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Planetary electromagnetic pollution: it is time to assess its impact

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Planetary Health Alliance mov wa r a productive second annual meeting, a discussion on the rapid global proliferation of artificial electromagnetic fields would now be apt. The most notable is the blanket of radiofrequency electromagnetic radiation, largely microwave radiation generated for wireless communication and surveillance technologies, as mounting scientific evidence suggests that prolonged exposure to radiofrequency electromagnetic radiation has serious biological and health effects. However, public exposure regulations in most countries continue to be based on the guidelines of the International Commission on Non-Ionizing Radiation Protection[1] and Institute of Electrical and Electronics Engineers,[2] which were established in the 1990s on the belief that only acute thermal effects are hazardous. Prevention of tissue heating by radiofrequency electromagnetic radiation is now proven to be ineffective in preventing biochemical and physiological interference. For

example, acute non-thermal exposure has been shown to alter human brain metabolism by NIH scientists,[3] electrical activity in the brain,[4] and systemic immune responses.[5] Chronic exposure has been associated with increased oxidative stress and DNA damage[6, 7] and cancer risk.[8] Laboratory studies, including large rodent studies by the US National Toxicology Program[9] and Ramazzini Institute of Italy,[10] confirm these biological and health effects in vivo. As we address the threats to human health from the changing environmental conditions due to human activity,[11] the increasing exposure to artificial electromagnetic radiation needs to be included in this discussion.

Due to the exponential increase in the use of wireless personal communication devices (eg, mobile or cordless phones and WiFi or Bluetooth-enabled devices) and the infrastructure facilitating them, levels of exposure to radiofrequency electromagnetic radiation around the 1 GHz frequency band, which is mostly used for modern wireless communications, have increased from extremely low natural levels by about 10^{18} times (figure). Radiofrequency electromagnetic radiation is also used for radar, security scanners, smart meters, and medical equipment (MRI, diathermy, and radiofrequency ablation). It is plausibly the most rapidly increasing anthropogenic environmental exposure since the mid-20th century, and levels will surge considerably again, as technologies like the Internet of Things and 5G add millions more radiofrequency transmitters around us.

Figure thumbnail gr1

Figure **Typical maximum daily exposure to radiofrequency electromagnetic radiation from man-made and natural power flux densities in comparison with International Commission on Non-Ionizing Radiation Protection safety guidelines**[1]

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Anthropogenic radiofrequency electromagnetic radiation levels are illustrated for different periods in the evolution of wireless communication technologies. These exposure levels are frequently experienced

daily by people using various wireless devices. The levels are instantaneous and not time-averaged over 6 minutes as specified by International Commission on Non-Ionizing Radiation Protection for thermal reasons. Figure modified from Philips and Lamburn[12] with permission. Natural levels of radiofrequency electromagnetic radiation were based on the NASA review report CR-166661.[13]

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Unprecedented human exposure to radiofrequency electromagnetic radiation from conception until death has been occurring in the past two decades. Evidence of its effects on the CNS, including altered neurodevelopment[14] and increased risk of some neurodegenerative diseases,[15] is a major concern considering the steady increase in their incidence. Evidence exists for an association between neurodevelopmental or behavioural disorders in children and exposure to wireless devices,[14] and experimental evidence, such as the Yale finding, shows that prenatal exposure could cause structural and functional changes in the brain associated with ADHD-like behaviour.[16] These findings deserve urgent attention.

At the Oceania Radiofrequency Scientific Advisory Association, an independent scientific organisation, volunteering scientists have constructed the world's largest categorised online database of peer-reviewed studies on radiofrequency electromagnetic radiation and other man-made electromagnetic fields of lower frequencies. A recent evaluation of 2266 studies (including in-vitro and in-vivo studies in human, animal, and plant experimental systems and population studies) found that most studies (n=1546, 68·2%) have demonstrated significant biological or health effects associated with exposure to anthropogenic electromagnetic fields. We have published our preliminary data on radiofrequency electromagnetic radiation, which shows that 89% (216 of 242) of experimental studies that investigated oxidative stress endpoints showed significant effects.[7] This weight of scientific evidence refutes the prominent claim that the deployment of wireless technologies poses no health risks at the currently permitted non-thermal radiofrequency exposure levels. Instead, the evidence supports the International EMF Scientist Appeal by 244 scientists from 41 countries who have published on the subject in peer-reviewed literature and collectively petitioned the WHO and the UN for

immediate measures to reduce public exposure to artificial electromagnetic fields and radiation.

Evidence also exists of the effects of radiofrequency electromagnetic radiation on flora and fauna. For example, the reported global reduction in bees and other insects is plausibly linked to the increased radiofrequency electromagnetic radiation in the environment.[17] Honeybees are among the species that use magnetoreception, which is sensitive to anthropogenic electromagnetic fields, for navigation.

Man-made electromagnetic fields range from extremely low frequency (associated with electricity supplies and electrical appliances) to low, medium, high, and extremely high frequency (mostly associated with wireless communication). The potential effects of these anthropogenic electromagnetic fields on natural electromagnetic fields, such as the Schumann Resonance that controls the weather and climate, have not been properly studied. Similarly, we do not adequately understand the effects of anthropogenic radiofrequency electromagnetic radiation on other natural and man-made atmospheric components or the ionosphere. It has been widely claimed that radiofrequency electromagnetic radiation, being non-ionising radiation, does not possess enough photon energy to cause DNA damage. This has now been proven wrong experimentally.[18, 19] Radiofrequency electromagnetic radiation causes DNA damage apparently through oxidative stress,[7] similar to near-UV radiation, which was also long thought to be harmless.

At a time when environmental health scientists tackle serious global issues such as climate change and chemical toxicants in public health, there is an urgent need to address so-called electrosmog. A genuine evidence-based approach to the risk assessment and regulation of anthropogenic electromagnetic fields will help the health of us all, as well as that of our planetary home. Some government health authorities have recently taken steps to reduce public exposure to radiofrequency electromagnetic radiation by regulating use of wireless devices by children and recommending preferential use of wired communication devices in general, but this ought to be a coordinated international effort.

We declare no competing interests. We thank Alasdair Philips for assistance with the figure and Victor Leach and Steve Weller for assistance with the ORSAA Database, which has enabled our overview of the scientific evidence in this area of research.

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Figures

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Figure Typical maximum daily exposure to radiofrequency electromagnetic radiation from man-m...

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These comments are submitted by and on behalf of a group of Malibu residents. They address 19 applications in various stages of the application process. Each application and its status is identified in the below table, based on information taken from the October 12, 2023 WCF Pending Projects Report.[1] The commenting residents request that a copy of these comments be placed in and considered part of the record in each of the 19 application files and used to determine the appropriate action to be taken for each project. Where we address a unique aspect of any given project or a discrete subset of projects, then the specific issue we identify should be resolved as to that individual project or the ones in that subset.

App	Street #	Street Name	Description	Status	Case Planner
WRP 22-006	3652.5	SWEETWATER MESA RD	Upgrade existing T-Mobile facility	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Coli Turner
WRP 22-010	20155.5	PACIFIC COAST HWY	Upgrade existing T-Mobile facility	Incomplete application	Alexander Da Silva
WRP 22-011	24034.5	MALIBU RD	T-Mobile upgrade existing	Notice of Application issued on 10/03/23; Application deemed complete on	Coli Turner

[1] According to the October 12, 2023 WCF Pending Project Report:
Red Font means there is an "update" to the last report for the project;
Green Font means the project is subject to public comment or there is an open appeal period; and
Black Font appears to represent no change from the last report for the project.

App	Street #	Street Name	Description	Status	Case Planner
			wireless with new antenna		
WRP 22-012	24467.5	MALIBU RD	T-Mobile upgrade existing wireless with new antenna	Notice of Application issued on 9/28/23; Application deemed complete on 9/22/23	Samantha Elias
WRP 22-013	25153.5	PACIFIC COAST HWY	T-Mobile upgrade existing wireless with new antenna	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Coli Turner
WRP 22-014	3011.5	CORRAL CANYON RD	T-Mobile upgrade existing wireless with new antenna	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Coli Turner
WRP 22-017	19900.5	BIG ROCK DR	T-Mobile upgrade existing wireless with new antenna	Incomplete application	Alexander Da Silva
WRP 22-018	7311.5	BIRDVIEW AVE.	T-Mobile upgrade existing wireless	Notice of Application issued on 9/28/23; Application deemed complete on 9/22/23	Samantha Elias
WRP 22-019	5818.5	KANAN DUME RD.	T-Mobile upgrade existing wireless	Notice of Application issued on 9/28/23; Application deemed complete on 9/22/23	Samantha Elias
WRP 22-021	27513.5	PACIFIC COAST HWY	T-Mobile upgrade existing wireless facility	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Coli Turner
WRP 23-002	29029.5	CLIFFSIDE DR	T-Mobile upgrade existing wireless facility	Incomplete application	Coli Turner

