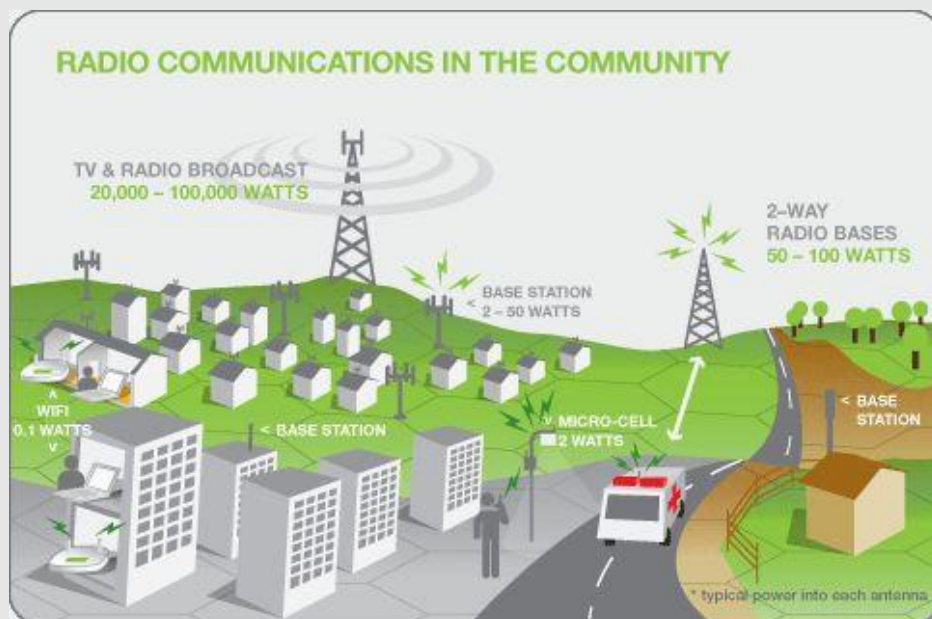


Information on mobile phone base stations

Mobile phones work by sending and receiving low power radio signals. The signals are sent to and received from antennas that are attached to radio transmitters and receivers, commonly referred to as mobile phone base stations. The base stations are linked to the rest of the mobile and fixed phone networks and pass the call on to those networks.

Radio communications have long been a part of everyday life. All radio communications systems utilise electromagnetic fields (EMF) in the radio frequency (RF) part of the electromagnetic spectrum. Typical background EMF levels from radio communications systems are very low and well below safety guidelines.



What determines the location of mobile phone base stations?

A mobile network is typically designed on a grid basis covering a geographic area. Base stations need to be located close to mobile phone users to provide good quality reception. The more people using mobile phones, the more capacity is required and this usually means more base stations closer together. The number of base stations required for a given area will depend on the terrain and number of people using mobile phones.

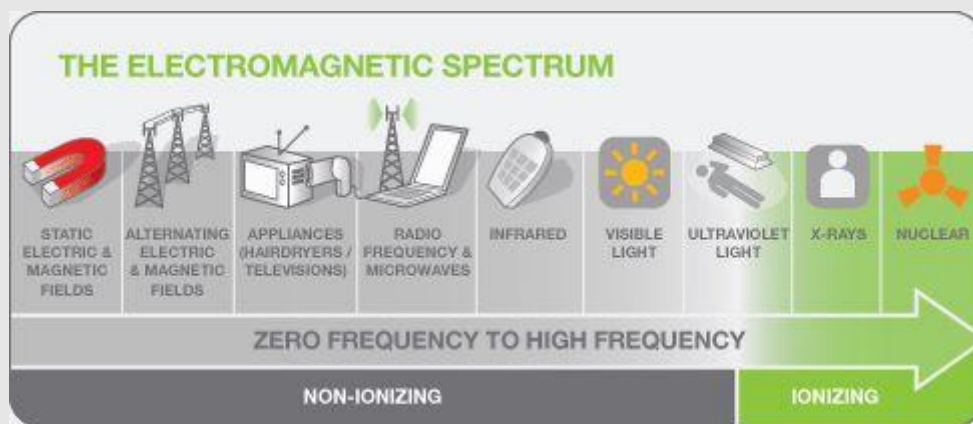
A suitable location for a new mobile phone site must fulfil the technical network requirements for improved coverage for mobile phone users, while balancing the reasonable expectations of the community and impacts on the local environment. There are a number of criteria to take into account, including compliance with the Resource Management Act and compliance with Local Authority District Plans.

