INFORMATION SHEET

CANCER INCIDENCE IN ZIP CODE 12059
(TOWN OF BERNE), ALBANY COUNTY, NEW YORK:

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Prepared by

DOH

STATE OF NEW YORK
DEPARTMENT OF HEALTH

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Background

Residents of East Berne, Albany County, contacted the New York State Department of Health (NYSDOH) in 1993 because they were concerned about the installation of a weather radar tower in their community. Because of its elevation on the Helderburg Plateau, East Berne was already the site of several radio and television towers. In response to these concerns, NYSDOH Bureau of Environmental Radiation Protection (BERP) staff evaluated radiofrequency levels in the area in October 1993, before the radar tower was operational. BERP staff also accompanied the consultants for the National Weather Service when they measured radiofrequency levels in March 1994, after the radar tower was operational.

In addition, the NYSDOH Bureau of Chronic Disease Epidemiology and Surveillance conducted a cancer incidence study to see whether people living in the area had experienced higher than expected rates of any type of cancer. The study evaluated cancers diagnosed from 1982 to 1991 among residents living in ZIP code 12059, which includes the Town of Berne and portions of the Towns of Knox and New Scotland. Prior to the release of this study, Cancer Registry data through 1996 had become available. An appendix has been added to the study in order to update the cancer incidence findings from 1992 through 1996.

Nexrad Weather Radar Tower

The weather radar tower that raised concerns among residents was installed in East Berne in the fall of 1993 and began operating in March of 1994. The radar tower is known as the NEXRAD Weather Radar Tower. NEXRAD refers to the Next Generation Weather Radar Program. The National Weather Service is building a nationwide network of over 100 NEXRAD radar towers, also known as Weather Surveillance Radar-88D (WSR-88D), to replace the old network of Weather Surveillance Radar-57 transmitters, installed in the 1950s. The new system’s improved processing of the radiofrequency signal allows forecasters to detect wind speed and other indicators of severe weather in order to provide more accurate predictions about the severity and location of damaging winds and floods.

Unlike the radiation from x-rays or radioactive materials, radiofrequency radiation is non-ionizing. This means it does not have sufficient energy to cause electrons to separate from atoms, and does not form ions that can be harmful in the body. Known human health effects from non-ionizing radiation are related to heating or thermal effects on cells, but the power levels emitted by the NEXRAD do not cause thermal effects in areas where the public is likely to be exposed. Thermal effects can only occur in the immediate beam, close to the radar antenna. There is ongoing research investigating whether human health effects, not due to heating, could possibly be caused by non-ionizing radiation. There is currently no clear evidence that radiofrequency fields induce non-thermal health effects, including cancer. In addition to the radiofrequency electromagnetic fields associated with the transmitters, magnetic fields are generated by the power lines providing electricity to these systems. While exposure to magnetic fields has been controversial, these fields are expected to be a small fraction of the fields produced by a home’s own electrical wiring and household appliances.
Radiofrequency Measurements

In October 1993, NYSDOH staff, accompanied by a representative of the Albany County Department of Health, conducted an evaluation of the radiofrequency levels in East Berne. Measurements were made at thirteen locations, including homes closest to the new radar tower, which was not yet in operation. All the readings were very close to zero, with only three being above the smallest scale division on the most sensitive scale. The highest of these three was taken in sight of a TV tower, and the combined TV and radio transmissions at this location showed a radiofrequency level that was less than 1.25 percent of the public protection guideline.\(^1\) The current radiation protection guideline for the general public is 1 milliWatt per square centimeter (mW/cm\(^2\)) as adopted by the Federal Communications Commission (FCC) in 1997, based upon the earlier recommendations of the National Council on Radiation Protection and Measurements (NCRP) and the Institute of Electrical and Electronic Engineers (IEEE).

With the involvement of the Town of Berne Planning Board, six sites where radiofrequency levels were expected to be highest were chosen for further testing after the NEXRAD system began operating. Five of these were sites where measurements had been made in October. The sixth site, about six miles from the tower, was the only location on the Helderberg plateau where modeling showed that the main axis of the radar beam could contact the ground. The radar beam from the NEXRAD system is very narrow and points upward. The narrow beam spread means that the edge of the main beam only contacts the ground at distances of more than 8,000 feet from the tower. At that point the intensity of the beam is less than 0.001 milliWatt per square centimeter (mW/cm\(^2\)).

