



February 10, 2016

The Honorable Lance Grenzeback
Chairman, Winchester Board of Selectmen
Winchester Town Hall
71 Mt. Vernon Street
Winchester, MA 01890

Dear Chairman Grenzeback,

Thank you for the opportunities for the Woburn to Wakefield and Mystic to Woburn Line Project (“Project” or “Projects”) Teams to present updates at the Board of Selectmen (BOS) public meetings held on January 27 and February 11, 2016. We continue to value input from the Board of Selectmen, Town Manager and local residents, and hope that our continued dialogue can assure Winchester’s residents of our commitment to pursue the least disruptive Project solutions, while meeting our regulatory obligation to maintain a reliable transmission system with the necessary capacity to meet the growing customer demand for power throughout the Greater Boston area.

From the BOS meeting held on January 27, 2016 on the Woburn to Wakefield Line Project, it appears that Electric and Magnetic Field (“EMF”) exposure is in the forefront of public concern. The purpose of this letter is to provide a summary of independent subject matter expert and applicable health organization positions on EMF exposure from electric transmission.

EMF Background

As a matter of course, Eversource and National Grid investigate practical and no- and low-cost approaches for reducing EMF when designing new transmission facilities, and follow the guidelines set forth by leading, independent health science organizations.

Sources of EMF include the electric power system and everything that runs on electricity such as household appliances, hair dryers, electronics, electric power tools and any other electric equipment drawing power. To help put the exposure in context, the public is exposed to EMF from a variety of everyday sources and locations, including the home, workplace, grocery stores, etc. In addition, with wireless communications so closely integrated into our daily lives, electromagnetic fields are all around us (e.g., mobile and cordless phones, wireless routers, wireless computers, fiber-optic cables). Over the past 30 years, many scientific studies have been conducted to determine whether these fields affect biological systems and health.

In the late 1990s, the United States Congress directed the National Institute of Environmental Health Sciences (NIEHS) to establish the EMF Research and Public Information Dissemination Program so that independent scientists could determine whether exposure to EMF poses risk to human health.

At the conclusion of this research in 1999, the Director of the NIEHS reported to Congress that: *“The probability that EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal scientific support that exposure to this agent is causing any degree of harm.”* Since that time, and in consideration of continued research that has occurred on this question, the recommendations from NIEHS to Congress have not changed.

In June, 2007, the World Health Organization (WHO) published its latest findings in its “Electromagnetic Fields and Public Health” fact sheet. The fact sheet is based on a review by a WHO Task Group of scientific experts who assessed risks associated with EMF and, based on the weight of the evidence, concluded, among other things, that policies based on the adoption of arbitrary low exposure limits are not warranted. (The fact sheet can be found at: <http://www.who.int/emf/publications/facts/fs322/en/index.html>.)

In response to media attention and general public concern, the International Commission of Non-Ionizing Radiation Protection (ICNIRP) established the health based guideline for public exposure to EMF at 2,000 milliGause (mG).

The EMF associated with these transmission projects are far below established, scientifically-based limits on EMF exposure. While public exposure from various everyday sources, as described above, are well within recommended ranges, the level of magnetic fields is often much stronger than that from transmission lines.

Independent Expert Testimony

As part of the review process by the Massachusetts Energy Facilities Siting Board, Eversource and National Grid must model and assess EMF levels associated with our projects. To do so we rely on independent industry experts. In the case of these Projects, we have engaged Dr. Peter Valberg of Gradient, an environmental and risk sciences consulting firm located in Harvard Square, Cambridge to perform independent assessments of the potential EMF impacts of the proposed underground transmission lines.

Dr. Valberg has 30 years of experience on the faculty of the Harvard School of Public Health and at Gradient. He specializes in the areas of exposure to, and toxicology of, environmental agents and ionizing/non-ionizing radiation. Dr. Valberg is frequently called upon to prepare and interpret health risk findings for a variety of audiences, and helps apply research results to the regulatory, litigation, and public policy arenas.

The EMF reports completed by Dr. Valberg for both Projects have been filed with the EFSB as part of the Projects' respective Petitions, and can be examined by the public. The reports show that the magnetic fields for the proposed Woburn to Wakefield and Mystic to Woburn Line Projects are far below the ICNIRP guidelines.

Project Specific EMF Calculations

As the proposed transmission lines are underground, the ground and/or cable sheath will shield the electric field completely. Magnetic fields are not shielded by the earth but, like electric fields, they rapidly decrease in magnitude with increasing distance from the source.

