

Cancerphobia: The Fear and the Decision by **Matthew G. Parisi**

I. INTRODUCTION

The New York Constitution, as well as the United States Constitution, prohibits the taking of private property without just compensation and declares that a person cannot be deprived of his property without due process of law. The Legislature cannot take or authorize the taking of private property for a public purpose without providing just compensation to the owner thereof. Property owners must be put in the same relative position as if the taking had not occurred. This generally means full compensation for the land taken plus damages to the remaining property.

It is clear that if land is taken for use as a hazardous waste disposal facility, the market value of the adjoining property is adversely affected by the reasonable fear of living near such a facility. However, what if the property is taken by a power company for high voltage transmission? In power line condemnation cases, the damages to the remaining property are a result of the public's possibly unreasonable fear of the adverse health effects associated with exposure to electromagnetic fields. Many jurisdictions are struggling with the issue of whether to award compensation based on this speculative and conjectural fear. In the past, claimants in New York were required to prove that the fear that affected market value was reasonable. However, due to the New York Court of Appeals' recent decision in *Criscuola v. Power Authority of the State of New York*, 81 N.Y.2d 649 (1993), future claimants will need to show only that market value is affected.

I. II. WHAT ELECTROMAGNETIC FIELDS ARE AND HOW THEY AFFECT THE HUMAN BODY

In order to analyze the effects of electromagnetic fields, one must obtain a basic understanding of what electromagnetic fields are and what creates them. Whenever electric current is flowing there are both electric and magnetic fields. The electric field of a charged object is merely a description of the electric force that the object is capable of exerting on other charges brought into its vicinity. The intensity of the electric field is proportional to the magnitude of this force. These fields result when two different electric charges come close to one another, causing electric current to flow.

Electric fields occur naturally. By simply rubbing two rubber balloons on clothing one can create an electric field that will cause the balloons to repel each other. This natural phenomena occurs because the electric charges in the one object form a force on the charges in the other object. If the nature of the charges are the same, namely positive or negative, repulsion will occur; if the charges are dissimilar, a positive and a negative, they will attract each other.

Powerful electric fields are likewise produced when thunderclouds discharge electricity through lightning. The Earth's electric fields, generated by atmospheric movements such as clouds and thunderstorms, are 90-130 V/m in fair weather conditions and up to 5 kV/m in severe weather conditions.¹ In comparison, a standard 230 kV transmission line produces an electric field of 2 kV/m at its maximum.²

Although electric and magnetic fields are created by the same electric charges, they are different in the way they are formed. Electric fields come directly from the strength of the charge, while magnetic fields come from the motion of the charge. A magnetic field represents the force that a moving charge exerts on another moving charge. Electric current is a group of charges all moving in the same direction. Therefore, all electric currents produce magnetic fields. The strength of a magnetic field depends upon the configuration of the circuit, the amount of current in the circuit and the proximity of an exposed object to the circuit.

Magnetic fields are also created naturally. The Earth's magnetic field varies over its surface, from maximum values of 600 to 700 mG at high latitudes, (there are 2 points of maximum in the Northern Hemisphere, and one in the Southern Hemisphere) to a minimum of 230 mG off the coast of Brazil.³ In comparison, the maximum strength of a 230 kV transmission line is 70 mG.⁴

The most intense magnetic fields are found near appliances (particularly those with small motors or transformers such as hair dryers and fluorescent light fixtures).⁵ Strong magnetic fields are generated by processes that use high currents, such as high voltage electric transmissions, arc welding, induction heating and some electric motors. Magnetic fields have also been measured around video display terminals (VDTs).

Since electric and magnetic fields always exist together, scientists often call them electromagnetic fields or EMFs. EMFs may be steady, such as the earth's relatively constant magnetic field, or they may vary in strength and direction, such as those created by electric power. In the United States, the electric power used is composed of electric charges which move back and forth at a frequency of 60 times per second or 60 Hertz. Many other EMFs, for example microwave and X-ray created EMFs, go through these changes at a frequency of a billion times per second. Appropriately, 60 Hz EMFs fall into the extremely low frequency category of the electromagnetic spectrum and are often called extremely low frequency fields or ELF fields.