App	Street #	Street Name	Description	Status	Case Planner
WRP 23-003	7101.5	FERNHILL DR	T-Mobile upgrade existing wireless facility	Notice of Application issued on 9/28/23; Application deemed complete on 9/22/23	Samantha Elias
WRP 23-004	24867.5	PACIFIC COAST HWY	T-Mobile upgrade existing wireless facility	Incomplete application	Coli Turner
WP 23-005	28211	PACIFIC COAST HWY	T-Mobile upgrade existing wireless facility	Incomplete application	Samantha Elias
WRP 23-005	6178.5	LATIGO CANYON RD	T-Mobile upgrade existing wireless facility	Incomplete application; Previous address: 6302.5 Latigo Canyon Road	Samantha Elias
WRP 23-007, CDP 23-003, VAR 23-001	21971.5	PACIFIC COAST HWY	T-Mobile upgrade existing wireless facility	Incomplete application	Samantha Elias
WRP 23-008	28395.5	PACIFIC COAST HIGHWAY	T-Mobile upgrade existing wireless facility	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Samantha Elias
WRP 23-009	23816.5	MALIBU CREST DR	T-Mobile upgrade existing wireless facility	Notice of Application issued on 9/28/23; Application deemed complete on 9/25/23	Coli Turner
WRP 23-010	22002.5	CARBON MESA RD	T-Mobile upgrade existing wireless facility	Incomplete application	Tyler Eaton

1. The Above Applications Are Being Processed In Contravention of Applicable Ordinances and Resolutions, And With Disregard for Residents' Rights

The residents who participated in the City Council's adoption of Ordinance 477, Ordinance 484 and each of the two associated Resolutions (Resolution 20-65 and Resolution 21-17) (hereafter referred to collectively as the Ordinances and Resolutions) had several key objectives. They sought to preserve, to the greatest extent possible, local control and they advocated for rational design guidelines to ensure the safety of wireless installations, particularly from fire. That is why the Council expressly required a showing of compliance with applicable safety codes and the material required by "Wireless Permit (WP) and Wireless ROW Permit (WRP) Submittal Checklist/ Packet Item 16 was put in the application content form. The residents also focused on the procedural process to ensure residents affected by a project could participate and have a voice in individual wireless facility applications.

The residents were somewhat comforted when their efforts resulted in the City Council's adoption of the Ordinances and Resolutions, and they are pleased that the Council recently recognized the need to further update them for consistency and clean-up. It is now apparent, however, that neither the residents' objectives and aspirations nor the City Council's intentions have been fulfilled in the handling of many of the above applications. The residents have not been afforded reasonable participatory rights and they have been denied timely and full access to important documents that the City has used to make procedural "completeness" determinations and that it will use to decide the merits of applications.

The residents have had to serially and repeatedly request application-related documents through public records requests and they have had no way of knowing when to file a refresh request to obtain documents and materials generated after the last request. The residents have had little to no insight into process or progress and could not anticipate when they might finally be allowed to provide any substantive input.

What is worse is that residents or their representatives were repeatedly informed that key materials existed but could not be released due to confidentiality or other reasons. The public documents released on Friday, October 13th reveal that these representations were untrue. The issue is ***not*** confidentiality of the documents; it is that there are, in fact, no such documents. City staff has not enforced the requirement for the key materials.

The claim of confidentiality was just a ruse to conceal the fact that higher-level[2] City staff were inhibiting implementation, application, and enforcement of the applicable wireless application content and processing rules. Residents were purposefully misinformed by certain City personnel and even the City's city attorney's office.[3] This deceit is disturbing in its own

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[2] The residents do not believe the case planners (Tyler Eaton, Coli Turner, Alexander Da Silva, or Samanth Elias) were willing participants in this gambit; at most they were carrying out instructions from their superiors.

[3] Assistant City Attorney Patrick Donegan asserted the "confidentiality" claim through correspondence with the undersigned. City Attorney Trevor Rusin made the "confidentiality" argument to the full City Council with regard to the same materials during the Council's June 26, 2023 regular meeting. So it is not just the residents that have been misled; the City's attorney repeated the deceptive claim to the City Council, his own clients.

right. But it also points up a fatal problem with the applications listed above. It is now apparent that essential required materials were never submitted to begin with, and this deficiency was obfuscated and then ignored for purposes of evaluating the completeness and merits of the applications. This is most apparent from the Submittal Checklist submitted on November 30, 2022 for WRP 23-005, 6400.5 Latigo Canyon Road. The applicant typed "N/A" for Checklist item 16 even though Item 16 ***does*** apply. For whatever reason the responsible city personnel never required that the Item 16 information be submitted and it was never submitted.

These applications must be denied or at least re-noticed for deficiency. Simply put, the applicants have not carried their burden of proving compliance with the Fire and Electrical Safety Standards in Resolution 20-65, Sec. 4.G and consistency with the applicable Ordinances and Resolutions.

The residents have tried to obtain full access to application files for two projects (23-002, 29029.5 Cliffside and 23-010 Carbon Mesa) for more than 8 months. As part of that process city staff stated that the plan check materials delivered to the Building and Safety Department could not be made available to the public due to "confidentiality" and "copyright" concerns. Specifically, we were advised that the material required by "Wireless Permit (WP) and Wireless ROW Permit (WRP) Submittal Checklist/ Packet Item 16 existed but would not be released. Undersigned counsel wrote a letter to City officials on July 11, 2023, contesting City staff's refusal to release this material. There was never any substantive response to that letter.

Between September 28 and October 3, Planning staff deemed several wireless applications complete and invited comment by Monday, October 9th. After complaint about the short notice and the fact that the residents were not able to proffer meaningful comment without access to the full application, including the Item 16 information, the Assistant Planning Director stated on October 13th that the full file for 12 applications, in response to PRA 536, PRA 537 and PRA 539 would be allowed. As promised, the information was delivered on Friday, October 13. All but one (WRP 23-006) of the 12 applications related to wireless projects that had recently been deemed complete on September 28 or October 3, and therefore open for comments on the merits. There was more than a gigabit of information, with thousands of pages to pore through. The Assistant Planning Director also indicated there was still time to submit comments. It took five business days to review the material, gather information, secure an expert opinion and prepare comments.

The residents now submit these comments on those 12 applications, along with 7 others including the two projects the residents selected to monitor since early 2023 (WRP 23-002, 29029.5 Cliffside and WRP 23-010 Carbon Mesa).[4] Notably, one of those two (WRP 23-002, 29029.5 Cliffside) is marked in green in the October 12, 2023 status report, indicating the project is open to public comment even though the status report also states the application is still incomplete.

The Applicant claims that wireless facilities in issue in 18[5] of the applications are in public right-of-way. The affected parties involved here do not concede that point since there has

[4] No Building and Safety plan check information for WRP 23-002 or WRP 23-010 has been provided even though the public records submitted for them specifically asked for all the plan check information.

[5] The other one is WP 23-005, 28211 Pacific Coast Highway and it involves a project on private property.

not been any reliable evidence (deed or plat records) so demonstrating in any of the available materials. Assuming, without conceding, that the facilities are or will be in right-of-way, then MMC Chapter 12.02 as amended by Ordinance 477 and Resolution 20-65 govern them. For LIP purposes LIP Chapter 3.16 as it existed prior to Ordinance 477/Resolution 20-65 still applies. These comments apply both MMC Chapter 12.02 and LIP Chapter 3.16.

2. The Applications are Missing Essential and Mandatory Electrical Safety Information

The City Council adopted Ordinance 477 and its companion Resolution 20-65 for wireless facilities in rights-of-way.[6] The residents active in the ordinance development proceedings dedicated considerable attention to fire, electrical, and structural safety. The residents' concerns flowed directly from the fact that Malibu was (and is still) reeling from the devastating 2018 Woolsey Fire. The residents were and still are most concerned about ensuring proper and ***safe*** design and operation for all wireless facilities in Malibu. This town has been devastated by two major fires in recent years (Woolsey Fire in 2018 and Malibu Canyon Fire in 2007), and both were caused in whole or part by faulty telecommunications equipment. The CPUC accused the responsible parties in both fires – three major wireless carriers including the applicant here, one major wireless infrastructure builder, and Malibu's primary utility, SCE – of attempting to impede the fire investigations. These parties still routinely ask for permits to build infrastructure.

History demands more scrutiny, not less, and certainly not turning a blind eye to the past. The carriers' reckless disregard for fire safety cannot be allowed to once again put Malibu at risk. That is why the City Council acted to adopt the Ordinances and Resolutions and it is why the City ***must*** enforce its safety requirements and ensure that public has access to information they need to be satisfied that happens. Certain city officials tried to prevent the public from discovering they were not enforcing the safety requirements put in place by the City Council. They have now been exposed.

The applications for 8 of the 19 projects (WRP 22-010,WRP 22-017, WRP 23-002, WRP 23-004, WP 23-005, WRP 23-005, WRP 23-007 and WRP 23-010) have still not been accepted as complete. The residents agree that these applications are not complete because the applicant has not provided documents and information expressly required by the Staff-promulgated "Wireless Permit (WP) and Wireless ROW Permit (WRP) Submittal Checklist/ Packet." Specifically, the applicant has not provided the information mandated by Item 16, as explained below.

The applications for the remaining 11 projects have been deemed "complete," but this was error. The finding of completeness must be rescinded and withdrawn since the applicant in each of those projects also has not supplied Item 16-compliant information. If the completeness finding is not rescinded or withdrawn, then each of the 11 applications must be denied because the applicant has not carried its burden of proving that the facility meets the Fire and Electrical Safety Standards in Resolution 20-65, Sec. 4.G.