In March 1994, NYSDOH staff observed the measurement of radiofrequency levels conducted by consultants working for the National Weather Service. Measurements were taken for the WSR-88D NEXRAD radar as well as for FM radio and television broadcast transmitters. At each of the six sites, signal levels from each source were measured and combined to compare the total emission levels to the maximum permissible exposure limits. The combined exposure levels at each site were many orders of magnitude lower than the maximum permissible exposure limits. The highest time-averaged, power-density level from the NEXRAD radar, measured at a site on Woodstock Road, was 0.0000044 mW/cm\(^2\). The site measurements are shown in the attached Table 1.

Cancer Incidence Study conducted by Cancer Surveillance Program

Methods: Health care providers are required by law to report to the NYSDOH Cancer Registry all cases of cancer diagnosed in New York State. For this cancer incidence study, all cases of cancer diagnosed among residents of ZIP code 12059 during the years 1982 to 1991 were selected from the Cancer Registry and compared to the number of cancer cases expected, based on the size and age of the population in the ZIP code area.

\(^1\) At that time there were suggested protection guidelines for the general public developed by the National Council on Radiation Protection and Measurements (NCRP) in 1986 and the Institute of Electrical and Electronic Engineers (IEEE) in 1992. This guideline was 1 milliWatt/cm\(^2\) for frequencies which include the NEXRAD frequencies (2700-3000 MHz).
Findings: For all types of cancers combined, for men and women, the number of cancer cases was not different from the number expected. The geographic locations of the residences of the persons diagnosed with cancer did not appear to be related to the location of the radio and television towers in the area.

Cancer Cases in Men: From 1982 to 1991, the number of newly diagnosed cancer cases was not significantly different from the number expected. Twenty-one cases of cancer were observed in men, while 25 cases were expected. Sixteen specific cancer sites were evaluated for men. Among men, one type of cancer, malignant melanoma (a type of skin cancer), showed statistically significantly more cases than expected. Only one case of malignant melanoma among men was expected, and more than one (but fewer than six) were observed. (When fewer than six cases are observed in an area smaller than a county, NYS DOH does not release the exact number of cases. This is part of NYS DOH policy for ensuring that personal information about health is not released.)

Cancer Cases in Women: For women, the overall number of newly diagnosed cancer cases was not significantly different from the number expected. Twenty-eight cases were observed, while 29 were expected. Among the 18 specific cancer sites evaluated for women, none showed statistically significantly higher numbers of cases than expected. No cases of malignant melanoma were diagnosed among women.

Cancer Incidence Update for 1992 through 1996

The updated cancer incidence evaluation for 1992 through 1996 also showed that for all types of cancers combined, for men and women, the number of cancers seen were not different from the number expected. From 1992 through 1996, 12 cases of cancer were observed in men while 19 were expected. For women, 18 cases were observed, while 21 were expected. Of the sixteen specific cancer sites evaluated for men, none were statistically significantly elevated. Of the eighteen specific cancer sites evaluated for women, none were statistically significantly elevated.

FOR MORE INFORMATION about environmental health issues, please contact:

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FOR MORE INFORMATION about the occurrence of cancer or questions about this cancer incidence investigation, please contact:

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Table 1
Radiofrequency Measurements, March 1994

<table>
<thead>
<tr>
<th>Site</th>
<th>Elevation In feet</th>
<th>Distance from WSR-88-D</th>
<th>Peak Power Density mW/cm²</th>
<th>Time-averaged Power Density mW/cm²</th>
<th>Maximum* Permissible Exposure mW/cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Woodstock Rd</td>
<td>1790</td>
<td>900 feet</td>
<td>0.13</td>
<td>0.00000044</td>
<td>1.00</td>
</tr>
<tr>
<td>2. Camp Woodstock</td>
<td>1720</td>
<td>4858 feet</td>
<td>0.025</td>
<td>0.00000054</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Joslyn School Rd</td>
<td>1560</td>
<td>1.3 miles</td>
<td>0.013</td>
<td>0.00000052</td>
<td>1.00</td>
</tr>
<tr>
<td>4. Wolf Hill</td>
<td>1440</td>
<td>3.0 miles</td>
<td>0.0079</td>
<td>0.00000015</td>
<td>1.00</td>
</tr>
<tr>
<td>5. Berne-Knox-Westerlo School</td>
<td>1030</td>
<td>5.0 miles</td>
<td>0.000000005</td>
<td>See note</td>
<td>1.00</td>
</tr>
<tr>
<td>6. Sickle Hill Road</td>
<td>1860</td>
<td>5.8 miles</td>
<td>1.0</td>
<td>0.0000034</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: The reading was below the sensitivity/measuring capability of the spectrum analyzer.


*As adopted by FCC in 1997.