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THE POWER LINE HEALTH CONTROVERSY: LEGAL PROBLEMS AND PROPOSALS FOR REFORM†

Philip S. McCune*

Recent findings about possible adverse health effects from high-voltage power lines have sparked a public outcry that has brought new power-line construction in the United States to a virtual standstill.¹ At least a dozen major power line and supporting utility projects have been delayed or canceled in recent years, largely because of lawsuits pursued by citizen groups.² Since 1985, power companies have defended more than one hundred suits involving possible health hazards from high-voltage electrical transmission lines, especially those near schools.³ Indeed, a recent Morgan Stanley study⁴ prompted one industry analyst to assert that “[t]ransmission capacity is not going to [increase] because of this controversy.”⁵

The public controversy threatening new power-line construction followed a 1979 epidemiological study⁶ asserting that the homes of children who developed cancer were found unduly often near electrical lines.⁷ More recently, the New York State Power Line Project’s scientific advisory panel endorsed studies that identify a connection between power-line electromagnetic fields (EMFs) and childhood cancer.⁸ The panel

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1. See Paul, *Concern About Low-Energy Radiation Leads to New Rules, Research and Suits*, Wall St. J., Oct. 11, 1988, § 2, at 6, col. 4 (“Power-line construction . . . has ground to a virtual halt because of people’s fear . . .”).

2. See *Electromagnetic Radiation: Asbestos in a Wire?*, 43 WASH. ST. BAR NEWS 35 (1989).

3. See Black, *Rising Tension Over High-Tension Lines*, BUS. WK., Oct. 30, 1989, at 158 (asserting this point and describing some lawsuits and their impact in detail).

4. *Power Line Talk*, MICROWAVE NEWS, July-Aug. 1989, at 5.

5. Black, *supra* note 3, at 158 (quoting Sanford Cohen, industry analyst at Morgan Stanley).

6. Wertheimer & Leeper, *Electrical Wiring Configurations and Childhood Cancer*, 109 AM. J. EPIDEMIOLOGY 273 (1979).

7. *Id.*

8. See *Scientific Advisory Panel, N.Y. STATE POWER LINE PROJECT, FINAL REPORT 2-10* (1987); see also *N.Y. State Power Lines Report: ELF Risks Gain*

estimated that if a causal relationship does exist, "10-15% of all childhood cancer cases are attributable to magnetic fields."⁹ Additionally, the U.S. Environmental Protection Agency (EPA) has drafted a report that concludes that EMFs may be linked to significant health problems.¹⁰ The scientific press generally has added support to these health fears,¹¹ as has the popular press, although the popular press sometimes has addressed the issue in an inflammatory fashion.¹²

National Attention, MICROWAVE NEWS, July-Aug. 1987, at 1, 8-10 (summarizing the report). The panel's report, *Biological Effects of Power Line Fields*, is summarized in the article. *Id.* at 8-10.

9. *ELF Risks*, *supra* note 8, at 1. For a succinct presentation of technical background on EMFs, see Note, *The Power Line Health Controversy: Legal Responses to Potential Electromagnetic Field Hazards*, 14 COLUM. J. ENVTL. LAW 360, 361-63 (1990) (authored by John Weiss).

10. See *E.P.A. Draft Report Cites Cancer and Electricity Links*, N.Y. Times, May 22, 1990, at B8, col. 5 (citing OFFICE OF HEALTH & ENVTL. ASSESSMENT, OFFICE OF RES. & DEV., U.S. EPA, EVALUATION OF THE POTENTIAL CARCINOGENICITY OF ELECTROMAGNETIC FIELDS (External Review Draft Oct. 1990) [hereinafter EPA EVALUATION]). The EPA released this draft report solely to elicit comments on its technical accuracy. The draft report does not reflect EPA policy or position. Meeting Notice, 55 Fed. Reg. 51,958 (1990) (giving notice of an upcoming meeting of the Nonionizing Electric and Magnetic Fields Subcommittee of the Science Advisory Board's Radiation Advisory Committee).

11. Best, *Killing Fields: The Epidemiological Evidence*, ELECTRONICS WORLD & WIRELESS WORLD, Feb. 1990, at 98, contains a superb bibliography citing many important health studies. For another excellent bibliography citing several scientific studies that analyze EMFs' health effects, see Coghill, *Killing Fields: The Biophysical Evidence*, ELECTRONICS WORLD & WIRELESS WORLD, Feb. 1990, at 112. Finally, Philips, *Killing Fields*, ELECTRONICS WORLD & WIRELESS WORLD, Feb. 1990, at 96, which introduces the series, also cites important articles and studies. Some of the more hair-raising studies accepted by a significant portion of the scientific community cite connections between EMFs and leukemia, depression, and suicides. *Id.* at 96-97. See also sources cited *infra* note 14. This Note does not directly address the merits of the arguments on either side of the controversy but seeks only to analyze the impact of the conflict. For a scholarly legal work that does address the merits of the scientific arguments, see Note, *supra* note 9, at 373-78 (concluding that fear of power-line EMFs is reasonable).

12. A cursory sampling of news reports includes: Brodeur, *Annals of Radiation* (pts. 1-3), NEW YORKER, June 12, 1989, at 51, NEW YORKER, June 19, 1989, at 47, NEW YORKER, June 26, 1989, at 39; Cowley, *An Electromagnetic Storm*, NEWSWEEK, July 10, 1989, at 77; Graves, *Radiation Alert*, FAM. CIRCLE, Nov. 7, 1989, at 85; Huber, *Electrophobia*, FORBES, Sept. 4, 1989, at 313; Noland, *Power Play*, DISCOVER, Dec. 1989, at 62; Toufexis, *Panic Over Power Lines: Are the Waves from Electrical Wires and Appliances Harmful?*, TIME, July 17, 1989, at 71; Wellborn, *An Electrifying New Hazard*, U.S. NEWS & WORLD REP., Mar. 30, 1987, at 72; Dietrich, *Power Alert*, Seattle Times, Apr. 8, 1983 (Pacific Magazine), at 8; *World News Tonight* (ABC television broadcast, Nov. 19, 1987); *Good Morning America* (ABC television broadcast, Aug. 11, 1989); 10 O'Clock News (Fox television broadcast, Feb. 19, 1987); see also *EMFs in the 1989 Popular Press*, MICROWAVE NEWS, Nov.-Dec. 1989, at 3 (indexing the year's popular reports).

Although a significant correlation between EMFs and adverse health effects has yet to be proved to any degree of certainty, the value of property located near high-voltage electrical wires has decreased because of fears that the extremely low-frequency EMFs generated by power lines can cause adverse health effects as serious as cancer and learning disabilities.¹³ Although studies of the biological effects of EMFs number in the hundreds,¹⁴ and millions of dollars are currently allocated for further research,¹⁵ the electrical power industry has done little to ensure that the economic and health concerns of individuals living near power lines are addressed properly. This Note explores how a combination of courtroom efforts by individual property owners and new approaches to electrical power transportation by utilities can address citizens' health concerns, eliminate the current political stalemate, and allow power-line construction to move forward.

13. See, e.g., *San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1341-43, 253 Cal. Rptr. 144, 147-49 (1988); *Zappavigna v. State*, No. 74085, slip op. at 25-31 (N.Y. Ct. Cl. Sept. 21, 1989); see also Black, *supra* note 3; Paul, *supra* note 1, at 6, col. 4; Worden, *Commission Clears Way for Power Line*, *Washington Post*, Jan. 4, 1990, at Md.1, col. 1.

14. See generally I. NAIR, M. MORGAN & H. FLORIA, *BIOLOGICAL EFFECTS OF POWER FREQUENCY ELECTRIC AND MAGNETIC FIELDS* 67 (1989) (background paper dated June 19, 1989 prepared for the U.S. Office of Technology Assessment (OTA) citing more than 100 studies discussing the current state of knowledge about the health effects of low-frequency EMFs and finding that EMFs can cause biological changes); C. RAFFERTY & R. BLACK, *EPRI RESEARCH AND RESULTS FOR EMF AND HUMAN HEALTH* (Sept. 15, 1989) (summarizing forthcoming studies funded by the Electric Power Research Institute); Coleman & Beral, *A Review of Epidemiological Studies of the Health Effects of Living Near or Working with Electricity Generation and Transmission Equipment*, 17 INT'L J. EPIDEMIOLOGY 1 (1988) (finding a slightly increased cancer risk for electrical workers because of EMF exposure, but none for individuals residing near EMF sources); Marino, *Environmental Electromagnetic Energy and Public Health*, 1988 MOD. BIOELECTRICITY 965 [hereinafter Marino, *Environmental Electromagnetic Energy*] (summarizing studies that generally found significant adverse health effects from EMFs); A. Marino, Address at the International Utility Symposium on the Health Effects of Electric and Magnetic Fields, Toronto, Canada (Sept. 16-19, 1986) (listing several studies finding adverse biological health effects from EMFs) (on file with the *University of Michigan Journal of Law Reform*); see also sources cited *supra* note 11.

15. For example, California recently allotted \$2 million to research the biological effects of extremely low-frequency EMFs. See 1988 Cal. Legis. Serv. 4340 (West). The National Cancer Institute is spending \$3.4 million through 1993 on an EMF childhood-cancer study. *NCI Awards Contract for EMF Childhood Cancer Study*, *MICROWAVE NEWS*, Sept.-Oct. 1989, at 5. The Electric Power Research Institute (EPRI) has budgeted \$21.9 million for research from 1989-91. See *EPRI R & D Budget for EMF's: \$21.9 million for 1989-91*, *MICROWAVE NEWS*, Mar.-Apr. 1989, at 6. The fact that these studies are largely funded by the utility-backed EPRI may diminish their credibility. See Note, *supra* note 9, at 383.

Part I of this Note examines the primary means of compensating individuals whose property is affected by EMFs from nearby power lines: eminent-domain and inverse-condemnation proceedings. Although power lines adversely affect property values in several ways,¹⁶ fear of the potential health problems caused by power lines has had the greatest impact.¹⁷ Part I evaluates the three approaches that courts have developed to determine whether plaintiffs can recover for the effect of public fears of EMFs on property values. This Part concludes that although testimony about the biological effects of EMFs should be inadmissible, property owners should be able to present particularized evidence as to the actual effect of such fear on the value of the property at issue.

Part II suggests three possible tort theories—battery, trespass, and nuisance—that plaintiffs might use to get injunctive relief and monetary damages for the harms caused by EMFs. Although these theories remain relatively untested in court, they have the potential to provide the monetary relief or cessation of EMF exposure that plaintiffs have sought. Part II suggests that plaintiffs seeking monetary damages should bring battery or trespass actions, while plaintiffs seeking injunctive relief may have more success under a nuisance theory.

Part III of the Note examines how utility companies can defuse opposition to power-line construction by changing their approach to the EMF issue. Power companies need to adopt both alternative technologies and a more politically sensitive attitude in addressing EMF concerns. Part III concludes that such steps will reduce the losses utility companies face from private lawsuits, while simultaneously accelerating new power-line construction.

16. Developers cite visual impairment and noise from electromagnetic emanations as reasons for lower property values near power lines. *See, e.g., Daley*, 205 Cal. App. 3d at 1346, 253 Cal. Rptr. at 150 (1988). EMFs also have been linked to milk production losses in exposed cattle. *See Farm Study: Stray Voltage & Dairy Cows*, MICROWAVE NEWS, Sept.-Oct. 1988, at 7.

17. *See, e.g., Daley*, 205 Cal. App. 3d at 1339, 1344, 253 Cal. Rptr. at 145, 149 (upholding jury award of over one million dollars in severance damages after hearing testimony about EMF fears that defendant sought to exclude as prejudicial).

I. THE HEALTH CONTROVERSY AND INVERSE-CONDEMNATION PROCEEDINGS: TOWARD AN OPTIMUM APPROACH

Inverse-condemnation and eminent-domain proceedings are the established methods for property owners to recover monetary damages for the impact of power-line EMFs on neighboring property.¹⁸ Property owners adjacent to high-voltage power lines often are concerned about aesthetics and possible health hazards from the power lines.¹⁹ EMF-related health concerns in power-line condemnation proceedings have significantly increased severance awards.²⁰ When plaintiffs assert these claims, juries²¹ generally focus on them.²²

Federal and state courts have developed three distinct approaches regarding compensation in eminent domain for diminution in property value caused by prospective buyers' fears

18. In eminent-domain proceedings where only a portion of an owner's land is taken, the court will award severance damages—the diminution in fair market value of the adjoining property—as well as compensation for the part taken. *See, e.g.*, *San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1344, 253 Cal. Rptr. 144, 149. Market value is defined usually as the value of a property at its most advantageous and potentially profitable use. *Id.* Where less than the entire property is appropriated, severance damages generally are determined by assessing the injury to the remainder caused by “(1) the severance of the remainder of the property taken and (2) the construction and use of the project for which the property taken was condemned.” *Id.* at 1344-45, 253 Cal. Rptr. at 149. *See generally* R. CUNNINGHAM, W. STOEUBUCK & D. WHITMAN, *THE LAW OF PROPERTY* § 9.1 (1984) [hereinafter CUNNINGHAM, STOEUBUCK & WHITMAN].