Every person is subject to electromagnetic fields every day, through a variety of sources. While we sleep, most people are subject to EMF exposure from their electric clock or electric blanket. Other objects that emit potentially dangerous EMFs include electric shavers and hair dryers, computers and video display terminals, and microwaves, toasters and other appliances. However, the extent to which the human body is exposed varies a great deal. The amount of EMF exposure diminishes rapidly as the distance between the source of electromagnetic fields (such as transmission lines, distribution lines and electric appliances) and the object exposed to them increases.⁶ *For example, a person standing within 10 yards of a 500 kV transmission line is exposed to an electric field of 10 kV/m and a magnetic field of 100 mG respectively. But if the person walks 100 yards away the exposure would drop to about 10 V/m and 1 mG respectively.*

Trees, tall fences, buildings and most other large structures provide shielding from electric fields. The presence of these structures can, therefore, have a significant effect on the electric fields to which people are exposed. Houses, for instance, attenuate electric fields from nearby power lines by roughly 90 percent.⁷ Magnetic fields, on the other hand, are shielded only by structures containing large amounts of ferrous and other special metals.

The interaction of EMFs with the human body occurs through a mechanism called induced current. The human body contains free electric negative charges which, when exposed to electric fields, will move in response to the charges flowing in electrical circuits. Since the charges in U.S. electrical circuits change their direction 60 times a second, the induced current inside the body will also alternate. Magnetic fields are generated in closed loops when current flows in a circuit. Therefore, the current induced inside the body by magnetic fields will also flow in loops. The density of this induced loop current is greatest on the periphery of the body and smallest at the center of the body.⁸

III. DOES A CAUSAL RELATIONSHIP EXIST BETWEEN EXPOSURE AND ADVERSE HEALTH EFFECTS?

In recent years many studies have been undertaken in an attempt to determine whether exposure to extremely low frequency fields will have an adverse effect on humans. Most of the research done in the last decade or so has fallen into one of three groups:

1. Cellular Level Studies, which evaluate the effects of exposure on cells or tissues of animals or humans;
2. Whole Animal or Human Studies, which assess such effects on whole organisms; and
3. Epidemiological Studies, which analyze the statistical relationships between exposure to such fields among humans and the incidence of disease.

A. Cellular Level Studies

Cellular level effects have been studied in numerous experiments. Based on these experiments, many scientists believe the cell membrane, which encloses the cell, is the most probable site where electromagnetic fields interact with the cell.⁹ The studies show that

electromagnetic fields can alter: ion and protein flow over cell membranes; rates of DNA synthesis and RNA transcription; the interaction with response to hormones effects on endocrine tissue; cell immune response; and rates of cancer promotion.¹⁰ However, a conclusion on whether or not electromagnetic field exposure causes adverse health effects based on cellular level studies cannot be as yet accurately determined.¹¹

B. Whole Animal and Human Studies

Whole animal and human studies are aimed at examining the effects of electromagnetic fields, if such exist, on a whole organism as a biological system. Recent whole animal and human studies on the biological effects of electromagnetic field exposure have focused on three areas: the interaction with the nervous system, behavioral change and the effects on reproduction.¹²

The largest set of behavioral studies have involved studies of animal preference to remain in or avoid strong electric fields. These studies, though not providing much insight on health effects, do suggest that effects observed in experiments involving strong electric fields may reflect the effects of sensory stimulation, rather than the direct effects of fields on a cell.¹³ Experiments to test the effects on reproduction and development have also been performed on various organisms and have sometimes produced conflicting results.¹⁴ However, animal studies do demonstrate a somewhat more positive association between exposure to electromagnetic fields and health effects on a biological system than do cellular level studies.¹⁵

C. Epidemiological Studies

Epidemiological studies look at the statistical relationship between a particular disease and a proposed agent. Usually both control and experimental populations are used where the control population does not have the agent present while the experimental population does. Since human beings are being used as subjects, the results can suggest the impact of the interaction of the human body with an external agent. However, these studies are carried out on subjects living in the natural world and exposed to all of what exists in their environment, making it difficult to single out a particular agent from other environmental influences.

