

March 30, 2018

Gwen R. Pinson
Executive Director
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, KY 40602

RECEIVED

APR 04 2018
PUBLIC SERVICE
COMMISSION

Re: Case No. 2018-00095
Application of East Kentucky Network, LLC d/b/a Appalachian Wireless
For Issuance of a Certificate of Public Convenience and Necessity to
Construct a Cellular Tower in the Commonwealth of Kentucky in the
County of Whitley

Dear Ms. Pinson:

As directed by the letters from the Public Service Commission dated March 29, 2018, East Kentucky Network, LLC d/b/a Appalachian Wireless has submitted a written response directly to Linda L. Reynolds and Michael and Angela Angel concerning their comments dated March 23, 2018 and March 26, 2018, respectively.

Please find enclosed for filing in your usual manner eleven (11) copies of said response (the original having been sent directly to Ms. Reynolds and Mr. and Mrs. Angel). If you have any questions or concerns regarding the enclosed, please do not hesitate to contact me.

Sincerely,

Krystal Branham

Krystal Branham
Regulatory Compliance Attorney
(606) 477-2355 ext. 1009
kbranham@ekn.com

Enclosure(s)



March 30, 2018

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VIA CERTIFIED MAIL – RETURN RECEIPT REQUESTED

APR 04 2018

Angela & Michael Angel
194 Harold Leforce Road
Williamsburg, KY 40769

PUBLIC SERVICE
COMMISSION

Re: Case No. 2018-00095
Application of East Kentucky Network, LLC d/b/a Appalachian Wireless
For Issuance of A Certificate of Public Convenience and Necessity to
Construct a Cellular Tower in the Commonwealth of Kentucky in the
County of Whitley

Dear Mr. and Mrs. Angel:

This letter is in response to your correspondence dated March 23, 2018. You have expressed concern regarding the potential health effects of the cell phone tower we seek to construct in Williamsburg, Kentucky and the impact it may have on property values in the area.

Let me first address the health concerns you have mentioned. We assume that your concerns relate to the radiofrequency (“RF”) energy that will be emitted from the cell phone tower.

RF emissions are fairly common in today’s society and are emitted by a number of devices including radios, microwaves, Wi-Fi, cordless telephones, personal cellular devices, and other equipment. The Federal Communications Commission (“FCC”) has adopted guidelines for RF emissions from cell phone towers. The FCC has concluded that the ground-level power density from cell phone towers, i.e. the exposure that would be experienced by someone on the ground beneath a cell tower, is well below the exposure limits established by the FCC. I have enclosed a copy of the FCC Consumer Guide titled *Human Exposure to Radio Frequency Fields: Guidelines for Cellular and PSC Sites*. There is a substantial amount of information on Radio Frequency Safety on the FCC website, which you may access at <https://www.fcc.gov/general/radio-frequency-safety-0>.

I am also enclosing a copy of the publication from the American Cancer Society titled *Cellular Phone Towers*. The American Cancer Society notes that:

“The 3 expert agencies that usually classify cancer-causing exposures (carcinogens) – the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and the US Environmental Protection

Agency (EPA) – have not classified cell phone towers as to their cancer-causing potential.”

In addition, the American Cancer Society quotes the following information from the FCC:

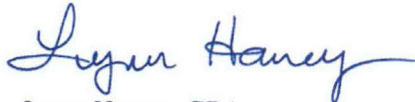
“Radiofrequency emissions from antennas used for cellular and PSC [personal communications service] transmissions result in exposure levels on the ground that are typically thousands of times below safety limits. These safety limits were adopted by the FCC based on the recommendations of expert organizations and endorsed by agencies of the Federal Government responsible for health and safety. **Therefore, there is no reason to believe that such towers could constitute a potential health hazard to nearby residents or students.**” (emphasis added).

I hope that these conclusions, from well-known and legitimate organizations, alleviate your concerns regarding health impacts from cell towers.

To address your concerns regarding property values, we strongly believe that cell phone towers have a positive effect on real estate values. East Kentucky Network, LLC is licensed by the FCC to provide telecommunications services to citizens in the area, and we use our best efforts to construct the infrastructure necessary to provide reliable coverage. Cellular service is vitally important to economic development and personal quality of life. In addition, essential emergency service providers rely upon the wireless network infrastructure to protect the public. We believe that our services improve the communities where we operate.

Should you need any additional information, please do not hesitate to contact me.