19. *See, e.g.*, *Daley*, 205 Cal. App. 3d at 1340, 1344, 253 Cal. Rptr. 147, 149 (aesthetics and health hazards); *Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 898 (Fla. 1987) (aesthetics and health hazards); *Houston Lighting & Power Co. v. Klein Indep. School Dist.*, 739 S.W.2d 508, 518 (Tex. Ct. App. 1987) (health hazards).

20. *See, e.g.*, *Florida Power & Light Co. v. Jennings*, 485 So. 2d 1374, 1377 (Fla. Dist. Ct. App. 1986) (jury's verdict exceeded defendant's valuation in each instance), *quashed*, 518 So. 2d 895, 899 (Fla. 1987) (holding that testimony about EMF health risks was inflammatory and prejudicial); *see also Daley*, 205 Cal. App. 3d at 1339, 253 Cal. Rptr. at 145-46 (upholding an award of \$1,225,000 in damages, \$1,035,000 of which represented severance damages, to a landowner who originally was willing to settle for \$750,000); *Willsey v. Kansas City Power & Light Co.*, 6 Kan. App. 2d 599, 600, 631 P.2d 268, 270 (1981) (upholding an award of \$39,300 even though court-appointed appraisers valued damages at \$25,650).

21. Inverse-condemnation and eminent-domain cases have been tried before both judges, *see, e.g.*, *Willsey*, 6 Kan. App. 2d 599, 631 P.2d 268, and juries, *see, e.g.*, *Zappavigna v. State*, No. 74085, (N.Y. Ct. Cl. Sept. 21, 1989). Throughout this article, however, I will use the term “jury” to refer to the trier-of-fact.

22. *See, e.g.*, *Jennings*, 518 So. 2d at 899 (attempting to limit the impact of scientific testimony on jury awards).

of power-line health hazards:²³ (1) allow no compensation for diminution caused by a buyer's fear because any danger from power lines is too remote and speculative to be measured by a jury;²⁴ (2) award damages if the fear of health hazards is reasonable and actually affects market values;²⁵ and (3) allow

23. See *Willsey*, 6 Kan. App. 2d at 603-07, 631 P.2d at 273-75 (1981) (surveying and categorizing relevant cases); see also Annotation, *Fear of Powerline Gas or Oil Pipeline or Related Structure as Element of Damages in Easement Condemnation Proceeding*, 23 A.L.R.4th 631 (1981). The *Willsey* court surveyed relevant case law and determined the number of jurisdictions adhering to each jurisprudential approach. 6 Kan. App. 2d at 604-08, 631 P.2d at 273-75. The court's analysis is incomplete and in five instances different from my own. The revised summary of case law in the following footnotes and text uses the *Willsey* analysis as its base. The cases cited in this footnote and the four footnotes that follow do not represent the full body of precedent in a given jurisdiction; rather, the cases listed are those most relevant today.

24. Three states follow the minority rule denying awards for the effect of fear upon market values: Illinois, West Virginia, and Alabama. See, e.g., *Central Ill. Light Co. v. Nierstheimer*, 26 Ill. 2d 136, 140-41, 185 N.E.2d 841, 843-44 (1962); *Chesapeake & Potomac Tel. Co. v. Red Jacket Consol. Coal & Coke Co.*, 95 W. Va. 406, 413, 121 S.E. 278, 280 (1924); *Pappas v. Alabama Power Co.*, 270 Ala. 472, 479-80, 119 So. 2d 899, 905 (1960). In another case, however, the Alabama Supreme Court allowed the testimony of a real estate appraiser who included the element of fear in his appraisal of damages, holding that the expert's consideration of an irrelevant element went to the weight of his testimony and not to its admissibility. See *Southern Elec. Generating Co. v. Howard*, 275 Ala. 498, 502-03, 156 So. 2d 359, 363 (1963). Florida recently rejected the minority rule in 1987. See *Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 898 (Fla. 1987).

25. The following nine states explicitly follow this intermediate rule: Connecticut, Kentucky, Missouri, Nebraska, New Jersey, New York, Tennessee, Texas, and Utah. See, e.g., *Northeastern Gas Transmission Co. v. Tersana Acres, Inc.*, 144 Conn. 509, 513-15, 134 A.2d 253, 255-56 (1957) (approving fear as an element of damages on a factual finding of a "well founded public belief in danger" from a gas line and leaving open whether it would be proper to approve fear as an element of damages if the fear were shown to be "not entirely unfounded"); *Witbeck v. Big Rivers Rural Elec. Coop. Corp.*, 412 S.W.2d 265, 267-68 (Ky. 1967), *overruled on other grounds*, Commonwealth, *Dep't of Hwys. v. Stephens Estate*, 502 S.W.2d 71 (Ky. 1973); *Kentucky Hydro-Electric Co. v. Woodard*, 216 Ky. 618, 631-32, 287 S.W. 985, 990-97 (1926); *Phillips Pipe Line Co. v. Ashley*, 605 S.W.2d 514, 518 (Mo. App. 1980); *Dunlap v. Loup River Pub. Power Dist.*, 136 Neb. 11, 17-19, 284 N.W. 742, 745-46 (1939); *Tennessee Gas Transmission Co. v. Maze*, 45 N.J. Super. 496, 502-03, 133 A.2d 28, 31 (1957); *Zappavigna v. State*, No. 74085, slip op. at 10 (N.Y. Ct. Cl. Sept. 21, 1989); *Hoge v. Southern Cities Power Co.*, 8 Tenn. App. 636, 639 (1928); *Heddin v. Delhi Gas Pipeline Co.*, 522 S.W.2d 886, 888 (Tex. 1975); *Telluride Power Co. v. Bruneau*, 41 Utah 4, 13, 125 P. 399, 402 (1912). Arizona also follows a version of this rule, allowing recovery if the plaintiff can demonstrate that a hypothetical fully informed buyer would pay less for the affected property. See *Selective Resources v. Superior Ct.*, 145 Ariz. 151, 154, 700 P.2d 849, 852 (Ct. App. 1984).

In EMF cases these courts will allow expert testimony on the biological effects of EMFs and then have the fact finder determine whether this information reasonably affects property values. See, e.g., *Selective Resources*, 145 Ariz. at 153, 700 P.2d at 851; *Zappavigna*, slip op. at 13-25.

Although not recognized in *Willsey v. Kansas City Power & Light Co.*, 6 Kan. App. 2d 599, 631 P.2d 268 (1981), the following five states also follow this intermediate

recovery for fears if the fear has a proven effect on market value,²⁶ but deem irrelevant the reasonableness of such fears.

rule: Arkansas, Indiana, North Carolina, Oklahoma, and Virginia. See, e.g., *Arkansas Power & Light Co. v. Haskins*, 258 Ark. 698, 701-03, 528 S.W.2d 407, 409-10 (1975) (applying rule that "it is a question for the jury whether a reasonable apprehension of danger from inherent defects and unavoidable accidents may exist, and if so, such an apprehension so far as it depreciates the current market value of the kind not taken is an element of incidental damages," and concluding that the fear of defendant's power line was reasonable); *Southern Ind. Gas & Elec. Co. v. Gerhardt*, 241 Ind. 389, 395, 172 N.E.2d 204, 206 (1961) (holding that a jury may consider the effect on market value of fears caused by the possibilities that high-tension power lines will fall during storms "[i]f such possibilities exist" (emphasis added)); *Colvard v. Nantahala Power & Light Co.*, 204 N.C. 97, 102, 167 S.E. 472, 475 (1933) (holding that plaintiff could recover when fear of power line "sensibly impair[ed]" the market value of his land (quoting *Carolina & Yadkin River R.R. v. Armfield*, 167 N.C. 464, 467, 83 S.E. 809, 811 (1914)) (emphasis added)); *Oklahoma Gas & Elec. Co. v. Kelly*, 177 Okla. 206, 207, 58 P.2d 328, 329 (1936) (same); *Appalachian Power Co. v. Johnson*, 137 Va. 12, 29, 119 S.E. 253, 257 (1923) (holding that jury may take into account all facts which would influence a reasonable purchaser).

The *Willsey* court included these states among the jurisdictions adopting the third rule because the courts in these states "assumed" the reasonableness of power-line fears. 6 Kan. App. 2d at 605-06, 631 P.2d at 274. But these courts still required that power-line fears be reasonable for plaintiffs to recover, and in the EMF setting they probably will demand explicit proof that EMF fears are reasonable. Therefore, for the purposes of my arguments, I have included these states with the jurisdictions that have adopted the intermediate rule.

26. The following eight states now follow this rule: California, Florida, Iowa, Kansas, Louisiana, Ohio, South Dakota, and Washington. See, e.g., *San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1347-49, 253 Cal. Rptr. 144, 151-53 (1988); *Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 899 (Fla. 1987); *Evans v. Iowa S. Utils. Co.*, 205 Iowa 283, 287, 218 N.W. 66, 67-68 (1928); *Meinhardt v. Kansas Power & Light Co.*, 8 Kan. App. 2d 471, 471-73, 661 P.2d 820, 822 (1983); *Willsey*, 6 Kan. App. 2d at 611, 631 P.2d at 278 (preferring the majority rule, but declining to reach the issue explicitly); *Claiborne Elec. Coop., Inc. v. Garrett*, 357 So. 2d 1251, 1257-58 (La. Ct. App. 1978), *cert. denied*, 359 So. 2d 1306 (La. 1978); *Ohio Pub. Serv. Co. v. Dehring*, 34 Ohio App. 532, 534, 172 N.E. 448, 449 (1929); *Basin Elec. Power Coop., Inc. v. Cutler*, 88 S.D. 214, 218, 217 N.W.2d 798, 800 (1974); *State v. Evans*, 26 Wash. App. 251, 261, 612 P.2d 442, 449 (1980) (allowing testimony regarding the diminution of market value caused by fears of nearby freeway's effect on cattle and citing EMF cases), *rev'd on other grounds*, 96 Wash. 2d 119, 634 P.2d 845 (1981).

The Sixth Circuit also endorsed this third rule in *United States ex rel. T.V.A. v. Easement & Right of Way*, 405 F.2d 305 (6th Cir. 1968). Thus, that court awards compensation for any loss in market value caused by a taking, even if the loss is in part because of unfounded fears as determined by objective standards. *Id.* at 309. The Fifth Circuit also follows this approach. In *United States ex rel. T.V.A. v. Robertson*, 354 F.2d 877 (5th Cir. 1966), the court held that diminution in value caused by public fear of power lines was a proper element of damages in a condemnation proceeding. *Id.* at 881.

Finally, the *Willsey* court also included Arkansas, Indiana, North Carolina, and Virginia with those jurisdictions that have adopted this third rule. 6 Kan. App. 2d 605-06, 631 P.2d at 274. I have included them with those states that have adopted the intermediate rule. See *supra* note 25 and accompanying text.

This third position makes direct scientific testimony about the grounds of these fears inadmissible.²⁷

These theories originally developed in power-line condemnation cases where plaintiffs asserted inchoate fears²⁸ and fears of electrocution,²⁹ but they can be adapted easily to handle concerns about the adverse effects of EMFs from power lines. Because only three states follow the first rule,³⁰ the discussion that follows focuses on the second³¹ and third rules.³²

A. *The "Recovery for Reasonable Fear" Approach and its "Informed Buyer" Variant*

In *Zappavigna v. State*,³³ one of the country's most recent significant EMF cases, the court denied recovery for diminution in land value caused by EMF fears and questioned the reasonableness of fears of high-voltage lines.³⁴ The plaintiff in *Zappavigna* sought direct and consequential damages for low property values caused by fear of the "alleged harmful effects of electromagnetic fields emanating from power lines."³⁵ The court held that to receive "just compensation" for such damages, the plaintiff must meet a twofold burden of proof:

(1) [Claimant] 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,

27. See, e.g., *Daley*, 205 Cal. App. 3d at 1348, 253 Cal. Rptr. at 152; *Jennings*, 518 So. 2d at 899; *Meinhardt*, 8 Kan. App. 2d at 473, 661 P.2d at 822.

28. See, e.g., *Garret*, 357 So. 2d at 1257-58 (recognizing diminution in value because of the psychological effect of power lines on prospective purchasers of property in close proximity).

29. See, e.g., *Haskins*, 258 Ark. at 702, 528 S.W.2d at 410 (holding that a diminution in value caused by fear of electrified towers' attached ladders situated close enough to the ground to attract the attention of small children is compensable); *Southwestern Pub. Serv. Co. v. Vanderburg*, 581 S.W.2d 239, 245 (Tex. Civ. App. 1979) (holding that reasonable fear of danger of electrocution is admissible in determining market value).