- The Mystic to Woburn Line Project is a 115-kV High Pressure Fluid Filled (HPFF) design which includes a steel pipe to contain the cables and cooling fluid. The steel pipe reduces the magnetic field. Calculations show the maximum magnetic field generated by the combined effects of the existing underground 115-kV HPFF line and proposed transmission line at peak operation was calculated to be 3.61 mG at the ground surface directly above the line -- a nominal fraction of the guideline set forth by ICNIRP. The details of the evaluation can be found within the EMF report submitted to the EFSB.
- The Woburn to Wakefield Line Project is a 345-kV Cross Linked Polyethylene (XLPE) design and cannot be contained within a steel pipe for technical reasons, including the potential overheating of the cable. At peak loading, the maximum magnetic generated by the proposed underground line at ground surface directly above the line was calculated to be 34 mG -- a nominal fraction of the guideline set forth by ICNIRP. The details can be found within the Project EMF report submitted to the EFSB.

Additional methods of reducing magnetic fields on 345-kV XLPE cable are possible; however, these methods introduce additional Project cost with little to no benefit:

Steel Plates

Steel plates are sometimes considered in an effort to take advantage of a phenomenon known as "flux shunting". The use of steel plates will reduce magnetic fields directly above the trench. However, while the fields will be reduced directly above the trench (in the street), the fields will simply transfer to the nearby area not covered by plates. Therefore, exposure will actually increase for the public on the sidewalks and nearby facilities. In addition, using steel plates is not practical as they limit the ability to access the conduit and cable for repair. Further, if there are any weaknesses in the adjoining adjacent steel plates – as what might occur over time due to traffic, then the flux shunting will break down at this location and the magnetic fields will actually be higher in these locations. The use of steel plates also affects cable performance as steel plate decreases the ratings of the cable by interfering with heat dissipation from the cables.

Conducting Plates (Copper and Aluminum)

Similar to steel plates as described above, the use of copper plates will simply redirect the magnetic fields from directly under the trench (streets) to areas more commonly used by the public. Conducting plate also has similar problems as those of the steel plate in terms of limiting access to the cable and the need to maintain good continuity between sections of plates. This option will also have a bigger effect on the rating of the cables because it not only blocks the heat dissipation, but also introduces a new heat source due to the copper/aluminum composition of the plating.

Cancellation Loops (Multiple Ground Continuity Conductors)

This method uses additional conductors in the trench to form currents which will cancel out the magnetic fields above the trench. While it does not have the maintenance concerns that the plate methods have, it does decrease the cable rating by introducing currents in the new cables which heat up the trench. Also, similar to the plate mechanisms described above, it reduces magnetic fields above the trench, but increases fields away from the trench.

Increased Trench Depth

Increasing the trench depth has the effect of only fractionally reducing fields directly above the trench. The benefit of increased trench depth is nominal and the significant increase in cost cannot be justified.

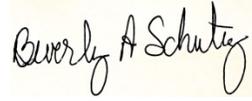
Conclusion

The United States has no federal health based standards limiting occupational or residential exposure to power frequency EMF. Eversource and National Grid rely on the consensus of independent health and scientific organizations and governmental bodies that make health risk determinations for the public, such as the NIEHS, the International Agency for Research on Cancer, ICNIRP, and the World Health Organization which have reviewed the large body of scientific research regarding EMF and health, when designing transmission lines.

While the EMF associated with these transmission projects are far below established, scientifically based limits on EMF exposure, we understand that some residents in the community may have additional questions. Should any Winchester resident or business owner with property on or near the proposed transmission lines request additional information about the EMF levels at their particular property, Eversource is happy to take EMF readings, provide information, and/or respond to questions or concerns. Residents may call Eversource's dedicated toll-free phone number (877-993-6377) and email (EMFQuestions@eversource.com) with any EMF questions or concerns, or to set up an appointment for a field reading.

Eversource wants you and the Winchester community to know that we are committed to being a good neighbor and a responsible provider of the power that is essential for the daily needs of Winchester residents, business owners and municipal operations.

Sincerely,

A handwritten signature in black ink on a light yellow background. The signature reads "Beverly A. Schultz" in a cursive script.

Beverly Schultz
Eversource Project Manager – Woburn to Wakefield Line Project

A handwritten signature in black ink. The signature reads "David Velez" in a cursive script.

David Velez
Eversource Project Manager – Mystic to Woburn Line Project

Cc:

James Johnson, Vice Chairman, Board of Selectmen
James Whitehead, Selectman
Michael Bettencourt, Selectman
Steve Powers, Selectman
Richard Howard, Town Manager
State Senator Jason Lewis
State Representative Michael Day