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[6] Ordinance 477 amended Malibu Municipal Code ("MMC") by adding Chapter 12.02. The amendments did not take immediate effect with regard to the Coastal Local Implementation Plan ("LIP") and the LIP portion has not yet become effective due to Coastal Commission approval delays. The previously-approved LIP terms still apply. The MMC amendments to Chapters 12.02, however, are effective.

The residents retained an electrical engineer to provide an opinion on the documentation and acceptable professional electrical engineering standards for two of the proposed wireless installations. Specifically, Erik Anderson, P.E., the principal of Andersen Engineering in Phoenix, Arizona reviewed the red-stamped "BSD Final Plans" for WRP 22-018, 7311.5 Birdview and WRP 23-008, 28395.5 Pacific Coast Highway. Engineer Anderson reviewed for the information that was there, and his opinion regarding the plans is attached and discussed below. More important, he was tasked with assessing the extent to which the applicant had satisfactorily supplied the information required by "Wireless Permit (WP) and Wireless ROW Permit (WRP) Submittal Checklist/ Packet" Item 16. He could not locate that material. The undersigned has also combed through the materials that were provided in response to the public records requests for 12 more of the 19 projects.[7] Not a single one of them includes a complete set of materials responsive to Item 16 in the submittal checklist.

Checklist item 16 requires:

> The following engineering documents prepared under the responsible charge of and sealed by a California licensed Professional Engineer must be included in the application:
>
> a. A short circuit and coordination study ("SCCS") calculated pursuant to the IEEE 551-2006: Recommended Practice for Calculating AC Short-Circuit Currents in Industrial and Commercial Power Systems or the latest version of that standard. The study must demonstrate the protection devices will ensure the equipment enclosure will not be breached. The SCCS must include analysis of Voltage Transient Surges due to contact of conductors of different voltages;
> b. A one-line diagram of the electrical system;
> c. Voltage Drop & Load Flow Study;
> d. Load Calculation;
> e. Panel Directories;
> f. A plot plan showing the location of the mounting structure including address, or structure designation, or GPS location on the front sheet;
> g. A plot plan showing the location of the service disconnecting means; and
> h. An elevation drawing of the equipment and the service disconnecting means.

As the attached opinion letter from Engineer Anderson explains, the application content checklist properly requires this engineering information because it is key to determining whether the proposed design is safe. It is not possible to assess electrical design adequacy without all the foregoing information as part of the SCCS, Voltage Drop & Load Flow Study and Load Calculation performed and described by a Professional Engineer. The load calculation, including panel/load center and connected load data and type of overcurrent protection[8] and KAIC[9] are all

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[7] The residents have not submitted public records requests for 5 of the applications and therefore cannot definitively state that the Item 16 responses are missing from them. The working assumption for these comments is that those 5 basically follow the same general trends those for which records have been supplied.

[8] Overcurrent protection is used to limit or disable current flow through hardware and other electrical components, typically in the form of fuses, circuit breakers, or fusible links.

[9] KAIC stands for Kilo Ampere Interrupting Capacity and is sometimes referred to as Thousand Ampere Interrupting Capacity. KAIC refers to measurements of the ability of a circuit breaker to withstand a short

essential because they provide substantive and objective information regarding the likelihood of catastrophic failure that might cause a major fire. Nor can the assessment be made when the location and elevation of the service disconnecting means is not included. Engineer Anderson's opinion letter states that "the system cannot be assessed for its ability to function safely. The applications are incomplete and an assessment of their ability to function safely is not possible."

All 19 applications ***must*** be rejected because the applicant has not carried its burden of proving that the facility meets the Fire and Electrical Safety Standards in Resolution 20-65, Sec. 4.G.

3. Design Defect Is Apparent From The Plan Information That Is Provided

The design information that has been supplied for each of the applications also reveals one and perhaps two significant flaws. One flaw is apparent in every application. The second may be present for all, but some of the applications do not contain sufficient information to tell.

Engineer Anderson's attached opinion addresses the two applications he was able to review (WRP 22-018, 7311.5 Birdview and WRP 23-008, 28395.5 Pacific Coast Highway) in the short time that was afforded. For both WRP 22-018 and WRP 23-008 Engineer Anderson notes that "[t]he plans show No. 14 AWG Copper branch circuitry protected by a 20 Amp circuit breaker. This would not be allowed in an installation governed by the National Electrical Code, and it does not follow good / safe engineering practices." For WRP 23-008 he observes that the "plans also show No. 10 AWG Copper conductors protected by a 60 Amp circuit breaker. This would not be approved in an installation governed by the National Electrical Code, and it does not follow good / safe engineering practices." The plans for WRP 22-018 do not reveal supply current or protection for the service entrance conductors, so it is not possible to discern if they are overrated through excessive breaker capacity.

14 gauge wire is rated for 15 Amps. Using 14 AWG with a 20 Amp breaker will result in overheating and therefore a risk of electrical fire. 12 gauge wire is necessary for a 15 Amp breaker. Similarly, 10 gauge wire is rated for 30 Amps. A 60 Amp breaker will, once again, overheat the conductor. It can melt and then cause a fire. Instead, 6 gauge wire is required. The plans demonstrate that the applicant has failed to employ the correct conductors for the overcurrent protection that was used in the design.

The materials for many of the projects contain "Equipment Spec" Sheets for the antennas and radios contemplated for these projects. Page 45 of that material directly cautions against the very design that was used. The relevant discussion is reproduced below.

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circuit or overload. Amperes is the unit used to measure electric current.

Fuse and Circuit Breaker Recommendations

The recommendations given in this section are based on peak power consumption and give no information on power consumption during normal operation.

The recommended melting fuse type is gG-gL-gD in accordance with IEC 60269-1. Circuit breakers must comply with at least Curve 3 tripping characteristics, in accordance with IEC 609 34.

The PSU AC has a built-in Class 1 (Type 1) SPD to protect the equipment in case of lightning and network transients. The recommended fuse or circuit breaker rating is therefore dimensioned for not tripping the fuse or circuit breaker in case of SPD operation. The PSU AC is described in Table 7.

Table 7 Radio 4455 Fuse and Circuit Breaker Recommendations

Unit (AC Powered)	Output Power	Nominal AC Input Voltage	Maximum AC Input Current(1)	Maximum Allowed Fuse Rating(2)
Radio 4455 B2/B25 B66A	4 × 40 W	100–127 V	10 A	16 A
		200–250 V	5 A	10 A

(1) The Maximum AC Input Current is calculated at a total tolerance of -14% of the nominal value. This results from -10% tolerance of the nominal voltage at the AC delivery point of the utility company, and -4% voltage drop during the installation. The voltage drop is in accordance with IEC 60364-5-52. For example, if the minimum Nominal AC Input Voltage is denoted Unom_min, then the Max AC Input Current is calculated at 0.86 x Unom_min.

(2) The Maximum Allowed Fuse Rating must be larger than the Maximum AC Input Current, yet still within a safety margin of 15%. This is to ensure reliable operation. However, it must not be larger than the standard value of the next or nearest higher fuse or circuit breaker. This is in order to minimize the cable cross-section area and comply with the relevant safety standard.

The equipment specifications state significantly lower Maximum Allowed Fuse ratings than the applicant has employed here. Note 2 directly says that exceeding the maximum will violate "the relevant safety standard."

It is clear that none of the studies required by Checklist Item 16 have been performed or submitted. The Short Circuit and Coordination Study would have revealed that the conductors were not coordinated with the breakers. The Voltage Drop & Load Flow Study and Load Calculation would have also allowed a reviewer to discover the mismatches between sources, conductors and load.

But even on their face the designs demonstrate lack of safe design. The applications must be rejected due to unsafe design. Applicant must be required to redesign each of these projects to ensure none of them include oversized breakers in relation to the wire gauge, thereby possibly allowing overheating and therefore a fire. Any redesign submission must include full and complete information to determine the supply current and protection for all sources, conductors and load. If this is not required Malibu will soon experience another devastating fire because of conductor failure due to excessive load. Another telecom-initiated fire will destroy this town.

4. Side-Mounted Antennas Project More Than 30 Inches From The Pole.

Resolution 20-65, Section B.a.(2) states that "side-mounted wireless facilities" "shall not project from the pole more than 30 inches." Most of the designs include side-mounted antennas and most of them include antennas that project more than 30 inches from the pole. The plans for WRP 23-003, 7101.5 Fernhill Drive have the antenna mount extending 3 feet (36 inches) and then the antenna goes out another 8 inches. WRP 22-006, 36652.5 Sweetwater Mesa, like WRP 23-003, has the mount extending 3 feet from the pole. WRP 23-006, 20111.5 Big Rock Drive, has the antenna positioned so that the mid-point is 3 feet from the pole, with the other half of the antenna protruding out farther by at least a few inches more. WRP 22-011, 24034.5 Malibu Road also has the antenna mid-point at 3 feet. This violation appears to be a constant with each, or at least the majority, of the 18 WRP applications. The applicant has not acknowledged this violation and did not attempt to seek an exception to the 30-inch projection limit "at the time the application [was] initially filed." Resolution 20-65, Section 9.C. There was no effort to prove up, through clear and convincing evidence, that the limit should be excused. Resolution 20-65, Section 9.A.B.