30. See *supra* note 24 and accompanying text.

31. See *supra* note 25 and accompanying text.

32. See *supra* notes 26-27 and accompanying text.

33. No. 74085 (N.Y. Ct. Cl. Sept. 21, 1989).

34. *Id.* slip op. at 25, 31.

35. *Id.* at 2.

(2) [Claimant must prove] that this reasonable apprehension has affected the purchaser's willingness to pay the fair market value of the property, as evidenced by proof from the real estate market, or, . . . "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

The court then held that, based on scientific evidence and expert testimony addressing the first prong of the test,³⁷ and sales evidence and expert testimony addressing the second prong of the test,³⁸ the plaintiff had not satisfied his burden for either prong.³⁹

A close examination of this ruling reveals the flaws inherent in basing recovery on the reasonableness of EMF fears. The *Zappavigna* test would allow a court to find that EMF fears do affect property values adversely (under the second prong of the test) and yet deny damages if the plaintiff does not prove the reasonableness of this fear by a preponderance of the credible scientific evidence (under the first prong of the test). Just compensation should be based solely on the loss in market value that is caused by the taking at issue.⁴⁰ Simply put, fear of EMFs that adversely affects property values must be accounted for to provide just compensation, regardless of the reasonableness of that fear. Thus, the inquiry into the

36. *Id.* at 10 (quoting *Miller v. State*, 117 Misc. 2d 444, 450, 458 N.Y.S.2d 973, 978 (Ct. Cl. 1982)). The *Zappavigna* court cited the "holding" of *Miller, id.*, and then proceeded to find that fears of adverse health effects from EMFs are unreasonable. *Id.* at 25. This implies erroneously that the *Miller* court found that EMF fears were unreasonable. In fact, the *Miller* court wrote that "[we] cannot believe that the [New York Public Service Commission] would have wasted five years, taken 14,000 pages of testimony, made several provisions for widening the right of way, and directed further testing if there never existed any reasonable ground for concern [that EMFs have adverse health effects]." *Miller v. State*, 117 Misc. 2d 444, 448, 458 N.Y.S.2d 973, 976 (Ct. Cl. 1982). The *Miller* court thus found that EMF fears were reasonable. The *Zappavigna* court employed the *Miller* test but came to the opposite conclusion regarding the reasonableness of EMF fears.

37. *Zappavigna*, slip op. at 25.

38. *Id.* at 31.

39. *Id.*

40. See, e.g., *San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1347-48, 253 Cal. Rptr. 144, 151-52 (1988); *Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 899 (Fla. 1987); *Willsey v. Kansas City Power & Light Co.*, 6 Kan. App. 2d 599, 611, 631 P.2d 268, 277 (1981); cf. *Selective Resources v. Superior Ct.*, 145 Ariz. 151, 153-54, 700 P.2d 849, 851-52 (Ct. App. 1984) (holding that compensation should be based on what the loss in market value would have been if the public were fully informed).

reasonableness of EMF-related fears, the first prong of the *Zappavigna* test, should be irrelevant.⁴¹

By admitting that EMF fears can decrease market value and yet denying compensation to a plaintiff for that loss of value if those fears are unreasonable, the *Zappavigna* test opens itself up to constitutional attack. A theory that allows proof of diminution in land value, but that nonetheless allows a court to deny compensation for that diminution may violate the taking clause of the fifth amendment which mandates "just compensation" for those whose private property is taken for public use.⁴² It is established doctrine that courts will find a taking when there has been a significant diminution in the value of neighboring land.⁴³ Refusing to permit recovery for a diminution in value caused by fear that does not meet the first prong of the *Zappavigna* test thus might violate the U.S. Constitution.⁴⁴

The *Zappavigna* test also requires an unreasonably high level of proof of actual market effect. *Zappavigna* demands proof from the real estate market or from actual pricing

41. Even in jurisdictions where the reasonableness of EMF fears is considered relevant, the magnitude of the EMF health controversy and the fact that reasonable scientific minds disagree about the potential adverse health effects of EMFs should mandate a finding by the jury that there is a reasonable basis for fears of power-line EMFs. See Note, *supra* note 9, at 376.

42. U.S. CONST. amend. V. The minority approach, discussed *supra* note 24 and accompanying text, is less susceptible to constitutional attack because it asserts that the dangers from power lines are too speculative and remote to be measured. Under this rationale, the effect of fears on market value is not judicially ascertainable. Without a judicially recognized diminution in market value, no "just compensation" is due.

43. *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922) (stating that a significant diminution in value of land results in a taking). Permanent physical occupation of an owner's property also constitutes a taking of property that requires just compensation. *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 434 (1982). EMFs conceivably could constitute such permanent physical occupation because they are "real, physical, incorporeal entities." See Marino, *Environmental Electromagnetic Energy*, *supra* note 14, at 965.

44. Also, state courts generally interpret their own constitutions to require severance damages for diminution in value of the remainder where less than an entire property is appropriated. See, e.g., *Jennings*, 518 So. 2d at 897 n.2, 898 (holding that pursuant to article X of the Florida Constitution, "the issue in eminent domain proceedings is to determine what is full compensation for both the property taken and for damages to the remaining property"); *Selective Resources*, 145 Ariz. at 153, 700 P.2d at 851 (interpreting article 2, § 17 of the Arizona Constitution and stating that "[d]amages to the remaining parcel of land consist of the difference between its value immediately before the [condemnation] and its value immediately after the severance"). See generally *supra* note 18. Thus, even if the denial of compensation for severance damages does not violate the U.S. Constitution, it might violate a state constitution.

experience (shown from before and after sales) to demonstrate actual market effect.⁴⁵ Expert testimony alone is insufficient.⁴⁶ Thus, plaintiffs must obtain sales data even before property affected by a taking normally would be sold.⁴⁷ Plaintiffs will be hard-pressed to obtain this information, and, as a result, deserving plaintiffs may not receive compensation. Such a severe burden is unmatched in other courts except those that follow the minority rule.⁴⁸ As such, *Zappavigna* provides a model for how *not* to approach plaintiffs' damage claims based upon assertions that fears of EMFs from power lines affect the value of their land.

Not all courts require proof of actual market effect. In the seminal case *Selective Resources v. Superior Court*,⁴⁹ an Arizona court held that "[the condemnee] need only establish that . . . the severance . . . will affect his remaining land in a manner which would diminish its value to a prospective buyer *who is informed of the conditions resulting from the severance*."⁵⁰ Under this approach, a plaintiff will prevail if he can convince the jury that a hypothetical buyer would pay less for property because of perceived EMF dangers.⁵¹

Thus, expert scientific testimony concerning the adverse biological effects of exposure to electromagnetic fields is permitted under both *Zappavigna* and *Selective Resources*. Under *Zappavigna*, scientific testimony is required to demonstrate the reasonableness of EMF fears.⁵² And under *Selective Resources* it is "highly relevant, . . . not a waste of time, [and not] prejudicial" as evidence demonstrating the changed condition of a property.⁵³ Such testimony demonstrates the

45. Slip op. at 10.

46. In *Zappavigna*, the plaintiff sought to demonstrate adverse market impact through expert testimony critiquing a sales study presented by the defendant's expert. The court held that the plaintiff's burden of proof required plaintiff to produce his own affirmative evidence of adverse market impact. *Id.* at 30-31.

47. See *supra* note 46.

48. Courts following the minority rule do not allow recovery for the effect of fear on market value. See *supra* note 24 and accompanying text.

49. 145 Ariz. 151, 700 P.2d 849 (Ct. App. 1984).

50. *Id.* at 154, 700 P.2d at 852 (emphasis added).

51. This model most properly belongs in the second, "recovery for reasonable fear," category because the jury hypothesizes a buyer *fully informed* of the condition of the property. Because only unreasonable buyers would act contrary to available information, this model requires the jury to hypothesize a fully informed, *reasonable* buyer.

52. See *supra* note 36 and accompanying text.

53. 145 Ariz. at 154, 700 P.2d at 852.

information possessed by the "fully informed" prospective buyer and supports the conclusions of valuation experts.⁵⁴

But admitting expert testimony about adverse health effects can sensationalize the issue of potential health risks and overemphasize the health issue for the jury. In *Selective Resources*, the court refers to "health hazard[s] created as a direct result of the taking,"⁵⁵ demonstrating its preoccupation with potential health hazards. The holding does not recognize that scientific evidence about EMF health effects remains hotly debated.⁵⁶ Actual testimony about possible negative EMF health effects will only sensationalize the market-value issue for a jury, creating a potential for compensation awards based more on emotion than fact. Courts that allow such volatile expert testimony at trial may pave the way for awards based on inadequate or questionable factual underpinnings. By concerning themselves with biological evidence, these courts ignore the primary issue in an eminent-domain hearing: the effect of EMF fears on market value.

This problem is exacerbated under the *Selective Services* "informed buyer" approach.⁵⁷ Juries unguided by evidence of actual market effect may give undue weight to inflammatory scientific evidence of EMF dangers when calculating the potential market effect of EMF fears. But scientific testimony about adverse health effects from EMFs should not be necessary under an approach that assumes buyer knowledge of the EMF controversy. Fears will affect property values whether or not adverse health effects of EMFs are proven to a court's satisfaction. Testimony speaking to the existence of health studies and the actual effect of EMF fears on market values is sufficient to ensure just compensation. Market-value assessments should be based on an expert evaluation of the current or future effects of fear on prospective purchasers.⁵⁸ To assume a perfectly informed public is to assume a virtual

54. *Id.*

55. *Id.* at 153, 700 P.2d at 851.

56. Other courts approach the EMF health issue with more skepticism. *See, e.g., Florida Power & Light Co. v. Jennings*, 518 So. 2d 895, 899 (Fla. 1987) (remanding and excluding on remand scientific testimony about EMFs' effect on grounds that it is "prejudicial and inflammatory"); *Meinhardt v. Kansas Power & Light Co.*, 8 Kan. App. 2d 471, 471-72, 661 P.2d 820, 822 (1983) (excluding scientific testimony about EMF effects as irrelevant to issue of just compensation).

57. *See supra* notes 50-51.

58. *See, e.g., San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1346-47, 253 Cal. Rptr. 144, 151 (1988); *see also infra* notes 59-68 and accompanying text.

impossibility. This legal fiction does nothing to assist the discovery of the effects of EMF fears on market value and may prejudice the jury with inflammatory testimony.

B. Recovery If Only Market Effect of Fear Is Shown

A number of courts have concluded that a more satisfactory approach is to limit evidence of EMF fears to their impact on the market. For example, in *Willsey v. Kansas City Power & Light Co.*,⁵⁹ the court held that an expert real estate appraiser could base his valuation partly on the effect of fear on the market value of property.⁶⁰ The court predicated its holding on the fact that the expert who testified did not attribute a dollar amount to the fear element and gave figures only for his ultimate opinion regarding market value.⁶¹ Thus, courts following the *Willsey* rule allow generalized expert testimony about the impact of EMF fears on market value, but disallow specific testimony as to the basis for these fears.⁶²

*San Diego Gas & Electric Co. v. Daley*⁶³ also addressed the issue of what types of expert testimony are admissible in condemnation proceedings. According to the court, "the truth or lack of truth [of] whether electromagnetic projections caused a health hazard to humans or animals was immaterial."⁶⁴ But when assessing severance damages, this California court allowed expert testimony about buyers' fears of electromagnetic radiation and the adverse effect of those fears on market value.⁶⁵ The court also accepted the testimony of a civil engineer and an environmental planner who testified that fears of possible health hazards caused by EMFs extending beyond the utilities' easement had affected market value.⁶⁶ In dictum, the court indicated that testimony about effects of EMFs on market value must be given by experts.⁶⁷ These

59. 6 Kan. App. 2d 599, 631 P.2d 268 (1981).

60. *Id.* at 615, 631 P.2d at 280.

61. *Id.*

62. *See, e.g.,* *Masson v. Kansas City Power & Light Co.*, 7 Kan. App. 2d 344, 346-47, 642 P.2d 113, 116 (1982).

63. 205 Cal. App. 3d 1334, 253 Cal. Rptr. 144 (1988).

64. *Id.* at 1349, 253 Cal. Rptr. at 152.

65. *Id.* at 1347, 253 Cal. Rptr. at 151.

66. *Id.* at 1341, 1342-43, 253 Cal. Rptr. at 147-48.