A recent study undertaken in Finland reviewed eight studies that had been previously undertaken, providing the following inconclusive summation:

... four of six studies on overall cancer risk in children found some indication of an increased risk and two did not. Four of five studies on nervous system tumors, five of seven studies on leukemia, and all four studies on lymphoma, using various exposure assessment methods, reported increase in risk. One study on nervous system tumors and two studies on leukemia detected no evidence of increased risk.¹⁶

The Finish study itself suggested that magnetic fields of power lines in Finland, when occurring at levels close to 0.2 uT do not form a major health risk regarding childhood cancers.¹⁷ However, the results of a recent Danish case control study found a positive association between all types of childhood cancer combined and exposure to an empirically defined average density of 0.4 uT or more of magnetic fields from high voltage installations.¹⁸ These conflicting results prohibit the drawing of definite conclusions about an association between exposure and harmful effects.

The studies that are presently receiving the most attention are two case control studies that were recently undertaken in Sweden. The first tested whether exposure to magnetic fields of the type generated by high-voltage power lines increases cancer incidence in children.¹⁹ The study base consisted of 127,383 people under 16 years of age who had lived on property located within 300 meters of any of the 15,000 kilometers of power lines in Sweden during the period 1960 to 1985. The results of this study provide more support for an association between magnetic fields than against it while providing no support for an association for central nervous system tumor, lymphoma and all childhood cancers combined.

The second study examined occupational exposure in relation to leukemia and brain tumors.²⁰ The study compared 250 leukemia and 261 brain tumor cases with a control group of 1121 randomly selected men from Sweden. The results of this study support the hypothesis that occupational EMF exposure is a hazard in the development of certain cancers.

The results from these epidemiological studies, though inconclusive, do tend to show an association between EMF exposure and certain cancers. However, a causal relation is difficult to make due to the lack of consistency among published studies and the absence of an accepted biological explanation for such a relation.

IV. THE *CRISCUOLA* DECISION

A. Introduction

Criscuola involved a parcel of real property located in Delaware County. Joseph and Dominick Criscuola acquired fee simple title to property located on Trout Brook Road in the Town of Colchester by deed in December of 1971. The brothers used the property as a rural vacation home, often snowmobiling and riding all-terrain vehicles on the property, and fishing in the small pond that was located on the eastern half of the property. The property consisted of 800 feet of frontage on the east side of Trout Brook Road, and stretched eastward in essentially a rectangular shape, up a gradual slope, for approximately 95 acres. The land was improved by a two story, farm-house style residence with a one-story addition, a wood frame barn, and a garage, all well maintained and in good condition.²¹

As part of the Marcy South Power Line Project, the Power Authority of the State of New York (“PASNY”) filed two appropriation maps that affected the *Criscuola* property.²² The first map involved a 4.07 acre permanent easement for construction, operation and maintenance of electric transmission lines, in the form of a 160 foot wide corridor crossing the *Criscuola* property diagonally in a north-south direction. It also provided for a 2.54 acre easement to cut, trim, and remove brush, trees and other obstructions, except buildings, located within 50 feet of the permanent easement. The second map consisted of a 2.2 acre parcel to be used as a winding roadway easement for access to the power line easement from Trout Brook Road. The power line easement is approximately 1500 feet east of any improvements on the property. The effect of the taking was to separate the *Criscuola* property into three remainder parcels with approximately 30 acres west of the power line easement and 70 acres east.

The New York Court of Appeals granted the *Criscuolas*’ leave to appeal a lower court’s holding denying consequential damages because the claimants had not met their burden of proving that “Cancerphobia,” a fear of adverse health effects associated with exposure to fields created by high voltage power lines, was reasonable.²³ The issue before the court was whether proof of reasonableness is required before a claimant can recover consequential damages for an eminent domain taking of property whose value may be affected by a perceived public fear of danger of health risks. On October 12, 1993, the Court of appeals (Bellacosa, J.) held that claimants should not have to prove the “reasonableness” of the public’s perception of a health risk from exposure to electromagnetic emissions from power lines as a separate, additional component of diminished market value.²⁴

B. Background

The issue in *Criscuola* was one of first impression in New York. However, the issue had been well ventilated in other jurisdictions around the country. A small number of courts have retained what now seems to be the minority rule.²⁵ This rule holds that evidence of lost market value due to fear may not be introduced, even though the fear may affect market value, because fear of adverse health effects from power lines is necessarily speculative. The Kansas Court of Appeals in *Willsey v. Kansas City Power & Light Co.*, an often cited case that reviews all three views, stated that the minority view holds that “fear of danger from power lines is necessarily based on pure speculation by an ignorant public and can never be an element of damages even if it affects market value of the land.”²⁶