The design for each of the projects violates the design guidelines. There was not a timely request for exception. There is no evidence to justify an exception in any event. Each and every one of the 18 WRP applications must be denied.

5. Coastal/LIP-Specific Issues

As noted earlier, the MMC amendments to Chapter 12.02 are effective but the right-of-way ordinance amendments relating to the LIP are not because of Coastal Commission approval delays. The previously-approved LIP terms in effect in since 2020 still apply to these applications. LIP Sections 2.2 and then 3.16 provide the current authority. Those provisions contemplate "site plan review permits" for facilities in right-of-way in all zones. LIP 3.16.2, 13.27.1.7. LIP 13.20.1 provides that decisions of the Planning Manager are appealable to the Planning Commission and then the Council. The assertion in the staff Pending Project Report that appeals are heard by a "Hearing Examiner" correctly reflects the outcome for MMC 12.02 but appeals to the Planning Commission and the Council are still available under the LIP. At least 6 applications (WRP 22-011, WRP 22-012, WRP 22-018, WRP 23-002, WP 23-005 and WRP 23-008) are completely or partially within the Coastal appeal area.

There is a latent issue in at least one of these applications, and perhaps others. Section 3.14.2.F of the LIP in effect in 2002 required that permits for wireless telecommunications facilities in rights-of-way "must be renewed every two years" and "inspected by the Public Works Director." There is good reason to believe that the MMC provision then in effect also had a similar term limit and related provisions.

At least one site – the one associated with WRP 23-010, 22002.5 Carbon Mesa – obtained its original permit when this LIP provision was in effect. There is no evidence in the file that the permit was ever subjected to renewal or that the permit holder ever requested, obtained and provided an inspection "to insure that the facility is still in operation, that it has been properly maintained, and that the original conditions of approval have been adhered to and whether they are to remain the same or need to be modified." That permit therefore lapsed some time in 2004. There may well be others within this group that also obtained their original permit when these older ordinances were in effect. For example, the Second Response Letter from the applicant in WRP 22-014, 3011.5 Corral Canyon Road incorrectly states that planning approval

was not required in 2001 "for ROW sites." The original permit for this site may have lapsed as well.

A proper review for each of these projects must be performed to determine whether the same problem applies for those original permits as well. Others may have also lapsed.

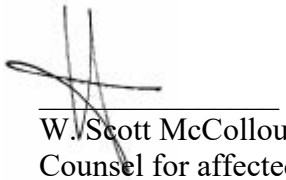
The wireless carrier must be required to turn off the existing facility for each of the sites where the original permit has lapsed, and then apply for a new permit. At minimum, the applicant cannot rely on its original permit for purposes of claiming the application qualifies as "a minor modification" or "exempt facility." *See* 47 C.F.R. § 1.6100(5) (definition of "existing").[10] Instead, it must be treated as a new application and the longer shot clock period for small cells applies.

LIP 3.16.5 requires that each facility "must comply with any and all applicable provisions of the Malibu LCP and Municipal Code, including but not limited to provisions of the Uniform Building Code, National Electric Code, Uniform Plumbing Code, Uniform Mechanical Code, and Uniform Fire Code." Therefore, all the discussion above related to electrical design applies in the LIP context as well.

Conclusion

Some of the concerns expressed herein are particular to some or a few of the applications, but several of the concerns apply to all. Collectively these comments demonstrate that each and every application has at least one significant problem and every one of these 19 applications must be denied or at least required to amend and/or supplement the application or proposed design.

These comments should give pause to middle and upper-level managers and officials inside the City; they should reflect on their performance and the actions they took that have brought us to this point. Malibu deserves better.



W. Scott McCollough
Counsel for affected Malibu residents

[10] The FCC has noted in a slightly different context that "in order for a locality to disqualify a modification as an eligible facilities request based on an applicant's noncompliance with a condition of the original approval, the locality must show that the condition existed at the time of the original approval." *In re Implementation of State & Local Governments' Obligation to Approve Certain Wireless Facility Modification Requests*, 35 FCC Rcd 5977, 5998 n.123 (2020). Here, the condition did exist at the time of original approval and the permit lapsed many years ago. Applicant cannot rely on an ineffective original authorization as the basis for claiming the current proposal is a "modification to an existing wireless tower or base station" under the Spectrum Act, 47 U.S.C. § 1455(a).

ATTACHMENT

Opinion Letter of Erik Anderson, P.E.

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October 18, 2023

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RE: Wireless Installation Proposals, Malibu, CA

Mr. McCollough,

This correspondence will serve as an opinion letter regarding the documentation and acceptable professional electrical engineering standards for wireless installations currently being proposed in Malibu, California.

I have reviewed the documentation provided regarding the proposed installations along with the required documentation for their application presented to the authority having jurisdiction (AHJ), the Planning Department.

The required documents are listed in the **City of Malibu Wireless Permit (WP) and Wireless ROW Permit (WRP) Submittal Checklist / Packet**. Specifically, section *16. Electrical and Structural Safety Information* relates to the electrical design of the proposed installation.

Section 16 is given as follows:

16. Electrical and Structural Safety Information

The following engineering documents prepared under the responsible charge of and sealed by a California licensed Professional Engineer must be included in the application:

a. *A short circuit and coordination study ("SCCS") calculated pursuant to the IEEE 551-2006: Recommended Practice for Calculating AC Short-Circuit Currents in Industrial and Commercial Power Systems or the latest version of that standard. The study must demonstrate the protection devices will ensure the equipment enclosure will not be breached. The SCCS must include analysis of Voltage Transient Surges due to contact of conductors of different voltages;*
b. *A one-line diagram of the electrical system;*

c. *Voltage Drop & Load Flow Study;*
d. *Load Calculation;*
e. *Panel Directories;*
f. *A plot plan showing the location of the mounting structure including address, or structure designation, or GPS location on the front sheet;*
g. *A plot plan showing the location of the service disconnecting means; and*
h. *An elevation drawing of the equipment and the service disconnecting means*

In reviewing the application documentation there is no short circuit and coordination study. The plans show on the New Panel Schedule that the voltage is 120/240V, 1 Phase, 30A, 10KAIC. There is no voltage drop and load flow study.

The plans show No. 14 AWG Copper branch circuitry protected by a 20 Amp circuit breaker. This would not be allowed in an installation governed by the National Electrical Code, and it does not follow good / safe engineering practices. The plans also show No. 10 AWG Copper conductors protected by a 60 Amp circuit breaker. This would not be approved in an installation governed by the National Electrical Code, and it does not follow good / safe engineering practices.

The language of section 16 states that all the documents listed must be included in the application. This is stated in mandatory language, they must be provided.

There is good reason for the requirements. The safety of the public is of prime importance. The design must be safe. Without the proper documentation, as listed in the application, the system cannot be assessed for its ability to function safely. The applications are incomplete and an assessment of their ability to function safely is not possible.

Sincerely,

Erik S. Anderson, P.E.

Expires 06/30/24

Congressional Testimony

Testimony of Mr. William Paul Mahoney III
Associate Director, National Center for Atmospheric Research
before the
Committee on Science, Space, and Technology
U.S. House of Representatives
July 20, 2021
"Spectrum Needs for Observations in Earth and Space Sciences"

Chairwoman Johnson, Ranking Member Lucas, and Members of the Committee, thank you for the opportunity to testify today. My name is William Mahoney, and I currently serve as an Associate Director of the National Center for Atmospheric Research. The National Center for Atmospheric Research (NCAR) is a Federally Funded Research and Development Center (FFRDC) of the National Science Foundation (NSF) and it is operated by the University Corporation for Atmospheric Research, which is a nonprofit consortium of more than 120 North American colleges and universities focused on research and training in the Earth system sciences. I have also had the privilege of previously serving at the Commissioner of the American Meteorological Society's (AMS) Commission on the Weather, Water, and Climate Enterprise, which is charged with ensuring the needs and concerns of the public, private and academic sectors of the United States weather, water and climate enterprise.

The Nation's economy and the public depend on accurate weather information. Remote observations of the Earth that utilize radio frequency channels, such as those operating in the 23.8 GHz spectrum, provide critical datasets required for weather prediction and the provision of warnings to save lives and protect property. This is why the public, private, and academic

sectors of the meteorological community are deeply concerned over increasing encroachment on weather-related radio frequency bands and are urging the FCC and other bodies to recognize the need for adequate protection and mitigation efforts against the loss and shared use of this critical spectrum for observing the Earth system[1]. Earth monitoring is required for weather forecasts, studies of climate change, for the protection of the environment, for economic development (transport, energy, food security, urban development, deployment of utilities, supply chain management and security) and for safety of life and property protection. This threat is coming during a period when our country is facing a significant increase in billion-dollar weather disaster events. The 1980–2020 average of billion-dollar disasters is 7.1 events per year (CPI-adjusted) while the annual average for the most recent 5 years (2016–2020) is 16.2 events (CPI-adjusted)[2]. The U.S. economy is also sensitive to weather. The U.S. economic output varies by up to $601 billion per year (CPI-adjusted) of gross domestic product (GDP) or about 3.4% of GDP owing to weather variability[3]. In addition, a nationwide survey indicated that weather forecasts generated $41.1 billion (CPI-adjusted) in economic benefits to U.S. households[4].