67. *Id.* at 1346, 253 Cal. Rptr. at 151.

experts cannot assign specific sums for the diminution in market value caused by fear of EMFs' health effects, but they may include such evaluations generally in their calculations of the total diminution in value.⁶⁸

Other courts still are struggling to determine what types of expert testimony and statistical studies should be admissible in condemnation proceedings. In *Florida Power & Light Co. v. Jennings*,⁶⁹ the Florida Supreme Court disallowed testimony addressing possible health effects of EMFs, but did not specifically disallow the use of a severance study based on sales of land next to transmission lines.⁷⁰ The plaintiff had produced the study to assist the jury in evaluating the impact of fears of EMFs on property values.⁷¹ Because the Florida Supreme Court relied on *Willsey*,⁷² however, Florida is likely to limit expert testimony about the effect of EMF fears on property values to a general recognition of the issue in an expert's total market-value estimate. Consequently, Florida probably will disallow specific monetary evaluations of EMF fears' market impact in cases arising from power-line eminent-domain proceedings.⁷³

The cases discussed above rightly conclude that recovery should be allowed only when a plaintiff can show the market effect of EMF fears. But these courts could improve their analyses by allowing particularized assessments of the amount of diminution in value that is caused by EMF fears. Such assessments would improve current models by further explaining how and why EMF fears influenced each expert's valuation of land near power lines. These assessments should provide a basis for determining the weight to be given expert evaluations and should improve appellate review of severance awards based on EMF fears. By allowing particularized assessments of this fear factor, judges, juries, and appellate courts could determine better the reasonableness of that element in evaluations of diminution in market value in studies or expert opinions.

68. *Id.* at 1351, 253 Cal. Rptr. at 154.

69. 518 So. 2d 895 (Fla. 1987).

70. *Id.* at 899-900.

71. *Id.* at 896.

72. *Id.* at 898 n.3, 899.

73. If this is the case, then the optimal means of ensuring a proper award of full compensation to plaintiffs for EMFs' impact on their land has yet to be applied in any jurisdiction.

Moreover, because the debate about the adverse health effects of EMFs emanating from power lines is highly emotional,⁷⁴ an examination of the relative weight given by experts for plaintiffs and defendants to fear of EMFs is especially important to ensure an equitable judgment in an eminent-domain proceeding. By disallowing specific dollar valuations of the diminution in property value from EMF fears or a quantitative analysis of that impact by experts, courts ignore this most difficult and important calculation in an analysis of severance damages. These courts thus create the potential to miscalculate fear's impact on property values, and without a record of the relative weight given to the element of fear, these miscalculations will go uncorrected on appellate review.

The approach by which these courts allow testimony by experts as to EMF fears' impact is still not ideal. These courts should therefore refine their theories of recovery to allow a particularized presentation of experts' evaluations regarding the impact of fears of EMFs upon prospective purchasers. Juries would thus have a more complete picture from which to evaluate the reasonableness of claims. Such a presentation also would help appellate courts assess the propriety of damage awards, including severance awards.

II. ADDITIONAL THEORIES OF RECOVERY: POTENTIAL REMEDIES FOR INDIVIDUALS LIVING NEAR HIGH-VOLTAGE POWER LINES

As the controversy about EMFs from power lines grows, so too does related litigation.⁷⁵ The previous section discussed individual condemnation suits. Alternative litigation strategies

74. Conflicts about the proposed construction of power lines and the damages from their operation often are highly emotional, with both sides venting their anger in the media. See, e.g., Hankin, *Md. Residents Fight Pepco Line*, *Washington Post*, Oct. 31, 1987, at F1, col. 1 (discussing residents' fears of adverse health effects in children and animals caused by a proposed power line); Moon, *Middletown Township Journal: Neighbors Oppose Plan for Power Lines Along Railway*, *N.Y. Times*, June 25, 1989, § 12 (New Jersey), at 2, col. 3 (discussing, in regard to a proposed power line, the utility's view that "there is little or no health risk associated with power lines" versus consumers' views that "children might get cancer because of this"). See generally *supra* note 12 (citing articles discussing the highly emotional nature of the controversy).

75. See Black, *supra* note 3, at 158.

also are available to individual property owners affected by EMFs from power lines. These strategies are especially important to property owners for whom condemnation proceedings are unavailable: people who have spent years bathed in possibly harmful EMFs emanating from power lines and who were unaware of the danger until recent publicity about EMF health studies and related litigation.

This section examines three alternative litigation theories—battery, trespass, and nuisance—and evaluates their strengths and weaknesses in this context. Although their application here may stretch traditional boundaries of recovery,⁷⁶ it is not uncommon for courts to expand the parameters of tort law.⁷⁷ Their success only requires imaginative lawyers and committed plaintiffs willing to gamble on a positive final ruling in the face of settlement offers.⁷⁸ These theories may compensate property owners exposed to high-level EMFs, and also force utilities to cease or alter the operation of power lines so that future exposure is minimized or eliminated. Each of the following sections suggests a theory of tort relief, outlines the elements plaintiffs must demonstrate to succeed under that theory, and evaluates the theory's potential for success given the current state of the law. Individual sections also show what remedies would be available under that theory.

A. Battery

Although the potential for a successful battery action in the power-line EMF setting was first noted in 1977,⁷⁹ plaintiffs

76. There are few reported personal injury cases involving EMF harms. For a description of two unreported cases, see Note, *supra* note 9, at 364-65.

77. See, e.g., *Sindell v. Abbott Laboratories*, 26 Cal. 3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (expanding tort law to include the concept of market-share liability), *cert. denied*, 449 U.S. 912 (1980); *Escola v. Coca Cola Bottling Co.*, 24 Cal. 2d 453, 150 P.2d 436 (1944) (extending the doctrine of *res ipsa loquitur* to strict product liability).

78. In the related area of microwave litigation, "suits have frequently been settled with stipulations that the details of the settlement are kept secret." See Note, *supra* note 9, at 364.

79. Dr. Marino's *amicus curiae* brief filed in hearings on the proposed Marcy-South power line in New York state noted that because of the high levels of EMFs that would emanate beyond the power-line right of way, the utilities were open to inverse-condemnation suits and battery actions. Brodeur (pt. 1), *supra* note 12, at 73.

continue to sue for inverse condemnation.⁸⁰ This is surprising because a successful battery case could force a utility to stop EMFs from invading private property and touching a plaintiff's body.⁸¹ Though prospects for significant damage awards under a battery theory are not promising, such an action could prove worthwhile in halting EMF exposure or assisting plaintiffs otherwise denied recovery for diminution in land value due to exposure from power-line EMFs.⁸²

1. *Theory*—Battery is the intentional infliction of a harmful or offensive bodily contact.⁸³ A plaintiff attempting to prove battery in an EMF case must demonstrate four elements: (a) intentional infliction; (b) harmful or offensive touching; (c) bodily contact; and (d) lack of consent.⁸⁴

a. *Intentional infliction*—A defendant in a battery action need not intend the harm resulting from the contact at issue, but she must intend the contact itself.⁸⁵ Intent can be proved by the utilities' knowledge, held for many years, that EMFs would emanate beyond power-line rights of way and make contact with the citizenry.⁸⁶ If the other elements of battery are satisfied, it is sufficient that the defendant set in motion the force that produces the harmful result.⁸⁷

80. See Note, *supra* note 9, at 365.

81. For a discussion of EMF-reducing technologies, see *infra* notes 210-12 and accompanying text.

82. See generally *supra* notes 33-58 and accompanying text (discussing states barring recovery for EMF fears when the fears are found to be unreasonable).

83. *E.g.*, *Caudle v. Betts*, 512 So. 2d 389, 390 (La. 1987); *Saba v. Darling*, 320 Md. 45, 49, 575 A.2d 1240, 1242 (1990); *Field v. Philadelphia Elec. Co.*, 388 Pa. Super. 400, 416-17, 565 A.2d 1170, 1178 (1989); see also RESTATEMENT (SECOND) OF TORTS §§ 13, 18 (1977).

84. In battery cases, courts "uniformly" require that plaintiffs demonstrate lack of consent. RESTATEMENT (SECOND) OF TORTS § 13 comment d (1977); see also *Fricke v. Owens-Corning Fiberglas Corp.*, 571 So.2d 130, 132 (La. 1990) (stating that a cause of action in battery lies if "the actor intends to inflict either a harmful or offensive contact without the other's consent"); *McQuiggan v. Boy Scouts of Am.*, 73 Md. App. 705, 714, 536 A.2d 137, 141 (Ct. Spec. App. 1988) ("The gist of [battery] is not hostile intent but the absence of consent to the contact on plaintiff's part."). Some courts do not state explicitly that lack of consent is a separate element of battery. See, *e.g.*, cases cited *supra* note 83. This is probably because lack of consent is an element of all torts. See RESTATEMENT (SECOND) OF TORTS § 892A (1977).

85. *White v. University of Idaho*, 115 Idaho 564, 565, 768 P.2d 827, 828 (Ct. App. 1989), *aff'd*, 118 Idaho 400, 797 P.2d 108 (1990); *Fricke*, 571 So. 2d at 132; RESTATEMENT (SECOND) OF TORTS § 16 (1977).

86. The necessity of warning residents near high-voltage power lines of potential danger from EMF exposure was debated extensively at public hearings as early as 1977. See Brodeur (pt. 1), *supra* note 12, at 74.

87. *Proffitt v. Ricci*, 463 A.2d 514, 517 (R.I. 1983); D. DOBBS, R. KEETON &

Utilities might claim that because public concern about EMFs from power lines is fairly recent, they could not foresee that emissions from EMFs would offend. This argument fails because battery theory holds a defendant liable for any consequences that ensue from an intentional touching, regardless of whether the consequences were intended or reasonably foreseeable.⁸⁸

b. Harmful or offensive touching—If a plaintiff cannot prove direct harm from the EMF contact in the sense of pain or bodily damage, he may still recover if the contact is “offensive.”⁸⁹ The standard for determining whether a particular contact is offensive is whether “the ordinary person . . . not unduly sensitive as to his personal dignity” would have been offended.⁹⁰ In light of widespread individual and community opposition to power-line projects⁹¹ and the extent of the EMF health controversy,⁹² EMF intrusion could offend an ordinary person.

c. Bodily contact—The contact element of a battery case is difficult to conceptualize with EMFs, but a plaintiff can prove contact because EMFs are “real, physical, incorporeal entities” that are emitted by functioning high-voltage power lines.⁹³ As one court recently held, “[t]he evidence is clear that both electrical and magnetic fields affect the human body.”⁹⁴ It is not necessary to a battery claim that a defendant touch a plaintiff with defendant’s own body.⁹⁵ Therefore, it should be

D. OWEN, PROSSER & KEETON ON THE LAW OF TORTS § 9, at 40 (5th ed. 1984) [hereinafter PROSSER & KEETON].

88. *Fricke*, 571 So. 2d at 132; *Ware v. Garvey*, 139 F. Supp. 71, 86 (D. Mass 1956); PROSSER & KEETON, *supra* note 87, § 9, at 40; RESTATEMENT (SECOND) OF TORTS § 16 comment a, illustration 2 (1977). *But cf.* *Mayer v. Town of Hampton*, 127 N.H. 81, 87, 497 A.2d 1206, 1210 (1985) (holding that conduct must be extreme and outrageous for there to be liability for an intentional tort when the conduct causes another to commit suicide).

89. RESTATEMENT (SECOND) OF TORTS § 19 (1977).

90. *Id.* § 19 comment a; *see also* *Herr v. Booten*, 398 Pa. Super. 166, 170, 580 A.2d 1115, 1117 (1990) (citing RESTATEMENT (SECOND) OF TORTS § 19 (1977)); *Newsome v. Cooper-Wiss, Inc.*, 179 Ga. App. 670, 672, 347 S.E.2d 619, 621 (1986) (same); PROSSER & KEETON, *supra* note 87, § 10, at 44.

91. *See supra* notes 1-5 and accompanying text.

92. *See supra* notes 10-11 and accompanying text.

93. *Marino, Environmental Electromagnetic Energy, supra* note 14, at 965.

94. *Rausch v. School Bd.*, No. CL-88-10772-AD, slip op. at 4 (Fla. Cir. Ct., Palm Beach County June 8, 1989).

95. *See, e.g., Inter-Insurance Exch. of the Auto. Club v. Lopez*, 238 Cal. App. 2d 441, 444-45, 47 Cal. Rptr. 834, 836 (Dist. Ct. App. 1965); RESTATEMENT (SECOND) OF TORTS § 18 comment c (1977); *see also* *Field v. Philadelphia Elec. Co.*, 388 Pa. Super.

sufficient for a plaintiff to demonstrate that a utility caused the EMF contact indirectly by building and operating power lines. Similarly, it is not necessary to a battery claim that a plaintiff have actual physical awareness of the EMF contact as it occurs.⁹⁶ Thus, the fact that a plaintiff later develops knowledge of the contact between an EMF emanating from a power line and the plaintiff's body should suffice to fulfill the contact prong of the battery cause of action.

d. Consent—A plaintiff in a battery action also may have difficulty proving lack of consent as an element of her prima facie case. If a plaintiff willingly sold an easement for power-line construction to a utility, a reasonable person in the position of the defendant might believe that the plaintiff consented to the touching of her person. A court might consider such a plaintiff to have consented constructively to the EMF contact.⁹⁷ Where a plaintiff's land is not sold voluntarily, and a utility obtains it through a condemnation proceeding, however, a court probably would not find implied or actual consent to the EMF contact.

