and Amazon/Kuiper's status as a late entrant. However, no reference was made to protecting biological beings or even medical equipment from "harmful interference", and the FCC did not discuss interference with earth's natural electrical circuit.

The Commission and Amazon/Kuiper also focused on investment opportunities:

> ¶ 42 "an open processing round approach would result in a deteriorating investment environment"
> ¶ 44 "the substantial financial investment underway would be stifled… that does not mean that investment expectations of prior authorized systems cannot be adversely affected"…

They neglected the public's "prior" "substantial" existence and broad interests including investment and economic opportunities that would be "adversely affected" or "stifled" in a "deteriorating investment environment" directly caused by Amazon/Kuiper's network, including lack of access for EMF-disabled people, impacts to agriculture and other negative impacts.

The FCC's decision also runs counter to the scientific evidence and federal laws submitted by public stakeholders on other applications, including Google and SpaceX applications. In fact, there is no clear process for reviewing scientific work submitted by experts and the public. No public hearings have been held on this license, despite that every human is a stakeholder in these applications and there was abundant time. There was no public notification such as occurs for utility company rate cases and initiatives. Instead, the FCC rejected any open or public process. It also appears the FCC did not budget funding to convene a committee of experts to consider the wide range of issues pertaining to this application. By disregarding subjects of vital and even overriding importance, the FCC's decision was not logical or rational or in the public's interest.

Before this decision was final, FCC General Counsel Thomas Johnson's editorial in the Washington Post[1] and in tweets and Commissioner Carr in an interview with Fierce Wireless[2] and in tweets slandered, libeled, and stigmatized the public who raise science-based issues to the Commission and oppose careless deployment of RF-EMF without reasoned analysis. As attorneys, both should be well-aware of their duties as officers of the court and public officials, particularly Mr. Stephens whose office is the "principal legal advisory office to the Commission as a whole…[including to] assist the Commission in its decision-making capacity."[3] This demonstrates that the FCC and its decision-making are compromised by bias and prejudice at the very top.

The FCC appears to make these satellite systems self-policing. Despite the GSO Operators' request (¶ 28) that Amazon/Kuiper "must have completed coordination with other NGSO operators to ensure compliance with aggregate EPFD limits", the FCC declined to adopt this requirement, deciding instead that Amazon/Kuiper "Kuiper must comply with ITU Resolution 76, which makes all NGSO FSS systems…jointly responsible for keeping aggregate EPFD levels within limits". This is self-policing on the honor system. The FCC also orders in ¶ 59 (f) that the company "cooperate with other NGSO FSS operators in order to ensure that all authorized operations jointly comport with the applicable limits for aggregate equivalent power flux density in the space-to-Earth direction".

Who will police? How will aggregate EPFD levels be measured? Who will know if limits are exceeded? How will fierce competitors decide who will turn down power, and who will not? FCC doesn't police or enforce now,[4] and self-policing strategies haven't worked

---

[1] https://www.washingtonpost.com/opinions/2020/06/04/5g-conspiracy-theories-threaten-us-reco very/
5G conspiracy theories threaten the U.S. recovery, June 4, 2020

[2] https://www.fiercewireless.com/regulatory/carr-5g-upgrade-order-will-make-antenna-swaps-faster-more-predictable
Carr: 5G Upgrade Order will make antenna swaps faster, more predictable, May 27, 2020

[3] Press release July 6, 2020, Chairman Pai names Ashley Boizelle acting FCC General Counsel

[4] http://www.wsj.com/articles/cellphone-boom-spurs-antenna-safety-worries-1412293055
One in 10 [cell tower] sites violates the rules, according to six engineers who examined more than 5,000 sites during safety audits for carriers and local municipalities.. The FCC has issued just two citations to cell carriers since adopting the rules in 1996. The FCC says it lacks resources to monitor each antenna.

"It's like having a speed limit and no police," said Marvin Wessel, an engineer who has audited more than 3,000 sites and found one in 10 out of compliance.

http://www.marketwire.com/press-release/-1770139.htm
Hundreds of wireless industry-operated antenna sites from Maine to California have been tested by EMRPI and found to be in gross violation -- up to and in excess of 600% -- of the FCC's public exposure limits…EMRPI informed FCC Chairman Julius Genachowski in December 2011 of widespread FCC rules violations. Despite detailed complaint letters sent to FCC Enforcement Bureau Chief P. Michele Ellison, ofRF safety violations in 23 states across all regions of the US, EMRPI has received no response that the FCC has taken any enforcement action against any noncompliant site. EMRPI's investigation re-tested sites and found violations still occurring months after EMRPI's initial filings with the FCC… FCC policy allows wireless companies to self-report their compliance with the lawful RF limits. The FCC website provides no information or procedures for either the public or workers to report potential or actual violations. Despite hundreds of thousands of wireless antenna sites across the US, since 1996 the FCC

for land-based antenna systems. They certainly won't work for space-based systems hanging over us, releasing RF-EMF emissions everywhere. This is reckless.

Does the FCC require Amazon and Kuiper to have General Liability Insurance without a pollution exclusion? On what basis is the American taxpayer indemnified in this license from any potential liability for damage, injury, and loss of life from this system?

What is the lifespan of these satellites? How often will they have to be replaced?

The Commission refused to examine all the relevant data. There was time to consider these issues, consult with experts and stakeholders, and involve the public. Instead, the FCC so narrowly limited the data it considered relevant and the input it accepted that it made the evaluative process meaningless. Despite devoting a full year to the Amazon/Kuiper review, the meager decision is remarkable. The FCC failed to conduct any detailed or significant analysis.

This is a reckless abdication of the public interest.

II NO EVALUATION OF FEDERAL AND STATE LAWS AND INTERNATIONAL CONVENTIONS THAT CONFLICT

The FCC exists under the jurisdiction of the U.S. Constitution and its charge to promote the general welfare, as well as establish justice, insure domestic tranquility and secure the blessings of liberty. But the FCC's microscopically thin definition of "public interest" completely fails as a rational description of this charge.

The FCC ignored its first obligation to promote the safety of life and property, as required by Section 332(a)(1) of the Communications Act of 1934 (47 U.S.C. § 332(a)(1)) that even a non-attorney such as myself can see in a plain reading:

> "(a) …In taking actions to manage the spectrum to be made available for use by the private mobile services, the Commission shall consider, consistent with section 151 of this title, whether such actions will—
> (1) promote the safety of life and property…"

The FCC also cannot sidestep other federal, state, or local laws according to the plain language of the Telecommunications Act from Title VI "Effect on Other Laws".

> SEC. 601. APPLICABILITY OF CONSENT DECREES AND OTHER LAW.
> (c) FEDERAL, STATE, AND LOCAL LAW.—
> (1) NO IMPLIED EFFECT.—This Act and the amendments made by this Act shall not be construed to modify, impair, or supersede Federal, State, or local law unless expressly so provided in such Act or amendments.

Further, 47 U.S.C. § 414 states

---

has issued only one wireless Notice of Violation, and not until 2010.

> SEC. 414. [47 U.S.C. 414] REMEDIES IN THIS ACT NOT EXCLUSIVE.
> Nothing in this Act contained shall in any way abridge or alter the remedies now existing at common law or by statute, but the provisions of this Act are in addition to such remedies. [5]

California's Constitution recognizes people's rights to safety, happiness, privacy, life, and liberty. Other states have similar provisions, but the FCC's grant of license to Amazon/Kuiper conflicts with those rights. The Commission decision also conflicts with state laws that include anti-discrimination laws and environmental laws.

It seems the FCC violated federal law and international obligations because the Commission did not protect public health and safety, the safety of property, or national security. This is based on a plain reading of 51 U.S.C § 50901(a)(7)

> 51 U.S. Code Chapter 509 - COMMERCIAL SPACE LAUNCH
> Section 7 of the following excerpt from the Legal Information Institute: (7) the United States should encourage private sector launches, reentries, and associated services and, only to the extent necessary, regulate those launches, reentries, and services **to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States** (emphasis added)[6]

The Commission failed to consider compliance with other important federal laws in light of the Amazon/Kuiper satellite proposal.

A. ADA, ADA Title II, and FHA

Federal civil rights rules are fundamental to freedom, protecting from discrimination and denial of access to housing and community. The FCC did not include consideration of the Americans with Disabilities Act or the Fair Housing Act or state equivalent civil rights rules in its order granting this license, despite Section 601(c) and Section 414.

I am disabled by electromagnetic sensitivity. The emissions from EMF-emitting devices pose serious disabling health effects to me, and I qualify as disabled under ADA's definition -- substantially limits one or more major life activities including major bodily functions. I and many others are EMS-disabled in the U.S. and other countries. The

---

[5] "Moreover, the TCA contains explicit language that narrows the reach of the statute. Section 414 provides that "nothing in this chapter contained shall in any way abridge or alter the remedies now existing at common law or by statute, but the provisions of this chapter are in addition to such remedies," which indicates that Congress intended that the rest of Chapter 5 of Title 47 would not abrogate provisions of other federal statutes."
G v. Fay Sch., Inc.,
282 F. Supp. 3d 381 (D. Mass. 2017)

[6] https://www.law.cornell.edu/uscode/text/51/50901 cited in GUARDS Informal Objection to SpaceX Application for Experimental License File No. 0356-EX-PL-2015

U.S. Access Board recognized EMS and that it could be considered disabling in 2002, and commissioned the National Institute of Building Sciences to develop a report on building modifications and accommodations for EMS-disabled people and those with multiple chemical sensitivities which was released in 2005.[7] In 2009 the European Parliament passed Resolution #2008/2211(INI) [8]

> It also calls on the 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.

The California legislature gave ADA accommodation to EMS-disabled people in 2017.

The FCC ignores these conditions and this growing disabled group, making false statements that "…there is no evidence to support that adverse health effects in humans are caused by exposures at, under, or even in some cases above, the current RF limits."[9] The Commission stands between me and my doctor, interfering with his advice and treatment of me. The FCC's reckless policies and uncontrolled rush to deploy wireless technologies and grant satellite licenses, including this license, cause life-threatening discrimination and danger to me and others already disabled by EMS and other sensitive medical conditions including those with medical implants. We are denied our civil rights, blocked from free and equal access to our communities and economic opportunities, public services, democratic process, and free association with our peers. This license and the FCC block me and others from the use and enjoyment our own homes because of the pervasive and pernicious nature of this environmental toxin RF-EMF used by these inaccessible services. We are grossly discriminated against.

By approving Amazon/Kuiper's project, the FCC and Amazon/Kuiper further violate the civil rights of EMF-disabled people, creating insurmountable barriers everywhere, with no safe place for anyone. The FCC ignores its duties under federal and state laws and shows depraved indifference toward our suffering and loss of freedom and civil liberties.

Healthy people can use these services but Amazon/Kuiper's satellite services are inaccessible to me and others. This violates the 1934 Communications Act

> Section 255, entitled "Access by persons with disabilities," is clearly directed toward telecommunications providers and manufacturers of telecommunications equipment, and mandates that these entities ensure that equipment and services are "accessible" to disabled individuals.[10]

The FCC has not conducted a transition plan per its ADA Title II obligations on how it

---

[7] https://www.access-board.gov/research/completed-research/indoor-environmental-quality
[8] https://oeil.secure.europarl.europa.eu/oeil/popups/summary.do?id=1074023&t=e&l=en
https://oeil.secure.europarl.europa.eu/oeil/popups/printsummary.pdf?id=1074023&l=en&t=E
[9] Paragraph 12, Order and NPRM 13-84, 19-226 p. 7
[10] 47 U.S.C.§ 255; G v. Fay Sch., Inc.,
282 F. Supp. 3d 381 (D. Mass. 2017)

will accommodate disabled persons with electromagnetic sensitivity and other EMF-sensitive medical conditions in its policies, practices, and rulemakings, despite that it has been notified for decades that this disabled population exists.

Scientists, physicians, academics, experts, and members of the public have provided documents, references, and personal testimonials to the Commission in many FCC proceedings. Boston and Philadelphia comments in 13-84 and 19-226 are among them.[11] FCC top officials with no science or medical credentials respond by demeaning medical doctors, research scientists, EMS-disabled persons, and the public as conspiracy theorists and "tin-foil hats", as previously mentioned.

The Fair Housing Act prohibits discrimination on the basis of disability in housing that makes a home inaccessible or uninhabitable.

> Excerpts (emphasis added):
> Sec. 804. [42 U.S.C. 3604] **Discrimination in sale or rental of housing and other prohibited practices** As made applicable by section 803 of this title and except as exempted by sections 803(b) and 807 of this title, it shall be unlawful--
> **…**
> (f)
> (1) To discriminate in the sale or rental, or to otherwise make unavailable or deny, a dwelling to any buyer or renter because of a handicap of--
> (A) that buyer or renter,
> (B) a person residing in or intending to reside in that dwelling after it is so sold, rented, or made available; or
> (C) any person associated with that buyer or renter.
> (2) To discriminate against any person in the terms, conditions, or privileges of sale or rental of a dwelling, or in the provision of services or facilities in connection with such dwelling, because of a handicap of--
> (A) that person; or
> (B) a person residing in or intending to reside in that dwelling after it is so sold, rented, or made available; or
> (C) any person associated with that person.
> (3) For purposes of this subsection, discrimination includes--
> …(B) a refusal to make reasonable accommodations in rules, policies, practices, or services, when such accommodations may be necessary to afford such person equal opportunity to use and enjoy a dwelling;

B. Public rights of way rules and state laws

Granting this license for pervasive exposure blocks access to the public rights of way – to sidewalks, roads, and highways – interfering with state and local rules and enforcement of full, free, and equal access to the public rights-of-way by state and

[11] https://ecfsapi.fcc.gov/file/7520958706.pdf

municipal governments.[12] This license increases access barriers to public spaces including parks to which disabled people are also guaranteed equal access.

C. Environmental laws

The Commission ignored environmental laws such as National Environmental Protection Act (NEPA) and the Migratory Bird Act. and state laws such as the California Environmental Quality Act. Granting this license is a major federal action that causes a major change in the environment. That requires NEPA review. To repeat comments made in another license consideration:

> Implementation of 5G is a major Federal action significantly affecting the quality of human environment; as such, a NEPA review is triggered. NEPA is not limited to specific projects and FCC approval of 5G rules as well as the dockets herein constitute "major Federal actions." The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [Envtl. Def. Fund v. Tenn. Valley Auth., 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether "services or capabilities are essential to public health, safety, or in the public interest" (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.
>
> This proposal also triggers the need for a Memoranda of Understanding (MOU) with U.S. Fish and Wildlife Service under Executive Order 13186 concerning effects on migratory birds.
> Global Union Against Radiation Deployment From Space, September 28, 2016[13]

These satellites will occupy the sky above the earth, interfere with astronomy, possibly interfere with GPS and air traffic, and interfere with the public's quiet enjoyment of the sky. It will impact public health and environment. It can have serious impacts on agriculture and food availability, due to impacts on plants, trees, and pollinators.

D. International Human Rights conventions, resolutions, and laws

The FCC also did not mention several international conventions in its decision which it appears to violate, including protection of humans, children, and disabled persons.

> 5G violates Article 3 of The U.N. Declaration of Human Rights, ratified by the General Assembly in 1948, which states "everyone has the right to life, liberty and security of person." Data exist showing RF radiation can cause serious biological effects at levels far below the existing FCC RF limits (www.bioinitiative.org). These include damage to DNA which can lead to an

[12] For example, California Public Utilities Code Section 7901

[13] GUARDS comments to the FCC in GN Docket No. 14-177, IB Docket No. 15-256, RM Docket No. 11664, WT Docket No. 10-112, IB Docket No. 97-95

increased risk for cancer and deleterious genetic mutations passed on to future generations. Decreases in sperm count and quality and increases in miscarriage and infertility have also been demonstrated in response to exposure to RF radiation. Although much of the recent research focuses on frequencies in WiFi and cellphone ranges, prior research is available showing serious biological effects in the millimeter wavelengths that are being proposed for 5G wireless.

Observed higher resonance frequencies of a living cell coincide with frequencies of radiation of communications satellites. The power densities and duration of irradiation created by these satellites will significantly exceed (by ten or more orders of magnitude—such irradiation is possible over the course of a whole lifetime) the energetic doses inducing changes in living cells…

Forced exposure to an agent that has the effects discussed above and enumerated in the resources listed above would have to be considered a violation of the Nuremberg Code of Ethics (http://www.hhs.gov/ohrp/archive/nurcode.html). 5G would force such an exposure.

Furthermore, 5G wireless proposals violate Article 25 of International Human Rights (1), which states, “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.”