Sincerely,



Lynn Haney, CPA
Regulatory Compliance Director
(606) 477-2355 ext. 1007
lhane@ekn.com

cc: Public Service Commission

Enclosure(s)



Human Exposure to Radio Frequency Fields: Guidelines for Cellular and PCS Sites

Primary antennas for transmitting wireless telephone service, including cellular and Personal Communications Service (PCS), are usually located outdoors on towers, water tanks and other elevated structures like rooftops and sides of buildings. The combination of antenna towers and associated electronic equipment is referred to as a "cellular or PCS cell site" or "base station." Cellular or PCS cell site towers are typically 50-200 feet high. Antennas are usually arranged in groups of three, with one antenna in each group used to transmit signals to mobile units, and the other two antennas used to receive signals from mobile units.

At a cell site, the total radio frequency (RF) power that can be transmitted from each transmitting antenna depends on the number of radio channels (transmitters) that have been authorized by the Federal Communications Commission (FCC) and the power of each transmitter. Although the FCC permits an effective radiated power (ERP) of up to 500 watts per channel (depending on the tower height), the majority of cellular or PCS cell sites in urban and suburban areas operate at an ERP of 100 watts per channel or less.

An ERP of 100 watts corresponds to an actual radiated power of 5-10 watts, depending on the type of antenna used. In urban areas, cell sites commonly emit an ERP of 10 watts per channel or less. For PCS cell sites, even lower ERPs are typical. As with all forms of electromagnetic energy, the power density from a cellular or PCS transmitter rapidly decreases as distance from the antenna increases.

Consequently, normal ground-level exposure is much less than the exposure that might be encountered if one were very close to the antenna and in its main transmitted beam. Measurements made near typical cellular and PCS cell sites have shown that ground-level power densities are well below the exposure limits recommended by RF/microwave safety standards used by the FCC.

Guidelines

In 1996, the FCC adopted updated guidelines for evaluating human exposure to RF fields from fixed transmitting antennas such as those used for cellular and PCS cell sites. The FCC's guidelines are identical to those recommended by the National Council on Radiation Protection and Measurements (NCRP), a non-profit corporation chartered by Congress to develop information and recommendations concerning radiation protection. The FCC's guidelines also resemble the 1992 guidelines recommended by the Institute of Electrical and Electronics Engineers (IEEE), a non-profit technical and professional engineering society, and endorsed by the American National Standards Institute (ANSI), a nonprofit, privately-funded membership organization that coordinates development of voluntary national standards in the United States.

In the case of cellular and PCS cell site transmitters, the FCC's RF exposure guidelines recommend a maximum permissible exposure level to the general public of approximately 580 microwatts per square centimeter. This limit is many times greater than RF levels typically found near the base of cellular or PCS cell site towers or in the vicinity of other, lower-powered cell site transmitters. Calculations corresponding to a "worst-case" situation (all transmitters operating simultaneously and continuously at



the maximum licensed power) show that, in order to be exposed to RF levels near the FCC's guidelines, an individual would essentially have to remain in the main transmitting beam and within a few feet of the antenna for several minutes or longer. Thus, the possibility that a member of the general public could be exposed to RF levels in excess of the FCC guidelines is extremely remote.

When cellular and PCS antennas are mounted on rooftops, RF emissions could exceed higher than desirable guideline levels on the rooftop itself, even though rooftop antennas usually operate at lower power levels than free-standing power antennas. Such levels might become an issue for maintenance or other personnel working on the rooftop. Exposures exceeding the guidelines levels, however, are only likely to be encountered very close to, and directly in front of, the antennas. In such cases, precautions such as time limits can avoid exposure in excess of the guidelines. Individuals living or working within the building are not at risk.

Consumer Help Center

For more information on consumer issues, visit the FCC's Consumer Help Center at www.fcc.gov/consumers.

Accessible formats

To request this article in an accessible format - braille, large print, Word or text document or audio - write or call us at the address or phone number at the bottom of the page, or send an email to fcc504@fcc.gov.

Last Reviewed 10/31/16





Cellular Phone Towers

Cellular (cell) phones first became widely available in the United States in the 1990s, but since then their use has increased dramatically. The widespread use of cell phones has led to cell phone towers being placed in many communities. These towers, also called *base stations*, have electronic equipment and antennas that receive and transmit radiofrequency (RF) signals.

How do cellular phone towers work?

Cell phone base stations may be free-standing towers or mounted on existing structures, such as trees, water tanks, or tall buildings. The antennas need to be high enough to adequately cover the area. Base stations are usually from 50-200 feet high.

Cell phones communicate with nearby cell towers mainly through radiofrequency (RF) waves, a form of energy in the electromagnetic spectrum between FM radio waves and microwaves. Like FM radio waves, microwaves, visible light, and heat, they are forms of **non-ionizing radiation**. This means they do not directly damage the DNA inside cells, which is how stronger (**ionizing**) types of radiation such as x-rays, gamma rays, and ultraviolet (UV) light are thought to be able to cause cancer.