2. Remedies—Assuming that the battery action is successful, the question remains whether damages would make the endeavor worthwhile to a plaintiff. A court could very likely find the EMF contact "offensive" but not "harmful" because the scientific community has yet to agree about EMF health effects.⁹⁸ Without a finding of actual harm, the court could award only nominal damages,⁹⁹ which would do little to

400, 416-17, 565 A.2d 1170, 1178 (1989) (holding that the defendant was liable for battery when it vented steam that came into contact with the plaintiff).

96. In battery, the plaintiff's interest in her personal integrity is entitled to protection even if she is unaware of the offensive contact at the time the contact occurs. RESTATEMENT (SECOND) OF TORTS § 18 comment d (1977). Battery cases brought by former patients asserting offensive contact while anesthetized illustrate this point. *See, e.g.,* *Mohr v. Williams*, 95 Minn. 261, 268, 104 N.W. 12, 14 (1905), *rev'd in part on other grounds*, 248 Minn. 527, 80 N.W.2d 854 (1957); *see also* PROSSER & KEETON, *supra* note 87, § 9, at 40.

97. *Cf. O'Brien v. Cunard S.S. Co.*, 154 Mass. 272, 273, 28 N.E. 266, 266 (1891) (holding that a doctor who vaccinated a patient was not liable for assault when "the plaintiff's behavior was such as to indicate consent . . . whatever her unexercised feelings may have been").

98. *See, e.g., Zappavigna v. State*, No. 74085, slip op. at 25 (N.Y. Ct. Cl. Sept. 21, 1989) (finding no "reasonable basis for any fear that power lines cause health problems").

99. *See, e.g., Bumgart v. Bailey*, 247 Miss. 604, 607-08, 156 So. 2d 823, 824-25 (1963) (allowing recovery of nominal damages where no actual damages were proved); *Rullis v. Jacobi*, 79 N.J. Super. 525, 530, 192 A.2d 186, 189 (Ch. Div. 1963) (same).

satisfy an aggrieved plaintiff.¹⁰⁰ Compensation might be available, however, for mental disturbance resulting from the EMF exposure. Fear, emotional distress, and revulsion are compensable mental effects of a battery.¹⁰¹ A large award is imaginable if, for example, a property-owning plaintiff near a power line developed cancer and believed that it was caused by EMFs from the power lines.¹⁰² Cancerphobia, however, may be difficult to prove in jurisdictions that require that some real physical injury attend the phobia.¹⁰³

A court also might issue an injunction to stop the contact. Although courts seldom employ this remedy in battery actions,¹⁰⁴ a court may issue an injunction where there is no adequate remedy at law.¹⁰⁵ Conceivably, a court could find that a utility had committed battery and initially award nominal damages. Without an injunction, the contact would probably continue and the plaintiff would return to court with the same cause of action covering a new time period. The court could then enjoin the utility from operating the power lines because the damages remedy was inadequate.¹⁰⁶

Even without an injunction, the repetition of the battery might compel the court to find the utility's conduct outrageous and award punitive damages.¹⁰⁷ The possibility of future

100. Nominal damages are a "trifling sum." BLACK'S LAW DICTIONARY 392 (6th ed. 1990). For example, in *Rullis*, the court awarded plaintiff nominal damages of only six cents. 79 N.J. Super. at 530, 192 A.2d at 189.

101. PROSSER & KEETON, *supra* note 87, § 9, at 40; *see also, e.g.*, *International Sec. Corp. v. McQueen*, 497 A.2d 1076, 1082 (D.C. 1985) (allowing a jury to consider humiliation as an element of damages); *Smith v. Hubbard*, 253 Minn. 215, 225, 91 N.W.2d 756, 764 (1958) (allowing recovery for humiliation and "mental suffering").

102. *See, e.g.*, *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1205-07 (6th Cir. 1988) (holding that plaintiffs exposed to contaminated water could be compensated for fears that they would contract cancer or other diseases).

103. *See, e.g.*, *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 526-29 (Fla. Dist. Ct. App. 1985) (holding that only those plaintiffs exposed to asbestos who manifested physical injury also could recover for fear of getting cancer), *review denied*, 492 So. 2d 1331 (Fla. 1986).

104. Battery actions usually result in damage awards. *See* PROSSER & KEETON, *supra* note 87, § 9, at 39-42 (discussing various battery actions).

105. *Daniels v. Griffin*, 769 S.W.2d 199, 201-02 (Mo. Ct. App. 1989); *cf. Kennedy v. Bond*, 80 N.M. 734, 738, 460 P.2d 809, 813 (1969) (holding that "[i]njunctive actions are granted to prevent irreparable injury for which there is no adequate and complete remedy at law" for an interference with reasonable use of an easement).

106. Courts have held that where it is likely that defendants will continue their illegal activities despite successful damage actions, the legal remedy is inadequate and an injunction is justified. *See, e.g.*, *Daniels*, 769 S.W.2d at 201-02; *Kennedy*, 80 N.M. at 738, 460 P.2d at 813.

107. RESTATEMENT (SECOND) OF TORTS § 908, at 465 (1977) ("[C]onscious action in deliberate disregard of [the rights of others] may provide the necessary state of

punitive damages might then force a utility to take measures to minimize EMFs emanating beyond power-line rights of way¹⁰⁸ or to purchase the plaintiff's property and resell it to purchasers consenting to the contact.¹⁰⁹

B. Trespass

Plaintiffs have asserted trespass claims in the EMF context, but no court has ruled on them.¹¹⁰ An inverse-condemnation hearing may often provide adequate compensation for diminution in land's market value without resort to a trespass complaint. Nonetheless, a successful trespass action carries the potential for far larger awards than does an inverse-condemnation hearing because of trespass's more liberal recovery theories¹¹¹ which will provide juries with more leeway in granting awards on such an emotional issue.¹¹² Theoretically, injunctions are available in a trespass action,

mind to justify punitive damages."); *see also* *Stojkovic v. Weller*, 802 S.W.2d 152, 158 (Mo. 1991) (stating that Missouri has adopted RESTATEMENT (SECOND) OF TORTS § 908 (1977)).

108. *See infra* notes 204-05 and accompanying text (discussing some utilities' efforts to reduce EMF emissions from power lines); *see also infra* notes 206-08 (discussing some public utility commissions' efforts to reduce EMF emissions).

109. *See infra* notes 219-25 and accompanying text (discussing the BC Hydro plan to purchase houses along a power-line right of way).

110. *See, e.g.,* *Linnebur v. Public Serv. Co.*, 44 Colo. App. 504, 504-05, 614 P.2d 912, 912-13 (1980) (upholding both trial court's dismissal of trespass claim and its grant of opportunity to amend previously filed eminent-domain complaint to incorporate trespass claims); *see also supra* note 76.

111. Punitive damages are appropriate in intentional trespass cases, although they are sometimes limited. *See, e.g.,* *Alaska Placer Co. v. Lee*, 553 P.2d 54, 61 (Alaska 1976) ("A finding of willful trespass results in a form of punitive damages for public policy reasons . . ."); *White v. Citizens Nat'l Bank*, 262 N.W.2d 812, 817 (Iowa 1978) (holding that punitive damages are available in trespass cases if "accompanied by circumstances which supply the necessary animus"). Trespass actions also may be governed by longer statutes of limitation. *See, e.g.,* *Martin v. Reynolds Metals Co.*, 221 Or. 86, 88-89, 342 P.2d 790, 791 (1959), *cert. denied*, 362 U.S. 918 (1960).

112. *Cf. Houston Lighting & Power Co. v. Klein Indep. School Dist.*, 739 S.W.2d 508, 511 (Tex. Ct. App. 1987) (reviewing jury award of \$25 million in punitive damages in inverse-condemnation action against utility that placed power lines near a school); *San Diego Gas & Elec. Co. v. Daley*, 205 Cal. App. 3d 1334, 1339, 1344, 253 Cal. Rptr. 144, 145, 149 (1988) (upholding a jury award to plaintiff of over \$1 million in severance damages in inverse-condemnation suit after hearing testimony regarding EMFs' effects on property values that defendant sought to exclude as prejudicial). Also, because in trespass cases juries can consider evidence of physical and emotional harm, trespass actions provide the potential for greater recovery than eminent-domain condemnation actions.

yet due to the nature of an EMF related action this possibility is limited.¹¹³

1. *Theory*—Intentional trespass onto land¹¹⁴ (“trespass”) is an unlawful physical invasion of exclusive possession of land.¹¹⁵ EMF emissions onto land satisfy all of the basic requirements for this tort.

a. *Entry onto land*—Many courts now hold that a defendant who has caused gasses or particles, however fine, to enter a plaintiff’s property may be held liable for trespass.¹¹⁶ The extension of these holdings to cover EMFs—measurable particles proven to affect biological systems¹¹⁷—seems a small step. Given that EMFs are “real, physical, incorporeal entities,”¹¹⁸ they appear to fall under the language of *Martin v. Reynolds Metals Co.*,¹¹⁹ a seminal¹²⁰ case stating that “we may define trespass as any intrusion that invades the possessor’s protected interest in exclusive possession, whether that intrusion is by visible or invisible pieces of matter or by energy which can be measured only by the mathematical language of the physicist.”¹²¹ A plaintiff could thus prove that EMFs fulfill the entry-onto-land prong of a trespass cause of action.¹²²

113. See *infra* notes 138-41 and accompanying text.

114. This Note examines only intentional trespass onto land, and not negligent trespass onto land.

115. *E.g.*, *Colwell Sys., Inc. v. Henson*, 117 Ill. App. 3d 113, 116, 452 N.E.2d 889, 892 (1983); *Martin v. Union P.R.R.*, 256 Or. 563, 565, 474 P.2d 739, 760 (1970); CUNNINGHAM, STOEBUCK & WHITMAN, *supra* note 18, § 7.1, at 411.

116. See, *e.g.*, *Martin v. Reynolds Metals Co.*, 221 Or. 86, 94, 342 P.2d 790, 794 (1959) (holding that the invasion of fluoride particulates constituted a trespass), *cert. denied*, 362 U.S. 918 (1960); *Union P.R.R.*, 256 Or. at 566, 474 P.2d at 740 (citing *Reynolds* for proposition that “a trespass can result from an intrusion by invisible as well as visible forces” and holding that “[t]he spread of . . . fire from the defendants’ land onto plaintiffs’ land was an intrusion of a character sufficient to constitute a trespass”); see also *Maryland Heights Leasing, Inc. v. Mallinckrodt, Inc.*, 706 S.W.2d 218, 226 (Mo. Ct. App. 1985) (concluding that “radioactive emissions may constitute trespass”); *cf. Staples v. Hoefke*, 189 Cal. App. 3d 1397, 1406, 235 Cal. Rptr. 165, 170 (1987) (noting that sound waves can constitute a trespass).

117. *N.Y. State Power Lines Report*, *supra* note 8, at 8 (quoting from the New York State Power Lines Project’s scientific advisory panel’s report, *Biological Effects of Power Line Fields*).

118. Marino, *Environmental Electromagnetic Energy*, *supra* note 14, at 965.

119. 221 Or. at 86, 342 P.2d at 790.

120. CUNNINGHAM, STOEBUCK & WHITMAN, *supra* note 18, § 7.1, at 412 n.7.

121. 221 Or. at 94, 342 P.2d at 794.

122. Some courts, however, require that particles settle on the land to constitute a trespass, see, *e.g.*, *Maryland Heights Leasing, Inc. v. Mallinckrodt, Inc.*, 706 S.W.2d 218, 225-26 (Mo. Ct. App. 1985); some require that there be actual damage to the land, see, *e.g.*, *Staples v. Hoefke*, 189 Cal. App. 3d 1397, 1406, 235 Cal. Rptr. 165,

b. *Intent*—The intent prong of a trespass action is as easy to prove as the intent element of a battery case because the defendant can have the requisite intent even though she does not intend any harm to the plaintiff's property interest.¹²³ If the defendant intends to commit a physical contact with the plaintiff's land, she will be deemed to have the requisite intent for trespass, even if she acted in good faith under the reasonably mistaken belief that she was committing no wrong.¹²⁴ Thus, regardless of a utility's specific intention, the utility's knowledge that EMFs emanating from power lines would extend beyond a power-line right of way and onto neighboring property should be enough to satisfy the intent prong of a trespass cause of action.¹²⁵

c. *Consent and mistake*—As in battery, consent presents a potential pitfall for a plaintiff in a trespass action.¹²⁶ For example, a court might find that a landowner consented to the intrusion if she sold her property willingly rather than under the compulsion of eminent domain. Similarly, if a utility knew that EMFs would invade property adjoining a right of way but believed that such an invasion was not opposed by a landowner, the utility might plead mistake. If a court finds that this mistake was in fact induced by the conduct of the landowner, it will not find the defendant liable for the EMF intrusion.¹²⁷

170 (1987); and some require both, *see, e.g.*, *Bradley v. American Smelting & Ref. Co.*, 104 Wash. 2d 677, 691-92, 709 P.2d 782, 791 (1985). A plaintiff claiming that an invasion of EMFs constituted a trespass could argue that because EMFs do not dissipate, they constitute a permanent occupation, even though no particles have settled on the ground. Proving actual damage to the land could be difficult.

