

The Safespace website¹ is designed to market and sell various “*EMF Protection Products*” that claim to provide “protection” from effects caused by power frequency electric and magnetic fields (EMF) (i.e., associated with electricity) and from radiofrequency EMF (i.e., associated with cell phones, wireless routers, and other technology). To support their claims, the website provides a biased and very selective “cherry-picked” overview of the scientific literature claiming various health effects related to EMF (mixing both power frequency and radiofrequency).

While some of the studies cited in the website are published in peer-reviewed journals, it is important to consider:

- The studies cited are only a few among the large database of literature on this subject, which seem to have been selectively “cherry-picked” to market Safespace products that purport to shield/treat EMF.
- Many of the adverse health effects alleged to occur due to EMF exposure appear to be based on data taken out of context from a few selected publications and particularly based on two reports by the BioInitiative working group from 2007 and 2012 and one report by the California Department of Health Services (CDHS) published in in 2002.
- The CDHS review was conducted by only three scientists; this small number of reviewers inherently lacks the relevant scientific disciplines needed for an authoritative multidisciplinary review panel. The CDHS reviewers expressed a “degree of certainty” as to whether the increased risks of certain diseases due to exposure to EMF are “real”; however, in addition to their small number, they also departed from the generally accepted weight-of-evidence scientific approach that is commonly used by the World Health Organization (WHO) and other authoritative, multi-disciplinary health and scientific agencies.
- The BioInitiative working group is a self-organized collection of individuals from academic institutions and public interest groups, who did not conduct their reviews under the aegis of any health, scientific, or government agency, and published their reports on the internet. Their reviews were heavily criticized by several authoritative scientific organizations,² for several reasons: the authors did not follow the scientific weight-of-evidence approach; they selectively referenced studies suggesting an association without considering the quality of studies; they summarily discounted studies not showing an effect; they relied heavily on laboratory studies of tissues and cells that play only secondary role in a proper risk assessment; and finally, their reports did not express a consensus opinion, as is customary in risk assessment panels—rather they were compilations of separate opinions by individual authors of various chapters.

It should be noted that the Safespace website fails to discuss the following:

¹ www.safespaceprotection.com/

² Such as the Advisory Group on Non-ionizing Radiation of the Health Protection Agency of Great Britain; the Health Council of the Netherlands; the Australian Centre for Radiofrequency Bioeffects Research; the EMF-NET Steering Committee of the European Commission; and the IEEE’s Committee on Man and Radiation.

- The WHO’s comprehensive review published in 2007 found that the scientific evidence was inadequate to indicate any health risk from EMF for almost all health conditions, but noted there was “limited” evidence from epidemiology studies of an association with childhood leukemia, which is not supported by the results of controlled laboratory research. The WHO concluded that this limited evidence did not provide a scientific basis to find that EMF actually causes or contributes to childhood leukemia, or is likely to do so—they could not rule out the role of chance, bias (i.e., errors in the studies), or confounding by other factors as explanations for this association. Overall, the WHO found there was no reliable scientific basis to conclude that exposure to EMF at levels below the current EMF exposure guidelines would cause any adverse health effects.
- Health Canada found that “the vast majority of scientific research to date does not support a link between ELF [extremely low frequency] magnetic-field exposure and human cancers. At present, the evidence of a possible link between ELF magnetic-field exposure and cancer risk is far from conclusive and more research is needed to clarify this ‘possible’ link”; they do not consider that any precautionary measures are needed to reduced daily exposure to power frequency EMF.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) is an independent scientific organization formally recognized by the WHO for providing guidance on standards for non-ionizing radiation exposure to protect the public, which in its most recent review in 2010 concluded that their existing guidelines are protective of the well-established acute effects of EMF exposure. These effects are due to direct stimulation of nerves and muscles, induction of visual phosphenes, and surface electric charges that may occur at field levels much higher than those the public may encounter. While ICNIRP recognized the limited epidemiologic evidence from some of the studies of childhood leukemia and EMF, they concluded that “the currently existing scientific evidence that prolonged exposure to low frequency magnetic fields is causally related with an increased risk of childhood leukemia is too weak to form the basis for exposure guidelines.” They also concluded that the evidence for all other diseases are inconclusive or not in support of a potential causal association, and stated that “[i]n general, the initially observed associations between 50–60 Hz [Hertz] magnetic fields and various cancers were not confirmed in studies designed to see whether the initial findings could be replicated.” With respect to potential effects on laboratory animals, ICNIRP concludes that “the animal cancer data, particularly those from large-scale lifetime studies, are almost universally negative.”
- Most recently, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), an independent scientific committee regularly reviews scientific literature on EMF and health for the Department of Health and Consumer Protection of the European Commission, issued their “Preliminary Opinion on Potential health effects of exposure to electromagnetic fields (EMF)” for public consultation on February 4, 2014. The overall conclusions of SCENIHR are consistent with those of WHO and ICNIRP. They acknowledge the statistical association in some of the epidemiologic literature on childhood leukemia, for which, however, chance, bias, and confounding cannot be ruled out as a potential explanation. Their report reiterates that “no mechanism has been identified that could explain these findings,” which, together with the lack of supportive

laboratory animal data, prevents causal interpretation.

Based on our review of and familiarity with the scientific literature, we make the following conclusions.

- The extensive scientific literature providing research results on potential health effects of power frequency EMF is regularly reviewed by numerous multidisciplinary expert panels on behalf of national and international health, scientific, and government agencies and none of these authoritative agencies concluded that there is any confirmed adverse health effect due to environmental exposures to power frequency EMF.
- The WHO currently states “[b]ased on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields.”³
- The WHO endorses the scientifically-established exposure guidelines developed by ICNIRP as protective of public health. The current ICNIRP magnetic-field exposure guideline for the general public is 2,000 milligauss (mG) [200 μ T], including adults and children. The WHO has endorsed this exposure limit as protective of public health, and these exposure guidelines have been adopted in a number of countries, including members of the European Union. The WHO concludes there is no scientific basis to claim health benefits in association with further reduction of power frequency EMF, which are already well below these guidelines. The levels away from and even under the existing and proposed lines on the St. Vital right-of-way will be far, far below the ICNIRP limit.
- The WHO concludes that since the “*benefits of exposure reduction on health are unclear*” the cost of any “*precautionary measures should be very low.*” Thus, the WHO endorses precautionary measures with little or no cost.
- Finally, after review of thousands of peer-reviewed scientific studies, detailed scientific assessments by the WHO, ICNIRP, and other health and scientific agencies have found the research does not provide a reliable scientific basis to conclude that exposure to EMF below the science-based international exposure guidelines can cause or contribute to any adverse health effects. While the presence of an association with EMF has raised the possibility of a risk with high average magnetic-field exposure, this association has not been judged by health authorities as providing a plausible basis to conclude that EMF exposure is actually harmful.

In closing, please understand that Manitoba Hydro’s approach to addressing EMF for its projects is based on both federal and provincial guidance. In its July 11, 2013, approval of an environmental license for the Bipole III transmission line and new 230-kV transmission lines, the Clean Energy Commission of Manitoba cited the conclusions of the WHO and Canadian authorities regarding EMF and health.

³ <http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html>