Radio-based observations such as remote sensing instruments operating on-board satellites and on the ground provide the main source of information about the Earth's atmosphere and surface. Measurement of the natural emission of microwave radiation of the Earth has been recognized as a priority of Earth observation for many decades and it expanded with the satellite microwave

[1] Radio Frequency Allocations for Meteorological Operations and Research: A Policy Statement of the American Meteorological Society. Adopted by the AMS Council on 1 October 2009.
[2] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73.
[3] Lazo, J.K., M. Lawson, P.H. Larsen, and D.M. Waldman. June 2011 "United States Economic Sensitivity to Weather Variability." Bulletin of the American Meteorological Society. 92: 709-720.
[4] Lazo, J.K., R.E. Morss, and J.L. Demuth. 2009. "300 Billion Served: Sources, Perceptions, Uses, and Values of Weather Forecasts." Bulletin of the American Meteorological Society. 90(6):785-798.

sounding instruments launched first in the 1970's[5]. These sensors exploit the oxygen absorption band between 50 to 60 GHz to provide global coverage of atmospheric temperature measurements of the troposphere and stratosphere[6]. While global remotely sensed temperature improves forecast skill, it is well recognized that atmospheric water vapor sensing is critical to improve the prediction of precipitation processes, severe weather, and drought. Advanced microwave sounding units operating at 23.6 – 24.0 GHz were developed and implemented on satellites to address this need and are considered part of the backbone of the global observing system[7]. Increased utilization of satellite-based water vapor sounding data is now recognized as a key reason behind increases in weather model prediction skill in recent years[8]. Some of the most advanced satellite-based microwave sounding systems utilized in the U.S. and internationally operate at 23.8 GHz, which is within the International Telecommunications Unions (ITU)[9] Earth Exploration Satellite Service (EESS) spectrum.

Protecting the Nation's ability to provide high-quality operational weather data and accurate weather forecasts requires limiting interference in the L-Band and in the passive microwave spectrum bands. The science is very clear on the positive impact on weather prediction skill from

[5] Njoku, E. G. (1982). Passive microwave remote sensing of the Earth from space—A review. Proc. IEEE, 70(7), 728–750, doi:10.1109/PROC.1982.12380.

[6] Rodgers, C. D. (1976). Retrieval of atmospheric temperature and composition from remote measurements of thermal radiation. Rev. Geophys., 14(4), 609–624, doi:10.1029/RG014i004p00609.

[7] English, S., McNally, A., Bormann, N., Salonen, K., Matricardi, M., Hor´anyi, A., Rennie, M., Janiskova, M., Michele, S. D., Geer, A. J., di Tomaso, E., Cardinali, C., de Rosnay, P., Sabater, J., Bonavita, M., Albergel, C., Engelen, R. and Th´epaut, J.-N. (2013). Impact of satellite data. Technical Report 711, ECMWF Tech. Memo., doi:10.21957/b6596ot1s, URL https://www.ecmwf.int/node/ 9301.

[8] Geer, A., Baordo, F., Bormann, N., Chambon, P., English, S., Kazumori, M., Lawrence, H., Lean, P., Lonitz, K. and Lupu, C. (2017). The growing impact of satellite observations sensitive to humidity, cloud and precipitation. Quart. J. Roy. Meteor. Soc., 143(709), 3189–3206, doi:10.1002/qj.3172.

[9] The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies. Founded in 1865 to facilitate international connectivity in communications networks, ITU allocates global radio spectrum and satellite orbit and develops the technical standards that ensure networks and technologies seamlessly interconnect.

utilizing remotely sensed temperature and water vapor data from the passive absorption bands. In general, it is critical that the scientific community be at the table to inform policy makers on issues such as this that have a major impact on science and critical operational public safety services. Spectrum allocation policy must be informed by science, particularly on issues where the science is so clear.

Background. The meteorological community increasingly relies on remote-sensing technologies for both routine and experimental Earth observations. These activities require global access to radio frequency spectrum for radars, wind profilers, microwave radiometers, and data telemetry systems, as well as for satellite-based passive and active sensors[10]. Radio spectrum is used for meteorology in three primary ways:

- Passive remote sensing, in which scientists measure the natural radio frequency emissions from the environment and space. This requires the use of a receiver only. These are generally located on space-based platforms.
- Active remote sensing, in which systems emit radio waves into the atmosphere and measure their transmission (e.g., Doppler weather radar and wind profilers). This requires the use of both a transmitter and a receiver.
- Data transmission, in which radio waves are used to distribute data. For environmental data, this may include broadcasting information directly from a satellite to users throughout the country (e.g., 1685.7 – 1686.6 MHz Geostationary Operational Environmental Satellite (GOES) downlink channel).

[10] The Radio Frequency Spectrum and Weather, Water, and Climate: Uses and Challenges
By AMS Policy Program, April 2017.

Radio waves are reflected, absorbed, scattered, refracted, and diffracted by the atmospheric conditions that they encounter, such as clouds and precipitation. Critically, different atmospheric conditions affect radio waves differently. This allows scientists to use radio frequencies directly or indirectly to detect tornadoes, track hurricanes, and to determine a wide range of meteorological conditions from the ground upward such as atmospheric humidity, cloud types and amounts, wind speed and direction, and precipitation types and amount. Furthermore, and critically, determining atmospheric conditions using passive remote sensing requires the use of specific radio frequencies for which substitution is not possible. For example, only certain wavelengths pass through clouds unimpeded. Often, the same wavelengths are valuable for telecommunications because they can pass through weather, buildings and other obstacles. Some examples of passive radio frequency bands that are critical for Earth system sensing are shown below.

Passive Band (GHz)	Frequency Range (GHz)	Principle Use
18.6	18.6 - 18.8	Sea Surface Wind Speed and Direction; Snow Coverage, Sea Ice, Precipitation
23.8	23.6 - 24.0	Integrated Atmospheric Water Vapor
36.5	36.0 - 37.0	Tropical Cyclone Monitoring; Sea Surface Wind Speed and Direction
50 - 60	50.2 - 50.4	Atmospheric Vertical Temperature Profile (multiple bands)

The significant progress that has been made in recent years in weather forecasting skill is largely attributable to these observing technologies and the use of Earth observations in weather prediction models, by forecasters, and the atmospheric science research community. To predict the weather accurately, the current state of the atmosphere must be known in detail across the globe from the surface of the Earth to the top of the atmosphere. In situ and remote sensing technologies are critical to the forecasting process. This is not an issue of academics or

researchers losing access to a data set, this is about not having the necessary information to protect life and property. Weather data and forecasts are important for the public and are required for large segments of our Nation's economy. Examples of how Earth system data and weather forecasts are used to support decision making include, but not limited to:

Agriculture: Daily and seasonal decisions are made regarding seed selection, pest mitigation, irrigation, fertilization, and harvesting. Soil moisture and soil temperature, whose remotely sensed measurements are also sensitive to out of band interference, are important parameters for agriculture planning and decision making and contribute to forecast skill. Weather information is used to analyze global and regional supply chain risks and market conditions related to extreme weather such as flooding and droughts.

Aviation: Daily decisions are made by airlines, general aviation pilots, and air traffic controllers on route selection to maximize flight efficiency and minimize fuel consumption, and for the avoidance of thunderstorms, wind shear, turbulence, low ceiling and visibilities, and icing to maximize flight safety.

Surface Transportation: Daily decisions are made by departments of transportation to optimize snow and ice control and pavement maintenance operations, anticipate extreme weather conditions and position emergency response assets such as tow vehicles to clear roadways when weather related incidents occur. Railroad operators utilize daily weather information to assess the risk of track washouts, buckling due to heat, track pull-aparts due to extreme cold, and strong crosswinds that could lead to railcar blowover events. Commercial freight operators use weather information for optimal routing to ensure the Nations' goods and services are delivered on schedule and are not impacted by poor road and weather conditions.

Water Management: Daily to seasonal decisions are made for reservoir management, hydro-power operations, river and stream flow rates for fish protection, recreation, to meet regulatory requirements, assess flooding potential, and predict water consumption.

Emergency Management: Weather information is used daily to support risk assessment, manage emergencies and evacuation planning, and support warning and recovery activities associated with tornadoes, hurricanes, flooding, snow and ice storms, derechos, landslides, severe thunderstorms and lightning, and high winds.

Wildfire: Weather information is used daily to determine the risk of wildfire ignition from lightning and human activities, fire rate of spread, intensity, air quality, and to manage ground based and airborne fire mitigation operations.

Energy: Energy production, generation, demand, and transmission are very sensitive to weather. Wind, solar, and hydroelectric power require accurate information on wind speed and direction, clouds, incoming solar radiation, and precipitation. Reductions in prediction accuracy due to the loss of remotely sensed weather data from frequency interference will increase the uncertainty in wind and solar energy prediction and therefore make the integration of variable generation energy into the electric grid more challenging and risky.