123. *See, e.g.*, *Cleveland Park Club v. Perry*, 165 A.2d 485, 487-88 (D.C. 1960) (holding that trespass occurred when the defendant damaged a pool by putting a tennis ball into the drain without intending harm).

124. *E.g.*, *Brown Jug, Inc. v. International Bhd. of Teamsters, Local 959*, 688 P.2d 932, 938 (Alaska 1984); *York Indus. Medical Center, Inc. v. Michigan Mut. Liab. Co.*, 271 N.C. 158, 163, 155 S.E.2d 501, 506 (1967); RESTATEMENT (SECOND) OF TORTS § 164 (1977).

125. Utilities have possessed such knowledge for over a decade. *See supra* notes 6-12 and accompanying text.

126. *See* PROSSER & KEETON, *supra* note 87, § 18, at 112. In trespass, however, the burden of proving consent is usually on the defendant. *Id.* at 112 n.2; *see also* *McCaig v. Talladega Publishing Co., Inc.*, 544 So. 2d 875, 879 (Ala. 1989) ("Consent is a defense to an action for damages for trespass.") (emphasis added); *Salisbury Livestock Co. v. Colorado Cent. Credit Union*, 793 P.2d 470, 475 (Wyo. 1990) (stating that consent is an "absolute defense" to trespass).

127. *See* PROSSER & KEETON, *supra* note 87, § 13, at 75; *see also* *Sumner v. Hebenstreit*, 167 Ill. App. 3d 881, 885, 522 N.E.2d 343, 346 (1988) ("Habitual acquiescence in a trespass may indeed constitute a license for persons to enter upon the land if the tolerance is so pronounced as to be tantamount to permission."); *Boling*

The likelihood of a successful defense of mistake, however, may be limited. First, it was unlikely, until recently, that even a landowner who acquiesced to power-line construction by willingly selling an easement to a utility reasonably could have known that her property lying close to the right of way would be bathed in a power line's EMF. A utility is unlikely to have informed the landowner of this circumstance or asked permission for the EMF invasion. Similarly, it would be difficult for a utility to assert that property owners knew about EMF trespass before the power-line construction. Public knowledge and concern about EMFs from power lines have emerged only recently.¹²⁸ Second, assuming that a utility could successfully assert a defense of mistake, or could demonstrate that the plaintiff granted permission for the EMF contact, the defendant may still commit a trespass if he refuses to cease the trespassory action after the plaintiff terminates her permission.¹²⁹

2. *Remedies*—In terms of damages, a successful trespass action may prove superior to theories of recovery based on inverse condemnation or battery. Intentional trespass entitles a plaintiff to only nominal damages where no harm has occurred.¹³⁰ But once trespass is established the defendant is liable for any visible or tangible damage inflicted upon the land even if the harm could not have been anticipated at the time of the unlawful entry.¹³¹ This liability has been extended to include injury to the person of the possessor, her chattels, and even her family.¹³² Thus, a damage award

Concrete Constr. Co., Inc. v. Townsend, 686 S.W.2d 842, 843 (Mo. Ct. App. 1985) ("Consent may be implied from . . . conduct." (quoting 75 AM. JUR. 2D *Trespass* § 41 (1974))); RESTATEMENT (SECOND) OF TORTS, § 891 (1977) ("If words or conduct are reasonably understood by another to be intended as consent they constitute apparent consent and are effective as consent in fact."). *But cf.* Serota v. M. & M. Utils., Inc., 55 Misc. 2d 286, 288, 285 N.Y.S.2d 121, 124 (Civ. Ct. 1967) (holding that mistaken belief that property owner granted consent does not negate liability for trespass).

128. Dietrich, *supra* note 12, at 16 ("Concern first arose when a 1979 study made a correlation between childhood leukemia and power-line magnetic fields in Denver.").

129. *See, e.g.*, Merrill Stevens Dry Dock Co. v. G & J Invs. Corp., 506 So. 2d 30, 32 (Fla. Dist. Ct. App.), *review denied*, 515 So. 2d 229 (Fla. 1987); Riddle Quarries, Inc. v. Thompson, 177 Kan. 307, 311, 279 P.2d 266, 269 (1955); RESTATEMENT (SECOND) OF TORTS § 160 (1977).

130. *See, e.g.*, Brown Jug, Inc. v. International Bhd. of Teamsters, Local 959, 688 P.2d 932, 938 (Alaska 1984); Pahl v. Brosamle, 98 Wis. 2d 130, 152, 295 N.W.2d 768, 781 (Ct. App. 1980); RESTATEMENT (SECOND) OF TORTS § 163 (1977).

131. *See* PROSSER & KEETON, *supra* note 87, § 13, at 76-77.

132. *Id.*; *see also* Wardrop v. City of Manhattan Beach, 160 Cal. App. 2d 779, 794, 326 P.2d 15, 24 (1958) (upholding a jury award to a child who contracted polio from contaminated water pumped into plaintiff's backyard).

could include diminution in land value¹³³ because of EMF presence, loss in livestock productivity because of EMF exposure,¹³⁴ and mental distress suffered not only by the possessor of the land¹³⁵ but also by her family.¹³⁶ An award for mental distress may be high when, for example, an individual, because of disputed scientific studies, blames her health ailments on the EMFs from power lines. Clearly, damage awards in a trespass action have the potential for greater remuneration than awards in an inverse-condemnation proceeding or a battery action.

The continuing nature of the EMF invasion upon private property illuminates one significant problem with the trespass theory. With a continuing trespass, some courts permit successive actions to recover for damages.¹³⁷ Some courts also have subjected defendants committing continuing trespasses to abatement or injunction.¹³⁸ But many courts will treat a structure authorized by eminent-domain statutes as a "permanent nuisance" not subject to abatement or injunction.¹³⁹ These courts will either permit only a single recovery for prospective damages,¹⁴⁰ or require that a plaintiff bring her action under inverse condemnation rather than trespass.¹⁴¹ Because a power line's continued presence and operation will be authorized by eminent domain, courts may treat trespass suits involving EMFs as "permanent nuisance"

133. *E.g.*, *Drake v. Claar*, 339 N.W.2d 844, 847 (Iowa Ct. App. 1983); *Sperry v. ITT Commercial Fin. Corp.*, 799 S.W.2d 871, 878 (Mo. Ct. App. 1990).

134. *See Farm Study: Stray Voltage and Dairy Cows*, *supra* note 16, at 7.

135. *See, e.g.*, *Walker v. Ingram*, 251 Ala. 395, 397, 37 So. 2d 685, 686 (1948); *Barrow v. Georgia Lightweight Aggregate Co.*, 103 Ga. App. 704, 709, 120 S.E.2d 636, 641 (1961); *PROSSER & KEETON*, *supra* note 87, § 13, at 76.

136. *See, e.g.*, *Walker*, 251 Ala. at 396-97, 37 So. 2d at 685-86; *Engle v. Simmons*, 148 Ala. 92, 94, 41 So. 1023, 1023 (1906); *RESTATEMENT (SECOND) OF TORTS* § 162 (1977); *PROSSER & KEETON*, *supra* note 87, § 13, at 76.

137. *See, e.g.*, *Riblet v. Ideal Cement Co.*, 54 Wash. 2d 779, 782-84, 345 P.2d 173, 175-76 (1959); *PROSSER & KEETON*, *supra* note 87, § 13, at 83-84.

138. *See, e.g.*, *Berin v. Olson*, 183 Conn. 337, 342-43, 439 A.2d 357, 360-61 (1981).

139. *PROSSER & KEETON*, *supra* note 87, § 13 n.60; *see also Beetschen v. Shell Pipe Line Corp.*, 363 Mo. 751, 758-59, 253 S.W.2d 785, 788 (1952); *Evans v. City of Johnstown*, 96 Misc. 2d 755, 759-60, 410 N.Y.S.2d 199, 200-01 (Sup. Ct. 1978).

140. *See, e.g., Beetschen*, 363 Mo. at 758-59, 253 S.W.2d at 788; *PROSSER & KEETON*, *supra* note 87, § 13 n.60.

141. *See, e.g., Tuffley v. City of Syracuse*, 82 A.D.2d 110, 116, 442 N.Y.S.2d 326, 330 (1981) ("Inverse condemnation, rather than trespass, is the appropriate theory for granting damages to an injured landowner where the trespasser is cloaked with the power of eminent domain.").

suits. Thus, the most important goal for a landowner whose property is exposed to EMFs, the cessation of the exposure, may be unobtainable by injunction.

Theoretically, though, a court could order the reduction of EMFs without interfering with eminent-domain statutes. The utility could reduce EMF exposure using available technologies¹⁴² or by purchasing the affected portion of the plaintiff's land.¹⁴³ These solutions would not require the utility to cease the transmission of electric power, and therefore the court would not be interfering with the public use that justified the exercise of eminent domain in the first place.

For a plaintiff seeking to obtain significant compensation for EMF impact upon her person, property, family, and chattels, trespass appears to be a more viable theory than battery, although applying trespass law in the EMF context would be unusual. Although court-ordered abatement of EMF levels is also possible, injunctive relief is probably not available to shut down power-line construction completely. In sum, the theory of trespass is an attractive, though not ideal, means of recovering adequate compensation for damages inflicted by prolonged contact with EMFs from power lines.

C. Private Nuisance

Private nuisance ("nuisance")¹⁴⁴ may not be as attractive as trespass because it lacks the generous compensation opportunities and possibilities for abatement orders available under trespass.¹⁴⁵ Moreover, nuisance calls for more specific proofs than does trespass.¹⁴⁶ The line between trespass and

142. For a discussion of these technologies see *infra* notes 210-12 and accompanying text.

143. See *infra* notes 219-25 and accompanying text (discussing BC Hydro's plan to buy property from residents along power-line right of way).

144. This Note considers only private nuisance. In one case plaintiffs already have attempted to enjoin power-line construction by using a public-nuisance theory, but that case was dismissed on jurisdictional grounds and did not reach the public-nuisance issue. *Stannard v. Axelrod*, 100 Misc. 2d 702, 706-11, 419 N.Y.S.2d 1012, 1015-18 (Sup. Ct. 1979). For a discussion of the difference between private nuisance and public nuisance, see RESTATEMENT (SECOND) OF TORTS ch. 40, introductory note, § 822 (1977).

145. See *infra* notes 164-72 and accompanying text.

146. See PROSSER & KEETON, *supra* note 87, § 87, at 622-23; Note, *State Common Law Actions and Federal Pollution Control Statutes: Can They Work Together?*, 1986

nuisance, however, has become "wavering and uncertain."¹⁴⁷ The theoretical distinction between the two theories is that trespass interferes with the plaintiff's right to exclusive possession of property while nuisance interferes with his right to use and enjoy property.¹⁴⁸ In an action relating to EMFs from power lines that emanate over private property, a court may misapply one theory or apply a mix of the two theories because of confusion about the distinction.¹⁴⁹ It is therefore important for potential plaintiffs both to understand the proper application of nuisance theory to the EMF context and to be prepared to use that approach in court.

1. *Theory*—To recover for private nuisance a plaintiff must first demonstrate substantial interference with the use and enjoyment of her land.¹⁵⁰ The substantial interference caused by EMFs emanating beyond rights of way could be proven by demonstrating a decrease in property values because of EMF fears.¹⁵¹ Second, the plaintiff must show that the defendant's conduct was negligent, abnormally dangerous, or intentional and unreasonable.¹⁵² Because courts do not recognize that EMFs from power lines are abnormally dangerous per se,¹⁵³ a plaintiff will probably be limited to pleading negligence or intent.

In some jurisdictions a plaintiff could prove negligence easily. The recent case of *Houston Lighting & Power Co.*

U. ILL. L. REV. 609, 616 (authored by Thomas C. Buchele) ("Trespass is distinct from nuisance in that it does not require an element of unreasonableness or actual harm . . .").

147. *Bradley v. American Smelting & Ref. Co.*, 104 Wash. 2d 677, 684, 709 P.2d 782, 787 (1985).