At very high levels, RF waves can heat up body tissues. (This is the basis for how microwave ovens work.) But the levels of energy used by cell phones and towers are much lower.

When a person makes a cell phone call, a signal is sent from the phone's antenna to the nearest base station antenna. The base station responds to this signal by assigning it an available radiofrequency channel. RF waves transfer the voice information to the base station. The voice signals are then sent to a switching center, which transfers the call to its destination. Voice signals are then relayed back and forth during the call.

How are people exposed to the energy from cellular phone towers?

As people use cell phones to make calls, signals are transmitted back and forth to the base station. The RF waves produced at the base station are given off into the environment, where people can be exposed to them.

The energy from a cellular phone tower antenna, like that of other telecommunication antennas, is directed toward the horizon (parallel to the ground), with some downward scatter. Base station antennas use higher power levels than other types of land-mobile antennas, but much lower levels than those from radio and television broadcast stations. The amount of energy decreases rapidly as the distance from the antenna increases. As a result, the level of exposure to radio waves at ground level is very low compared to the level close to the antenna.

Public exposure to radio waves from cell phone tower antennas is slight for several reasons. The power levels are relatively low, the antennas are mounted high above ground level, and the signals are transmitted intermittently, rather than constantly.

At ground level near typical cellular base stations, the amount of RF energy is thousands of times less than the limits for safe exposure set by the US Federal Communication Commission (FCC) and other regulatory authorities. It is very unlikely that a person could be exposed to RF levels in excess of these limits just by being near a cell phone tower.

When a cellular antenna is mounted on a roof, it is possible that a person on the roof could be exposed to RF levels greater than those typically encountered on the ground. But even then, exposure levels approaching or exceeding the FCC safety guidelines are only likely to be found very close to and directly in front of the antennas. If this is the case, access to these areas should be limited.

The level of RF energy inside buildings where a base station is mounted is typically much lower than the level outside, depending on the construction materials of the building. Wood or cement block reduces the exposure level of RF radiation by a factor of about 10. The energy level *behind* an antenna is hundreds to thousands of times lower than in front. Therefore, if an antenna is mounted on

the side of a building, the exposure level in the room directly behind the wall is typically well below the recommended exposure limits.

Do cellular phone towers cause cancer?

Some people have expressed concern that living, working, or going to school near a cell phone tower might increase the risk of cancer or other health problems. At this time, there is very little evidence to support this idea. In theory, there are some important points that would argue against cellular phone towers being able to cause cancer.

First, the energy level of radiofrequency (RF) waves is relatively low, especially when compared with the types of radiation that are known to increase cancer risk, such as gamma rays, x-rays, and ultraviolet (UV) light. The energy of RF waves given off by cell phone towers is not enough to break chemical bonds in DNA molecules, which is how these stronger forms of radiation may lead to cancer.

A second issue has to do with wavelength. RF waves have long wavelengths, which can only be concentrated to about an inch or two in size. This makes it unlikely that the energy from RF waves could be concentrated enough to affect individual cells in the body.

Third, even if RF waves were somehow able to affect cells in the body at higher doses, the level of RF waves present at ground level is very low – well below the recommended limits. Levels of energy from RF waves near cell phone towers are not significantly different from the background levels of RF radiation in urban areas from other sources, such as radio and television broadcast stations.

Studies in people

Very few human studies have focused specifically on cellular phone towers and cancer risk.

In one large study, British researchers compared a group of more than 1,000 families of young children with cancer against a similar group of families of children without cancer. They found no link between a mother's exposure to the towers during pregnancy (based on the distance from the home to the nearest tower and on the amount of energy given off by nearby towers) and the risk of

early childhood cancer.

In another study, researchers compared a group of more than 2,600 children with cancer to a group of similar children without cancer. They found that those who lived in a town that could have exposed them to higher than average RF radiation from cellular phone towers in the previous 5 years had a slightly higher risk of cancer, although not of any certain type of cancer (like leukemia or brain tumors). This study estimated the children's possible exposure based on the number of towers in their town and how strong the signals were from the towers. It did not look at actual exposure of any individual child based on how far their home or school was from a tower. This limitation reduces confidence in the results of the study.

One study looked for signs of DNA and cell damage in blood cells as a possible indicator of cancer-causing potential. They found that the damage was no worse in people who lived near a cell phone tower as compared with those didn't.

