

March 16, 2004

Ms. Pamela B. Katz  
Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: Docket No. 272 - Middletown-Norwalk 345kV Transmission Line

Dear Ms. Katz:

This letter provides the response to requests for the information listed below.

While it is not possible to provide all the information requested at this time, the Company is attaching the information which has been completed.

Response to TOWNS-02 Interrogatories dated 02/17/2004  
TOWNS - 033 , 034 , 035 , 039 , 040 , 041 , 043

Very truly yours,

Anne B. Bartosewicz  
Project Director - Transmission Business

ABB/tms  
cc: Service List

**Witness: Dr. Bailey**  
**Request from: Connecticut Siting Council**

**Question:**

Reference the Exponent "Electric and Magnetic Field Assessment: Middletown-Norwalk Transmission Reinforcement" ("the Exponent EMF Assessment") included in Volume 6 of the Application.

- a. Please state whether it is Exponent's position that no adverse effects on human health or cancer can be caused by prolonged exposure to EMF of any magnitude.
- b. If the answer to part a. of this question is no, please specify the magnitude of the magnetic field (in milligauss), i.e., what levels of EMF, that could have adverse effects on human health, compromise normal function, or cause cancer.
- c. Please provide the health and scientific studies which form the basis for the answer to part b. of this question.

**Response:**

a. The portion of the Exponent report that discussed research on EMF and human health was prepared by William H. Bailey, Ph.D. It is his opinion that the weight of the evidence does not support the hypothesis that EMF at environmental levels cause cancer or adverse effects on human health. Environmental levels refers to levels of EMF encountered by people living, working, going to school, etc in the vicinity of sources of power frequency EMF, including power lines.

b. Exposure to magnetic fields at levels above those encountered in occupational environments might be sufficient to induce electric fields within the body of such a magnitude that adverse responses resulting from stimulation of excitable tissues such as nerves and muscles could occur. The most recent standard recommended by the IEEE International Committee on Electromagnetic Safety (ICES) suggests occupational exposure limits for whole body exposure of 20 kV/m and 27,100 mG to prevent such effects-

c. The studies and reviews of the literature considered by Dr. Bailey over the past 30 years are too voluminous to identify and list. However, an important subset of these studies would include most of the studies cited in recent literature reviews by the National Institute of Environmental Health Sciences (1998) and the International Agency for Research on Cancer (2002).

**CL&P/UI**  
**Docket No. 272**

**Data Request TOWNS-02**  
**Dated: 02/17/2004**  
**Q- TOWNS-034**  
**Page 1 of 1**

**Witness: Dr. Bailey**  
**Request from: Connecticut Siting Council**

**Question:**

Please indicate whether the proposed magnetic fields (mG) presented on Tables 5, A-1, A-2, and A-3 in the Exponent EMF Assessment reflect the total magnetic field from all of the transmission lines, including the proposed 345-kV line, that would be within the same right-of-way or only the magnetic field from the proposed 345-kV line.

**Response:**

The calculated Electric and Magnetic field levels were based on all of the transmission lines within the right-of-way for both the existing, proposed, and alternative cases. These calculations did not incorporate electric and magnetic field contributions from other sources outside the transmission right-of-way.

**CL&P/UI**  
**Docket No. 272**

**Data Request TOWNS-02**  
**Dated: 02/17/2004**  
**Q- TOWNS-035**  
**Page 1 of 1**

**Witness: Peter T. Brandien**  
**Request from: Connecticut Siting Council**

**Question:**

Reference pages 23 and 24 of the Exponent EMF Assessment. If the projected peak load is 27 GW and the average load is 15 GW, specify how many hours of the year the New England load would exceed 15 GW.

**Response:**

For the year 2002, New England experienced load in excess of 15 GW for 4187 hours, almost 48% of the year. It is reasonable to conclude that when New England peak load periods approach 27.7 GW, New England load will exceed 15 GW more than half the hours in a calendar year.

**Witness: Dr. Bailey**  
**Request from: Connecticut Siting Council**

**Question:**

Reference Table 5 in the Exponent EMF Assessment.