Exposure to an agent that disrupts hormones, sleep, cardiac and neurological function, and has forced numerous people from their homes and into poverty is an obvious violation of numerous fundamental rights which are to be universally protected according to The U.N. Declaration of Human Rights. Violation of U.N. Convention on the Rights of the Child Under the Convention on the Rights of the Child, states/countries are responsible for acting in their children’s best interest. In this case, that would mean halting implementation of 5G wireless, pending medical-grade safety testing…Dr. [Erica] Mallery-Blythe’s presentation[14] references several U.N. Conventions on the Rights of the Child that would be violated by this project including:

> Article 3 (best interests of a child) The best interests of a child must be a top priority in all decisions and actions that affect children.
> Article 23 (children with a disability) A child with a disability has the right to live a full and decent life with dignity, and, as far as possible, independence and to play an active part in the community. Governments must do all that they can to support disabled children and their families.
> Article 24 (health and services) Every child has the right to the best possible health. Governments must provide good quality health care,

[14] https://www.youtube.com/watch?v=sNFdZVeXw7M

> clean water, nutritious food and a clean environment and education on health and wellbeing so that children can stay healthy...

Violation of U.N. Convention on the Rights of Persons with Disabilities: Increasing numbers of countries, such as Sweden and France, (as do the Canadian Human Rights Commission and European Parliament) recognize Electrohypersensitivity (EHS) as an environmentally induced functional impairment or disability triggered by exposure to electromagnetic fields (including RF). Continental or global WiFi would contravene:

> Article 1 "promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity";
> Article 3 "Full and effective participation and inclusion in society"; Article 15(2) states: "Parties shall take all effective legislative, administrative, judicial or other measures to prevent persons with disabilities, on an equal basis with others, from being subjected to torture or cruel, inhuman or degrading treatment or punishment"; and violate the intent of many more Articles, since the planet would be blanketed with microwave radiation that those suffering EHS could not escape.[15]

In addition, the FCC violates General Assembly Resolution 66/288 "The Future We Want" (July 2012) which says in part:

> 275. We recognize the importance of strengthening international, regional and national capacities in re-search and technology assessment, especially in view of the rapid development and possible deployment of new technologies that may also have unintended negative impacts, in particular on biodiversity and health, or other unforeseen consequences[16]

E. Other considerations and laws

I am not attorney, but as an ordinary person, I have a basic understanding of other principles that pertain to this situation.

The FCC's decision approving Amazon/Kuiper's satellite network and other network approvals are mandated exposures for everyone and everything. For many including myself, the radiation from these satellites is a pernicious and pervasive toxin from which there is no escape and no freedom or relief. The FCC did not consider my rights or the rights of others to be free from this intrusion or to be free of compulsory exposure. The FCC also did not discuss my right to refuse it, and attempted to bypass constitutional protections of personal rights and property rights vis-a-vis exposure in its decisionmaking on 5G and wireless broadband.

---

[15] GUARDS Comments to the FCC in GN Docket No. 14-177, IB Docket No. 15-256, RM Docket No. 11664, WT Docket No. 10-112, IB Docket No. 97-95

[16] http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E cited in GUARDS Informal Objection to SpaceX Application for Experimental License File No. 0356-EX-PL-2015

Granting this license can be considered a takings and eminent domain without due process and without compensation. I will not be able to exclude this radiation from my home or property. This RF transmission permitted by the FCC is a violation of my personal private property rights and is, therefore, trespass.

> FCC-authorized emissions intrude on private property against the owner's will. "The hallmark of a protected property interest is the right to exclude others. That is 'one of the most essential sticks in the bundle of rights that are commonly characterized as property.'" Coll. Sav. Bank v. Fla. Prepaid Postsecondary Educ. Expense Bd., 527 U.S. 666, 673, 119 S. Ct. 2219, 2224 (1999).[17]

Furthermore, this decision allows Amazon/Kuiper to conduct its commercial business through people's homes and properties and through their physical bodies. This could constitute home invasion as well as battery.

> FCC-authorized emissions violate non-consenting citizens' "right to be let alone." In common law and most state statutes, non-consensual irradiation is a "battery." "A battery is an intentional act that causes harmful or offensive bodily contact." Doe v. District of Columbia, 796 F.3d 96, 107 (D.C. Cir. 2015). RF/EMF radiation "contacts" the body and penetrates the skin. People who suffer contact and penetration after expressing non-consent will be both harmed and offended. The wireless provider is intentionally unleashing radiation and knows there will be contact.[18]

Amazon/Kuiper's satellite system is a defective product because it cannot accommodate EMS-disabled people. Applying for a license to deploy this defective product and approving it may be considered fraud.

This is a violation of air rights which even during World War II had to be compensated.

> Government-authorized interference with enjoyment and use of the land is a compensable taking. United States v. Causby, 328 U.S. 256, 66 S. Ct. 1062 (1946) (non-physical intrusion of airport noise)…[19]

If I were an attorney, which I am not, I would be well versed on additional considerations and federal and state rules that are at issue here.

By neglecting TCA and Communications Act provisions, the FCC's own mandate, and state and federal laws and international conventions, the Commission's decision is not logical or rational and may not be legal.

I incorporate by reference comments filed in other satellite proceedings by Global Union Against Radiation from Space (GUARDS) attached herein.

---

[17] Cited in Joint Opening Brief, p. 88, EHT v FCC
[18] ibid p. 89
[19] Cited in Joint Opening Brief, p. 88, EHT v FCC

III. NO EVALUATION OF EXTENSIVE PUBLIC HEALTH OR ENVIRONMENTAL EFFECTS

"Thank God men cannot fly, and lay waste the sky as well as the earth,"
Henry David Thoreau

A. Environmental damage – rocket launches

This space initiative and the others like it can be appropriately described as trashing the planet.

The atmosphere is a thin layer around the Earth. It sustains life and is fragile. Harmful impacts from Amazon/Kuiper's satellite program include:

- Pollution from rocket launches – exhaust, soot, chemical fall-out – contaminating air, water, and land
- Climate damage from rising atmospheric soot
- Ozone damage and depletion
- Consumption and burn-up in space of earth resources – irresponsible
- Fossil fuel use

I will discuss later these impacts:

- Satellite and satellite debris contaminating Earth's upper atmosphere
- Collisions of satellite and debris intensifying contamination
- Atmospheric contamination/pollution from satellite de-orbitting and burning up
- Satellite debris damaging the earth

The Earth and the atmosphere have never experienced the volume of rocket launches or orbiting satellites happening now and planned. A few thousand satellites are currently in orbit. This will increase to tens of thousands of satellite launches and other launches. These satellites have short lifespans, so rocket launches will constantly be required to put new satellites into service, while defunct satellites will continue orbiting until re-entry into Earth's atmosphere. The FCC has ignored all but the debris problem, and minimizes that, and the Commission devotes only one short paragraph to radio astronomy impacts (G. Other Matters, ¶ 57)

Each fossil-fuel-burning rocket launch uses toxic chemicals and metals and causes toxic fallout. They also put particulate matter and exhaust into the atmosphere, and destroy part of the ozone layer.[20]

For example, before leaving Earth's atmosphere, each shuttle spewed thousands of

[20] https://www.5gspaceappeal.org/the-appeal/
www.stopglobalwifi.org

pounds of metals and other chemicals into the air, including lithium, nickel, mercury,[21] bismuth, manganese, aluminum, iron, and zinc. “People think of a shuttle launch as a short-term, finite event, but each launch expels a huge amount of debris into the atmosphere with the potential for long-term effects on the surrounding ecosystem. The plume contains hydrogen chloride, a strong acid. After launches, the pH of the [nearby] lagoons may plummet for a short time, rendering the water nearly as caustic as battery acid.” -- John Bowden, environmental chemist at Hollings Marine Laboratory in Charleston, S.C., 2014[22]

The many thousands of rockets for Wi-Fi and 5G will dramatically worsen this.[23]

> Global wireless (5G) from space as envisioned by telecommunications giants would utilize extensive satellite networks and require the launch of hundreds of kerosene-burning rockets annually. This would re-distribute the ozone layer and significantly contribute to climate change (http://www.eucassproceedings.eu/articles/eucass/pdf/2013/01/eucass4p657.pdf) .
> Martin Ross of the Aerospace Corporation was the lead author of a paper published in 2010 titled "Potential climate impact of black carbon emitted by rockets" (http://onlinelibrary.wiley.com/doi/10.1029/2010GL044548/abstract). The authors developed a computer model to predict what would happen in different parts of the planet if the number of launches burning kerosene (then 25 annually) increased by a factor of ten. His model predicts as much as a 4% loss of ozone over the tropics and subtropics, as much as a 3-degree Celsius summertime increase in temperature over the South Pole, more than a one-degree overall increase in Antarctic temperature, and a decrease in Antarctic sea ice by 5% or more.
>
> In a 2011 Aerospace article titled "Rocket Soot Emissions and Climate Change" (http://www.aerospace.org/crosslinkmag/summer2011/rocket-soot-emissions-and-climate-change/), Ross states “The Aerospace study shows that the radiative forcing of soot from a given hydrocarbon rocket scenario is as much as 100,000 times that of the carbon dioxide from the rockets.” Obviously, the soot or black carbon emissions would be an important factor in accelerating climate change if the planned launches move forward.
>
> Solid state rocket exhaust is no better. It contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of solid state rockets. The New York Times (May 14, 1991, p. 4; http://www.nytimes.com/1991/05/14/news/some-say-the-rockets-redglare-

[21] https://www.peer.org/news/press-releases/mercury-may-reach-orbit-through-regulatory-blindspot.html

[22] http://www.environmentalhealthnews.org/ehs/news/2014/may/space-shuttle-contaminants

[23] https://www.cellphonetaskforce.org/planetary-emergency/

> is-eating-away-at-the-ozone-layer.html) quoted Aleksandr Dunayev of the Russian Space Agency saying,
>
> "About 300 launches of the [space] shuttle each year would be a catastrophe and the ozone layer would be completely destroyed."
>
> At that time, the world averaged only 12 rocket launches per year. Maintaining a fleet of (ultimately) 4,000 satellites, each with an expected lifespan of five years, will likely involve enough yearly rocket launches to be an environmental catastrophe. (emphasis added)

B. Interference with Earth's natural electrical circuit

The FCC discussed extensively the "interference environment" eg ¶ 48 and not causing "harmful interference in any operational system" ¶ 50, but gives no consideration to the interference these space-based transmitting and receiving equipment can cause in biological systems or interference in medical implants and devices, or interference with wireless utility equipment or other equipment in place in communities.

The most critical interference ignored by the FCC is the potentially catastrophic effect this will have on the Earth's natural electrical circuit.

The finely tuned and balanced natural electricity, polarities, magnetics, frequencies, and ions around and within all living beings and the Earth make life possible and healthy, and create homeostasis in, on, and around the Earth. This system is being disrupted, altered, overridden, and silenced by powerful manmade artificial electromagnetic fields, including pulsed and encoded RF-EMF. Arthur Firstenberg's "The Invisible Rainbow", especially Chapter 9, discusses the natural electromagnetic environment

> Living organisms [] are part of the global circuit. Each of us generates our own electric fields, which keep us vertically polarized like the atmosphere, with our feet and hands negative with respect to our spine and head. Our negative feet walk on the negative ground, as our positive heads point to the positive sky. The complex electric circuits that course gently through our bodies are completed by ground and sky, and in this very real way the earth and sun, the Great Yin and the Great Yank of the Yellow Emperor's Classic, are energy sources for life.
> …Electrically, too, life is essential. Living trees rise hundreds of feet into the air from the negatively charged ground. and because most raindrops, except in thunderstorms, carry positive charge down to earth, trees attract rain out the clouds, and the felling of trees contributes electrically towards a loss of rainfall where forests used to stand.
> …The house we live in, which is the biosphere, the roughly 55-mile-high space filled with air that wraps around the earth, is a resonant cavity that rings like a gong every time a lightning bolt strikes. In addition to maintaining the static electric field of 130 volts per meter in which we all stand and walk, and in which birds fly, lightning sets the biosphere ringing at particular low frequency tones…It

> so happens that in a state of awake relaxation, our brains tune in to these precise frequencies. The dominant pattern of a human electroencephalogram, from before birth through adulthood – the well-known alpha rhythm…-- is bounded by the first two Schumann resonances. An old part of the brain call the limbic system, which is involved in emotions, and in long-term memory, produces theta waves…bounded above by the first Schumann resonance…The first Schumann resonance, [Herbert Kőnig] wrote, is so completely identical to the alpha rhythm that even an expert is hard pressed to tell the difference between the tracings of the brain and the atmosphere.
> …Hsiao-Tsung Lin is a professor of chemical and material science at National Central University in Taiwan. The qi that flows through our meridians, he tells us, is an electrical current that brings both power and information to our cells, current whose source is both internal and external. Every acupuncture point has a double function: as an amplifier for the internal electrical signals, boosting their strength as they travel along the meridians; and as an antenna that receives electromagnetic signals from the environment. The dantians, or energy centers of Chinese medicine, located in the head, heart, and abdomen – equivalent to the chakras of Indian tradition – are electromagnetic oscillators that resonate at particular frequencies, and that communicate with the meridians and regulate their flow. They have capacitance and inductance like oscillators in any electrical circuitry. The body, says Lin, is a super-complex electromagnetic oscillation network, enormously intricate and delicate…

There is much more. In addition, Martin Pall PhD and others have written extensively on activation of voltage-gated calcium channels by low-level microwave EMF.

The atmosphere's natural electromagnetic system has been contaminated and damaged for decades by military and telecommunications work and equipment, including damage to the Van Allen belts, bombardment of the magnetosphere, and intentional altering of the ionosphere. Scientists have shown for decades the damage this artificial, out-of-balance EMF does to everything. Now the intense "development" of space including the Amazon/Kuiper project will inject RF-EMF including 5G's encoded, phased frequencies on a massive scale into the atmosphere and at the Earth. The only thought processes seem to be "Gee whiz, we're the Jetsons" or "Look, I'm Captain Picard from Star Trek".

Amazon/Kuiper is obsessed with consumerism. Consumerism sucks the life force from this Earth and from humans, disconnecting humans from what's real and from themselves, strips resources, destroys ecosystems, uproots peoples, destroys countries, is a leading cause of wars and conflict, and eviscerates this beautiful planet -- all for a quick consumptive "fix" at great temporary profit to the companies. The backlash of reduced oxygen, reduced magnetic field, reduced ozone, increased CO2, increased UV radiation, the great extinction of species, and climate change underway signals approaching death due to consumerism and the quest for power and money. Heedless of the future, the 7th generation, and the great environmental damage worldwide, modern day Easter Islanders are cutting down the last proverbial tree for

these delusional and dangerous projects that threaten to extinguish all life and this beautiful Earth with their artificial fire. And the FCC pours gasoline on these flames.

Hopi spiritual leader Thomas Banyacya told Hopi prophecies to the United Nations in 1992.[24] He said because of human actions, three previous worlds have been destroyed on Earth, and only a few people escaped each time. He said we are now in the Fourth World, repeating the same mistakes, disconnected from nature and spiritual values. He said time is running out to change direction and save the Earth and us. He warned that living on the technology path, disconnected from Earth, will lead to destruction:

> This Hopi ceremonial rattle represents Mother Earth. The line running around it is a time line and indicates that we are in the final days of the prophecy. What have you as individuals, as nations and as the world body been doing to take care of this Earth?
>
> …Nature itself does not speak with a voice that we can easily understand. Neither can the animals and birds we are threatening with extinction talk to us. Who in this world can speak for nature and the spiritual energy that creates and flows through all life? In every continent are human beings who are like you but who have not separated themselves from the land and from nature. It is through their voice that Nature can speak to us …The native peoples of the world have seen and spoken to you about the destruction of their lives and homelands, the ruination of nature and the desecration of their sacred sites. It is time the United Nations used its rules to investigate these occurrences and stop them now.
>
> The Four Corners area of the Hopi is bordered by four sacred mountains. The spiritual center within is a sacred site our prophecies say will have a special purpose in the future for mankind to survive and now should be left in its natural state. All nations must protect this spiritual center.
>
> …The United Nations stands on our native homeland. The United Nations talks about human rights, equality and justice and yet the native people have never had a real opportunity to speak to this assembly since its establishment until today. It should be the mission of your nations and this assembly to use your power and rules to examine and work to cure the damage people have done to this earth and to each other. …
>
> Nature, the First People and the spirit of our ancestors are giving you loud warnings. Today, December 10,1992, you see increasing floods, more damaging hurricanes, hail storms, climate changes and earthquakes as our prophecies said would come. Even animals and birds are warning us with strange change in their behavior such as the beaching of whales. Why do animals act like they know about earth's problems and most humans act like they know nothing. If we humans do not wake up to the warnings, the great purification will come to destroy this world just as the previous worlds were destroyed.
>
> (Thomas and Oren Lyons held up a picture of a large rock drawing in Hopiland.)
>
> This rock drawing, shows part of the Hopi prophecy. There are two paths. The first with high technology but separate from natural and spiritual law leads to these jagged lines representing chaos. The lower path is one that remains in

[24] The Hopi Message To The United Nations General Assembly Submitted By Thomas Banyacya, Kykyotsmovi, Arizona, December 10, 1992

> harmony with natural law. Here we see a line that represents a choice like a bridge joining the paths. If we return to spiritual harmony and live from our hearts we can experience a paradise in this world. If we continue only on this upper path, we will come to destruction.
> It's up to all of us, as children of mother earth to clean up this mess before it's too late.

