milligauss.[19] Locations of the inverters and ISU transformers at the Morven Solar project have been preliminarily identified and all are well beyond the 500-ft residential setback requirements for the facility. This setback will ensure that no solar ground-mounted equipment is closer than 500 feet from existing residential uses. With these setbacks, the EMF from the inverters and ISU transformers are not expected to extend onto any residential property. Similarly, the magnetic fields from substations generally do not extend far enough to leave the fence around the substation, so the same can be expected for the Project's substation.[20]

The bottom line is that the EMF from the Morven Solar project will not increase the EMF exposure of any neighbors. Even if some EMF from the PV facility were to extend beyond the PV site, there would still be no public health impact because low levels of extremely low frequency ("ELF") EMF exposure are not harmful to humans. After extensive study of the potential health impacts of EMF from grid electricity the WHO concludes:

> *"Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health."*[21]

Sources for Further Reading on EMF:

- Electric Power Research Institute: EMF and Your Health: 2019 Update, December 2019
- World Health Organization: Electromagnetic Fields (accessed September 2022)

Heat Island Effect

The localized effects of utility-scale PV facilities on temperature and moisture are not yet well understood. However, the localized micro-climate effects of utility-scale PV facilities are understood well enough to determine that they do not create a heat island effect similar to the well-documented urban heat island effect from dark, massive, surfaces in urban environments, such as asphalt paved streets and parking lots, that cause urban areas to be significantly warmer than the surrounding rural area during the day and night. The changes that solar panels may make to the way land absorbs, reflects, and emits the energy from sunlight are minimal compared to the changes created by buildings, vehicles, and many miles of concrete and asphalt. By comparison, solar panels absorb and reflect a similar amount of solar energy as vegetation and soil. Solar panels are lightweight and cannot store large amounts of thermal energy, and the ground remains covered in vegetation with its natural exposure to air and water. Additionally, the solar panels remove about 20% of the solar energy that strikes them as electricity sent to the grid.

Initial research into the potential for PV systems to cause a heat island effect has used a variety of techniques, including conceptual energy flow calculations, advanced fluid dynamic computer simulations, and field measurements of temperature.[22, 23, 24] This research found a range of different effects on temperature, but none indicate that a large PV system could affect the temperature of the surrounding community. Most found that compared to similar undeveloped land the air temperature in a solar facility increases during the day, but the nighttime results were mixed. Some studies found PV sites to be cooler than non-PV sites at night, but others found them to be warmer. Much of this variation is likely explained by the different climates studied but may also be due to the different methods of the studies. Much of the research on solar

[19] Study of Acoustic and EMF Levels from Solar Photovoltaic Projects. Tech Environmental, Inc., December 2012, www.co.champaign.il.us/CountyBoard/ZBA/2018/180329_Meeting/180329__Massachusetts%20Acoustic%20Study%20for%20PV%20Solar%20Projects.pdf

[20] www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

[21] World Health Organization (WHO), webpage: Electromagnetic Fields – Summary of health effects, www.who.int/peh-emf/about/WhatisEMF/en/index1.html

[22] Broadbent, Ashley & Krayenhoff, Eric & Georgescu, Matei & Sailor, David. (2019). The Observed Effects of Utility-Scale Photovoltaics on Near-Surface Air Temperature and Energy Balance. Journal of Applied Meteorology and Climatology. 58. 10.1175/JAMC-D-18-0271.1.

[23] Barron-Gafford, G. A. et al. The Photovoltaic Heat Island Effect: Larger solar power plants increase local temperatures. Sci. Rep. 6, 35070; doi: 10.1038/srep35070 (2016).

[24] V. Fthenakis and Y. Yu, "Analysis of the potential for a heat island effect in large solar farms," 2013 IEEE 39th Photovoltaic Specialists Conference (PVSC), Tampa, FL, 2013, pp. 3362-3366, doi: 10.1109/PVSC.2013.6745171.