The second rule of law, followed by a larger number of courts,²⁷ holds that evidence of the existence of fear of adverse health effects and their effect on market value may be introduced if it is shown that such fear is reasonable. “While these courts hold that, conjectural damages are non-compensable, if the fear is shown to be reasonable (or at least not wholly unreasonable) and in fact affects the market value, the loss is

compensable.”²⁸ The *Willsey* court, in ultimately following the intermediate rule, found that there can be no quarrel with the proposition that mere fears of injury may not be compensated. The court, however, held that “logic and fairness dictate that any loss in market value proven with a reasonable degree of probability should be compensable.”²⁹

The third rule, followed in a large number of jurisdictions,³⁰ holds that evidence of lost market value due to the fear of adverse health effects may be introduced regardless of the reasonableness of the fear. The *Willsey* court described this rule as holding that “the dangerous nature of power lines is a fact proven by common experience, and that the impact of public fear of such danger on market value may be shown and compensated without independent proof of the reasonableness of the fear.”³¹ Florida courts followed the minority rule for 24 years until, 1987, when the Florida Supreme Court in *Florida Power & Light Co. v. Jennings* held that “[t]he impact of public fear on the market value of the property is admissible without independent proof of the reasonableness of the fear.”³² The court found that evidence of “. . . any factor, including public fear, that impacts on the market value of the land taken may be considered to explain the basis for an expert’s valuation opinion.”³³ In *San Diego Gas & Electric v. Daley*, the California Court of Appeals stated that “the truth or lack of truth in whether electromagnetic projections caused a health hazard to humans or animals was immaterial. Rather, the question is whether the fear of the danger existed and would affect market value.”³⁴

New York courts had traditionally followed the intermediate rule. The trial court in the *Criscuola* case, following the holding in *Miller v. State of New York*,³⁵ found

. . . that the claimant has a two fold burden of proof:

- 1) he must prove that a potential purchaser has *reasonable grounds* for apprehension that power lines cause health problems. Claimant has the burden of proving this by a preponderance of the credible scientific evidence; and**
- 2) that this reasonable apprehension has affected the purchaser’s willingness to pay the fair market value of the property, as evidence by proof from the real estate market, or, as stated in [Miller], “based on the actual pricing experience shown from before and after sales.” Claimant has the burden of proof by a preponderance of the credible real estate evidence.**³⁶

In *Criscuola*, PAsNY argued that New York courts should continue to require proof of a rational basis for fear of cancer as a prerequisite to consequential damage recovery, noting that in *Willsey*, the Kansas Court of Appeals ultimately required that the fear be reasonable.³⁷ PAsNY also argued that reasonableness should be required to preclude baseless and speculative claims:

The courts of New York consistently have refused to award “phobia” damages where plaintiffs claim damages due to mental anguish, psychic injury, or emotional distress resulting from unreasonable fears of contracting cancer, AIDS or some other disease. Such claims have been denied because without a rational basis for the fear, such as a causal relationship between an event and the disease, there is no guarantee of genuineness.³⁸

The *Criscuolas* argued that it does not matter whether there is scientific proof that exposure to electromagnetic fields causes cancer, stating “the fact is that the public perceives the risk.”³⁹ They also argued that national publications, television and local newspapers have reported “an unmistakable correlation between the degree of exposure to an electromagnetic field and the risk of [harmful effects].”⁴⁰ Finally, the *Criscuolas* argued that if a health risk is perceived by the public, this perception can be quantified by an appraiser utilizing comparable sales and his experience.⁴¹

C. Decision

Judge Bellacosa, writing for a unanimous court, began his analysis by discussing the basic theory behind a just compensation proceeding. The issue in a just compensation proceeding is simply “[w]hether or not the market value has been adversely affected.”⁴² The court went on to note that the consequence may be present even if the public’s fear is unreasonable. Genuineness and proportionate dollar effects are relevant factors, to be contested between the parties’ market value experts, “not magnified and escalated by a whole

new battery of electromagnetic power engineers, scientists or medical experts.”⁴³

The court relied heavily on the *Willsey* case to quickly review the positions taken in courts throughout the country. Judge Bellacosa next noted that recently Florida, California and Kansas had reaffirmed that reasonableness is not a factor in such a proceeding, citing the holdings in *Florida Power, San Diego Gas and Electric* and *Ryan v. Kansas Power & Light Co.*⁴⁴ Agreeing with the conclusion of the Supreme Court of Kansas in *Ryan*, the New York Court of Appeals asserted that “evidence of fear in the market place is admissible with respect to the value of the property taken without proof of the reasonableness of the fear.”⁴⁵