148. *Id.*

149. *See, e.g., Borland v. Sanders Lead Co., Inc.*, 369 So. 2d 523, 527-29 (Ala. 1979) (discussing courts' confusion of trespass and nuisance); *Carrigan v. Purkhiser*, 466 A.2d 1243, 1244 (D.C. 1983) (reversing trial court which had confused the law of trespass with the law of nuisance).

150. *E.g., Snelling v. Land Clearance for Redevelopment Auth.*, 793 S.W.2d 232, 233 (Mo. Ct. App. 1990); *Hendricks v. Stalnaker*, 380 S.E.2d 198, 200 (W. Va. 1989).

151. *See CUNNINGHAM, STOEBUCK & WHITMAN, supra* note 18, § 7.2, at 416 (stating that a large financial loss demonstrates substantial harm).

152. *Hendricks*, 380 S.E.2d at 200; *see also Hall v. Phillips*, 231 Neb. 269, 271-72, 436 N.W.2d 139, 141-42 (1989) ("One is subject to liability for private nuisance if . . . [his] invasion is either (a) intentional and unreasonable, or (b) unintentional and otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities." (quoting RESTATEMENT (SECOND) OF TORTS § 822 (1977))).

153. *See supra* notes 23-27 and accompanying text (indicating that no court has held that EMFs are dangerous per se).

*v. Klein Independent School District*¹⁵⁴ indicates that juries may find that power-line EMFs pose health risks and that uncertainty over the magnitude of such risks should dictate caution by the utility.¹⁵⁵ In *Klein*, the jury found that a utility acted in "reckless disregard" of community safety when it placed a high-voltage power line next to a school so that EMFs from the line invaded school property.¹⁵⁶

But because courts in other jurisdictions may not be as receptive to negligence claims,¹⁵⁷ another productive strategy for plaintiffs would be to assert that defendants' actions in causing an EMF interference were intentional. As the Wisconsin Supreme Court has stated, "a continued invasion of a plaintiff's interests by non-negligent conduct, when the actor knows of the nature of the injury inflicted, is an intentional tort, and the fact the hurt is administered non-negligently is not a defense to liability."¹⁵⁸ A plaintiff could demonstrate such knowing infliction of injury by presenting proof of the known link between diminution of market value and public fears of EMFs,¹⁵⁹ between EMFs and decreased farm production,¹⁶⁰ or between EMFs and health problems.¹⁶¹

An intentional interference must also be unreasonable.¹⁶² An unreasonable interference occurs if "the harm caused by the conduct is serious, and the financial burden of compensating for this and similar harm to others would not make the continuation of the conduct [un]feasible."¹⁶³ As Part III will demonstrate, the cost to utilities and ratepayers of compensation for EMF damages does not render power-line construction and the transport of electricity unfeasible.

154. 739 S.W.2d 508 (Tex. Ct. App. 1987).

155. *Id.* at 518; *cf.* Brock v. New Orleans Pub. Serv., Inc., 433 So. 2d 1083, 1087 (La. Ct. App.) ("Mere compliance with minimum safety standards does not, per se, relieve the utility company of negligence."), *cert. denied*, 437 So. 2d 1148 (La. 1983).

156. 739 S.W.2d at 511.

157. *Cf.* Zappavigna v. State, No. 74085, slip op. at 25 (N.Y. Ct. Cl. Sept. 21, 1989) (finding no reasonable basis to believe that power lines cause health problems).

158. Jost v. Dairyland Power Coop., 45 Wis. 2d 164, 173, 172 N.W.2d 647, 652 (1969).

159. For a discussion of case holdings regarding the admission of such evidence in *eminent-domain* suits, see Part I.

160. *See supra* note 16.

161. *See supra* notes 6-12 and accompanying text.

162. RESTATEMENT (SECOND) OF TORTS § 822 (1977); *see also* cases cited *supra* note 152.

163. RESTATEMENT (SECOND) OF TORTS § 826 (1977).

Therefore, no matter how socially useful an electrical utility's activity, so long as harm from power-line EMFs is substantial the defendant in a nuisance action should be forced to pay for that harm.

2. *Remedies*—Given the difficulty of proving special damages such as emotional distress,¹⁶⁴ a court that finds a utility negligent or willful in causing EMF exposure might not grant compensatory damages much more significant than those awarded in an inverse-condemnation hearing.¹⁶⁵

The primary advantage of a nuisance action is the established remedy of an injunction.¹⁶⁶ But to obtain an injunction a plaintiff must show that the harm actually outweighs the usefulness of defendant's conduct. Courts thus balance the equities when deciding whether to issue an injunction.¹⁶⁷ Therefore, given the need for and benefit of a local and national power transportation system, the likelihood of an injunction is slim, especially considering the "permanent nuisance" approach used by some courts.¹⁶⁸ One outcome of an EMF-nuisance action might be similar to the result in *Boomer v. Atlantic Cement Co.*,¹⁶⁹ in which the court granted permanent damages while allowing the nuisance to continue.¹⁷⁰

164. Some states' courts hold that damages for emotional distress are recoverable in a nuisance action. See, e.g., *French v. Ralph E. Moore, Inc.*, 203 Mont. 327, 335, 661 P.2d 844, 848 (1983); *Wilson v. Key Tronic Corp.*, 40 Wash. App. 802, 809, 701 P.2d 518, 524 (1985). But at least one state does not recognize emotional distress and other special damages in private nuisance. See, e.g., *Baker v. Burbank-Glendale-Pasadena Airport Auth.*, 220 Cal. App. 3d 1602, 1610, 270 Cal. Rptr. 337, 341 (1990) (noting that "emotional distress damages are available only in actions based on public nuisance"). Even in states where courts permit recovery of damages for emotional distress in private nuisance actions the level of proof required may limit recovery. See, e.g., *Rice v. Merritt*, 549 So. 2d 508, 511 (Ala. Civ. App. 1989) (stating that, unless there was a physical injury, mental anguish is only compensable in a nuisance case if it was accompanied by "malice, insult, inhumanity or contumely").

165. See, e.g., *Houston Lighting & Power Co. v. Klein Indep. School Dist.*, 739 S.W.2d 508, 518-19 (Tex. Ct. App. 1987) (reducing a high EMF damage award on the grounds that it was punitive and not compensatory).

166. See, e.g., *Southwestern Constr. Co., Inc. v. Liberto*, 385 So. 2d 633, 635 (Ala. 1980); *Village of Wilsonville v. SCA Servs., Inc.*, 86 Ill. 2d 1, 22, 426 N.E.2d 824, 834 (1981); RESTATEMENT (SECOND) OF TORTS § 822 comment d (1977).

167. See, e.g., *Haack v. Lindsay Light and Chem. Co.*, 393 Ill. 367, 373-75, 66 N.E.2d 391, 394 (1946) (holding that defendant's activities were essential to war effort and outweighed plaintiffs' right to an injunction); *Antonik v. Chamberlain*, 81 Ohio App. 465, 479, 78 N.E.2d 752, 760 (1947) (stating that "the life or death of a legitimate and necessary business" outweighs the plaintiff's discomfort); see also PROSSER & KEETON, *supra* note 87, § 88A, at 631.

168. See *supra* notes 139-41 and accompanying text.

169. 26 N.Y.2d 219, 257 N.E.2d 870, 309 N.Y.S.2d 312 (1970).

170. *Id.* at 232, 257 N.E.2d at 875, 309 N.Y.S.2d at 319.

Unless studies conclusively prove a significant link between EMFs and adverse health effects, the best a plaintiff could hope for in a nuisance action would be for an imaginative court to mandate, in lieu of future damages, the reduction of EMFs that emanate beyond rights of way. Another attractive possibility is a BC Hydro-type solution, where a court would order a utility to purchase homes affected by EMFs if homeowners so desire.¹⁷¹

Nuisance is not the best litigation strategy for a plaintiff affected by power-line EMFs. It is much easier for plaintiffs to maintain an inverse-condemnation action. Even a successful action might gain little more for a plaintiff than would an inverse-condemnation proceeding. Furthermore, mental duress and other indirect damages are more traditionally part of a trespass cause of action than a nuisance award.¹⁷² Nuisance thus appears to be an attractive theory of recovery for property owners affected by EMFs only as a complement to other theories. But the injunctive component of nuisance may become more attractive if the link between EMFs and significant adverse health effects becomes more evident in future scientific studies.

D. Overview

The theories of recovery proposed above may be somewhat whimsical. All are untested, and EMF-related claims under any of the three theories stretch traditional tort law boundaries. Public policy also weighs strongly against large awards in the case of trespass and battery. Similarly, public policy rationales diminish the possibility of injunctive relief or even abatement under a nuisance theory.

Nonetheless, scientific data increasingly demonstrate cognizable and significant correlations between EMFs from power lines

171. For a discussion of this approach, see *infra* notes 219-25 and accompanying text. Subsequent buyers of such land might not recover in a nuisance action because they "came to the nuisance." See generally RESTATEMENT (SECOND) OF TORTS § 840D (1977) (discussing "coming to the nuisance"). Anyone who moved onto such land at the current time would probably face the same predicament because of the recent widespread public awareness of EMF dangers.

172. See *supra* notes 130-36 and accompanying text.

and cancer and other adverse health effects.¹⁷³ As the impact of these studies grows, juries will become increasingly likely to grant large awards, given the opportunities that theories such as those above provide.¹⁷⁴ Similarly, courts may issue injunctions or abatement orders more readily as more information about the dangers of power-line EMFs and the relative ease of abating their dangers becomes available.

Battery, trespass, and nuisance provide possible avenues for plaintiffs to gain significantly more than they would in condemnation or eminent-domain proceedings. The theories also provide sound legal frameworks for plaintiffs to gain injunctions or abatement orders to end or diminish the perceived threat from power-line EMFs. Additionally, a small number of successful suits might spur legislators and utilities to take a more serious look at using current and developing methods of reducing EMF exposure beyond rights of way in both existing power lines and future construction projects.

III. PROPOSALS TO ALLEVIATE THE CURRENT POWER-LINE CONSTRUCTION IMPASSE

A. *The Strength of Citizen Groups Seeking to Stop Further Power-Line Construction*

Organized opponents to power-line construction in the United States have used both political and legal strategies to force utilities to address concerns about EMFs.¹⁷⁵ Because of these efforts, delays and cancellations of construction projects have cost consumers billions of dollars in lost opportunities for cheaper, more easily transported power.¹⁷⁶ These efforts are dangerous to utility companies because the EMF controversy could lead to restrictive regulation of power-line construction.¹⁷⁷

173. See *supra* notes 6-15 and accompanying text.

174. See *supra* note 112 and accompanying text.

175. See *infra* notes 179-99 and accompanying text.

176. For an indication of the costs of delays in power-line construction, see, e.g., March, *Hydroelectric Project Criticized*, United Press Int'l, Feb. 5, 1986 (LEXIS, Nexis library) (discussing an example of community opposition to one line that would save New England ratepayers \$1.9 billion). See also *supra* notes 1-5 and accompanying text.

177. See *infra* notes 192-96 and accompanying text.

In Maryland, county councils, community groups (most notably the Maryland People's Council (MPC)), and residents along the proposed right of way for a large power line have delayed construction since 1980, when the Potomac Electric Power Company first received permission to build the line.¹⁷⁸ One of the counties and the MPC have demonstrated repeatedly their willingness to go to court to plead their case.¹⁷⁹ The \$20 million line is the last link in a regional electric loop surrounding the Washington, D.C. area. It is a joint venture by the utility companies of several states that the utilities insist is essential to exchange power cheaply among themselves and utilities in other states.¹⁸⁰ The contested stretch interferes with housing subdivisions more than other parts of the loop that have already been completed.¹⁸¹ Without the contested segment, the purposes of the joint venture—cheaper electricity and an ability to meet consumer demand—will remain unfulfilled.

In Seattle, opposition by city residents recently met with greater success. In late 1987, Citizens Against Overhead Power Lines, Inc. (CAOPL), a group of homeowners in the Highline area of South Seattle, organized a campaign against the construction of two major power lines in the rights of way along two city streets.¹⁸² Seattle City Light acknowledged that over 500 homes initially would be exposed to amounts of EMFs that are greater than amounts showing correlations to cancer in several published scientific studies.¹⁸³ The Washington State Department of Transportation eventually withheld approval from the city utility, citing fears of long-term health effects, and, less selflessly, because of concerns about possible litigation in relation to the Department's "hold harmless" contract provisions.¹⁸⁴

178. See Worden, *supra* note 13; Hankin, *supra* note 74.

179. For descriptions of the controversy and its history, see *Power Line Talk*, MICROWAVE NEWS, Sept.-Oct. 1988, at 5-6; *Power Line Talk*, MICROWAVE NEWS, Mar.-Apr. 1988, at 2-3; Worden, *supra* note 13; Hankin, *supra* note 74.