C. Environmental and health damage to humans and Earth biology from RF-EMF

> "Since the Commission is not a health and safety agency, we defer to other organizations and agencies with respect to interpreting the biological research necessary to determine what levels are safe."
> FCC NOI, 13-84

There are many, many environmental and health issues related to this license. They are not mentioned in the FCC decision. Federal rules dictate that the FCC's first duty is to "promote the safety of life and property, but the Commission neglected its duty as a regulator and violated the public trust by focusing only on promoting commerce. This may constitute criminal negligence.

FCC officials with no medical or biological expertise make these biology-impacting decisions. Medical and biological evidence is unconsidered, and the public is prohibited from commenting at Commission meetings.

The Commission did not convene an expert committee to review information from this perspective or have open meetings with appropriate health and environmental agencies and stakeholders. It did not conduct public hearings regionally to gather the public's information and that of independent experts. It gave no thorough, reasoned analysis of the substantial issues related to this application, and as likely as not, other satellite applications received the same superficial and biased review.

The FCC has received overwhelming documentation from experts for years on the biological effects from wireless radiation exposure. Since the FCC has this documentation easily available in its docketed proceedings, I will only list a few references as reminders:

- www.bioinitiative.org
  The Bioinitiative Report and updates
- https://www.saferemr.com/2018/01/national-toxicology-program-peer-public.html
  National Toxicology Program: Peer & public review of cell phone radiation study reports
- https://smartmeterharm.files.wordpress.com/2018/08/martin-pall-8-18-report-5g-emf-hazards-dr-martin-l-pall-eu-emf2018-6-11us3.pdf
  5G: Great risk for EU, U.S. and International Health! Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them, Martin Pall PhD, 5/17//18
- https://olis.leg.state.or.us/liz/2013I1/Downloads/CommitteeMeetingDocument/426

24
Biological And Health Effects Of Microwave Radio Frequency Transmissions: A Review Of The Research Literature, Paul Dart M.D. etal, 6/4/13

- http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf
  Department of Interior letter on FirstNet to Department of Commerce, 2/7/14
- https://static1.squarespace.com/static/5b8dbc1b7c9327d89d9428a4/t/5dc5c161006ee44c09c8e27f/1573241198220/International+Appeal+-+Stop+5G+on+Earth+and+in+Space.pdf
  https://www.5gspaceappeal.org
  International Appeal to Stop 5G on Earth and in Space
- http://www.ncbi.nlm.nih.gov/pubmed/26300312?dopt=Abstract
  Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression, Martin Pall PhD
- https://kompetenzinitiative.com/wp-content/uploads/2019/08/ki_beesbirdsandmankind_screen.pdf
  Birds, Bees and Mankind: Destroying Nature by 'Electrosmog', Warnke, 2007
- https://www.nature.com/articles/s41598-019-56948-0.pdf
  Radio-Frequency Electromagnetic Field Exposure of Western Honey Bees, Scientific Reports, 2020
- The Invisible Rainbow, by Arthur Firstenberg, AGB Press, 2017
  https://web.archive.org/web/20121027200328/http://moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf
  Report on Possible Impacts of Communication Towers on Wildlife including Birds and Bees, October 2011, Government of India, Ministry of Environment and Forests
- https://wifiinschools.com/uploads/3/4/3/4/34340185/freiburger_appeal.pdf
  2002 Freiburg Appeal
- http://freiburger-appell-2012.info/media/International_Doctors_Appeal_2012_Nov.pdf
  2012 International Doctors Appeal

Statements by the Commission, by General Counsel Thomas Stephens, and by the FCC legal team are completely false on the safety of RF-EMF emissions and RF-EMF-emitting devices. They have no rational or logical basis. If Jeff Bezos cares about protecting the planet as he advertises, he will cancel this project and his other space projects.

There are no federal standards in place to protect humans. The FCC has refused to adopt any non-thermal exposure guidelines for humans or wildlife or vulnerable groups. The FCC decision to allow greater universal exposure by this license and its plan to raise exposure limits 4X in ET19-226 is criminal negligence and depraved indifference. Even the thermal exposure guidelines now in place are hopelessly compromised by averaging, The FCC guidelines have been criticized by the EPA and the Interagency Working Group, and repeatedly censured by independent scientists and health professionals. FCC officials' response to those who raise rational scientific and medical considerations and call for reasoned decision-making is to slander and libel them.

The FCC's lack of public notification and limited time to respond to this approval don't allow for the full discussion that this subject requires.

I incorporate by reference comments filed in other satellite proceedings attached herein.

D. Environmental damage from space debris and fall-out

The staggering contempt for life and property by the Commission is exemplified in the brief discussion of space debris and fall-out in Section D Orbital Debris Mitigation. It only contains three short paragraphs.

Amazon/Kuiper plans to de-orbit 355 days after end of "mission". These satellite launches will occur in close temporal sequence, so they will end their "missions" at similar times. This will result in constant de-orbitation and a shower of debris and pollution plumes over relatively short time spans, repeatedly.

This is an issue of vital public importance. The meager FCC discussion directs the reader to the FCC's new Mitigation of Orbital Debris in the New Space Age, Report and Order and Further Notice of Proposed Rulemaking.[25] This difficult to find but vital document has not yet been published in the Federal Register, so comment deadlines are unclear. In the brief look I've had time for, I find the FCC is discussing "acceptable" casualty rates of 1 per 10,000 people from falling debris.

This means that from one mission or satellite, 47 people in my county are allowed to die. In cities of approximately 1 million, 100 people can die. In the U.S. 30,000 people can die, and in the world, millions of people can die. This is shocking, and the public has no idea or that its safety is carelessly being considered and compromised right now by the FCC.

Why is the FCC, a non-environmental, non-health agency, doing rulemaking on collisions and setting standards for acceptable satellite "disposal"? The EPA and likely the FAA are the correct agencies to review environmental criteria.

Just like the rivers, ocean, and land, the sky and space are being treated like a sewer, a rubbish pit, a dump by the FCC and these much hyped projects. Earth and its people will suffer from these reckless actions.

Many parents teach their children responsibility as they grow up -- to clean up toys and messes before moving on to another project, to participate in family chores. It seems that FCC decision-makers and project planners did not have that essential training and may even have been protected from the negative consequences of their inactions as children. If so, as these parties take enormous power over the Earth, they would have no tools for using it responsibly, even if it is theirs to "take".

[25] https://docs.fcc.gov/public/attachments/FCC-20-54A1.pdf

E. Amazon record

PBS Frontline recently showed the documentary “Amazon Empire: The Rise and Reign of Jeff Bezos” which touched on many issues. For instance, despite Amazon’s enormous profits and extensive holdings, Amazon pays no taxes. The film showed business practices and expansions that cleverly skirt laws, protected by legal and accounting strategems.

It also mentioned other Amazon controversies and problems around safety, including unsafe products, uncertain supply chains, delivery accidents and deaths, unsafe working conditions, impossible workplace goals for its warehouse personnel, low wages for its warehouse workers, and refusal to let workers unionize.

Most of this is well-known, and that should have given the FCC pause in permitting Amazon/Kuiper from operating dangerous machinery in the sky over everyone’s heads.

In relation to this proposed satellite venture, the FCC had the opportunity to do a detailed analysis of Amazon company practices especially around safety in relation to this satellite venture. The FCC failed to do so. The FCC’s narrow focus seems to preclude safety considerations despite the enormous ramifications for Earth and all life.

IV. ‘TAKING’ OF THE COMMONS

The sky and space are the commons. This is the air we breathe, the protective atmosphere over our heads, the climate around us, the sky that many creatures live in, and the beauty we enjoy. The sky and space belong to everyone and everything. They are sacred and alive to many people worldwide.

The sky and space are not the private property of anyone. By granting the Amazon/Kuiper license and others, the FCC has improperly taken what belongs to everyone and handed it to a group of private investors and companies for private financial gain. This will result in incursion, pollution, domination, and ultimately destruction of this commons.

The Earth’s natural electric circuit is a part of everyone and everything. It is essential to all life and the life of the planet. The climate, the magnetosphere, the ionosphere belong to everyone and no one.

Instead of a free sky that Earth’s living creatures can enjoy in its pure beauty, able to see the stars and planets, and receive life from, the sky is burdened, poisoned, and defaced by these spacecraft and their debris. This must stop now.

Some areas of space, according to the FCC’s own report, are already so full of flying debris currently as to be virtually unnavigable. The FCC’s approval of this application worsens this situation.

V. CONCLUSION

The FCC approval of Amazon/Kuiper's application is not promoting the general welfare. This is endangering life on Earth, and depriving everyone of what is theirs by birthright. This is eminent domain and a takings of the Earth.

To paraphrase what I said to the FCC in File No. 0747-EX-PL-2015, the public is prevented from having meaningful input into this process. These approvals at the FCC, approved by engineers, not independent medical professionals or scientists or public stakeholders, without public hearings, without seeking public comment or testimony, and under the political pressure of an industry-dominated agency, happen outside the view of most Americans. The public has to dig around in the FCC website to find decisions despite that these vital decisions are about heavy RF-spewing polluting objects over their heads in the sky.

This is a planetary experiment with no full informed consent and no vote.

Life, health, and a free sky are essential. Broadband, which can be accomplished by wires, is not essential.

I request reconsideration and denial of this license.

Due to the lack of broad public notification on this license of broad public impact, such that an ordinary person can learn of pending applications, and the short time frame of days in which I learned of this application and its approval, I request a variance to submit this request at this time if deadlines have passed, and I request this as a reasonable disabled accommodation under ADA.

Research and information cited are included by reference, including comments filed in other satellite proceedings by Global Union Against Radiation from Space (GUARDS) attached herein.

/s/ Nina Beety
Nina Beety

September 2, 2020

AFFIDAVIT OF NINA BEETY

State of California, County of Monterey,

1. I, Nina Beety, attest that my statements are true to the best of my knowledge.

2. I reside at 277 Mar Vista Drive, Monterey, CA 93940 in Monterey County. My parents also occupy this residence.

3, I am disabled by electromagnetic sensitivity, as disability is defined in the Americans with Disabilities Act and in California law.

4. I filed a protest of the experimental license for Google Loon, and have filed comments in other FCC proceedings.

5. If Amazon/Kuiper's satellite network is launched and made operational, the radiofrequency (RF-EMF) emissions will go onto my property and into my home and will be present everywhere I am. I have no present means of preventing this from occurring. Said radiation is likely to be harmful to my health and safety, that of my family, and my community.

6. Any harm to my health and safety or that of my family or my community due to RF-EMF emissions will be irreparable.

7. Other environmental harms will result from normal launch, operation, and de-orbitting of this system, as well as abnormal events and unforeseen circumstances. I have no present means of preventing this from occurring. These events will likely be harmful to my health and safety, that of my family, and my community.

8. Any harm to my health and safety or that of my family and community from these normal and abnormal Amazon/Kuiper satellite operations and events will be irreparable.

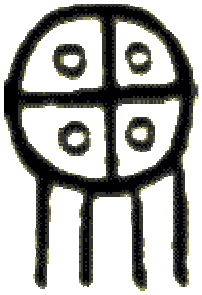
Respectfuliy submitted,

/s/ Nina Beety

Nina Beety
277 Mar Vista Dr.
Monterey, CA 93940

September 2, 2020

Exhibit A



The Hopi Message To The United Nations General Assembly

Submitted By Thomas Banyacya, Kykyotsmovi, Arizona
December 10, 1992

The presentation by Mr. Thomas Banyacya, the final indigenous speaker, was preceded by three shouts by Oren Lyons, Faithkeeper of the Six Nations and first speaker of the day. The shouts were a spiritual announcement to the Great Spirit of the presence of the people assembled and the intention to give a message of spiritual importance.

Thomas then sprinkled corn meal next to the podium of the General Assembly and made a brief remark in Hopi that translates as follows:

Hopi Spiritual leaders had an ancient prophecy that some day world leaders would gather in a Great House of Mica with rules and regulations to solve world problems without war. I am amazed to see the prophecy has come true and here you are today! But only a handful of United Nations Delegates are present to hear the Motee Sinom (Hopi for First People) from around the world who spoke hear today.

My name is Banyacya of the Wolf, Fox and Coyote clan and I am a member of the Hopi sovereign nation. Hopi in our language means a peaceful, kind, gentle, truthful people. The traditional Hopi follows the spiritual path that was given to us by Massau'u the Great Spirit. We made a sacred covenant to follow his life plan at all times, which includes the responsibility of taking care of this land and life for his divine purpose. We have never made treaties with any foreign nation including the United States, but for many centuries we have honored this sacred agreement. Our goals are not to gain political control, monetary wealth nor military power, but rather to pray and to promote the welfare of all living beings and to preserve the world in a natural way. We still have our ancient sacred stone tablets and spiritual religious societies which are the foundations of the Hopi way of life. Our history says our white brother should have retained those same sacred objects and spiritual foundations.

In 1948, all traditional Hopi spiritual leaders met and spoke of things I felt strongly were of great importance to all people. They selected four interpreters to carry their message of which I am the only one still living

today. At that time I was given a sacred prayer feather by the spiritual leaders. I made a commitment to carry the Hopi message of peace and deliver warnings from prophecies known since the time the previous world was destroyed by flood and our ancestors came to this land.

My mission was also to open the doors of this great House of Mica to native peoples. The Elders said to knock four times and this commitment was fulfilled when I delivered a letter and the sacred prayer feather I had been given to John Washburn in the Secretary Generals office in October 1991. I am bringing part of the Hopi message to you here today. We have only ten minutes to speak and time is late so I am making my statement short.

At the meeting in 1948, Hopi leaders 80, 90, and even 100 years old explained that the creator made the first world in perfect balance where humans spoke a common language, but humans turned away from moral and spiritual principles. They misused their spiritual powers for selfish purposes. They did not follow nature's rules. Eventually, their world was destroyed by sinking of land and separation of land which you would call major arthquakes. Many died and only a small handful survived.

Then this handful of peaceful people came into the second world. There they repeated their mistakes and the world was destroyed by freezing which you call the great Ice Age.

The few survivors entered the third world. That world lasted a long time and as in previous worlds, the people spoke one language. The people invented many machines and conveniences of high technology some of which have not been seen yet in this age. They even had spiritual powers that they used for good. They gradually turned away from natural laws and pursued only material things and finally only gambling while they ridiculed spiritual principles. No one stopped them from this course and the world was destroyed by the great flood that many nations still recall in their ancient history or in their religions.

The elders said again only a small group escaped and came to this fourth world where we now live. Our world is in terrible shape again even though the Great Spirit gave us different languages and sent us to the four corners of the world and told us to take care of the Earth and all that is in it.

This Hopi ceremonial rattle represents Mother Earth. The line running around it is a time line and indicates that we are in the final days of the prophecy. What have you as individuals, as nations and as the world body been doing to take care of this Earth? In the Earth today, humans poison

their own food, water and air with pollution. Many of us including children are left to starve. Many wars are still being fought. Greed and concern for material things is a common disease.

In this Western hemisphere, our homeland, many original native people are landless, homeless, starving and have no medical help.

The Hopi knew humans would develop many powerful technologies that would be abused. In this century we have seen the First World War and the Second World War in which the predicted gourd of ashes which you call the atomic bomb fell from the sky with great destruction. Many thousands of people were destroyed in Hiroshima and Nagasaki.

For many years there has been great fear and danger of World War Three. The Hopi believe the Persian Gulf War was the beginning of World War Three but it was stopped and the worst weapons of destruction were not used. This is now a time to weigh the choices for our future. We do have a choice. If you, the nations of this Earth create another great war, the Hopi believe we humans will burn ourselves to death with ashes. That's why the spiritual Elders stress strongly that the United Nations fully open the door for native spiritual leaders to speak as soon as possible.