Finally, the Court of Appeals addressed PASNY’s claim that proof of a rational basis for the fear be a prerequisite to awards of consequential damages in order to preclude baseless and speculative claims. The court required that future claimants “still establish some prevalent perception of a danger emanating from the objectionable condition.”⁴⁶

Some credible, tangible evidence that a fear is prevalent must be presented to prove the adverse market value impact. Claimants should have to connect the market value diminution of the property to the particular fear in much the same manner that any other adverse market effects are shown, e.g., by proffering evidence that the market value of property across which power lines have been built had been negatively affected in relation to comparable properties across which no power lines have been built.⁴⁷

The court concluded by warning future claimants that, “while a personal or quirky fear or perception is not proof enough, the public’s or the market’s relatively more prevalent perception should suffice, scientific certitude or reasonableness notwithstanding.”⁴⁸

D. Analysis

Criscuola brings New York in line with a majority of jurisdictions around the country. The change in law shifts the emphasis in power line condemnation cases from testimony by scientists to that of appraisers. A reasonableness requirement subjects the trier of fact to a scientific and medical battle between parties relying on inconclusive studies being undertaken in an attempt to determine whether there is a causal connection between electromagnetic field exposure and disease. While this battle is appropriate in a personal injury action based on exposure to electromagnetic fields, it has no place in a just compensation proceeding.

In order to determine just compensation, a market value analysis is required. A claimant in an eminent domain proceeding is entitled to compensation for the diminished value of the remaining property after a partial condemnation of his land. *Criscuola* requires that a claimant show only that a fear of living in close proximity to power lines exists, not that the fear is reasonable. If a prevalent fear is shown, and market value is affected, compensatory damages will be established. With more and more studies showing that those in close proximity to power lines are affected, and the constant attention given this subject by the media and many other sources, it appears that “cancerphobia” will continue to be widespread and the market value of property in close proximity to these lines will continue to be affected.

The Court did not, however, address the concerns of the utility industry by requiring “some credible, tangible evidence.” Citing the Kansas Court of Appeals in *Ryan*, the court noted that “no witness, whether expert or non-expert, may use his or her personal fear as a basis for testifying about fear in the market place. However, any other evidence that fear exists in the public about the dangers of high voltage is admissible.”⁴⁹ The best evidence of this fear in a power line condemnation case will be the difference in market value of property located in close proximity to the power lines as compared to those in a power line free environment. However, in the first power line condemnation case to reach the appellate level since the *Criscuola* decision,⁵⁰ the Second Department affirmed a lower court’s denial of consequential damages for, among other things, negative view, cancerphobia, and noise pollution. The court held that the claimants had “failed to demonstrate that the market value of property adjacent to or near land upon which power lines have been built was diminished by such factors in relation to comparable properties which are not adjacent to or near power lines.”⁵¹

An avalanche of claims induced by the success of the *Criscuolas* is not likely. Homeowners who have lived near power lines for many years will not be entitled to consequential damages even if they have a personal fear of developing cancer. In addition, condemnation damages are set at the time the property is taken. Therefore, land taken before “cancerphobia” affected market value

will have a difficult time justifying compensation damages.

One other factor that will prevent an avalanche of claims is the fact that the strength of electromagnetic fields drops off rapidly as distance from the source of the fields increases. As the public becomes more aware of this fact, only the market value in close proximity to power lines will be adversely affected. This will provide a natural limit to the amount of land that is affected by power line cases. This fact may lead power companies to condemn a slightly larger piece of land around power lines in order to avoid “cancerphobia” claims to the property not taken.

V. CONCLUSION

In our industrialized society, everyone is subject to electromagnetic fields each and every day. Whether these fields adversely affect the human body has yet to be determined. However, electromagnetic fields do appear to have an effect on market value. In New York, as in a majority of jurisdictions around the country, power line condemnation cases will no longer focus on scientific evidence to determine whether it is reasonable to perceive that there is a health risk associated with exposure to electromagnetic fields. The New York Court of Appeals has determined, in *Criscuola v. Power Authority of the State of New York*, that what is important when determining consequential damages in a power line condemnation case is the extent to which “cancerphobia” has affected market value.

