

January 12, 2016

Randy Quale
Bloomington Park and Recreation Manager
1800 West Old Shakopee Road
Bloomington, MN 55431

Re: Verizon Wireless proposed communications facility at Valley View Park.

Dear Mr. Quale,

As per our discussions I have enclosed some additional information requested for our public hearing to be held on January 14, 2016.

Enclosed are the following documents for reference:

- Non-Interference statement from Verizon Wireless engineer
- Portion of FCC website on RF safety
- Portion of American Cancer Society website on cell phone and cell towers

We are proposing adding less than 2 feet of height to the existing pole, along with a new 3 foot lightning rod. The closest home is over 200 feet away from our facility. As per the enclosed documents this distance does not propose any health or interference problems to any home in the area.

Verizon Wireless initially looked at collocation on the water tower but ultimately did not work out. This proposal is for the replacement of the existing light pole at the ball field and installing our antennas on the pole. Our proposed shelter will look very similar to the existing dugouts at the very same field.

The generator will run when there is a power outage and creates minimal noise in the area. The city has approved similar facilities at Sunrise Park, Dred Scott Park, Smith Park and the water tower at Reynolds Park. There are currently 3 carriers on the water tower at Valley View Park.

Cordially,

Curt Walter
Curt Walter

January 12th, 2016

Randy Quale
Bloomington Parks and Recreation Manager
1800 West Old Shakopee Road
Bloomington, MN 55431

RE: Non-Interference with Public Safety or Private Telecommunications, (Re. Verizon Wireless Project Name "MIN PORTLAND" monopole proposed for construction on Hennepin County PID# 10-027-24-41-0059)

Dear Mr. Quale:

This letter serves to confirm that the proposed telecommunications equipment to be operated on the Verizon Wireless "MIN PORTLAND" tower will not interfere with public safety or private telecommunications.

Verizon Wireless provides Commercial Mobile Radio Services ("CMRS") under licenses granted by the Federal Communications Commission ("FCC"). Pursuant to these licenses, Verizon Wireless is authorized to provide CMRS and operate a CMRS network in many geographic areas throughout the nation, including Bloomington, Minnesota.

The FCC exclusively regulates all technical aspects of Verizon Wireless' operations and network and preempts all state and local regulation of radiofrequency transmissions. The FCC rules protect co-channel and adjacent licensees against harmful interference.

The above noted proposed Verizon Wireless facility is in compliance with all applicable FCC requirements. The following points cover Verizon Wireless' practices pertinent to complying with the FCC requirements:

1. Verizon Wireless locates its transmitting antenna(s) in order to maximize vertical and horizontal separation from other operator's systems to minimize interference potential.

2. All operating hardware at the site is type-accepted by the FCC as far as emission levels within our licensed frequency band in addition to spurious emissions outside of our frequency band.
3. The power levels generated by the base station hardware and corresponding effective radiated power (ERP) from the transmit antenna(s) are within the limitations specified by Part 22 (for cellular), Part 24 (for PCS), or Part 101 (for microwave) of the Commission's Rules.
4. Intermodulation studies are prepared and analyzed considering all carriers on our tower to ensure no mixing of frequencies will create harmful interference to / from our wireless system.

Verizon Wireless is committed to providing state of the art wireless services that benefit your community. If you have any questions please feel free to contact me.

Sincerely,



Mihaela Oxley
Radio Frequency Design Engineer
Verizon Wireless
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FCC RF Safety Literature

Full FCC page found at:

<http://www.fcc.gov/oet/rfsafety/rf-faqs.html#Q15>

Below is section specific to cellular and PCS:

ARE CELLULAR AND PCS TOWERS AND ANTENNAS SAFE?

Cellular radio services transmit using frequencies between 824 and 894 megahertz (MHz). Transmitters in the Personal Communications Service (PCS) use frequencies in the range of 1850-1990 MHz. Antennas used for cellular and PCS transmissions are typically located on towers, water tanks or other elevated structures including rooftops and the sides of buildings. The combination of antennas and associated electronic equipment is referred to as a cellular or PCS "base station" or "cell site." Typical heights for free-standing base station towers or structures are 50-200 feet. A cellular base station may utilize several "omni-directional" antennas that look like poles, 10 to 15 feet in length, although these types of antennas are less common in urbanized areas.

In urban and suburban areas, cellular and PCS service providers commonly use "sector" antennas for their base stations. These antennas are rectangular panels, *e.g.*, about 1 by 4 feet in size, typically mounted on a rooftop or other structure, but they are also mounted on towers or poles. Panel antennas are usually arranged in three groups of three each. It is common that not all antennas are used for the transmission of RF energy; some antennas may be receive-only.

At a given cell site, the total RF power that could be radiated by the antennas depends on the number of radio channels (transmitters) installed, the power of each transmitter, and the type of antenna. While it is theoretically possible for cell sites to radiate at very high power levels, the maximum power radiated in any direction usually does not exceed 50 watts.

The RF emissions from cellular or PCS base station antennas are generally directed toward the horizon in a relatively narrow pattern in the vertical plane. In the case of sector (panel) antennas, the pattern is fan-shaped, like a wedge cut from a pie. As with all forms of electromagnetic energy, the power density from the antenna decreases rapidly as one moves away from the antenna. Consequently, ground-level exposures are much less than exposures if one were at the same height and directly in front of the antenna.

Measurements made near typical cellular and PCS installations, especially those with tower-mounted antennas, have shown that ground-level power densities are thousands of times less than the FCC's limits for safe exposure. This makes it extremely unlikely that a member of the general public could be exposed to RF levels in excess of FCC guidelines due solely to cellular or PCS base station antennas located on towers or monopoles.

When cellular and PCS antennas are mounted at rooftop locations it is possible that a person could encounter RF levels greater than those typically encountered on the ground. However, once again, exposures approaching or exceeding the safety

guidelines are only likely to be encountered very close to and directly in front of the antennas. For sector-type antennas, RF levels to rear are usually very low. ([Back to Index](#))

For further information on cellular services go to http://wireless.fcc.gov/services/index.htm?job=service_home&id=cellular

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

As discussed above, radiofrequency emissions from antennas used for cellular and PCS 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.

Other antennas, such as those used for radio and television broadcast transmissions, use power levels that are generally much higher than those used for cellular and PCS antennas. Therefore, in some cases there could be a potential for higher levels of exposure to persons on the ground. However, all broadcast stations are required to demonstrate compliance with FCC safety guidelines, and ambient exposures to nearby persons from such stations are typically well below FCC safety limits. ([Back to Index](#))



<http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/cellular-phone-towers>

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 cannot cause cancer by directly damaging DNA. RF waves are different from stronger types of radiation such as x-rays, gamma rays, and ultraviolet (UV) light, which can break the chemical bonds in DNA.

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.

For these reasons, most scientists agree that cell phone antennas or towers are unlikely to cause cancer.

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 the document, [Cellular Phones](#).

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.

Some scientists have reported that the 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. Research in this area continues.

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 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 our document, [Known and Probable Human Carcinogens](#).) 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.