The amount of exposure from living near a cell phone tower is typically many times lower than the exposure from using a cell phone. About 30 studies have looked at possible links between cell phone use and tumors in people. Most studies to date have not found a link between cell phone use and the development of tumors, although these studies have had some important limitations. This is an area of active research. For more information, see *Cellular Phones* (</cancer/cancer-causes/radiation-exposure/cellular-phones.html>).

Studies done in the lab

Laboratory studies have looked at whether the types of RF waves used in cell phone communication can cause DNA damage. Most of these studies have supported the idea that the RF waves given off by cell phones and towers don't have enough energy to damage DNA directly. Because of this, it's not clear how cell phones and towers might be able to cause cancer, but research in this area continues.

Some scientists have reported that RF waves may produce other effects in human cells (in lab dishes) that might possibly help tumors grow. However, these studies have not been verified, and these effects weren't seen in a study that looked at the blood cells from people living near a cellular phone tower.

Several studies in rats and mice have looked at whether RF energy might promote the development of tumors caused by other known carcinogens (cancer-causing agents). These studies did not find evidence of tumor promotion, but this is still an area of research.

A large study by the US National Toxicology Program (NTP) exposed groups of lab rats and mice to RF energy over their entire bodies for about 9 hours a day, starting before birth and continuing for up to 2 years (which is the equivalent of about 70 years for humans, according to NTP scientists). In a draft report of the final results (released in February 2018), the study found an increased risk of tumors called malignant schwannomas of the heart in male rats exposed to RF radiation. But some aspects of this study make it hard to know just how these results might apply to RF exposure from cell phone towers in people. For example, there was no increased risk among female rats or among male or female mice in the study. The doses of RF radiation in the study were also generally higher than those people are exposed to when using cell phones (much less being near a cell phone tower). The male rats in the study exposed to RF waves also lived longer, on average, than the rats who were not exposed, for unclear reasons. Still, the results add evidence to the idea that the signals used in cell phone communication might potentially impact human health.

What expert agencies say

About cell phone towers

The 3 expert agencies that usually classify cancer-causing exposures (carcinogens) – the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and the US Environmental Protection Agency (EPA) – have not classified cell phone towers specifically as to their cancer-causing potential.

The **US Federal Communications Commission (FCC)** has said this about cell phone towers near homes or schools:

“Radiofrequency emissions from antennas used for cellular and PCS [personal communications service] transmissions result in exposure levels on the ground that are typically thousands of times below safety limits. These safety limits were adopted by the FCC based on the recommendations of expert organizations and endorsed by agencies of the Federal Government responsible for health and safety. Therefore, there is no reason to believe that such towers could constitute a potential health hazard to nearby residents or students.”

About RF radiation

Some of the agencies that classify cancer-causing exposures have, however, made statements about radiofrequency radiation.

The **International Agency for Research on Cancer (IARC)** has classified RF fields as “possibly carcinogenic to humans,” based on limited evidence of a possible increase in risk for brain tumors among cell phone users, and inadequate evidence for other types of cancer. (For more information on the IARC classification system, see *Known and Probable Human Carcinogens* (</cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html>)). IARC also noted that exposure to the brain from RF fields from cell phone base stations (mounted on roofs or towers) is less than 1/100th the exposure to the brain from mobile devices such as cell phones.

The **Environmental Protection Agency (EPA)** states:

“At very high levels, RF energy is dangerous. It can heat the body's tissues rapidly. However, such high levels are found only near certain equipment, such as powerful long-distance transmitters. Cellphones and wireless networks produce RF, but not at levels that cause significant heating. In addition, RF energy decreases quickly over distance. At ground level, exposure to RF from sources like cellphone towers is usually very low.

Some people are concerned about potential health effects, especially on the developing brains and bodies of children. Some studies suggest that heavy long-term use of cellphones could have health effects. Other studies don't find any health effects from cellphone use. Long-term studies on animals exposed to the RF found in wireless networks (Wi-Fi) have, so far, found no health effects. Scientists continue to study the effects of long-term exposure to low levels of RF.”

Can I limit my exposure?

Cell phone towers are not known to cause any health effects. But if you are concerned about possible exposure from a cell phone tower near your home or office, you can ask a government agency or private firm to measure the RF field strength near the tower (where a person could be exposed) to ensure that it is within the acceptable range.

What should I do if I've been exposed to cellular phone towers?

There is no test to measure whether you have been exposed to RF radiation from cellular phone towers. But as noted above, most researchers and regulatory authorities do not believe that cell phone towers pose health risks under ordinary conditions. If you have additional health concerns, you might want to talk with your doctor.

Written by [Additional resources](#) [Resources](#)



The American Cancer Society medical and editorial content team

(</cancer/acs-medical-content-and-news-staff.html>) Our team is made up of doctors and master's-prepared nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

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