What is EMF?

EMF is short for electromagnetic fields or sometimes known as electromagnetic radiation (EMR) or electromagnetic energy (EME). Electromagnetic fields are present everywhere in our environment – the earth, sun and ionosphere are all natural sources of EMF.

Electric and magnetic fields are part of the spectrum of electromagnetic energy which extends from static electric and magnetic fields, mains power frequencies (50/60Hz) through to radiofrequency, infrared, and visible light to X-rays.

Many electrical appliances don't just create EMF – they rely on them to work. Television and radio, mobile and cordless phones, remote control handsets, baby monitors and the communication systems used by emergency services all communicate using Radio Frequency EMF. So do wireless technologies such as WiFi, which is increasingly used by computer networks.



Electromagnetic fields which cannot break down molecular bonds are called non-ionising radiation. Visible light is a type of non-ionising radiation, which we are exposed to daily from natural and artificial sources such as the sun and indoor lighting. Radio Frequency EMF is also a source of non-ionising radiation, which does not carry enough energy to break down chemical bonds within cells and tissues.

Some electromagnetic waves carry such large quantities of energy that they can ionise particles of matter and consequently break down the chemical bonds between molecules. This type of radiation is potentially harmful to health, and is only used in a small number of specific applications: X-rays used for both diagnostic and therapeutic purposes (radiotherapy), gamma-rays (emitted by radioactive materials) and cosmic radiation all have the ability to break molecular bonds.



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What standards apply to mobile phone base stations in New Zealand?

Standards are part of everyday life in today's society but many people don't realise they exist. The homes we live in, the cars we drive and appliances we use are all built to standards, developed by experts so they work correctly and are safe to use.

Decades of research into EMF and health has produced a large body of scientific literature which national and international standards organisations can review to establish safe exposure limits.

New Zealand Standard NZS 2772.1:1991

National Environmental Standard (NES) 2008

The World Health Organisation (WHO) formally recognised the International Commission on Non-Ionising Radiation Protection (ICNIRP) to develop international EMF exposure guidelines. The ICNIRP guidelines are based on careful analysis of the scientific literature and are designed to offer protection for all ages, including children, against identified health effects of EMF with a large built-in safety margin.

The ICNIRP guidelines form the basis of the New Zealand radiofrequency field exposure standard NZS 2772.1:1999. The recently introduced NES requires that all network operators comply with NZS 2772.1:1999, ensuring that the same standard applies across all local authorities. Previously some District Plans referred to an outdated standard.

Community Engagement Guidelines for Wireless Telecommunications Sites

The Community Engagement Guidelines are an industry code of practice for the rollout of new wireless telecommunications sites, including mobile base stations. The Engagement Guidelines were created by members of the Telecommunications Carriers' Forum (TCF) in 2009.

The purpose of the Engagement Guidelines are to: standardise and enhance the approach taken by wireless network operators when engaging with members of the public in areas that are zoned and occupied for primarily residential purposes; ensure the public are provided with accurate information regarding wireless facilities; and to assist wireless network operators to communicate effectively with interested parties regarding the location of new or upgraded wireless facilities.

Frequently Asked Questions

Are mobile phones and base stations safe?

The consensus of scientific opinion is that there is no substantiated evidence of adverse health effects from exposure to radiofrequency (RF) fields below the limits recommended by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The World Health Organisation (WHO) has concluded that current evidence does not confirm the existence of any health consequences from exposure to low level RF fields and states "From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations."¹

However the WHO has recommended that research continues. Vodafone supports and funds independent research in a number of countries.