National Security and Defense: Accurate weather information and forecasts are critical for our armed services conducting land, sea and air operations around the world including humanitarian missions. Precise information is needed on ceiling, visibility, severe weather, wind shear, turbulence, and marine conditions.

At a time of increasing weather hazard vulnerability due to climate change and demographic shifts, it is imperative that critical Earth observations be protected from interference. The radio

frequency allocation process must adopt a "do no harm" posture that requires evidence that commercial activities would not interfere with critical Earth observations.

Spectrum Inference Concerns. Spectrum sharing can create significant challenges because receivers and transmitters must be able to distinguish among meaningful signals, background noise, and unwanted signals. In some cases, protective zones placed around critical satellite downlink receiving stations (i.e., areas where commercial telecom users are prohibited from interfering with scientific and operational uses) can accommodate commercial uses of the radio spectrum while maintaining critical Federal operations. However, protected zones are not always adequate to protect all Federal users and do not help the large population of non-Federal users that are distributed throughout the country and sit outside the protected zones. There are Federal agencies that utilize GOES downlink receiver stations that may not be considered for protection zones in a similar manner as NOAA, the primary stakeholder. Non-Federal users include the Nation's private sector weather industry that provides critical user-tailored weather and warning information to state and local emergency management, utilities, water managers, commercial freight operators, trucking industry, transportation officials, and many more end-users. There is a significant concern that the downlink of GOES data will be contaminated by interference if the 1675-1680 MHz band is not safeguarded. Interference could have a disastrous impact on both the government and the commercial weather industry and its stakeholders.

A major concern of the U.S. weather, water, and climate communities is the potential for interference in the specific radio frequencies for which substitution is not possible. While imperfect, there may be ways to mitigate interference in other frequencies, but the laws of physics make it impossible to find substitutes for specific atmospheric absorption frequencies such as the 23.6-24 GHZ spectrum band. The 23.6-24 GHz spectrum band is used for

microwave sensor-based remote sensing of atmospheric levels of water vapor, which is the single most impactful data type for accurately forecasting weather and weather hazards and it is critical for atmospheric science research aimed at improving understanding and predictability of the Earth system. These passive instruments are, by necessity, sensitive to extremely weak signals naturally emitted by the Earth's atmosphere, including signals emitted at 23.8 GHz. The sensors are even more vulnerable to radio frequency interference as they have a much bigger footprint and use wider bandwidth.

Atmospheric microwave emissions in the Earth Exploration-Satellite Service spectrum are a unique natural resource of the Earth. The Earth's natural microwave emissions can be contaminated by even slight noise into the band. A total combined power in excess of 0.1 Watts from all terrestrial sources will contaminate the measurements. 5G wireless technology encompasses a broad spectrum. It is projected that more than 50% of data transfer in 5G will take advantage of Wi-fi[11]. Wi-fi signal strength (Pico Watt) is ten times stronger than the weakest signal detected by radar and satellite receivers. Therefore, radio frequency interference will significantly degrade or make the satellite and radar signals useless. Unwanted byproducts from a 5G signal that falls within the frequency range detected by the weather satellite would raise the noise floor or confuse the sensor. There is no method to separate the unwanted 5G signal from the desired natural signal, which simply measures the total power detected, meaning it would not be possible to know that the environmental data had been contaminated. Preliminary studies have indicated that the proliferation of terrestrial 5G systems using 24 GHz frequencies will make

[11] Emerging Technologies and Their Expected Impact on Non-Federal Spectrum Demand. Office of Science and Technology Policy, May 2019.

current and future data less accurate, or even unusable, unless 5G is rigorously implemented in a manner that protects the adjacent Earth Exploration Satellite Service spectrum.

Summary. The meteorological community (public, private, and academic sectors) relies on high quality, real-time and archived Earth system data for weather, climate, and water monitoring, prediction and warnings, natural disaster risk reduction, support of disaster-relief operations, homeland security and defense, and for planning preventive measures for adapting to and mitigating the negative effects of climate change. The socioeconomic benefits associated with the meteorological use of radio frequency spectrum are central to the success of society and must be accounted for in optimal spectrum management. Critically, virtually every sector of the Nation's economy is weather-sensitive and any degradation of Earth observation data for scientific and operational uses can be expected to have significant negative financial and safety impacts. If forecasts of hurricanes, floods, and other natural disasters were degraded, lives and property would be at risk. The profitability of United States industries, ranging from agriculture and energy to manufacturing and transportation, would also be adversely affected if forecasts become less accurate.

It is in the Nations' best interest to protect radio frequencies essential for meteorological activities that are critical for the accurate forecasting of adverse weather, climate-change research and assessment, and to ensure the Nation's leadership in future wireless technologies and in science and engineering. Advancements in environmental forecasting and hazard prediction can only occur if existing spectrum assets in the key passive bands such as 23.6-24 GHz are protected from interference. The laws of physics dictate these frequency bands; therefore, there is no alternative other than protection.

THE ASPEN TIMES Snowmass Sun

Guest commentary: Is 5G a potential fire hazard?

Opinion | Jun 13, 2021

Tom Lankering and Kathleen Fors
Guest commentary

Fire! This word strikes fear in Colorado. Our state is facing its worst fire season ever. This summer may be as dangerous as any we have faced, and we are all in a hypervigilant state to prevent fires. Compounding the threat is the unprecedented proliferation of 5G cell towers.

According to Tony P. Simmons, P. E., an electrical engineer who is a subject matter expert on electrical safety in California and Nevada, "Many people are not aware that electrical equipment, including all cell towers and 5G small cell sites, pose a fire threat that must be mitigated by a recognized electrical fire safety expert. Every electrical device is going to fail at some point. The goal is to ensure that failures do not imperil life, health and property."

Three fires in California have been started either in part or in whole by telecommunications equipment failures: Silverado, Woolsey and Malibu Canyon.

The cause of the 2020 Silverado Fire appears to be shared responsibility between Southern California Edison (SCE) and telecom giant T-Mobile. SCE admits the fire started at the location of one of its utility poles but has pointed its finger at T-Mobile for the failure of a telecommunications lashing wire on an SCE utility pole as the suspected cause.

In 2018 a lashing wire belonging to an unknown carrier appears to have been the cause of at least one of two ignition points for the Woolsey Fire, which destroyed over 400 homes in Malibu and caused residents to flee into the ocean because the three routes of exit out of the city were blocked by traffic and fire. The carrier, at this point, is unknown because the Woolsey Fire remains under criminal investigation. Over $6 billion in damages was inflicted before the fire was finally extinguished. SCE and the telecom that owned the lashing wire have shared responsibility for the Woolsey inferno.

The 2007 Malibu Canyon Fire was caused by the failure of an SCE utility pole that was overloaded with telecom equipment owned by AT&T, Verizon, and Sprint (now T-Mobile). These four and NextG, now owned by telecom infrastructure builder Crown Castle International, Inc. was accused of misleading investigators, and eventually settled with the California Public Utilities Commission for over $60 million.

5G TALK

Tom Lankering and Kathleen Fors are writing a monthly series on 5G for The Aspen Times; the next installment on July 11.Their previous installments can be found here:

April: History of 5G and what people should know

May: People deserve to know about the health effects of 5G and EMFs

Cell tower fires are infrequent but devastating when they do occur. Susan Foster, writer and honorary firefighter with the San Diego Fire Department who now lives in Colorado, told us in an interview that "electrical fires cannot be fought through conventional means until the power has been cut. Firefighters or anyone else trying to put water on an energized cell tower fire will be electrocuted.

"Imagine this scenario," Foster explains, "a cell tower catches on fire with winds gusting at 50 miles an hour. This fire is going to spread until the utility cuts the power and that can take between 10 minutes and one hour." Foster cautions cities to establish residential setbacks from all wireless installations so that people have time to escape in the event of a fire.

To regulate the design of cell sites to protect the public from electrical hazards, Cellular installations must be viewed for what they are: electrical installations.

"Frankly, the promise of 5G is hype, and the fire danger of having cell towers close to our homes, schools and places of business can have devastating consequences," Foster says. "Electric fire safety experts were not involved in the 5G mandate, but telecom executives and attorneys were. They had different priorities. I want my family to be safe. Telecom wants their market share to increase."

We have witnessed how fast and uncontrollable a fire can spread, not only with the fires we had in Basalt and Glenwood Springs but also in other areas in Colorado. We have no desire for the "promise of 5G" to add to the existing fire risks our state already faces.

The April 2021 recall of 2.5 million hotspots by Verizon due to fire risks and the recent collapse of an AT&T cell tower due to electric arcing on a high school campus in Chula Vista, California, demonstrates that it is irresponsible for local governments to trust the engineering of the telecom companies. The most effective way to protect Colorado from wildfires caused by telecommunication equipment is to regulate the design of a cell site with the same rigor most cities already require from their building officials, but did not realize they had the right to demand of telecoms.

Tom Lankering and Kathleen Fors are local health professionals and members of Colorado for Safe Technology and are writing a monthly series on 5G for The Aspen Times. More information can be found at Environment Health Trust, EHTrust.org; Children's Health Defense, ChildrensHealthDefense.org; and Colorado for Safe Technology, CO4SafeTech.com.