- a. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 8.6 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- b. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 8.6 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- c. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 9.6 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- d. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 9.6 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- e. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 11.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- f. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 11.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- g. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 13.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- h. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 13.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- i. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-

term exposure to a magnetic field of 17.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

- j. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 17.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- k. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 19.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- l. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 19.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- m. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 21.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- n. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 21.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- o. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 28.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- p. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 28.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- q. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 31.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- r. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 31.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- s. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 31.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- t. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 31.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

**Response:**

CL&P and UI are not scientific organizations and do not develop scientific opinions of their own. Rather, they look to national and international organizations that have drawn upon the multidisciplinary expertise of scientists within their organization or outside scientific advisory panels for guidance as to what conclusions may be drawn from the scientific literature on EMF.

Dr. Bailey's response to this question is as follows:

The magnetic field values listed in Table 5 of the Exponent Report are calculated values at the edge of the right-of-way at an average projected system power flow. (Please note that a revised Table 5 was filed on 3/15/04.) As explained in my prefiled testimony, it would be erroneous to interpret these values as estimates of a person's level of *exposure* to EMF. A magnetic field value calculated or measured at a particular location in an instant in time is not a measure of human exposure.

The epidemiology studies of human populations in residential settings have used various methods to estimate their total long-term exposure to magnetic fields. These methods have included surrogates for measurements of long-term exposure including distance to power lines, the number and size of conductors, spot measurements in home, schools, or workplaces, repeated personal measurements over one or two days, and calculations of the magnetic field at a residence based upon annual average loading of nearby power lines. These surrogates for actual measurements of long-term exposure have been used in community studies to compare the estimated exposures of groups of persons with and without the disease of interest, with the idea being that differences in the exposures of these groups might shed light on factors that might affect the etiology or development of the disease.

For example, in the studies of childhood leukemia, the investigators used the above methods to compare the exposures of a group of children with leukemia to other children in the same community without leukemia. The results of such studies may indicate differences in the relative exposures of the groups – indicating a statistical association between the exposure and the disease. However, by themselves they provide little basis to discern a cause and effect relationship, especially since bias and confounding cannot be ruled out, and there is virtually no biologic data or mechanisms that support the plausibility of a causal relationship.

Hence, it would not be correct to regard the associations in EMF epidemiologic studies as providing estimates of effect thresholds

As is also discussed in the Exponent report and in my prefiled testimony, there is no basis in the experimental literature to conclude that long-term exposure to magnetic fields at the levels indicated pose any risk of cancer or toxicity.



**Witness: Dr. Bailey  
Request from: Connecticut Siting Council**

**Question:**

Reference Table A-1 in the Exponent EMF Assessment.

- a. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 25.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- b. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 25.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- c. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 30.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- d. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 30.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- e. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 96.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- f. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 96.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

**Response:**

See response as to TOWNS-002, Q-TOWNS-039.

**Witness: Dr. Bailey**  
**Request from: Connecticut Siting Council**

**Question:**

Reference Table A-3 in the Exponent EMF Assessment.

- a. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 10.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- b. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 10.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- c. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 12.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- d. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 12.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- e. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 16.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- f. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 16.3 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- g. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 17.1 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- h. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 17.1 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

i. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 28.1 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

- j. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 28.1 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- k. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 38.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- l. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 38.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- m. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 39.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- n. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 39.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- o. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 39.9 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- p. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 39.9 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- q. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 41.2 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- r. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 41.2 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- s. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 44.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer.
- t. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 44.7 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.
- u. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-

term exposure to a magnetic field of 45.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

v. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 45.0 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

w. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 49.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

x. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 49.5 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

y. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 58.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

z. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 58.4 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

aa. Describe the evidence that, in the opinion of Exponent, CL&P and UI, would support the conclusion that long-term exposure to a magnetic field of 58.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer.

bb. Provide copies of the health and scientific studies which form the basis for the conclusion that long-term exposure to a magnetic field of 58.8 mG would not have adverse effects on human health, compromise normal function, or cause cancer. Please identify the specific statements, tables and findings in each such study which support this conclusion.

**Response:**

See response as to TOWNS-02, Q-TOWNS-039.

**CL&P/UI**  
**Docket No. 272**

**Data Request TOWNS-02**  
**Dated: 02/17/2004**  
**Q- TOWNS-043**  
**Page 1 of 1**

**Witness: Dr. Bailey**  
**Request from: Connecticut Siting Council**

**Question:**

Provide copies of each of the health and scientific studies discussed or included as references in the Exponent EMF Assessment.

**Response:**

All of these studies are publically available, in many cases on the internet. Production of even a single copy of every one of the referenced studies and reports would be a overly burdensome and wasteful. Accordingly the Companies object to this request.