Why do we need more base stations?

Base stations are needed to make mobile phones work. More base stations are required to improve service quality, fill in coverage holes, and to provide enhanced services to the customer. Most new sites support improved technologies such as 3rd Generation (3G) which provides high data rates to allow mobile devices to download and upload large data files and access the internet. As well as providing a new range of services, 3G networks are far more efficient in their use of radio spectrum and generate less energy than earlier generation technology.

Mobile phone networks haven't been around for that long, isn't it too early for the experts to say if they are safe or not?

Mobile phone networks operate through the use of RF, which has been used commercially throughout the world for over half a century to provide services such as radio and television broadcast, and two-way radio communication. Over the past 50 years a large body of more than 1400 studies into RF and health have been conducted, leading to the conclusion as stated by the World Health Organisation that "Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects."²

¹ World Health Organisation Fact sheet N°304 May 2006 Electromagnetic fields and public health

² World Health Organisation Fact sheet N°304 May 2006 Electromagnetic fields and public health

How do people get to have a say about base station proposals?

A base station can only be located on a property with the agreement of the landowner. The design and location of the base station must comply with the Resource Management Act (1991) (RMA) together with any relevant parts of the local District Plan. For individual consent applications where the Council determine there are affected parties there would be a formal submission process during which Council would notify the affected parties.

Anyone can have a say in the way their local District Plan rules are put together through the submission process.

Under the Community Engagement Guidelines, people living near a proposed base station in a residential area will be contacted by Vodafone prior to Vodafone applying for any consents under the RMA, and again prior to construction commencing.

How is the New Zealand Standard adjusted in accordance with the latest research?

As set out above, the NZ Standard is based on the ICNIRP guidelines which are endorsed by the World Health Organisation. The New Zealand Standard has a similar basis to many developed countries including the United Kingdom, Australia, France, Germany, USA, Canada, and South Africa.

In 2009 ICNIRP published a detailed review of the latest research and concluded that there was no need to change the current ICNIRP guidelines, upon which the New Zealand Standard is based³.

In 2010 the New Zealand Government released a statement affirming the basis of the New Zealand Standard and stated that “New Zealand has a comprehensive and robust framework in place for managing the risks associated with radiofrequency fields that reflects current international best practice.”⁴

The New Zealand Interagency Committee on the Health Effects of Non-Ionising Fields (the Interagency Committee) reviews the latest relevant research biannually and reports to the Director-General of Health. The Interagency Committee is tasked with providing the Director-General of Health with high quality, independent scientific and technical advice on any potential health effects from exposures to extremely low or radiofrequency fields.

³ ICNIRP. ICNIRP statement on the “Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)”. Health Physics 97 (3): 257-258, 2009.

⁴ Government Response to the Report of the Local Government and Environment Committee on Petition 2005/179 of Sarah Allen and 3,100 others and two other petitions of a similar nature.



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Why can't base stations be put up on hills far away from where people live?

The energy of radio signals reduces very quickly over distance. If sites are located far away from the users they serve, both the base station equipment and the mobile phone must generate significantly higher radio power levels to maintain two way communication. Mobile phone base stations are instead designed to serve much smaller defined geographical areas which, as well as reducing RF power levels, enables the efficient reuse of the limited available radio spectrum. Unlike one way broadcast systems such as TV which use much higher powered transmitters to broadcast over a wide area, base stations need to be located closer to the customers they serve to work effectively.

Where can I get more information regarding mobile phone networks and health?

The **World Health Organisation** maintains a section on Electromagnetic Fields at:
www.who.int/topics/electromagnetic_fields/

The **National Radiation Laboratory**, part of the **Ministry of Health**, also publishes independent information on mobile phones and health. They also publish the results of independent monitoring of Vodafone mobile phone sites: www.nrl.moh.govt.nz

Vodafone's information on mobile phones, masts and health is available at:
www.vodafone.com/mpmh

For further enquiries you can contact the Vodafone Community Relations team on **0800 10 17 10** or community.relations.nz@vodafone.com