In order to have both accurate weather forecasts and 5G technologies, prudent restrictions on the use of spectrum near the weather data bands are required for maintaining and enhancing the quality and accuracy of Earth system observations and weather predictions.

Collaborative studies involving science agencies and non-Federal stakeholders should be funded to assess the impact of terrestrial interference in the atmospheric absorption bands and their cascading effects on numerical weather prediction skill and Earth system science. Research programs such as or similar to the National Science Foundation's (NSF) Spectrum Innovation Initiative, which is designed to develop innovations that can circumvent the challenges of radio spectrum scarcity and interference, need to be expanded.

The concerns of the weather enterprise and Earth sciences community need to be heard and taken seriously as the impact of lost Earth observing data could be catastrophic for the Nation.

Thank you for giving me the opportunity to testify before this committee.

Malibu Times
Since 1946

$12 million settlement approved in 2007 Malibu Canyon fire

By **13StarsManager** - September 13, 2012

The California Public Utilities Commission on Thursday approved a $12 million settlement with three cellphone companies for allegedly overloading power lines in Malibu Canyon that led to the 2007 Canyon fire. Roughly half of the settlement will go toward installing stronger wooden telephone poles in Malibu Canyon and a second safety project.

The fire, which began when at a power pole snapped and sparked surrounding brush, destroyed 14 buildings and shut down central Malibu for almost three

days. Investigators for the PUC allege that the pole was dangerously and illegally overloaded with telecommunications equipment, and that the pole's owner, Southern California Edison, and four cellphone companies who paid Edison to carry their equipment later misled to investigators after the fire.

The three cellphone companies, AT&T, Sprint and Verizon Wireless, agreed at a meeting Thursday in San Francisco to pay the state $4 million each in a settlement, while still denying the allegations.

Southern California Edison and another cellphone company, NextG, still face a trial and $74 million in fines proposed by state investigators for their role in the fire.

Roughly half of the settlement payment will be paid to the State of California. The other half is expected to be spent on replacing existing wooden power poles along the 3.4 miles of lower Malibu Canyon. Another portion will be spent on an independent safety survey to study a representative sample of Southern California Edison power poles across its 50,000-square-mile service area. The intent of the study, according to the settlement is to determine the severity of the problem with pole-overloading, which was blamed for a power outage in the San Gabriel Valley in fall 2011 when a windstorm blew over more than 200 Edison power poles.

13StarsManager

https://malibutimes.com

The Malibu Times is the first newspaper in Malibu, serving the community since 1946.

ENVIRONMENT • FRANCE

4G antenna suspected of disturbing cows will be shut down

French courts have ordered this unprecedented measure to determine the antenna's impact. The animals have been feeding less, suffering from diseases and producing less milk since its installation, according to their owners.

By Manuel Armand (Clermont-Ferrand (France) correspondent)
Published on June 8, 2022, at 2:49 am (Paris), updated on June 8, 2022, at 8:05 am
• 3 min read

Subscribers only

A telephone relay antenna of the Orange 4G network located near the communal agricultural cooperative known as "GAEC de Coupet" in Mazeyrat-d'Allier (Haute-Loire), on June 3, 2022. THIERRY ZOCCOLAN / AFP

"I can see from my tractor that they are all skin and bones. It's enough to make you cry." On the other side of the small road that winds along his property, a short distance from the town of Mazeyrat-

d'Allier, in the Haute-Loire department, Frédéric Salgues can spot what he considers to be the cause of his cows' problems, less than 300 meters away: a cell phone tower commissioned by Orange on June 28, 2021.

Torn between anger and dejection, the breeder, who runs the communal agricultural co-operative Gaec de Coupet with his wife Géraldine and his brother Yannick, was nevertheless starting to regain hope. On May 23, the administrative court of Clermont-Ferrand ordered the 4G antenna's cessation of operation for a period of two months.

This measure, unprecedented in France, should become effective within three months. The objective is to carry out an expert assessment in order to "establish a potential causal link between the behavior of the cattle and this antenna." The administrative court highlights "a significant drop in the quality and quantity of milk produced, a serious disruption in the behavior of the herd and its voluntary denutrition and abnormally high deaths. Standing in front of his herd of Prim'Holsteins, the black and white cows that are champions of milk productivity, Mr. Salgues was distressed. They are all thin," he said . "They don't get up at night to eat, and they hardly drink at all. And this one, which stays completely still with her jaw stuck on the side and her head down, you can see this is not normal behavior!" Then he added, "These cows, they are sad."

More on this topic The pig 'macro-farms' taking over Spain

His brother Yannick showed us the calendar from the co-operative that collects the milk every two days. The quantities are carefully noted. In June 2021, the average was 4,200 liters. On July 3, less than a week after the antenna went into operation, the Salgues registered 3,792 liters. In the days that followed, the drop was staggering: down to 2,700 liters by the end of the month.

Since then, production has not recovered. On top of that, there are other difficulties. "We have had 40 dead cattle in a timespan of 11 months, as opposed to ten or so in normal times." Reproduction is becoming uncertain. "The Haute-Loire Health Defense Group, an association that monitors animal health in conjunction with the public authorities, is closely monitoring the Gaec de Coupet. There are very disturbing phenomena in terms of animal behavior with animals that do not eat or drink," says its director, Julien Bachellerie. We've looked at all the usual hypotheses and haven't found any that stand out. The quality of the food or water, the breeding methods, the presence of diseases... nothing could be pointed out. And the autopsies did not reveal anything.

Electrosensitivity

The suspension of the antenna's operation will be a full-scale test carefully scrutinized by dozens of breeders who claim to be victims of electromagnetic fields generated by telephone antennas, high-voltage lines or wind turbines. In particular by those of the National Association of Animals Under Tension (ANAST). "We are more than a hundred members," said Yann Joly, the secretary of the association. "I am not against telephone antennas or wind turbines," he said . "I simply don't think that the regulations for this type of electrical installation are adapted to prevent parasitic and stray currents that run through the subsoil. They can affect the health of animals, which are much more

sensitive to them than we are."

The difficulty is that science has little to say on the topic of electrosensitivity among farm animals. In front of the administrative court, Orange defended itself by saying that there is "no scientific data" showing "a link between cell phone antennas and disturbances to the herd."

More on this topic Glyphosate threatens bumblebees' ability to reproduce

A finding also established in March 2021 by the report by centrist MP Philippe Bolo, for the Parliamentary Office for the Evaluation of Scientific and Technological Options. "The contribution of electromagnetic fields to behavioral disorders in animals is not demonstrated by science," he says. However, he notes that observations show "a correlation between the installation of energy or telecommunication infrastructures and the appearance of behavioral disorders in animals." He also notes "a relative consensus on the role of the strong sensitivity of animals" to parasitic currents, in particular those established between the ground and the animals' feet.

'It's David versus Goliath'

An expert appointed by the judicial court of Puy-en-Velay (south-central France) had asked the prefect of the Haute-Loire, Eric Etienne, on April 4, 2022, to organize a temporary suspension of the antenna. Apparently convinced of the seriousness of the case, the prefect had immediately referred the matter to Junior Minister for the Digital Transition and Electronic Communications Cédric O. This request went unanswered. The prefect had not fared any better in September 2021 when he had already alerted the minister on this case. "It is a case of David versus Goliath," complained the secretary of ANAST. The mayor of Mazeyrat-d'Allier, Philippe Molherat (independent), also perceives strong resistance: "I have the impression that one must not jeopardize the deployment program of antennas in rural areas."

Manuel Armand (Clermont-Ferrand (France) correspondent)

AUGUST 3, 2021 | 5 MIN READ

5G Wireless Could Interfere with Weather Forecasts

Satellite tracking of water vapor, critical for accurate forecasts, may be foiled by cellphone tower transmissions

BY JOHN FIALKA & E&E NEWS

Go Nakamura *Getty Images*

Weather

Federal agencies are competing with one another over radio waves used to help predict changes in the climate as the sky is increasingly cluttered with noise from billions of smartphones.

On one side are NOAA and NASA. They have developed space satellites that passively capture and decode the faint energy signals given off by changes in water vapor, temperatures, rain and wind that determine future weather patterns.

They are supported by weather and earth scientists who say the signals are threatened by 5G, the emerging "fifth generation" of wireless communication devices that could create enough electronic noise on radio spectrums to reduce forecasting skills and distort computer models needed to predict the progress of climate change.

On the other side are wireless communication companies, smartphone manufacturers and the Federal Communications Commission (FCC), which regulates the use of the radio frequency spectrum. The FCC has begun a series of moves to allow companies to "share" spectrums used by federal science-related agencies to accommodate the rapid growth of 5G.

The FCC has been supporting 5G since 2016 when its former chairman, Tom Wheeler, initiated a policy he called "Spectrum Frontiers" to push the growth of 5G. "In a 5G world, the internet of everything will be fully realized," he asserted. "Everything that can be connected will be connected."

Creating more room for billions of smartphones and other 5G devices is "damn important," he told reporters, "because it means U.S. companies will

be first out of the gate."

In 2019, the House Committee on Science, Space and Technology raised questions about two studies prepared by NOAA and NASA that predicted the FCC's rush to auction off space within radio frequencies would disrupt weather data needed for forecasts. Ajit Pai, the chairman of the FCC at the time, responded that there was no evidence of potential interference and proceeded with an auction.