Nature itself does not speak with a voice that we can easily understand. Neither can the animals and birds we are threatening with extinction talk to us. Who in this world can speak for nature and the spiritual energy that creates and flows through all life? In every continent are humanbeings who are like you but who have not separated themselves from the land and from nature. It is through their voice that Nature can speak to us. You have heard those voices and many messages from the four comers of the world today. I have studied comparative religion and I think in your own nations and cultures you have knowledge of the consequences of living out of balance with nature and spirit. The native peoples of the world have seen and spoken to you about the destruction of their lives and homelands, the ruination of nature and the desecration of their sacred sites. It is time the United Nations used its rules to investigate these occurrences and stop them now.

The Four Corners area of the Hopi is bordered by four sacred mountains. The spiritual center within is a sacred site our prophecies say will have a special purpose in the future for mankind to survive and now should be left in its natural state. All nations must protect this spiritual center.

The Hopi and all original native people hold the land in balance by prayer, fasting, and performing ceremonies. Our spiritual Elders still hold the land

in the Western Hemisphere in balance for all living beings including humans. No one should be relocated from their sacred homelands in this Western Hemisphere or anywhere in the world. Acts of forced relocation such as Public Law 93531 in the United States must be repealed.

The United Nations stands on our native homeland. The United Nations talks about human rights, equality and justice and yet the native people have never had a real opportunity to speak to this assembly since its establishment until today. It should be the mission of your nations and this assembly to use your power and rules to examine and work to cure the damage people have done to this earth and to each other. Hopi Elders know that was your mission and they wait to see whether you will act on it now.

Nature, the First People and the spirit of our ancestors are giving you loud warnings. Today, December 10,1992, you see increasing floods, more damaging hurricanes, hail storms, climate changes and earthquakes as our prophecies said would come. Even animals and birds are warning us with strange change in their behavior such as the beaching of whales. Why do animals act like they know about earth's problems and most humans act like they know nothing. If we humans do not wake up to the warnings, the great purification will come to destroy this world just as the previous worlds were destroyed.

(Thomas and Oren Lyons held up a picture of a large rock drawing in Hopiland.)

This rock drawing, shows part of the Hopi prophecy. There are two paths. The first with high technology but separate from natural and spiritual law leads to these jagged lines representing chaos. The lower path is one that remains in harmony with natural law. Here we see a line that represents a choice like a bridge joining the paths. If we return to spiritual harmony and live from our hearts we can experience a paradise in this world. If we continue only on this upper path, we will come to destruction.

Its up to all of us, as children of mother earth to clean up this mess before its too late.

The Elders request that during this International Year for the Worlds Indigenous Peoples, the United Nations keep that door open for spiritual leaders from the four comers of the world to come to speak to you for more than a few minutes as soon as possible. The Elders also request that eight investigative teams visit the native areas of the world, observe and tell the truth about what is being done and stop these nations from moving in this

self destructive direction.

If any of you leaders want to learn more about the spiritual vision and power of the elders, I invite you to come out to Hopiland and sit down with our real spiritual leaders in their sacred Kivas where they will reveal the ancient secrets of survival and balance.

I hope that all members of this assembly that know the spiritual way will not just talk about it but in order to have real peace and harmony, will really follow what it says across the United Nations wall: "They shall beat their swords into plowshares and study war no more." Lets together do that now!

Epilogue

The night before the presentations of the native people from around the world to the General Assembly there was a total eclipse of the moon over New York City and the sky was clear. The evening after the presentation by Mr. Banyacya and the other native spokespersons, heavy rain and strong wind began. The weathermen had been calling for a snowstorm but what came the following day were the worst floods in New York's memory. Major highways were closed, some houses were washed away by the sea and the United Nations itself experienced flooding of its lower subfloors forcing a shut down of its heating and air conditioning and all personnel were dismissed at three o'clock. To the native people present, these events were more than coincidental.

In the ground floor meeting room where on December 11, native peoples were meeting representatives of various U.N. agencies, Thomas Banyacya spontaneously called on all the participants including U.N. officials to form a great circle. All the Elders were in the center and Thomas called in some non native people as well. Each silently said a prayer. The forming of the circle of unity of all people from the four corners of the Earth was more than just a symbolic act. One participant said she had never felt herself to be in such a safe place. Later, several present noted that no further storm damage occurred in Manhattan and that the storm itself abated that afternoon.

NEXT - Letter to Sec. Gen. Boutros Boutros-Ghali
PREVIOUS - Message from Hopi Spiritual Leaders to Chairman and members of the

U.N.Vancouver, June 1976

HOME

Exhibit B

Global Union Against Radiation Deployment from Space

www.stopglobalwifi.org

Before the Federal Communications Commission
Washington, D.C. 20554

To: Office of the Secretary
Federal Communications Commission
Washington, DC 2055
September 28, 2016 Via E-mail-Electronic Filing

Comment Filed by: GUARDS (Global Union Against Radiation Deployment from Space)

In the Matters of:

Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM Docket No. 11664
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0- 38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95

Dear Ms. Dortch,

We are writing to bring the serious environmental and human health consequences of moving forward with the development of 5G wireless to your attention. According to Chairman Wheeler himself, "5G buildout is going to be very infrastructure intensive, requiring a massive deployment of small cells." and "Current blocks of licensed low-band spectrum are usually 5 to 10 MHz in width. With 5G, however, we are looking at blocks of at least 200 MHz in width." 5G is a more radiation intensive technology, necessitating an extensive wireless network and community and countrywide saturation with very high frequency (mm range) radiofrequency radiation (RF) in order for 5G to function (https://apps.fcc.gov/edocs_public/attachmatch/DOC-339920A1.pdf). Due to the documented harmful effects of RF radiation exposure on human health and the environment, any project which would increase these exposures necessitates a full NEPA review and EIS. Implementation of 5G would also violate the U.N. Convention on the Rights of Persons with Disabilities, several sections of the U.N. Convention on the Rights of the Child, and International Human Rights Law in the Universal Declaration of Human Rights, and implementation should therefore be halted.

GUARDS is an international coalition against global WiFi from space, a technology that endangers all life on Earth. Wireless connections and transmissions use **pulse-modulated electromagnetic microwave radiation** at low intensity levels. These have been shown by multiple peer-reviewed studies to cause serious adverse bioeffects - genetic, neurological, physiological and psychological damage (http://www.mainecoalitiontostopsmartmeters.org/?p=1469). As the evidence of harm continues to mount, between 1993-2013 more than 81 governments and organizations world-wide have banned or warned about the hazards of wireless technology (http://www.cellphonetaskforce.org/?page_id=128).

On May 27, 2016, the U.S. National Toxicology Program announced that radiation from cellphones is carcinogenic. This finding is consistent with epidemiological studies and other toxicology studies. Yet, global space-based WiFi projects will make this exposure ubiquitous and inescapable both directly from space transmissions and indirectly from expansion of earth-based wireless radiation networks dependent on the satellite networks.

There are legal implications related to irradiating entire countries and their citizens without informed consent. Strong correlations exist between RF radiation exposure from wireless technologies, increasing rates of Radiofrequency Sickness and many cancers. In several countries (Italy, France, Spain, Australia), plaintiffs have gone beyond correlation to successfully prove causation, and damages have been awarded by the courts. The insurance industry currently recognizes the immense risks of insuring companies against radiofrequency injury claims, and coverage from the major firms like Lloyds and Swiss Re is no longer available.

NEPA and Environmental Review

Implementation of 5G is a major Federal action significantly affecting the quality of human environment; as such, a NEPA review is triggered. NEPA is not limited to specific projects and FCC approval of 5G rules as well as the dockets herein constitute "major Federal actions." The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [*Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether "*services or capabilities are essential to public health, safety, or in the public interest*" (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.

The FCC is not entitled to essentially disregard comments that do not provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission)*. The Commission has an affirmative duty to inquire into and consider all relevant facts. The FCC must use government resources to perform the relevant analysis. The FCC should request the EPA use its National Risk Management Research Laboratory resources and experts to conduct all cost analyses necessary.

This proposal also triggers the need for a Memoranda of Understanding (MOU) with U.S. Fish and Wildlife Service under Executive Order 13186 concerning effects on migratory birds.

RF Radiation - Environmentally Harmful and a Public Health Hazard

Environmental Impacts

U.S. Department of Interior States: Current Radiation Standards Inapplicable

On February 7, 2014, the U.S. Department of Interior (DOI) stated, "*the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today,*" in reference to the current limits governing radiation utilized by WiFi. The DOI letter discusses a number of studies in which birds appear harmed by low-level RF radiation associated with cell towers and other wireless technologies (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf). **Furthermore, DOI required FirstNet to undergo a comprehensive NEPA review and planning program. Implementation of 5G which will have similar widespread impacts must do so as well.**

RF radiation kills and damages trees

Trees and other vegetation are being killed and damaged across the U.S. and world-wide even without full-scale implementation of 5G. RF radiation is being implicated as the cause. Several studies show the very serious effects that RF radiation has on the health of trees. Trees, agricultural crops and other plants are essential to the welfare of the global environment and the continuation of the human race. Decimation of the amazon rainforest by direct human actions has been oft-cited as endangering the global environment, the FCC should not be moving forward with implementing a technology (5G wireless), that will hasten the RF caused death of our urban and rural forests, cropland and other vegetation and associated insect/pollinator life. Please read the following papers to see the toll RF is already taking on trees. We cannot afford additional forest die-off. Large mature trees are being seriously damaged and killed, this damage will take 50 years or more to repair.

- Radiofrequency radiation injures trees around mobile phone base stations https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations
- Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations https://www.hindawi.com/journals/ijfr/2010/836278/
- Review: Weak radiofrequency radiation exposure from mobile phone radiation on plants. http://www.ncbi.nlm.nih.gov/pubmed/27650031?dopt=Abstract
- Tree damage in the vicinity of mobile phone base stations http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf

- The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage: http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Documentation-2006-2016.pdf

RF radiation kills and impairs reproduction of wildlife

A parade of studies continue to be published implicating wireless technology in the demise of frogs, bats, and honey bees, the threatened extinction of the house sparrow, and damage to the DNA of the human species. It is vital to the continuation of life that large parts of Earth are spared the incessant radiation that accompanies wireless technologies.

- "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August 2010 by the Ministry of Environment and Forest, Government of India http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf

- "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review," http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf

- Balmori, A. "Electromagnetic pollution from phone masts. Effects on wildlife," *Pathophysiology* (2009), doi:10.1016/j.pathophys.2009.01.007 http://www.ncbi.nlm.nih.gov/pubmed/19264463

- October 31, 2014 presentation to the Manitoba Entomological Society, reviewing 91 studies on the effects of RF/MW radiation on honey bees, insects, birds, etc: https://groups.google.com/forum/#!topic/mobilfunk_newsletter/0RUPGTI4qQY

- A BRIEFING MEMORANDUM: What We Know, Can Infer, and Don't Yet Know about Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife — for Public Release July 14, 2016. Albert M. Manville, II, Ph.D., C.W.B. http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2016/07/Manville-7-14-2016-Radiation-Briefing-Memo-Public.pdf

Atmospheric Impacts of Global Wireless (5G) from Space/Upper Atmosphere

Global wireless (5G) from space as envisioned by telecommunications giants would utilize extensive satellite networks and require the launch of hundreds of kerosene-burning rockets annually. This would re-distribute the ozone layer and significantly contribute to climate change (http://www.eucass-proceedings.eu/articles/eucass/pdf/2013/01/eucass4p657.pdf).

Martin Ross of the Aerospace Corporation was the lead author of a paper published in 2010 titled "Potential climate impact of black carbon emitted by rockets" (http://onlinelibrary.wiley.com/doi/10.1029/2010GL044548/abstract). The authors developed a computer model to predict what would happen in different parts of the planet if the number of launches burning kerosene (then 25 annually) increased by a factor of ten. His model predicts as much as a 4% loss of ozone over the tropics and subtropics, as much as a 3-degree Celsius summertime increase in temperature over the South Pole, more than a one-degree overall increase in Antarctic temperature, and a decrease in Antarctic sea ice by 5% or more.

In a 2011 Aerospace article titled "Rocket Soot Emissions and Climate Change"(http://www.aerospace.org/crosslinkmag/summer2011/rocket-soot-emissions-and-climate-change/), Ross states "The Aerospace study shows that the radiative forcing of soot from a given hydrocarbon rocket scenario is

as much as 100,000 times that of the carbon dioxide from the rockets." Obviously, the soot or black carbon emissions would be an important factor in accelerating climate change if the planned launches move forward.

Solid state rocket exhaust is no better. It contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of solid state rockets.

The New York Times (May 14, 1991, p. 4; http://www.nytimes.com/1991/05/14/news/some-say-the-rockets-red-glare-is-eating-away-at-the-ozone-layer.html) quoted Aleksandr Dunayev of the Russian Space Agency saying, "About 300 launches of the [space] shuttle each year would be a catastrophe and the ozone layer would be completely destroyed."

At that time, the world averaged only 12 rocket launches per year. Maintaining a fleet of (ultimately) 4,000 satellites, each with an expected lifespan of five years, will likely involve enough yearly rocket launches to be an environmental catastrophe.

Project Loon utilizes a scarce resource - helium - with reckless abandon. Helium is key to the function and manufacture of many technologies. Helium also has important scientific and hospital uses. It is a scarce fossil resource (http://phys.org/news/2010-08-world-helium-nobel-prize-winner.html) and should be conserved, not squandered. The balloons used by Project Loon are inflated with helium which is released into the atmosphere when the balloons are grounded. Furthermore, the balloons are made of polyethylene plastic which is not biodegradable, yet the balloons are only expected to have a life-span of 10 months. Our best estimate is that it would take 100,000 balloons to provide wireless to landmasses worldwide. This is a lot of polyethylene to discard and a lot of helium to squander.

United Nations Rio Declaration on Environment and Development

The Precautionary Principle as drawn up in Rio in 1992 - the Rio Declaration: http://www.gdrc.org/u-gov/precaution-7.html

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
>
> Principle 15 codified for the first time at the global level the precautionary approach, which indicates lack of scientific certainty is no reason to postpone action to avoid potentially serious or irreversible harm to the environment. Central to principle 15 is the element of anticipation, reflecting a requirement that effective environmental measures need to be based upon actions which take a long-term approach and which might anticipate changes on the basis of scientific knowledge.

From the U.N. General Assembly: Resolution adopted by the General Assembly July 2012 66/288 The Future We Want

> We recognize the importance of strengthening international, regional and national capacities in research and technology assessment, especially in view of the rapid development and possible deployment of new technologies that may also have unintended negative impacts, in particular on biodiversity and health, or other unforeseen consequences.
> http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E

An ETC Group Press Release UN Moves Towards an Early Listening System shares: "*The decision paves the way for a badly needed early warning system on the impacts of new technologies*" and explains:

> ETC Group proposed the creation of a technology assessment capacity in the UN in the lead up to the 2012 Rio Summit. At that time, the proposal was backed by the G-77 and China and a few OECD states such as Sweden and Norway. The Summit concluded with a surprisingly strong call for technology assessment from local to global levels warning that new technologies could pose significant health and environmental risks**.** http://www.etcgroup.org/content/un-moves-towards-technology-early-listening-system

And from *The Lancet*:

> Planetary health is a new science that is only beginning to draw the coordinates of its interests and concerns. It demands new coalitions and partnerships across many different disciplines to meet the pervasive knowledge failures identified by this Commission. It demands new attention to governance and implementation. And, perhaps most of all, it demands more creative imagination among scientists and practitioners working in health—redefining the meaning of human progress, rethinking the possibilities for human cooperation, and revitalizing the prospects for the health of human civilizations. (par 7)

and

> Second, planetary health concerns the natural systems within which our species exists—for example, the health and diversity of the biosphere. Human beings live within a safe operating space of planetary existence. If the boundaries of that space are breached, the conditions for our survival will be diminished." Currently, natural systems are being degraded to an extent unprecedented in history, with known and as yet unknown and unquantified effects on human health. (par 2)
> http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(15)61038-8.pdf

Human Health Impacts

U.S. National Toxicology Program: Radiation from Cellphones Carcinogenic

The U.S. National Toxicology Program released results showing that exposure to non-thermal levels of pulse-modulated microwave radiation causes cancer, specifically intracardiac schwannomas and malignant gliomas, and breaks DNA (http://ehtrust.org/science/facts-national-toxicology-program-cellphone-rat-cancer-study/). Epidemiological data show that the rate of glioblastoma multiforme of the brain, a malignant type of glioma, is increasing (http://microwavenews.com/news-center/ntp-and-brain-tumor-rates). Obviously the results of this study support an immediate halt to the implementation of 5G pending safety evaluation.

