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June 18, 1999

Mr. Robert Cupit
Environmental Quality Board
658 Cedar Street
St. Paul, Minnesota 55155

Re: Southeast Metro 115 kV Transmission Line Project

Dear Mr. Cupit:

The Minnesota Environmental Quality Board was provided a copy of a letter from Mr. Roger Conant to Mr. Jack Sjöholm of Northern States Power Company, dated May 28, 1999. In the letter, Mr. Conant describes the medical history of a resident of Sunfish Lake and research regarding the reproductive effects of electromagnetic fields (EMF) exposure.

NSP cannot respond to the allegations regarding the medical history of the resident of Sunfish Lake. Not only does NSP not have complete and reliable information concerning her medical history, NSP does not believe it is appropriate to discuss an individual's medical condition or history in a public docket.

With respect to the research regarding the reproductive effects of EMF exposure, Mr. Conant states, "All of the studies identified by the NIH and the National Academy found statistically significant relationships between EMF from power lines and miscarriages." As shown in detail below, this is incorrect. Moreover, statistical significance in a study does not establish that EMF exposure causes adverse reproductive effects. Similarly, statistical significance in a study does not establish a risk warranting concern. NSP agrees with the statement in the Environmental Assessment Worksheet (EAW) for the Project:

Over twenty independent scientific groups through the past 18 years have evaluated the evidence from human, animal and exposure assessment research on the potential health effects associated with exposure to electric and magnetic fields. All of these groups have concluded that the body of data, as large as it is, does not support the conclusion that exposure to power-frequency electric or magnetic fields (at intensities that span the lowest recorded environmental levels to those that far exceed environmental and usual occupational exposure) causes cancer or otherwise constitutes a health hazard. EAW at page 15. The other health hazards referred to include reproductive effects of EMF exposure. This statement is supported by the most recent and authoritative reviews of the evidence on the possible health effects of EMF exposure.

First, the National Academy of Sciences concluded in its 1997 report entitled, "Possible Health Effects of Exposure to Residential Electric and Magnetic Fields":

Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive evidence shows that exposure to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects or reproductive and developmental effects.

(emphasis added) National Academy of Science Report, "Conclusions of the Committee," at page 1. In its description of Epidemiological Study Findings, the National Academy of Sciences states:

In the aggregate, epidemiologic evidence does not support possible associations of magnetic fields with adult cancers, pregnancy outcome, neurobehavioral disorders, and childhood cancers other than leukemia.

(emphasis added) National Academy of Science Report, "Study Findings-Epidemiology," at page 3. In its description of In Vivo Study Findings, the National Academy of Sciences states:

There is no evidence of any adverse effects on reproduction or development in animals, particularly mammals, from exposure to power-frequency 50- or 60- Hz electric and magnetic fields.

National Academy of Science Report, "Study Findings-In Vivo Studies on Exposure to Electric and Magnetic Fields," at page 7.

Second, the National Institute of Environmental Health Sciences (NIEHS) Working Group reviewed evidence on cancer and non-cancer adverse health effects from EMF in its 1998 report entitled, "Assessment of Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields." The NIEHS Working Group states:

None of the evidence for adverse health effects seen after exposure to ELF-EMF achieved a degree of evidence exceeding 'inadequate' (for humans) or 'weak' (for experimental animals). The end-points evaluated in humans were adverse birth outcomes after exposure, adverse reproductive effects after paternal exposure, Alzheimer disease, amyotrophic lateral sclerosis and other motor neuron diseases, suicide and depression and cardiovascular disease.

(emphasis added) NIEHS Work Group Report at page 399.

Third, the NIEHS Report which reviewed and presented the findings of the Working Group to the United States Congress in its report released two days ago entitled, "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields," concludes:

The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually

everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern.

(emphasis added) NIEHS Report, "Executive Summary" at page iii. On the specific issue of reproductive effects of EMF exposure, the Report states:

The relationship between spontaneous abortion and exposure to ELF-EMF has been considered in several studies. Recent occupational and residential studies were the focus of this assessment. In the first occupational study (56), no association was observed. In a second occupational study (57), a significant association was found with exposure to high ELF-EMF; however, the response rate was very poor, particularly among controls, which could have biased this result upward. Pregnancy loss was investigated in two residential cohort studies (58, 59). In one study (58), an increased risk was observed in the highest exposure category but not in the intermediate category. In the other (59), no association was observed for any measure of exposure. In a carefully designed prospective study in the United States (60), no association was reported between measured fields (including personal exposure monitoring) and intrauterine growth, birth weight or gestational age.

NIEHS Report, at pages 16-17. Based on these studies, the NIEHS concluded there is insufficient evidence of a risk to currently warrant concern.

Thank you for your consideration. If you have any questions, please call me.

Very truly yours,



Michael Connelly

cc: R. Conant
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