¹⁽¹⁾ *Thomas Sykes and Ping Li, Possible Health Effects of Electric and Magnetic Fields from Electric Power Lines: a Summary of Scientific Studies (1990), 4 [hereinafter Scientific Studies].*

²⁽²⁾ *New York State Power Lines Project Scientific Advisory Panel Final Report, Biological Effects of Power Line Fields 31 (1987).*

³⁽³⁾ *Id.*

⁴⁽⁴⁾ *Scientific Studies, supra note 1, at 4.* Power line electric and magnetic field magnitudes may be compared with these typical quasi-static values for the earth, but it is important to remember that the latter values are effectively DC and their comparison with magnitudes of power line and other more rapidly oscillating fields may have little biological significance. *Id.*

⁵⁽⁵⁾ Office of Technology Assessment, U.S. Congress, *Biological Effects of Power Frequency Electric and Magnetic Fields – Background Paper 15 (1989)* [hereinafter *OTA Background Paper*]. Because appliance fields fall off rapidly with distance and since people generally spend only brief moments of time very close to appliances (with the exception of electric blankets and a few other appliances), appliances are usually not dominant contributors to time-averaged magnetic field exposure. However, since it is not known what aspect of the field, if any, is biologically important, care must be taken in making inferences from this fact. *Id.*

⁶⁽⁶⁾ *Mathematically, electric field intensity is provided by the equation $E = a_r E_r = a_r (q/[constant]R^2)$. This tells us that the electric field intensity of a positive point charge (q) is in the outward radial direction (a_r) and has a magnitude proportional to the charge and inversely proportional to the square of the distance from the charge (R^2) (emphasis added). David K. Cheng, *Field and Wave Electronics 77 (2d ed 1989).**

⁷⁽⁷⁾ *OTA Background Paper, supra note 5, at 16.*

⁸⁽⁸⁾ *Id.* at 5. For example, the current induced inside the body by a 1 gauss, 60 Hz magnetic field will be about 100 nanoamps per square centimeter on the periphery of the body and zero nanoamps at the center of the body. *Id.*

⁹⁽⁹⁾ *Scientific Studies, supra note 1 at 10,* One of the functions of the cell membrane is to serve as a messenger that transmits information received at the surface of the cell to be transferred to the interior of the cell, where the life process begins, by controlling the flow of ions, through channels known as “ion channels” in the cell. The cell membrane is covered with strands of protein, which act as information receptors and these receptors project into the ion channels. Because the ends of these strands are electrically charged, they may detect environmental electromagnetic fields. When information in the form of

chemical or electrical signals arrive at the cell they are transmitted by the membrane strands into the interior of the cell, which in turn activate all the main functions of the cell, including the growth of normal cells as well as abnormal cells such as cancer. *Id.*

¹⁰⁽¹⁰⁾ See, *Pace University Center for Environmental Studies, Environmental Costs of Electricity 343 (1990)* [hereinafter *Pace University Studies*]; *OTA Background Paper, supra note 5; Scientific Studies, supra note 1.*

¹¹⁽¹¹⁾ *Scientific Studies, supra note 1, at 13-14.*

¹²⁽¹²⁾ *Id.* at 17.

¹³⁽¹³⁾ *OTA Background Paper, supra note 5, at 36.*

¹⁴⁽¹⁴⁾ See, *Pace University Studies, supra note 10, at 344.*

¹⁵⁽¹⁵⁾ *OTA Background Paper, supra note 5, at 35-51.*

¹⁶⁽¹⁶⁾ Verkasalo, Pukkala, Hongisto, Valjius, Jarviven, & Heikkila, *Risk of cancer in Finnish children living close to power lines. BMJ 1993, 307:895-99.*

¹⁷⁽¹⁷⁾ *Id.* At 898-90.

¹⁸⁽¹⁸⁾ Olsen, Nielson, & Schulgen, *Residence near high voltage facilities and risk of cancer in children. BMJ 1993, 307:891-5.*

¹⁹⁽¹⁹⁾ Feyting & Ahlbom, *Magnetic Fields and Cancer in Children Residing Near Swedish High Voltage Power Lines, 138 Am. J. Epidemiology 467 (October 1, 1993)* (Stockholm: Karolinska Institutet., 1992).