FCC Investigation of Current Exposure Limits Underway

With the FCC finally beginning re-evaluation of current irrelevant and obsolete non-ionizing RF exposure guidelines, it seems imprudent to move forward with implementing 5G, a technology encouraging global proliferation of RF microwave radiation. This evaluation should be completed prior to implementing 5G.

In the Inquiry the FCC requests comment to determine whether its RF exposure limits and policies need to be reassessed. Since consideration of the limits themselves is explicitly outside of the scope of ET Docket No. 03-137, the FCC opened a new docket, ET Docket No. 13-84, with the Inquiry to consider these limits in light of more recent developments. The Inquiry is intended to open discussion on both the currency of our RF exposure limits and possible policy approaches regarding RF exposure (https://www.fcc.gov/encyclopedia/radio-frequency-safety).

International Recognition of Need for More Conservative RF Safety Limits

Countries around the world are increasingly recognizing the risks of RF radiation and advising action to protect the public (http://www.cellphonetaskforce.org/?page_id=128). Even the U.S., as cited above, is in the process of reviewing RF exposure guidelines. Countries such as China, Russia, Italy and Switzerland already have wireless radiation safety limits 100 times lower than the United States.

Even ICNIRP recognizes the need to protect vulnerable populations by lowering general exposure levels: "Different groups in a population may have differences in their ability to tolerate a particular NIR (non-ionizing radiation) exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups. " from ICNIRP Statement, General Approach to Protection Against Non-ionizing Radiation, (HEALTH PHYSICS 82(4):540-548; 2002) https://www.icnirp.org/documents/philosophy.pdf

Canada: Previous Safety Code 6 Inadequate

In June 2015, Canadian Parliament's Standing Committee on Health (HESA) issued a report with 12 unanimous recommendations for increased caution, investigations, reporting and data gathering with regard to RF/EMF and wireless devices. Health Canada's Safety Code 6 provided guidelines for RF exposure virtually identical to 1996 FCC guidelines until recently (March 2015) when Canada reduced some of its maximum permissible exposure limits by nearly 50%.

> "*The [HESA] Committee agrees that the potential risks of exposure to RF fields are a serious public health issue that needs to be brought to the attention of Canadians so that they have the knowledge to use wireless devices responsibly and are able to make decisions about the use of wireless devices in a manner that protects their health and the health of their families.*"

The Standing Committee report shares themes, including cancer, illness, fertility, autism, public awareness, school environments, and medical responsibilities. It discusses studies demonstrating adverse effects at levels below Health Canada's guidelines (http://www.parl.gc.ca/Content/HOC/Committee/412/HESA/Reports/RP8041315/412_HESA_Rpt13_PDF/412_HESA_Rpt13-e.pdf).

World Health Organization (WHO) Scientists Warn of Increased Risk to Public Health

Increases in microwave radiation exposure caused by planned airborne wireless deployments will be harmful to public health. Wireless technology operates using pulse-modulated microwave radiation: "*The human body*," says Dr. GJ. Hyland (International Institute of Biophysics, Neuss-Holzheim, Germany), "*is an electrochemical instrument of exquisite sensitivity*," noting that, "*like a radio, it can be interfered with by incoming radiation.*" If a signal is strong enough to operate a device, it is strong enough to disturb every cell in the human body.

In 2011, the International Agency for Research on Cancer (IARC), a committee of the WHO, classified RF radiation as a Group 2B carcinogen in the same category as lead, engine exhaust, and DDT. Alarmingly, several scientists who were members of the IARC working group involved with this classification now conclude the risks are much greater than originally thought. For example, Dr. Dariusz Leszczynski warns that RF-EMF should be classified as a Group 2A carcinogen, and Dr. Lennart Hardell reports that several studies indicate a Group 1 classification is justified, placing RF-EMF in the same category as tobacco, asbestos, and benzene.

Dr. Dariusz Leszczynski MSc, DSc, PhD
https://betweenrockandhardplace.wordpress.com/2014/08/14/carcinogenicity-of-cell-phone-radiation-2b-or-not-2b/

> "*In conclusion, I consider that currently the scientific evidence is sufficient to classify cell phone radiation as a probable human carcinogen – 2A category in IARC scale. Time will show whether 'the probable' will change into 'the certain'. However, it will take tens of years before the issue is really resolved. In the mean time we should implement the Precautionary Principle. There is a serious reason for doing so.*"

Dr. Lennart Hardell MD, PhD http://www.ncbi.nlm.nih.gov/pubmed/24192496

> "*Based on the Hill criteria, glioma and acoustic neuroma should be considered to be caused by RF-EMF emissions from wireless phones and regarded as carcinogenic to humans, classifying it as group 1 according to the IARC classification. Current guidelines for exposure need to be urgently revised*."

Statements like these support our contention that no new large-scale irradiation of the public should be allowed prior to establishment of biologically protective RF safety limits. In fact, condoning such a project without first updating RF safety limits to be biologically protective of the whole population for the exposures they are likely to experience daily would be in direct violation of the entire Nuremberg Code of Ethics (http://www.hhs.gov/ohrp/archive/nurcode.html).

International Scientists Warn of High Risk and Multigenerational Effects

The 1,500-page BioInitiative Report on RF/MW health effects was published in 2012. The authors are 29 scientists from 10 countries. They reviewed thousands of studies showing interference with chemical processes in the body, implicating RF/MW in a whole spectrum of alarming effects including genetic damage, cancer, immune dysfunction, neurological injury, and infertility www.bioinitiative.org.

More recently, in 2015, over 220 scientists from 41 countries with over 2,000 peer-reviewed journal articles to their collective credit in the field of biological impacts from RF/EMF appealed to the U.N. and the WHO for greater precautions with regard to exposures from wireless technologies. This is the latest in many such alerts to the health effects of RF/EMF exposure https://www.emfscientist.org/.

A paper by Microwski, *Electromagnetic Fields: High Level Microwave Technology Concerns* http://c4st.org/images/documents/wifi-in-schools/doclinks/RFCorrosion,etc-1.pdf references a study by Magras and Xenos 1997, *RF Radiation-induced Changes in the Prenatal Development of Mice* http://www.ncbi.nlm.nih.gov/pubmed/9261543. The study indicates at environmental wireless exposure levels (0.168 μW/cm2 to 1.053 μW/cm2) lower than those now commonplace outdoors in Canadian cities such as Metro Toronto, Hamilton, Mississauga, mice become infertile between third and fifth generations.

The continuous exposure to microwave radiation from global wireless, along with that emitted from a myriad of wireless devices, may have implications far greater than we could imagine with nothing less than the continuation of the human race at stake.

Violation of International Human Rights

5G violates Article 3 of The U.N. Declaration of Human Rights, ratified by the General Assembly in 1948, which states "*everyone has the right to life, liberty and security of person*." Data exist showing RF radiation can cause serious biological effects at levels far below the existing FCC RF limits (www.bioinitiative.org). These include damage to DNA which can lead to an increased risk for cancer and deleterious genetic mutations passed on to future generations. Decreases in sperm count and quality and increases in miscarriage and infertility have also been demonstrated in response to exposure to RF radiation. Although much of the recent research focuses on frequencies in WiFi and cellphone ranges, prior research is available showing serious biological effects in the millimeter wavelengths that are being proposed for 5G wireless.

> *Observed higher resonance frequencies of a living cell coincide with frequencies of radiation of communications satellites. The power densities and duration of irradiation created by these satellites will significantly exceed (by ten or more orders of magnitude—such irradiation is possible over the course of a whole lifetime) the energetic doses inducing changes in living cells.*

Negative consequences of this may be changes in cell structures and physiological processes, genetic changes, and alteration of psychophysiological conditions and behavior (http://www.stopglobalwifi.org/documents/2001_kositsky_et_al._-_ussr_review.pdf).

More recent scientific publications look specifically at causality, such as M.L. Pall in "*Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression*" (J Chem Neuroanat. 2015 Aug 20; http://www.sciencedirect.com/science/article/pii/S0891061815000599). It discusses the causal relationship between exposure to radiation from wireless technology and neuropsychiatric effects. Mechanisms of action are also discussed.

Yakymenko, et al., 2014 discuss the fact that RF radiation is documented in numerous studies to cause oxidative damage and discuss mechanisms (*Low Intensity Radiofrequency Radiation: A New Oxidant for Living Cells*; Oxid Antioxid Med Sci 2014; 3(1):1-3; (https://www.researchgate.net/publication/269995792_Low_intensity_radiofrequency_radiation_a_new_oxidant_for_living_cells).

A more recent study by Yakymenko, et al., 2015, *Oxidative Mechanisms of Biological Activity of Low-intensity Radiofrequency Radiation* finds in 93 of 100 reviewed studies a wide pathogenic potential of the induced Reactive Oxygen Species (ROS) and their involvement in cell signaling pathways explains a range of biological/health effects of low intensity RF radiation, which include both cancer and non-cancer pathologies. Their concluding analysis demonstrates low-intensity RF radiation is an impressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RF radiation exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation. (http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2015/07/Yakymenko-et-al-2015.pdf)

Lerchl, et. al. in 2015 performed a replication experiment of work done by Tilmann, et. al. in 2010 but increased the number of mice. Their work: *Tumor Promotion by Exposure to Radiofrequency Electromagnetic Fields Below Exposure Limits for Humans* found tumors in mice promoted by exposures to levels of RF at below government exposure limits for the use of mobile phones. Numbers of tumors of the lungs and livers in exposed animals were significantly higher than in sham-exposed controls. In addition, lymphomas were also found to be significantly elevated by exposure (http://www.ncbi.nlm.nih.gov/pubmed/25749340).

Industry continues to falsely claim that there are no known mechanisms by which the non-ionizing radiation emitted by wireless devices can cause cancer. Oxidants lead to the formation of free radicals. Free radicals may cause DNA breakage and, therefore, cancer. Radiation from wireless devices has been found to cause oxidative damage. Therefore, oxidative damage is one mechanism by which radiation from wireless devices may cause cancer.

Replicated double-blind studies show that a cordless phone base station operating at WiFi frequencies can cause cardiac arrhythmias in susceptible individuals (http:// www.magdahavas.com/wordpress/wp-content/uploads/2012/01/Havas-HRV-Ramazzini.pdf and www.ncbi.nlm.nih.gov/pubmed/23675629#). Flooding the globe with radiation that can have such a serious, even deadly effect, is unethical. A study in rabbits found that not only did WiFi change heart function parameters, but it dramatically changed the cardiac effects of both dopamine and epinephrine: Saili L, et al. *Effects of Acute Exposure to WIFI Signals (2.45 GHz) on Heart Variability and Blood Pressure in Albinos Rabbit.* Environmental Toxicology and Pharmacology 40 (2015) 600–605; (http://www.sciencedirect.com/science/article/pii/S1382668915300594). Therefore, ubiquitous RF radiation may not only cause cardiac emergencies, but prevent treatments from working and cause deaths. The threat to cardiac health is also supported by epidemiological studies showing increased death from cardiac events and heart disease - Criticism of the Health Assessment in the ICNIRP Guidelines for Radiofrequency and Microwave Radiation (100 kHz - 300 GHz) (www.electricalpollution.com/documents/Cherry2000EMR_ICNIRP_critique_09-02.pdf).

Forced exposure to an agent that has the effects discussed above and enumerated in the resources listed above would have to be considered a violation of the Nuremberg Code of Ethics (http://www.hhs.gov/ohrp/archive/nurcode.html). 5G would force such an exposure.

Furthermore, 5G wireless proposals violate Article 25 of International Human Rights (1), which states, "*Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control*."

Exposure to an agent that disrupts hormones, sleep, cardiac and neurological function, and has forced numerous people from their homes and into poverty is an obvious violation of numerous fundamental rights which are to be universally protected according to The U.N. Declaration of Human Rights.

Violation of U.N. Convention on the Rights of the Child

Under the Convention on the Rights of the Child, states/countries are responsible for acting in their children's best interest. In this case, that would mean halting implementation of 5G wireless, pending medical-grade safety testing.

In a letter to Congress, the American Academy of Pediatrics stated:

> **"***Children are disproportionately affected by environmental exposures, including cell phone radiation. The differences in bone density and the amount of fluid in a child's brain compared to an adult's brain could allow children to absorb greater quantities of RF energy deeper into their brains than adults*." http://apps.fcc.gov/ecfs/document/view?id=7520941318

No child should be forced to be exposed to RF radiation and therefore forced to incur an increased risk of cancer, functional impairment leading to ill health or cognitive impairment, or genetic damage in *their* children.

Any of these outcomes, which research supports as likely, violate children's rights. Electromagnetic Radiation, Health and Children 2014 by Dr. Erica Mallery-Blythe (https://www.youtube.com/watch?v=sNFdZVeXw7M) is a must-watch presentation about the hazard that RF radiation emitted by wireless technology poses to children.

Dr. Mallery-Blythe's presentation references several U.N. Conventions on the Rights of the Child that would be violated by this project including:

Article 3 (best interests of a child) The best interests of a child must be a top priority in all decisions and actions that affect children.

Article 23 (children with a disability) A child with a disability has the right to live a full and decent life with dignity, and, as far as possible, independence and to play an active part in the community. Governments must do all that they can to support disabled children and their families.

Article 24 (health and services) Every child has the right to the best possible health. Governments must provide good quality health care, clean water, nutritious food and a clean environment and education on health and well-being so that children can stay healthy

Article 28 (right to education) Every child has a right to education.

A Brief from the Canadian Teachers' Federation, *The Use of WiFi in Schools* (2014), warns, *"Teachers and school communities have not been informed regarding the implementation of WiFi and any inherent potential hazards*" and goes on to share, "*Teachers are rightly concerned for their personal safety and the safety of the children in their care*" (http://www.ctf-fce.ca/Research-Library/wifi-final-2014-ENG.pdf).

Schools, unions and PTAs worldwide have issued statements, enacted policy and are calling for safer, wired technology in schools to address this unprecedented health disaster (http://ehtrust.org/policy/schools-unions-and-pta-actions/).

Violation of U.N. Convention on the Rights of Persons with Disabilities

Increasing numbers of countries, such as Sweden and France, (as do the Canadian Human Rights Commission and European Parliament) recognize Electrohypersensitivity (EHS) as an environmentally induced functional impairment or disability triggered by exposure to electromagnetic fields (including RF). Continental or global WiFi would contravene: Article 1 "*promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity*"; Article 3 "*Full and effective participation and inclusion in society*"; Article 15(2) states: "*Parties shall take all effective legislative, administrative, judicial or other measures to prevent persons with disabilities, on an equal basis with others, from being subjected to torture or cruel, inhuman or degrading treatment or punishment*"; and violate the intent of many more Articles, since the planet would be blanketed with microwave radiation that those suffering EHS could not escape.

The European Economic and Social Committee (EESC) is an E.U. advisory body comprising representatives of workers' and employers' organizations and other interest groups. It issues opinions on E.U. issues to the European Commission, the Council of the E.U., and the European Parliament, thus acting as a bridge between the E.U.'s decision-making institutions and E.U. citizens. In February 2015, a formal letter of notice was sent to the EESC by the Radiation Research Trust (based in U.K.) and approximately 90 other organizations from around the world in support of millions of people, estimated to be between 22,000,000 and 37,000,000 throughout Europe currently suffering EHS due to exposure to the proliferation of RF emissions and emitters (i.e., mobile phones, DECT cordless phones, cordless baby monitors, phone masts, WiFi, smart meters, the smart grid, et al.) (http://www.radiationresearch.org/images/rrt_articles/EM-Radiation-Research-Trust-Letter-of-Notice-Served-on-Mr-Richard-Adams.pdf).

Some researchers estimate approximately 3% of the population has severe symptoms of EHS and another 35% of the population has moderate symptoms such as impaired immune system and chronic illness (Havas, 2007).

Canadians For Safe Technology (C4ST) points out, "*EHS is accepted as a functional impairment in Sweden and the Canadian Human Rights Commission recognizes it as an environmental sensitivity and classifies it as a disability.*" With some countries already recognizing the medical needs of those affected by EHS and the potential for millions of people around the world to suffer EHS from increased exposure to radiation from wireless technology, further proliferation of wireless technology on a wide scale is unacceptable.

Jenny Fry (age 15) hanged herself when her school refused to understand that being in classrooms with WiFi caused her to experience serious physical discomfort and harassed and bullied her by requiring her to serve detentions for leaving classes due to WiFi induced symptoms in rooms where she experienced intense functional impairment (http://www.independent.co.uk/news/uk/home-news/school-girl-found-hanged-after-suffering-from-allergy-to-wifi-a6755401.html).