Committee leaders called for an examination by the Government Accountability Office (GAO). The report, released last month, said demand for spectrum space is "growing exponentially," with the potential for between 25 billion to 50 billion devices competing for space by 2025.

It said the arguments among U.S. agencies concerning weather and climate forecasting problems were "highly contentious." The FCC sought support from the Trump White House, according to the GAO, and despite the lack of consensus, the weaker rules of the FCC's Spectrum Frontiers program became the U.S. position.

It was then adopted by the International Telecommunication Union (ITU), based in Geneva, Switzerland. It writes the global rules.

The GAO reported that officials in NOAA and NASA are worried that the push for the less stringent rules on the expanded sharing of weather-related spectrums will continue at the next meeting of the ITU, which is set for 2023.

"These data are absolutely critical," explained William Mahoney III, associate

director of the National Center for Atmospheric Research and one of the leaders of the science-related agencies involved in the dispute.

In an interview, he explained the biggest issue involves a spectrum called 24 gigahertz, which weather satellites use to monitor natural microwave signals produced by water vapor at various levels in the atmosphere. The device they use is a microwave radiometer.

“It is one of those things that are a gift of nature,” Mahoney said, because the signals from the varying presence of water vapor allows satellites to explore the weather forming in different layers of the atmosphere. “A third of the current forecasting skill comes from this data,” he added, noting that the data captured by orbiting satellites can “make the difference between a blue sky day and a tornado day.”

But the signals made by water vapor and other natural weather signatures become fainter in a cacophonous surge of phone signals. “If you have a large network of cellphone towers transmitting many orders of magnitude more power near the ground, some of that reflects upward and parts of the atmosphere will become very noisy,” Mahoney said.

The stakes of losing data are high.

“This is not an issue of academics or researchers losing access to a data set, this is about not having the necessary information to protect life and property,” Mahoney told members of the House Science Committee.

Accurate weather data, he added, is necessary for agriculture, aviation, water

management, monitoring wildfires and managing energy production, as well as for U.S. defense agencies.

'INSIDIOUS' MALFUNCTIONS

A second spectrum at 16 megahertz connects satellites with signals from a variety of automated gauges used by the U.S. to measure water levels in streams and rivers and wind speeds. The satellites collect the signals and send the resulting data to the National Weather Service and private weather reporting companies that are also concerned about rising "noise levels," Mahoney explained in the interview.

Steven Root, president of the American Weather and Climate Industry Association, wrote to the committee that the interference caused by sharing the band "will significantly threaten the distribution of crucial weather information by AWCIA members like AccuWeather, UNISYS Weather and WeatherBank, Inc., that the nation relies on to respond immediately with the highest quality information to dangerous weather like tornadoes, hurricanes and wildfires."

Another expert witness told the House panel that the most "insidious" impact of rising noise levels on a weather spectrum would emerge if they caused errors or gaps in the weather data that is undetected. The erroneous data might be included in computer models that scientists use for, among other things, predicting future climate behavior.

There is new technology to detect "contaminated" data, explained David Lubar, a project leader on spectrum issues at the Aerospace Corp., a

nonprofit agency established by Congress to provide technical advice on space programs.

Lubar said agencies working on the technology lack the funding to develop and deploy it on new satellites. “I am heartened that this hearing is being held to examine these issues,” he told the panel.

Just where the FCC will go next with its Frontier Spectrum policy on 5G is unclear. According to the House Science Committee, it has already taken in almost $2 billion from 29 winning bidders for space on the 24 gigahertz band.

An FCC spokesman said the agency “is now laser focused on forging strong relationships with its federal partners and revitalizing the interagency coordination process so that it once again is able to produce results for American consumers and the economy.”

Better coordination between these agencies ultimately means more spectrum and more innovation to help restore American wireless leadership, he said. “We look forward to working with other federal agencies to review the GAO recommendations.”

In a Congress that is deeply divided on many issues, the House Science Committee appears to have a bipartisan consensus that more work remains to be done among federal agencies before international regulations on radio spectrums are made.

“The [GAO] report makes it clear that the existing process is flawed and highlights a number of instances in which coordination fell apart. We can’t

highlights a number of instances in which coordination fell apart. "We can't afford to have this happen again." said Rep. Frank Lucas of Oklahoma, the panel's top Republican.

Rep. Eddie Bernice Johnson (D-Texas), the chairwoman of the Science Committee, said in a statement to E&E News that "improvements to the interagency process for spectrum auctions remain necessary."

She said the "FCC must—at a minimum—apply globally-set standards to protect both domestic science and our diplomatic standing," adding that her panel will work to "ensure that we use scientific evidence to protect critical services for our nation."

JOHN FIALKA is a reporter with *E&E News*.

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PHIL PLAIT

To: His Excellency Antonio Guterres, Secretary-General of the United Nations;
Honorable Dr. Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization;
Honorable Inger Andersen, Executive Director of the U.N. Environment Programme; U.N. Member Nations

International Appeal:
Scientists call for Protection from Non-ionizing Electromagnetic Field Exposure[1]

We are scientists engaged in the study of biological and health effects of non-ionizing electromagnetic fields (EMF). Based upon peer-reviewed, published research, we have serious concerns regarding the ubiquitous and increasing exposure to EMF generated by electric and wireless devices. These include– but are not limited to– radiofrequency radiation (RFR) emitting devices, such as cellular and cordless phones and their base stations, Wi-Fi, broadcast antennas, smart meters, and baby monitors as well as electric devices and infra-structures used in the delivery of electricity that generate extremely-low frequency electromagnetic field (ELF EMF).

Scientific basis for our common concerns

Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life.

These findings justify our appeal to the United Nations (UN) and, all member States in the world, to encourage the World Health Organization (WHO) to exert strong leadership in fostering the development of more protective EMF guidelines, encouraging precautionary measures, and educating the public about health risks, particularly risk to children and fetal development. By not taking action, the WHO is failing to fulfill its role as the preeminent international public health agency.

Inadequate non-ionizing EMF international guidelines

The various agencies setting safety standards have failed to impose sufficient guidelines to protect the general public, particularly children who are more vulnerable to the effects of EMF. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) established in 1998 the "Guidelines For

Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)"[1]. These guidelines are accepted by the WHO and numerous countries around the world. The WHO is calling for all

nations to adopt the ICNIRP guidelines to encourage international harmonization of standards. In 2009, the ICNIRP released a statement saying that it was reaffirming its
1998 guidelines, as in their opinion, the scientific literature published since that time "has provided no evidence of any adverse effects below the basic restrictions and does not necessitate an immediate revision of its guidance on limiting exposure to high frequency electromagnetic fields[2]. ICNIRP continues to the present day to make these assertions, in spite of growing scientific evidence to the contrary. It is our opinion that, because the ICNIRP guidelines do not cover long-term exposure and low-intensity effects, they are insufficient to protect public health.

The WHO adopted the International Agency for Research on Cancer (IARC) classification of extremely low frequency magnetic fields (ELF-MF) in 2002[3] and radiofrequency radiation (RFR) in 2011[4]. This classification states that EMF is **a *possible human carcinogen (Group 2B)*.** Despite both IARC findings, the WHO continues to maintain that there is insufficient evidence to justify lowering these quantitative exposure limits.

Since there is controversy about a rationale for setting standards to avoid adverse health effects, we recommend that the United Nations Environmental Programme (UNEP) convene and fund an independent multidisciplinary committee to explore the pros and cons of alternatives to current practices that could substantially lower human exposures to RF and ELF fields. The deliberations of this group should be conducted in a transparent and impartial way. Although it is essential that industry be involved and cooperate in this process, industry should not be allowed to bias its processes or conclusions. This group should provide their analysis to the UN and the WHO to guide precautionary action.

1. children and pregnant women be protected;
2. guidelines and regulatory standards be strengthened;
3. manufacturers be encouraged to develop safer technology;
4. utilities responsible for the generation, transmission, distribution, and monitoring of electricity maintain adequate power quality and ensure proper electrical wiring to minimize harmful ground current;
5. the public be fully informed about the potential health risks from electromagnetic energy and taught harm reduction strategies;
6. medical professionals be educated about the biological effects of electromagnetic energy and be provided training on treatment of patients with electromagnetic hypersensitivity;
7. governments fund training and research on electromagnetic fields and health that is independent of industry and mandate industry cooperation with researchers;
8. media disclose experts' financial relationships with industry when citing their opinions regarding health and safety aspects of EMF-emitting technologies; and
9. white-zones (radiation-free areas) be established.

[1] http://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf

[2] http://www.icnirp.org/cms/upload/publications/ICNIRPStatementEMF.pdf

[3] https://publications.iarc.fr/98

[4] https://publications.iarc.fr/126

Initial release date: May 11, 2015
Date of this version: July 4, 2024

Inquiries, including those from qualified scientists who request that their name be added to the Appeal, may be made by contacting Elizabeth Kelley, M.A., Director, EMFscientist.org, at info@EMFscientist.org.
Note: the signatories to this appeal have signed as individuals, giving their professional affiliations, but this does not necessarily mean that this represents the views of their employers or the professional organizations they are affiliated with.

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