²⁰⁽²⁰⁾ Floderus, Persson, Stenlund, Wennburg, Ost & Knave. *Occupational exposure to electromagnetic fields in relation to leukemia and brain tumors: a case control study in Sweden, 4 Cancer Causes and Control 465 (1993).*

²¹⁽²¹⁾ Record at 212-16, *Criscuola* (Appraisal Report by American Property Counselors).

²²⁽²²⁾ *Id.* at 14-17 (Decision of the Hon. Peter A. McCabe, Jr. dated June 17, 1991).

²³⁽²³⁾ *81 N.Y.2d 707 (1993).*

²⁴⁽²⁴⁾ *Criscuola v. Power Authority of the State of New York, 81 N.Y.2d 649 (1993).*

²⁵⁽²⁵⁾ See *Alabama Power Co. v. Keystone Lime Co., 67 So. 833 (1914); Central Illinois Light Co. v. Niertheimer 185 N.E.2d 841 (1962).*

²⁶⁽²⁶⁾ *631 P.2d 268, 273-274 (Kan. Ct. App. 1981).*

²⁷⁽²⁷⁾ *Id.* at 268; *Dunlap v. Loup River Pub. Power District, 284 N.W. 742 (1939).*

²⁸⁽²⁸⁾ *Willsey, 631 P.2d at 274.*

²⁹⁽²⁹⁾ *Id.*

³⁰⁽³⁰⁾ Including: Arkansas, California, Florida, Indiana, Kansas, Ohio, Oklahoma and the U.S. Court of Appeals for the 6th Circuit, with its many Tennessee Valley Authority cases.

³¹⁽³¹⁾ *Willsey, 631 P.2d at 274.*

³²⁽³²⁾ *518 So.2d 895 (Fla. 1987).*

³³⁽³³⁾ *Id.* at 899.

³⁴⁽³⁴⁾ *205 Cal. App. 3d 1334, 1349 (1988).*

³⁵⁽³⁵⁾ *117 Misc.2d 444 (1982)* (The *Miller* court listed, at page 450, other cases dealing with 345 kV lines and their holdings concerning the effects of transmission lines on property values. The court ultimately relied on *Olin v. State of New York, 41 Misc.2d 678 (1964).*)

³⁶⁽³⁶⁾ Record at 409, *Criscuola* (Decision of Hon. Peter A. McCabe, Jr., of the New York Court of Claims, Dated September 21, 1989, *Zappavigna v. State of New York*, Awarding Damages).

³⁷⁽³⁷⁾ *Brief for Defendants-Respondents, Criscuola at 21.*

³⁸⁽³⁸⁾ *Id.* at 23. (Citing *Conway v. Brooklyn Union Gas Co., 592 N.Y.S.2d 782 (2d Dept. 1993); Hare v. State of New York, 143 Misc.2d 281 (1989), aff'd. 173 A.D.2d 523 (1991); Doe v. Doe, 136 Misc.2d 1015 (1987).*)

³⁹⁽³⁹⁾ Reply Brief for Claimants-Appellants at 13, *Criscuola*.

⁴⁰⁽⁴⁰⁾ *Id.* (Citing on October 26, 1992 Time Magazine article and a March 1, 1993 statement from Attorney General Robert Abrams.)

⁴¹⁽⁴¹⁾ *Id.* (Citing Goldstein, *Condemnation and Tax Certiorari, N.Y.L.J., Jan. 28, 1993, p. 3, col. 1.*)

⁴²⁽⁴²⁾ *Criscuola, 81 N.Y.2d at 652.* (Relying generally on *Nichols on Eminent Domain, Sackman (3d ed. 1993).*)

⁴³⁽⁴³⁾ *Id.*

⁴⁴⁽⁴⁴⁾ *815 P.2d 528.*

⁴⁵⁽⁴⁵⁾ *Criscuola, 81 N.Y.2d at 652.*

⁴⁶⁽⁴⁶⁾ *Id.* at 653.

⁴⁷⁽⁴⁷⁾ *Id.* at 654.

⁴⁸⁽⁴⁸⁾ *Id.*

⁴⁹⁽⁴⁹⁾ *Id.* at 653.

⁵⁰⁽⁵⁰⁾ *Janas v. Power Authority of the State of New York, 620 N.Y.S.2d 991 (2d Dept. 1994).*

⁵¹⁽⁵¹⁾ *Id.*

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