International Human Rights, Article 26 states that "(1) *Everyone has the right to education.*" People with disabilities and functional impairments like Jenny's have a right to go to school in an environment free from RF radiation, in a school that will not make them sick. Her rights, like the rights of all those experiencing this type of functional impairment, should be protected under the Universal Declaration of Human Rights.

Many other persons experience similar functional impairment when exposed to RF radiation: "Parents Sue School, Claim Wi-Fi Makes Son" (https://www.yahoo.com/parenting/parents-sue-school-claim-wi-fi-makes-son-sick-127644771007.html), "WiFi in Schools: How Safe" (http://www.publicnewsservice.org/2014-09-22/health-issues/wifi-in-schools-how-safe/a41810-1) and "Maryland women suffers acute radiation exposure from a bank of smart meters" (https://www.youtube.com/watch?x-yt-cl=84503534&x-yt-ts=1421914688&v=F9QZuWPw6Y0).

Insurance Companies Warn of Large Losses Due To Electromagnetic Fields

We also note that insurance in the event of injury due to RF/MW radiation is not likely to be adequate – see pages 1 and 2 in the document at the following link:
http://www.gao.gov/assets/600/591391.pdf

Stop Smart Meters UK shares that: "*Insurance Firm, Swiss Re, Warns of Large Losses from "Unforeseen Consequences" of Wireless Technologies*: http://stopsmartmeters.org.uk/insurance-firm-swiss-re-warns-of-large-losses-from-unforeseen-health-claims-due-to-wireless-technologies/ (Source: swissre.com)

> Specialists from the Emerging Risks team at leading global reinsurance firm, Swiss Re, are warning the insurance industry that "unforeseen consequences of electromagnetic fields" could lead to a raft of claims and significant product liability losses in the next 10 years.
>
> In its Swiss Re SONAR Emerging Risks report, 2013, which covers risks that could "*impact the insurance industry in the future*", the company categorizes the impact of health claims related to electromagnetic fields (EMFs) as 'high'. It acknowledges recent reports of courts' ruling in favor of claimants who have experienced health damage from mobile phones, and also says that anxiety over risks related to EMFs is "on the rise".
>
> The document states that whilst the majority of the topics covered in its pages were of "medium impact", health issues associated with EMFs sit in the highest impact category. Other topics discussed include the dangers of cyber attacks, power blackouts, workplace safety and Big Data all of which are exacerbated and/or added to with the ill-conceived "smart" metering programs.

Lloyd's listed hazards from new technologies including EMF in its 2011 Top 50 Risks. Coverage for RF/EMF injuries typically related to cell phones and cell towers is now categorically excluded. In their 2013 Risk Report, new technology risks have increased slightly in risk rank. It is worth noting these risks are classified under Environmental (i.e., does the applicant expect to have an adverse environmental impact?) as distinct from the Lloyd's appraisal of cybersecurity risks (also applicable to 5G wireless and rated much higher risk).
http://www.lloyds.com/~/media/Files/News%20and%20Insight/Risk%20Insight/Risk%20Index%202013/Report/Lloyds%20Risk%20Index%202013report100713.pdf

GUARDS asserts that 5G would intensify these concerns on a continental and global scale.

Interference with Airplane Instrumentation and Hazard to Flight Crew and Passengers

The satellite portion of the proposed 5G wireless project would locate transmitters at altitudes where they could cause dangerous interference with aircraft.

Wireless signals are already causing interference with aircraft systems. An FAA Airworthiness Directive (or AD) points out that WiFi on board aircraft is blanking out display units in the cockpit (http://www.b737.org.uk/ad-2014-20-06.pdf, https://s3.amazonaws.com/public-inspection.federalregister.gov/2014-23231.pdf). The FAA has given a five-year time limit for airlines to replace all these display units. However, even new units may not be able to withstand the strength of signal that the 5G satellite project would expose them to. There is reason for

concern because the same AD mentions, “The intent of this AD is to eliminate this known susceptibility of the phase 3 DUs to RF transmissions, including those from sources outside the airplane. This susceptibility is not limited to WiFi transmissions, but has been verified to exist in a range of the RF spectrum used by mobile satellite communications, cell phones, air surveillance and weather radar, and other systems.”

Furthermore, the signal strength will certainly be strong enough to cause biological functional impairment of the flight crew and the passengers. Since biological functional impairment induced by exposure to RF radiation from wireless technology can range from minor to serious, even including death, it is of paramount importance for the safety of air travel that the permit be denied.

Conclusion

The serious environmental damage that 5G wireless would do necessitates a thorough NEPA review and EIS. So do the serious human health consequences that implementation of 5G would entail. Increased health care costs, increased disability and associated costs, decreased productivity from missed or substandard work performance, lost or compromised ecological services and agricultural harm from RF-EMF exposure could cost societies billions of dollars. Not only is RF-EMF proliferation bad for health and the environment directly, this damage has a major economic cost as well.

Please consider our comments as reasons to halt implementation of 5G wireless. In brief, those reasons include: environmental damage, insurance industry recognition of serious risk to health, cyber and national security, demonstrated detrimental biological effects at levels far below existing inadequate RF safety limits, radiofrequency radiation currently classified “*possible human carcinogen*” by the World Health Organization, results from the U.S. National Toxicology Program finding RF radiation breaks DNA and causes cancer, legal implications related to irradiating the entire continent (and continents) without informed consent, and resultant violations of U.N. Conventions and Universal Declaration of Human Rights.

5G wireless, with all its serious safety problems, is an unacceptable hazard. Widely available fast internet access is a goal that can be safely attained using various forms of cabled connectivity.

GUARDS respectfully requests the FCC halt implementation of 5G wireless pending a thorough NEPA review, EIS, and results of medical-style safety testing.

Sincerely,

Ed Friedman
42 Stevens Rd.
Bowdoinham, ME 04008
207-666-3372
edfomb@comcast.net

Marcey Kliparchuk
10859-147 Street
Edmonton, AB, Canada, T5N 3E1
780-760-0872
marcey.klip@yahoo.ca

GUARDS is an international coalition against global WiFi from space, a complex technology of radiation and toxic chemicals endangering all life on Earth.

Exhibit C

Global Union Against Radiation Deployment from Space

www.stopglobalwifi.org

July 29, 2015

E-Filed

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C., 20554

Re: Informal Objection Under Section 5.95 to Application of Space Exploration Technologies Corp. ("SpaceX"), Application for Experimental License for the MicroSat-1a/b Test and Demonstration Mission, File No. 0356-EX-PL-2015

Dear Ms. Dortch,

As reported in the *New York Times* (June 15, 2015), Elon Musk's spacecraft and rocket manufacturing company, SpaceX, has begun the application process to launch 4,000 low-orbit satellites over the next five years to facilitate global WiFi, using pulsed microwave radiation from space. This raises many public health and environmental issues discussed below. Question 9 of the SpaceX FCC application asks if there will be an Environmental Impact from the project and the applicant has answered in the negative. We emphatically disagree.

GUARDS is an international coalition against global WiFi from space, a complex technology of radiation and toxic chemicals endangering all life on Earth. We are concerned pollution arising from these many rocket launchings will negatively impact and possibly even destroy the ozone layer, thereby significantly contributing to rapid adverse climate change. The insurance industry currently recognizes the immense risks of insuring companies against radiofrequency injury claims and coverage from the major firms like Lloyds and Swiss Re is no longer available. With the lack of adequate insurance, and radiofrequency radiation (RFR) currently classified a "possible human carcinogen" by the World Health Organization, there are legal implications related to irradiating entire countries, and citizens, across the planet without their informed consent. Strong correlations exist between RFR exposure from wireless technologies, increasing rates of Electrohypersensitivity (EHS) and some cancers. In several countries plaintiffs have gone beyond correlation to successfully prove causation and damages have been awarded by the courts. It is also important to highlight the potential that satellites and or their communications could be hijacked, posing serious security risks.

Furthermore, this proposal violates Section 7 of the 51 U.S. Code Chapter 509 - COMMERCIAL SPACE LAUNCH, the **United Nations** Rio Convention, the UN Convention on the Rights of Persons with Disabilities, several sections of the UN Convention on the Rights of the Child, and International Human Rights Law. Seeing that increasing numbers of countries, such as Switzerland and Australia, recognize Electrohypersensitivity (EHS) as a medical disability, global WiFi would contravene Article 3 of being afforded "equal access to public service in one's country," since the planet would be blanketed with microwave radiation (MWR) that those with EHS could not escape. This proposal also triggers the need for

an MOU with USFWS under Executive Order 13186 concerning effects on migratory birds. Legal issues and liability aside, the cumulative and additive atmospheric, environmental and health risks of MWR saturation from space are extremely high. Approval of such technology may never be appropriate given the high risks to societies but certainly at present, given the current state of our knowledge, permit approval would be premature.

Destruction of Ozone Layer and Impact on Climate – An Environmental Catastrophe

Rocket exhaust contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of rockets. The *New York Times* (May 14, 1991, p. 4) quoted Aleksandr Dunayev of the Russian Space Agency saying, "About 300 launches of the space shuttle each year would be a catastrophe and the ozone layer would be completely destroyed."

In 1991, the world averaged only 12 rocket launches per year. Maintaining a fleet of (ultimately) 4,000 satellites, each with an expected lifespan of five years, will likely involve enough yearly rocket launches to be an environmental catastrophe.

The full text of a 2009 article by Martin N. Ross of the Aerospace Corporation and others, titled "Limits on the Space Launch Market Related to Stratospheric Ozone Depletion," is here:
http://www.tandfonline.com/doi/full/10.1080/14777620902768867#abstract

This article updates the science and expresses the concern a significant increase in rocket launches could have a devastating impact on the ozone layer.

Increased Black Carbon from rocket soot emissions may also play a major role in atmospheric ozone and temperature changes. A 2010 article by Ross, et al., concerned with carbon soot from rockets, is here:
http://onlinelibrary.wiley.com/doi/10.1029/2010GL044548/epdf
The authors conclude a dramatic increase in rocket launches could significantly impact climate. This is because rockets are prolific emitters of carbon soot, such soot remains in the stratosphere for years, and black soot absorbs heat. Ross states that an increase in the number of launches by a factor of ten or more would be of extreme concern. He mentions space exploration, space tourism, solar power, and other reasons for an expected increase in launches. At the time he wrote, the prospect of launching 800 satellites per year for global WiFi had not yet been conceived.

A 2013 article, titled "Impact of Rocket Exhaust Plumes on Atmospheric Composition and Climate – An Overview," by scientists at the Institute for Atmospheric Physics in Germany, echoes earlier concerns even more strongly. http://www.eucass-proceedings.eu/articles/eucass/pdf/2013/01/eucass4p657.pdf

SpaceX's proposed 4,000 satellites have an expected lifespan of 5 years, so to maintain such a fleet would require at least 800 satellites to be launched per year. The FCC ought not approve such a scheme without analyzing the expected effects on climate and the ozone layer.

RF Radiation - Environmentally Harmful and a Public Health Hazard

DOI States Current Radiation Standards Inapplicable

On February 7, 2014, the U.S. Department of Interior stated that **"the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today,"** in reference to the current limits governing radiation utilized by WiFi. The DOI letter discusses a number of studies in which birds appear

harmed by low-level radiofrequency radiation associated with cell towers and other wireless technologies, as are planned by SpaceX. http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf

FCC Investigation of Current Exposure Limits Underway

With the FCC finally beginning reevaluation of current irrelevant and obsolete non-ionizing RF exposure guidelines, it seems hardly prudent to approve technology applications encouraging global proliferation of RF microwave radiation. "In the *Inquiry* the FCC requests comment to determine whether its RF exposure limits and policies need to be reassessed. Since consideration of the limits themselves is explicitly outside of the scope of ET Docket No. 03-137, the FCC opens a new docket, ET Docket No. 13-84, with the *Inquiry* to consider these limits in light of more recent developments. The *Inquiry* is intended to open discussion on both the currency of our RF exposure limits and possible policy approaches regarding RF exposure." https://www.fcc.gov/encyclopedia/radio-frequency-safety

World Health Organization (WHO) Scientists Warn of Increased Risk to Public Health

We are also concerned spatial and temporal increases in microwave radiation caused by this and other planned airborne WiFi deployments will be harmful to public health. WiFi operates using pulsed microwave radiation: "The human body says Dr GJ Hyland, (International Institute of Biophysics* Neuss-Holzheim, Germany) is an electrochemical instrument of exquisite sensitivity" noting that, like a radio, it can be interfered with by incoming radiation." If a signal is strong enough to operate a device, it is strong enough to disturb every cell in the human body.

In 2011, the International Agency for Research on Cancer (IARC), a committee of the WHO, classified RF radiation as a Group 2B carcinogen in the same category as lead and DDT. Alarmingly, several scientists that were members of the IARC working group involved with this classification now conclude the risks are much greater than originally thought. For example, Dr. Darius Leszczynski warns that RF-EMF should be classified as a Group 2A carcinogen, and Dr. Lennart Hardell reports that several studies indicate a Group 1 classification is justified, placing RF-EMF in the same category as tobacco, asbestos, and benzene. Dr. Lennart Hardell MD, PhD http://www.ncbi.nlm.nih.gov/pubmed/24192496

> Based on the Hill criteria, glioma and acoustic neuroma should be considered to be caused by RF-EMF emissions from wireless phones and regarded as carcinogenic to humans, **classifying it as group 1** according to the IARC classification. **Current guidelines for exposure need to be urgently revised** (emphasis added).

Dr. Dariusz Leszczynski MSc, DSc, PhD
https://betweenrockandhardplace.wordpress.com/2014/08/14/carcinogenicity-of-cell-phone-radiation-2b-or-not-2b/

> In conclusion, I consider that currently the scientific evidence is sufficient to classify cell phone radiation as a probable human carcinogen – **2A category in IARC scale**. Time will show whether 'the probable' will change into 'the certain'. However, it will take tens of years before issue is really resolved. In the meantime **we should implement the Precautionary Principle. There is a serious reason for doing so** (emphasis added).

The World Health Organization also admits current RF exposure guidelines do not protect the public.

> Guidelines are set for the average population and **cannot directly address the requirements of a minority of potentially more sensitive people (**emphasis added**).** Air pollution guidelines, for example, are not based on the special needs of asthmatics. Similarly, electromagnetic field guidelines are not designed to protect people from interference with implanted medical electronic devices such

as heart pacemakers. Instead, advice about exposure situations to be avoided should be sought from the manufacturers and from the clinician implanting the device.
http://www.who.int/peh-emf/about/WhatisEMF/en/index4.html

International Scientists Warn of High Risk and Multigenerational Effects

The 1500-page BioInitiative Report on RF/MW health effects was published in 2012. The authors are 29 scientists from ten countries. They reviewed thousands of studies showing interference with chemical processes in the body, implicating RF/MW in a whole spectrum of alarming effects including genetic damage, cancer, immune dysfunction, neurological injury, and infertility. www.bioinitiative.org

Just recently over 200 scientists from 40 countries with over 2,000 peer-reviewed journal articles to their collective credit in the field of biological impacts from RF/EMF, appealed to the UN and WHO for greater precautions with regard to exposures from wireless technologies. This is the latest in many such alerts to the health effects of RF/EMF exposure. https://www.emfscientist.org/

International Liability

Countries around the world are increasingly recognizing the risks of RF radiation and advising action to protect the public http://www.cellphonetaskforce.org/?page_id=128. Even the US as cited above is in the process of reviewing RF exposure guidelines. Countries such as China, Russia, Italy and Switzerland already have wireless radiation safety limits 100 times safer than the United States.

In June 2015, Canadian Parliament's Standing Committee on Health (HESA) issued a report with 12 recommendations for increased caution, investigations, reporting and data gathering with regard to RF/EMF and wireless devices. "The [HESA] Committee agrees that the potential risks of exposure to RF fields are a serious public health issue that needs to be brought to the attention of Canadians so that they have the knowledge to use wireless devices responsibly and are able to make decisions about the use of wireless devices in a manner that protects their health and the health of their families."
http://www.parl.gc.ca/Content/HOC/Committee/412/HESA/Reports/RP8041315/412_HESA_Rpt13_PDF/412_HESA_Rpt13-e.pdf

Canada's Safety Code 6 providing guidelines for RF exposure were virtually identical to 1996 FCC guidelines until recently (March, 2015) when Canada reduced its maximum permissible WiFi RF exposure limits by nearly 50%.

The European Economic and Social Committee (EESC) is an EU advisory body comprising representatives of workers' and employers' organizations and other interest groups. It issues opinions on EU issues to the European Commission, the Council of the EU and the European Parliament, thus acting as a bridge between the EU's decision-making institutions and EU citizens. Its three key tasks are to:

- ensure that EU policy and law are geared to economic and social conditions, by seeking a consensus that serves the common good
- promote a participatory EU by giving workers' and employers' organizations and other interest groups a voice and securing dialogue with them
- promote the values of European integration, and advance the cause of participatory democracy and civil society organizations.

In February 2015, a formal letter of notice was sent to the European Economic Social Committee by the UK Radiation Research Trust and approximately 90 other organizations from around the world in support of millions of people, estimated to be between 22,000,000 and 37,000,000 throughout Europe, currently suf-

fering with electromagnetic hypersensitivity due to exposure to the proliferation of mobile phones, DECT cordless phones, cordless baby monitors, phone masts, WiFi, smart meters and the smart grid.

These are but three indications of the potential global liability and political implications that space-based WiFi technology could affect. http://www.radiationresearch.org/images/rrt_articles/EM-Radiation-Research-Trust-Letter-of-Notice-Served-on-Mr-Richard-Adams.pdf

Canadians for Safe Technology (C4ST) point out that some "researchers estimate approximately 3% of the population has moderate symptoms such as impaired immune system and chronic illness (Havas, 2007.) Hallberg and Oberfeld, published in Electromagnetic Biology and Medicine, (2006,) show historical EHS data and project if past trends continue that 50% of the total population is expected to be Electrosensitive by year 2017. http://www.next-up.org/pdf/EHS2006_HallbergOberfeld.pdf

C4ST elaborate that "EHS is accepted as a functional impairment in Sweden and the Canadian Human Rights Commission recognizes it as an environmental sensitivity and classifies it as a disability." With some countries already recognizing the medical needs of those affected by EHS, the potential for millions of people around the world to become EHS from increased WiFi proliferation is unacceptable.

Environmental Impacts

A parade of studies continue to be published implicating wireless technology in the die-off of forests, the demise of frogs, bats, and honey bees, the threatened extinction of the house sparrow, and damage to the DNA of the human species. It is vital to the continuation of life that large parts of Earth are spared the incessant radiation that accompanies wireless technologies.

- "The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees" commissioned on 30th August 2010 by the Ministry of Environment and Forest, Government of India http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf
- "Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a view," http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf
- Balmori, A. "Electromagnetic pollution from phone masts. Effects on wildlife," *Pathophysiology* (2009), doi:10.1016/j.pathophys.2009.01.007 http://www.ncbi.nlm.nih.gov/pubmed/19264463
- An October 31, 2014, presentation to the Manitoba Entomological Society, reviewing 91 studies on the effects of RF/MW radiation on honey bees, insects, birds, etc: https://groups.google.com/forum/#!topic/mobilfunk_newsletter/0RUPGTI4qQY

United Nations Rio Declaration on Environment and Development

The Precautionary Principle as drawn up in Rio in 1992 - the Rio Declaration: http://www.gdrc.org/u-gov/precaution-7.html

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

> Principle 15 codified for the first time at the global level the precautionary approach, which indicates that lack of scientific certainty is no reason to postpone action to avoid potentially serious or irreversible harm to the environment. Central to principle 15 is the element of anticipation, reflecting a requirement that effective environmental measures need to be based upon actions which take a long-term approach and which might anticipate changes on the basis of scientific knowledge.

From the UN General Assembly: Resolution adopted by the General Assembly July 2012

66/288 The Future We Want

275. We recognize the importance of strengthening international, regional and national capacities in research and technology assessment, **especially in view of the rapid development and possible deployment of new technologies that may also have unintended negative impacts, in particular on biodiversity and health, or other unforeseen consequences** (emphasis added.)
http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E

An ETC Group Press Release "UN moves towards an early listening system," shares: "The decision paves the way for a badly needed early warning system on the impacts of new technologies" and explains:

> ETC Group proposed the creation of a technology assessment capacity in the UN in the lead up to the 2012 Rio Summit. At that time, the proposal was backed by the G-77 and China and a few OECD states such as Sweden and Norway. **The Summit concluded with a surprisingly strong call for technology assessment from local to global levels warning that new technologies could pose significant health and environmental risks** (emphasis added.)[i]

http://www.etcgroup.org/content/un-moves-towards-technology-early-listening-system

And from the Lancet:

> Planetary health is a new science that is only beginning to draw the coordinates of its interests and concerns. It demands new coalitions and partnerships across many different disciplines to meet the pervasive knowledge failures identified by this Commission. It demands new attention to governance and implementation. And, perhaps most of all, it demands **more creative imagination among scientists and practitioners working in health—redefining the meaning of human progress, rethinking the possibilities for human cooperation, and revitalising the prospects for the health of human civilizations** (emphasis added.) (par 7)

and

> Second, planetary health concerns the natural systems within which our species exists—for example, **the health and diversity of the biosphere. Human beings live within a safe operating space of planetary existence. If the boundaries of that space are breached, the conditions for our survival will be diminished** (emphasis added.)" Currently, natural systems are being degraded to an extent unprecedented in history, with known and as yet unknown and unquantified effects on human health. (par 2)
> http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(15)61038-8.pdf

51 U.S. Code Chapter 509 - COMMERCIAL SPACE LAUNCH

Section 7 of the following excerpt from the Legal Information Institute: (7) the United States should encourage private sector launches, reentries, and associated services and, only to the extent necessary, regulate those launches, reentries, and services to ***ensure compliance with international obligations of the***

United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States (emphasis added);
https://www.law.cornell.edu/uscode/text/51/50901

Insurance Companies Warn of Large Losses from Electromagnetic Fields

We also note that insurance in the event of injury due to RF/MWR radiation is not likely to be adequate – see pages 1 and 2 in the document at the following link:

http://www.gao.gov/assets/600/591391.pdf

A recent blog shares: "Insurance firm, Swiss Re, warns of large losses from "unforeseen consequences" of wireless technologies: http://emfrefugee.blogspot.ca/2014/04/major-insurance-firm-swiss-re-warns-of.html (Source: swissre.com)

> Specialists from the Emerging Risks team at leading global reinsurance firm, Swiss Re, are warning the insurance industry that "unforeseen consequences of electromagnetic fields" could lead to a raft of claims and significant product liability losses in the next 10 years.
>
> In its Swiss Re SONAR Emerging Risks report, 2013, which covers risks that could "impact the insurance industry in the future", the company categorizes the impact of health claims related to electromagnetic fields (EMFs) as 'high'. It acknowledges recent reports of courts' ruling in favor of claimants who have experienced health damage from mobile phones, and also says that anxiety over risks related to EMFs is "on the rise".
>
> The document states that whilst the majority of the topics covered in its pages were of "medium impact", health issues associated with EMFs sit in the highest impact category. Other topics discussed include the dangers of cyber attacks, power blackouts, workplace safety and Big Data all of which are exacerbated and/or added to with the ill-conceived "smart" metering programs.

Lloyds listed hazards from new technologies including EMF in its 2011 Top 50 Risks. Coverage for RF/EMF injuries typically related to cell phones and cell towers is now categorically excluded. In their 2013 Risk Report new technology risks have increased slightly in risk rank. It is worth noting these risks are classified under Environmental (i.e. does the applicant expect to have an adverse environmental impact?) as distinct from the Lloyds appraisal of cybersecurity risks (also applicable to SpaceX and rated much higher risk).

http://www.lloyds.com/~/media/Files/News%20and%20Insight/Risk%20Insight/Risk%20Index%202013/Report/Lloyds%20Risk%20Index%202013report100713.pdf

GUARDS asserts the global WiFi proposal would intensify these concerns on a global scale.

NEPA and Environmental Review

This is major Federal action significantly affecting the quality of human environment, as such a NEPA review would be triggered. The potential environment and human health hazards from SpaceX's and similar space-based WiFi projects underscore the need for comprehensive review. This is a situation that calls for NEPA review *Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972), and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of climate and environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether

"services or capabilities are essential to public health, safety, or in the public interest" (H.R. Report No. 104-204, p. 94) so must protect the public from possible harm caused by radiofrequency radiation.

The FCC is not entitled to essentially disregard our comments because they do not provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission)*. The Commission has an affirmative duty to inquire into and consider all relevant facts. They must use government resources to perform the relevant analysis. The FCC should request the EPA use its National Risk Management Research Laboratory resources and experts to conduct all cost analyses necessary.

Conclusion

Direct health care costs, production costs from missed or substandard work performance, lost or compromised ecological services and direct agricultural related costs related to RF/EMF exposure could cost societies billions of dollars. Not only is RF/EMF proliferation bad for health and the environment directly, this damage has a major economic cost as well.

With the very real threat to our ozone layer, implications for accelerated climate change, the insurance industry recognizing the serious potential for risk from cyber and grid security and health aspects of this technology, radiofrequency radiation currently classified "possible human carcinogen" by the World Health Organization, legal implications related to irradiating entire countries across the planet without informed consent, personal security risks, and resulting UN conventions that would be violated, please consider our comments as reasons a permit for the proposed project should be denied. Because the potential global effects of this and similar proposals from Facebook, Google and others are devastating, any consideration must proceed only with maximum levels of due diligence including full public access to application documents and all project specifications.

Sincerely,

Ed Friedman
42 Stevens Rd.
Bowdoinham, ME 04008
207-666-3372
edfomb@comcast.net

Marcey Kliparchuk
10859-147 Street
Edmonton, AB, Canada, T5N 3E1
780-760-0872
marcey.klip@yahoo.ca

GUARDS is an international coalition against global WiFi from space, a complex technology of radiation and toxic chemicals endangering all life on Earth.

Exhibit D

January 13, 2016
To the FCC Office of Engineering and Technology
Informal Objections to Google application for Experimental License –
File No. 0747-EX-PL-2015

I ask you to deny Google's application for experimental license #0747-EX-PL-2015

The public is prevented from having meaningful input into this process. These experimental approvals at the FCC, approved by engineers, not independent medical professionals or scientists, without public hearings, without seeking public comment or testimony, and under the political pressure of an industry-dominated agency, happen outside the view of most Americans. Their only input is through casting informal objections over the industry-guarded wall of the FCC and hoping someone takes notice inside.

We in the public are the subject of experiments, with no informed consent. FCC rules are so permissive that it is difficult to know what they prevent, especially when pulses or RF packets of information are involved. For instance and by comparison, 4 bullets are fired in 6 minutes and time averaged as to force of impact, and then this is extrapolated to 24/7 exposure of bullets being fired. I can't imagine any sane person saying, "I feel safe living in this bullet-populated environment because the guidelines say there's no harmful impact that I would endure." Would FCC engineers be willing to test out that sort of real world comparison of their time-averaging scheme?

It's also obvious that very few FCC engineers are willing to admit having left a pot on the stove over a low burner and forgotten it for 15, 20, 30, 45 minutes, only to find the pot, which previously hadn't even gotten warm, was now boiled dry, the food burned black, and the pot red-hot and creating a fire hazard. If they had, this criminal and hysterically ridiculous 6-minute exposure rule would be laughed out of the room. It was only invented under immense political pressure to create a guideline that permits anything the military and the industry want to create. It reminds me of the plight of the Syrians, with ISIS oil tankers, supply trucks, and arms traveling back and forth constantly through the Turkish border with no restrictions. Unfortunately, the American public doesn't have a Russian Air Force to protect it.

Many environmental impacts will result from Google's deployment. It is frightening to think that Google lacks such common sense as to deploy their project and think that it will have no effect. It is even more frightening to realize that the public has very little power to prevent it.

Objections:
It's difficult to be completely specific on impacts, when the platform is unknown.

If Google uses balloons, then events will include:

- Crashes endangering life and property
- Crashes onto motorways – streets and highways – with pounds of equipment and large balloons. When that happens, there will be mayhem, damage, and deaths.

- Transmitters continuing to broadcast after a crash, creating high, immediately injurious levels of RF for people and wildlife
- Crashes in waterways and the ocean, creating plastic debris. Some of this will never be recovered.

Despite advertising perfectly controlled descents, Google engineers have told the public that they lose control over these balloons. There are no laboratory ideal conditions in reality. The danger to the public will be substantial. The public can be assured that these balloons will have many problems and probably cause deaths.

- Physical interference with airplane travel – "dodge ball" with a plane full of people
- Uncontrolled descending equipment-laden balloons crashing onto airplanes
- Balloons being sucked into engines
- RF interference with FAA NexGen GPS or radar systems – balloons will be above airline routes, between planes and satellites
- RF interference with plane functioning such as the cell phone that caused vital aircraft systems to malfunction
- RF radiation affecting pilots, crew, and passengers
- Crashes without any knowledge or response from Google, such as the crash in South Africa - the omniscience of connectivity doesn't exist.
- Crashes onto power lines. This has happened at least once already and is completely unacceptable. Blackouts to the grid cause impacts to public safety that cannot be mitigated. And if the blackout in a region caused problems with nuclear power plants, the impacts would be beyond calculating.

Drones will have many of the same problems. Remote-controlled hobby planes routinely crash when they encounter interference; the pilot has no control of the rudder on his radio. This is similar to what utility companies discovered when they moved from their PowerPoint presentations and sims to real life -- Smart Meters and their network often don't work under real world conditions. The animations of drones (or balloons) all doing what they're supposed to, in sync with controllers, is nothing but the pure fantasy of cartoon worlds. Approval of this and other experimental projects brings liability on the FCC because these problems are easily forecasted.

And what of hacking? These are wireless. Drones or balloons, the controls can be altered by those who are skilled. Drones have a greater capacity for harm if hijacked. That could be horrifying.

Interference will occur on many levels. In addition to interference with airplanes, there could also be interference with medical devices and implants in people, security systems, a whole host of electronics and communication devices, and hospital monitoring equipment. People with metal implants could experience hotspots, just as with other sources of wireless radiation. There will be issues of reflection; if 600 MHz is used for part of Google's system, allowing greater penetration into buildings, automobiles, and planes, passengers of planes could be exposed to considerable reflection factors. "Fried in the sky" might be a new slogan.

The impact of these space-based systems, individually and together, on aviation ultimately affect the economy. When planes start crashing, It will take all the powers of spin doctors in Washington to keep the public in the dark. Would they blame that on terrorism, too?

RF emissions from Google's system are not reassuring when 0.0000000000001 microW/cm2 caused genetic alteration in e coli bacteria in a 1996 study. That's 1/ten-trillionth microW per cm2. In answer to whether there is a safe level of exposure to microwave radiation, particularly pulsed, the answer is probably "no." Yet, the FCC continues to push an engineering-based thermal-only model which has always ignored biology.

It's embarrassing as an American when foreign organizations such as the Austrian Medical Association propose preliminary "normal" levels of exposure 10,000,000 times lower than U.S. FCC "safe" guidelines. The Austrian Medical Association did not even say their proposed levels were safe, only more protective. And they set very abnormal and unsafe levels of RF exposure 10,000 times beneath FCC guidelines' so-called "safe" levels. Are FCC levels safe or easy?

On a practical level, I regularly deal with the fall-out from FCC guidelines. I know people who formerly had homes and careers and participated in society. Now, since the wireless revolution, they suffer cardiac, neurological, and immune impacts, some of them life-threatening, and often excruciating pain. Many are now homeless, destitute, and with nowhere safe to go. These already impacted individuals are terrified at the possibility of Google, SpaceX and other systems being deployed and how they will be affected. The high frequencies in Google's application also have more power and may actually break DNA bonds, rather than cause DNA damage by other mechanisms.

These space internet schemes will provide agony and increased struggle for growing numbers of people in the U.S. The environmental impacts to all species will be great. Eagles were suffering seizures and dying several years ago. Biologists were at a loss to understand, but it wasn't mysterious to those who know or have experienced the neurological effects of microwave radiation. Either military or industry experimentation easily explains this suffering.

With current cancer estimates being 1 out of 2 people getting cancer, and 1 in 5 children having mental disorders, and rates of autism that are approaching 1 in 50 children, we are in a health crisis.

The research has been clear for years on the impacts. Attached are a number of documents including the 1973 paper by the Canadian National Research Council "Electromagnetic Pollution by Microwave Radiation: A Potential Threat to Human Health."

The US falls further and further behind the rest of the world in addressing this issue, with its conspicuous lack of safeguards of any kind. In contrast, other countries have repeatedly taken action.

The surveillance issue is another serious consideration. I have never given my permission for Google to conduct surveillance over my community. Yet it does, every day. The frequencies Google

is experimenting are used for DHS-style scanning. They can look through objects. The possibilities for scanning populated areas and providing detailed interior modeling may be endless. That would be illegal. Google's insistence on secrecy, while stripping the public of their privacy, does not engender any confidence in their purposes. The public has no protection from the overt or covert uses by Google and other companies in concert with the federal government. These space-based systems become just another assault on an increasingly ill public.

Finally, there is the occupation of the commons above us -- the sky that belongs to everyone being filled with commercial and hazardous enterprises and junk. That is a crime against the earth and every creature on earth.

There are too many considerations to allow this application to proceed. The informal objection by GUARDS is absolutely right: "Global wireless access, with all its serious safety problems, is an unacceptable hazard."The public "benefits" from being able to stream NetFlix anywhere, in contrast to the many serious and harmful impacts, make the cost/benefit quite simple.

Deny this project as having unacceptable public safety impacts.

Sincerely,

Nina Beety
Member, California EMF Safety Coalition
Monterey, CA

Exhibit E

http://www.electromagnetic-pollution.com/main/page_biological_effects_exposure_tables.html

BIOLOGICAL EFFECTS OF MICROWAVES BELOW U.S. & CANADA'S REGULATORY LIMIT
(*micro*W/cm2) Reported Biological Effects References

• 0.0000000000001 Altered genetic structure in *E. Coli* Belyaev 1996

• 0.0000000001 Threshold of human sensitivity Kositsky 2001

• 0.000000001 Altered EEG in human subjects Bise 1978

• 0.0000000027 Growth stimulation in *Vicius fabus* Brauer 1950

• 0.00000001 Effects on immune system in mice Bundyuk 1994

• 0.00000002 Stimulation of ovulation in chickens Kondra 1970

• 0.000005 Effect on cell growth in yeast Grundler 1992

• 0.00001 Conditioned "avoidance" reflex in rats Kositsky 2001

• 0.000027 Premature aging of pine needles Selga 1996

0.001 100 Yards / metres from Cell Phone

• 0.002 Sleep disorders, abnormal blood pressure, nervousness, weakness, fatigue, limb and joint pain, digestive problems, fewer schoolchildren promoted Altpeter 1995, 1997

• 0.0027 Growth inhibition in *Vicius fabus* Brauer 1950

• 0.0027 to 0.065 Smaller tree growth rings Balodis 1996

0.007 50 Feet from a Cordless Phone

• 0.01 Human sensation Kolbun 1987

0.016 1 Mile (1.6Km) from a Cellular Tower

• 0.06 Altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels, structural changes in liver, spleen, testes, and brain in white rats and rabbits Dumanskij 1974

• 0.06 Slowing of the heart, change in EEG in rabbits Serkyuk, reported in McRee 1980

0.05 10 Feet /3 meters from a Wireless Computer

• 0.1 Increase in melatonin in cows Stark 1997

• 0.1 to 1.8 Decreased life span, impaired reproduction, structural and developmental abnormalities in duckweed plants Magone 1996

• 0.13 Decreased cell growth (human epithelial amnion cells) Kwee 1997

• 0.168 Irreversible sterility in mice Magras 1997

• 0.2 to 8.0 Childhood leukemia near transmitters Hocking 1996

- 0.3 Impaired motor function, reaction time, memory and attention of school children, and altered sex ratio of children (fewer boys) Kolodynski 1996
- 0.6 Change in calcium ion efflux from brain tissue Dutta 1986
- 0.6 Cardiac arrhythmias and sometimes cardiac arrest (frogs) Frey 1968
- 0–4 Altered white blood cell activity in schoolchildren Chiang 1989
- 1.0 Headache, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion (humans—occupational exposure) Simonenko1998
- 1.0 Stimulation of white cells in guinea pigs Shandala 1978
- 2.5 Breakdown of blood-brain barrier (used a digital cell phone to radiate) Salford 1997
- 5.0 Leukemia, skin melanoma and bladder cancer near TV and FM transmitter Dolk 1997
- 2.0 (lower “Microwave hearing” - clicking, buzzing, chirping, hissing, or high-pitched threshold note tones known) Frey 1963, 1969, 1971, 1973, 1988, Justeson 1979, Olsen 1980, Wieske 1963, Lin 1978
- 5.0 Biochemical and histological changes in liver, heart, kidney, and brain tissue Belokrinitskiy l982
- 10.0 Damaged mitochondria, nucleus of cells in hippocampus of brain Belokrinitskiy 1982a
- 10.0 Impaired memory and visual reaction time in people living near transmitters Chiang 1989
- 10.0 Decreased size of litter, increased number of stillborns in mice Il’Chevich (reported in McRee 1980)
- 10.0 Redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood Shutenko 1981
- **1000.0 United States FCC Exposure Limit, Safety Code 6 Canada limit**

Used by Meg Sears, *Medical Perspective on Environmental Sensitivities*, Canadian Human Rights Commission, 2007.

Source: Arthur Firstenberg

References used above

Altpeter, E. S. et al., 1995. Study on health effects of the shortwave transmitter station of Schwarzenburg, Berne, Switzerland, Study No. 55, Swiss Federal Office of Energy.

Bachurin, I. V., 1979. Influence of small doses of electromagnetic waves on some human organs and systems. Vrachebnoye Delo 7:95-97, JPRS 75515, pp. 36-39.

Balodis, V. et al., 1996. Does the Skrunda Radio Location Station diminish the radial growth of pine trees? The Science of the Total Environment 180:81-85.

Baranski, S. and Edelwejn, Z., 1975. Experimental morphologic and EEG studies of microwave effects on the nervous system. Annals of the New York Academy of Sciences 247:109-116.

Belokrinitskiy, V.S., 1982. Hygienic evaluation of biological effects of non-ionizing microwaves. Gigiyena i Sanitariya 6:32-34, JPRS 81865, pp. 1-5.

Belokrinitskiy, V. S., 1982a. Destructive and reparative processes in hippocampus with long-term exposure to nonionizing microwave radiation. Bulletin of Experimental Biology and Medicine 93(3):89-92.

Belyaev, I. Y., et al., 1996. Resonance effect of millimeter waves in the power range from 10–19 to 3 x 10–3 W/cm2 on Escherichia coli cells at different concentrations. Bioelectromagnetics 17:312-321.

Bergqvist, U., and Vogel, E., eds. Possible Health Implications of Subjective Symptoms and Electromagnetic Fields. Solna, Sweden: National Institute for Working Life, 1997.

Bise, W., 1978. Low power radio-frequency and microwave effects on human electroencephalogram and behaviour. Physiological Chemistry and Physics 10(5):387-398.

Brauer, I., 1950. Experimenta1 studies on the effect of meter waves of various field intensities on the growth of plants by division. Chromosoma 3:483-509.

Bundyuk, L.S., et al., 1994. Corrective action of millimeter waves on systems of various levels of hierarchy. Physics of the Alive 2(1):12-25.

Chiang, H., 1981. Assessment of health hazard and standard promulgation in China. Biological Effects and Dosimetry of Nonionizing Radiation, NATO Conference, Erice, Italy, pp. 627-644.

Chiang, H., et al., 1989. Health effects of environmental electromagnetic fields. Journal of Bioelectricity 8(1):127-131.

Dolk, H, et al., 1997. Cancer incidence near radio and television transmitters in Great Britain, I. Sutton Coldfield transmitter. American Journal of Epidemiology 145(1):1-9.

Dumanskij, J. D., and Shandala, M. G., 1974. The biologic action and hygienic significance of electromagnetic fields of super-high and ultrahigh frequencies in densely populated areas. Biologic Effects and Health Hazards of Microwave Radiation, Proceedings of an International Symposium, Warsaw, 15-18 Oct. 1973, P. Czerski et al., eds.

Dutta, S. K., et al, 1986. Microwave radiation-induced calcium ion flux from human neuroblastoma cells: dependence on depth of amplitude modulation and exposure time. Biological Effects of Electropollution, S. Dutta and R. Millis, eds., pp. 63-69. Philadelphia, PA: Information Ventures.

Flakiewicz, W., and Cebulska-Wasilewska, A., 1992. Biological effects of EM field on randomly selected human population residing permanently close to the high power, long wave radio transmitter, and Trandescantia plant model system in situ. International Wroclaw Symposium on Electromagnetic Compatibility, pp. 72-76.

Frey, A. H., 1963. Human response to very-low-frequency electromagnetic energy. Nav. Res. Rev. 1968:1-4.

Frey, A. H., and Seifert, E., l968. Pulse modulated UHF energy illumination of the heart associated with change in heart rate. Life Sciences 7(Part II):505-512.

Frey, A. H., 1968. Effects of microwave and radio frequency energy on the central nervous system. Symposium Proceedings. Biological Effects and Health Implications of Microwave Radiation, Richmond, VA, Sept. 1969, pp. 134-139.

Frey, A.H., 1971. Biological function as influenced by low power modulated RF energy. IEEE Transactions on Microwave Theory and Techniques, MTT-19(2):153-164.

Frey, A. H., and Messenger, R., 1973. Human perception of illumination with pulsed ultrahigh-frequency electromagnetic energy. Science 181:356-358.

Frey, A. H., 1986. Evolution and results of biological research with low-intensity non-ionizing radiation. Modern Bioelectricity, A. A. Marino, ed., pp. 785-837. New York, NY: Dekker.

Gorbach, I. N., 1982. Changes in nervous system of individuals exposed to microradiowaves for long period of time. Zdravookhraneniye Belorussii 5:51-53, JPRS 81865, pp. 24-28.

Grant, L., 1995. Electrica1 Sensitivity Handbook. Prescott, AZ: Weldon Publishing.

Grundler, W., and Kaiser, F., l992. Experimental evidence for coherent excitations correlated with cell growth. Nanobiology 1:163-176.

Hocking, B., and Gordon, I., 1996. Cancer incidence and mortality and proximity to TV towers. Medical Journal of Australia 165(11-12):601-605.

Hocking, B., 1998. Symptoms associated with mobile phone use, Occupationa1 Medicine 48(6):357-360, and letter, vol. 48(7):472.

Justeson, D. R., 1979. Behavioral and psychological effects of microwave radiation. Bulletin of the New York Academy of Medicine 55(11):1058-1078.

Klimkova-Deutschova, E., 1974. Neurologic findings in persons exposed to microwaves. Biologic Effects and Health Hazards of Microwave Radiation, Proceedings of an International Symposium, Warsaw, 15-18 Oct. 1973, P. Czerski et al., eds., pp. 268-272.

Kolbun, N. D, and Sit'ko, S. P., 1987. Sensory indications by the human body of EHF-range electromagnetic radiation. Mechanisms of Biological Action of Electromagnetic Radiation: Proceedings of the Pushchino Symposium, 27-31 Oct. 1987.

Kolodynski, A. A., and Kolodynska, V. V., 1996, Motor and psychological functions of school children living in the area of the Skrunda Radio Location Station in Latvia. The Science of the Total Environment 180:87-93.

Kondra, P. A., et al., 1970. Growth and reproduction of chickens subjected to microwave radiation. Canadian Journal of Animal Science 50:639-644.

Kositsky, N. N., et al., 2001. Influence of high-frequency electromagnetic radiation at non-thermal intensities on the human body (a review of work by Russian and Ukrainian researchers). No Place To Hide 3(1) Supplement.

Kwee, S., and Raskmark, P. , 1997. Radiofrequency electromagnetic fields and cell proliferation. In Proceedings of the Second World Congress for Electricity and Magnetism in Biology and Medicine, June 8-12, 1997, Bologna, Italy, F. Bersani, ed.

Lilienfeld, A. M., 1978. Evaluation of Health Status of Foreign service and Other Employees from Selected Eastern European Posts, National Technical Information Service, PB288-163.

Lin, J. C., 1970. Microwave Auditory Effects and Applications. Springfield, IL: Charles C. Thomas. Magone, I., 1996. The effect of electromagnetic radiation from the Skrunda Radio Location Station on Spirodela polyrhiza (L.) Schleiden cultures. The Science of the Total Environment 180:75-80.

Magras, I. N., and Xenos, T. D., 1997. RF radiation-induced changes in the prenatal development of mice. Bioelectromagnetics 18:455-461.

Marha, H., 1969. Maximum admissible values of HF and UHF electromagnetic radiation at work places in Czechoslovakia. Symposium Proceedings. Biological Effects and Health Implications of Microwave Radiation. Richmond, VA, Sept. 1969, S. Cleary, ed., pp. 188-191.

Markarov. G., et al., 1995. Hypersensitivity to EMF, and the dependence of brain bioelectrical activity and general hemodynamics in cerebral asthenic (CA) patients, exposed to radioactive irradiation upon EMF 20-80 Hz effect, Proceedings of the 2nd Copenhagen Conference on Electromagnetic Hypersensitivity, May 1995. J. Katajainen and B. Knave, eds., pp. 57-60.

Mild, K. H., et al., 1998. Comparison of symptoms experienced by users of analogue and digital mobile phones. A Swedish-Norwegian epidemiological study. 1998:23. Umea, Sweden: National Institute for Working Life

Olsen, R. G., 1980. Evidence for microwave-induced acoustic resonances in biological material. Bioelectromagnetics 1:219.

Proceedings of the COST 244 Meeting on Electromagnetic Hypersensitivity, Graz, Austria, Sept. 26-27, 1994, Dina Simunic, ed.

Proceedings: 15th Annual International Symposium on Man and His Environment in Health and Disease: Environmental Aspects of EMF and Bioelectricity, American Environmental Health Foundation, February 20-23, 1997, Dallas, Texas.

Proceedings: First Copenhagen Meeting on Electromagnetic Hypersensitivity, 1994. Danish Assoc. for the Electromagnetically Hypersensitive, c/o Aase Thomassen, Lunden 1, Alum, DK-8900, Randers, Denmark.

Proceedings: Second Copenhagen Conference on Electromagnetic Hypersensitivity, 1995. Danish Assoc. for the Electromagnetically Hypersensitive.

Sadchikova, M. N., State of the nervous system under the influence of UHF. The Biological Action of Ultrahigh Frequencies, A.A. Letavet and Z.V. Gordon, eds., Academy of Medical Sciences, Moscow, pp. 25-29.

Sadchikova, M. N., Clinical manifestations of reactions to microwave radiation in various occupational groups. Biologic Effects and Health Hazards of Microwave Radiation, Proceedings of an International Symposium, Warsaw, 15-18 Oct. 1973, P. Czerski et al., eds., pp. 261-267.

Sadchikova, M. N., et al., 1980. Significance of blood lipid and electrolyte disturbances in the development of some reactions to microwaves. Gigiyena Truda I Professional'nyye Zabolevaniya 2:38-39, JPRS 77393, pp. 37-39.

Salford, L. G., et al., 1997. Blood brain barrier permeability in rats exposed to electromagnetic fields from a GSM wireless communication transmitter. In: Proceedings of the Second World Congress for Electricity and Magnetism in Biology and Medicine, June 8-12, 1997, Bologna, Italy, F. Bersani, ed.

Selga, T., and Selga, M., Response of Pinus sylvestris L. needles to electromagnetic fields. Cytological and ultrastructural aspects. The Science of the Total Environment 180:65-73.

Shandala, M.G., and Vinogradov, G. I., 1978. Immunological effects of microwave action. Gigiyena i Sanitariya, no. 10:34-38, JPRS 72956, pp. 16-21.

Shutenko, O. I., et al., 1981. Effects of superhigh frequency electromagnetic fields on animals of different ages. Gigiyena i Sanitariya, no. 10:35-38, JPRS 84221, pp. 85-90.

Simonenko, V. B., et al., 1998. Influence of electromagnetic radiation in the radiofrequency range on the health condition of an organized collective. Voenno-meditsinskiy zhurnal CCCXIX(5):64-68.

Stark, K., et al., 1997. Absence of chronic effect of exposure to short-wave radio broadcast signal on salivary melatonin concentrations in dairy cattle. Journal of Pineal Research 22:171-176.

Trinos, M. S., 1982. Frequency of diseases of digestive organs in people working under conditions of combined effect of lead and SHF-range electromagnetic energy. Gigiyena i Sanitariya, no. 9:93-94, JPRS 84221, pp. 23-26.

Wieske, C. W., 1962. Human sensitivity to electric fields. In Proceedings of the First National Biomedical Sciences Instrumentation Symposium, Los Angeles, July 14-17, 1962, Reprinted in Electrical Sensitivity News 1(5):1-4, l996.

Zalyubovskaya, N. P., and Kiselev, R. I., 1978. Effect of radio waves of a millimeter frequency range on the body of man and animals. Gigiyena i Sanitariya 8:35-39, JPRS 72956, pp. 9-15.