180. Hankin, *supra* note 74.

181. *Id.*

182. For information about the Seattle power-line construction controversy, see Brodeur (pt. 2), *supra* note 12, at 73. See also Dietrich, *supra* note 12, at 8 (discussing CAOPL's efforts and other instances of community opposition to power-line construction in the northwestern United States).

183. Brodeur (pt. 2), *supra* note 12, at 72-73.

184. *Id.* at 73. The rationale of the department foreshadowed the assertions by industry experts that utilities, and by inference all organizations involved with

Community opposition to the construction of New York's Marcey-South power line ended in September of 1989 with the failure of a "cancerphobia" suit by fifty-eight landowners against the New York Power Authority.¹⁸⁵ But the expense of the trial, which cost the New York Power Authority alone over \$2.6 million,¹⁸⁶ foreshadows other costly and time-consuming actions for utilities.

Citizens of Middletown, New Jersey, led by their deputy mayor, recently formed Residents Against Giant Electric (RAGE) to oppose a major power-line construction project through the "heart of the community."¹⁸⁷ Prodded by RAGE, the town's deputy mayor opposed the construction project and led the search for a lawyer to represent the town in its suit against the power company.¹⁸⁸ The local utility, also fighting a battle over power-line construction in a nearby community,¹⁸⁹ asserted, in a response typical of utilities involved in such controversies, that the line must be built as proposed or the increased price of electricity would "impose unnecessary costs on the rate-conscious public"¹⁹⁰ and that "the utility will not be able to meet increasing energy demands."¹⁹¹

Many state agencies and legislatures are reacting to this opposition to power-line construction projects. Public officials in Washington, Oregon, New York, New Jersey, California, and Virginia have debated measures to control EMF exposure from power lines.¹⁹² Similarly, state legislatures and administrative

electrical construction and production, will face "massive new liabilities if allegations about the potential health hazards caused by exposure to electromagnetic fields produced by electricity are proven." Bradford, *Electromagnetic Fields: Hidden Hazard?*, BUS. INS., Feb. 1988, at 3.

185. See *NY Judge Rejects Power Line "Cancerphobia" Argument*, MICROWAVE NEWS, Sept.-Oct. 1989, at 1, 5; *Zappavigna v. State*, No. 74085, slip op. at 31 (N.Y. Ct. Cl. Sept. 21, 1989) (holding that plaintiff could not recover for diminution in the value of his land caused by EMF fears).

186. *NY Judge Rejects Power Line "Cancerphobia" Argument*, *supra* note 185, at 1.

187. Handlin, *Power Lines and Battle Lines*, N.Y. Times, Nov. 5, 1989 § 12 (New Jersey), at 32, col. 1; see also *Around the U.S. and Canada*, MICROWAVE NEWS, July-Aug. 1989, at 9 (providing a brief history of the New Jersey conflict); cf. *Colorado PUC Adopts "Prudent Avoidance" Strategy*, MICROWAVE NEWS, Nov.-Dec. 1989, at 7 (describing opposition to power lines in Douglas County, Colorado).

188. Handlin, *supra* note 187.

189. See *Around the U.S. and Canada*, *supra* note 187, at 9.

190. Handlin, *supra* note 187, at 32, col. 5.

191. Moon, *supra* note 74, at 2, col. 3.

192. See *Around the U.S. and Canada*, *supra* note 187, at 8-9 (discussing bill pending in New Jersey and regulatory efforts in California); *Power Line Actions*

agencies in Virginia, Maryland, and California are beginning to pursue research on the issue.¹⁹³ Already Florida's legislature has asserted authority over its utilities in response to the EMF issue. Section 403.523(14) of the Florida Statutes, added in 1983,¹⁹⁴ orders the Department of Environmental Regulation "[t]o set requirements that reasonably protect the public health and welfare from the electric and magnetic fields of transmission lines."¹⁹⁵ As of 1989, seven states had passed similar measures.¹⁹⁶

Nonetheless, much of the proposed legislation that would curtail utility autonomy has yet to pass.¹⁹⁷ Similarly, some restrictive administrative rules have been relaxed after lobbying by utilities.¹⁹⁸ However, the increasing publicity about the possible harm from power-line EMFs and community reaction to this publicity increases the likelihood that other states will pass restrictive legislation like Florida's. Meanwhile, at the local administrative level, some restrictive measures have retained their strength despite opposition from utilities.¹⁹⁹

Across the U.S., MICROWAVE NEWS, Mar.-Apr. 1989, at 7 (discussing bills pending in Oregon and Washington, and a Public Service Commission order in New York); *States Seek Power Line Rules in Face of Federal Inaction*, MICROWAVE NEWS, May-June 1988, at 4 (citing bills pending in New York, California, and Washington, and a Virginia study). New York, for example, has proposed interim standards to limit EMFs emanating beyond power-line rights of way for future major electric-transmission construction projects. See *N.Y. State Proposes Power Line Magnetic Field Limits*, Reuters News Wire Serv., May 3, 1990 (LEXIS, Nexis library).

193. See *States Seek Power Line Rules*, *supra* note 192, at 4, 5-6 (reporting that California and Virginia are pursuing research); *Power Line Actions*, *supra* note 192, at 7, 8 (reporting that Maryland has tentatively scheduled a one-year study).

194. See Act approved June 24, 1983, ch. 83-222, § 4, 1983 Fla. Laws, 1134, 1139.

195. FLA. STAT. § 403.523(14) (1989).

196. Note, *supra* note 9, at 360.

197. See *Around the United States*, MICROWAVE NEWS, May-June 1989, at 8 (noting that Maine withdrew a bill imposing interim standards and that Oregon dropped interim field limits from a bill); *States Seek Power Line Rules*, *supra* note 192, at 5 (noting that a Washington state bill requiring utilities to bury 200kV lines under certain circumstances was not voted on after a local utility canceled its construction plans).

198. See, e.g., *Florida Adopts First U.S. Power Line Magnetic Field Limits*, MICROWAVE NEWS, Mar.-Apr. 1989, at 1, 14. See generally *Florida Power Lines Regulations Due Out Soon*, MICROWAVE NEWS, Mar.-Apr. 1987, at 7.

199. See *supra* notes 182-84 and accompanying text.

*B. Politically Sensitive Strategies by Power Companies
Could Spur New Construction*

Power companies must change their approach to the construction of new power lines if they wish to expand their electrical transmission capacity and move forward with its expansion. Utilities can use several reasonable strategies to defuse the health controversies certain to arise around future power-line construction projects. These strategies would enable the utilities to maintain planning flexibility for future projects. They also might prevent power-line construction from falling under the control of less-experienced legislators and administrators.²⁰⁰ Liabilities arising from existing power lines are more problematic, but one innovative utility's program may have achieved a workable means toward a more harmonious citizen-utility relationship.²⁰¹

The most obvious strategy to alleviate the crisis is to plan construction projects so that they do not interfere with major population centers. The savings realized by reducing community opposition could offset the added cost of constructing power lines around city limits rather than through housing developments.

Another obvious strategy is to purchase wider rights of way. EMF emissions dissipate as the distance from a power line increases.²⁰² For many projects proposed in nonurban areas, utilities could guarantee that EMF levels at the edges of power-line rights of way do not exceed those considered safe by even the most cautious researchers simply by purchasing wider corridors of relatively inexpensive rural land.

A few utilities and public utility commissions, prompted by community opinion,²⁰³ currently pursue policies that will

200. These strategies also would be cheaper than the utility industry's present efforts to allay consumer fears about EMFs. The Electric Power Research Institute, an industry-funded research group, has been spending over six million dollars a year to counter consumer fears of EMFs. See Black, *supra* note 3, at 159. The institute may have spent as much as three hundred million dollars in this effort between 1974 and 1989. Telephone interviews with Dr. Andrew Marino, professor at Louisiana State School of Medicine, Shreveport (Oct. 12, 24, 1989) [hereinafter Marino Interviews]. Costs like these probably are passed on to consumers. Cf. Handlin, *supra* note 187 (asserting that utilities will pass on the costs of reducing EMFs).

201. See *infra* notes 219-25 and accompanying text.

202. See Marino, *Environmental Electromagnetic Energy*, *supra* note 14, at 970 fig. 3.

203. See *supra* Part III.A.

increase community trust and eventually community safety. New York utilities are developing plans to reduce power-line EMFs.²⁰⁴ In Seattle, Seattle City Light is preparing to "make changes in [power-line] design [necessary to reduce EMFs] that may be warranted in the future."²⁰⁵ The Public Service Commission (PSC) of Wisconsin recently ordered the implementation of innovative ways to reduce power-line EMFs. The measures include a requirement that local utilities evaluate and include information on how magnetic fields vary for alternative line configurations when they apply for construction authority.²⁰⁶ Similarly, the Colorado Public Utilities Commission (PUC) recently announced that it would adopt a "prudent avoidance" strategy to minimize EMF exposure from new power lines.²⁰⁷ The PUC will translate this initiative into statewide rules to create low-cost ways to limit potential dangers. These rules will require restringing lines, centering lines in easements, and using different types of pole construction.²⁰⁸ Residents in the path of power-line construction had strongly urged the action in hearings regarding the construction of new lines.²⁰⁹

These policies may prove among the best public relations and litigation-reducing strategies at hand today. Utilities would do well to create a more positive community image by demonstrating a commitment to alter power-line construction methods to protect community safety.

Some EMF-reducing technologies exist today. EMFs from underground cables dissipate more rapidly than fields from overhead lines. One study found that when EMFs were measured fifty meters from a high-voltage power line, those

204. See *Power Line Actions Across the U.S.*, MICROWAVE NEWS, Mar.-Apr. 1989, at 7; *N.Y. State Proposes Line Magnetic Field Limits*, *supra* note 192.

205. *Sheppard to Seattle City Light: Consider Epidemiological Data*, MICROWAVE NEWS, Jan.-Feb. 1989, at 7.

206. *In re Advance Plans for Constr. of Facilities*, 102 P.U.R.4th 245, 270 (Wis. 1989). Although the PSC concluded that there was no proven health risk from EMFs, it ordered utilities to provide the public with information on EMFs' effects. *Id.* at 269-70. The Wisconsin PSC also has taken steps to reduce stray voltage. See *generally In re Stray Voltage for Elec. Distribution Util.*, 100 P.U.R.4th 99, 107-14 (Wis. 1989). Recently, however, the PSC demonstrated its ambivalence towards the EMF issue by voiding a municipal ordinance that required utilities to place high-voltage lines underground, partly because the Commission believed that such placement has not been adequately proven to reduce EMFs. *Wisconsin Pub. Serv. Corp. v. Town of Sevastopol*, 105 P.U.R.4th 45, 46 (Wis. 1989).

207. *Colorado PUC Adopts "Prudent Avoidance" Strategy*, *supra* note 187, at 6.

208. *Id.*

209. *Id.* at 7.

from a buried line were nine percent of those from an overhead line.²¹⁰ But burying power lines increases costs five to seven times.²¹¹ Alternatively, overhead lines with a double rather than a single circuit create approximately one half the EMF level at an added cost of only twelve percent, excluding the possible cost of the extra easement required for that configuration.²¹²

Utilities probably will claim that the costs of minimizing EMFs from power lines are prohibitive. In the past, power companies have argued that burying new lines underground would impose unnecessary costs on a rate-conscious public.²¹³ In response to Colorado citizens' demands that power lines be buried to reduce EMF emissions, a local utility responded that a utility has "no right to spend the customers' money to reduce something which the best experts say is not something to be worried about."²¹⁴

Although residents of an area who stand to gain from a proposed power line without exposure to possible health hazards or visual blight may find these claims persuasive, power-line EMFs have been described as "the environmental issue of the 1990's,"²¹⁵ and the cost of pursuing such measures may diminish relative to the costs of delays and litigation as utilities face more and more citizens who feel they have a vested interest in avoiding EMF exposure.²¹⁶ Additionally, if EMFs from high-voltage power lines are linked conclusively to cancer in the coming years, cautious measures implemented today will save future tort litigation costs. Finally, the argument that the increased costs of alternative power-line

210. *Overhead vs. Underground Lines: Field Levels and Costs*, MICROWAVE NEWS, Sept.-Oct. 1988, at 6 (reviewing a 1988 report by a government panel in Victoria, Australia titled *Electromagnetic Fields From Overhead Transmission Lines and Underground Cables*).

211. *Id.*

212. *Id.* at 7.

213. See e.g., Handlin, *supra* note 187.

214. *Colorado PUC Adopts "Prudent Avoidance" Strategy*, *supra* note 187, at 6.

215. Moon, *supra* note 74, at 2, col. 4 (statement of Middletown Councilwoman Peters).

216. A Department of Energy spokesperson claims that it would cost the U.S. \$5 billion every year for 20 years to address the EMF problem. *Power Line Talk*, MICROWAVE NEWS, Nov.-Dec. 1989 at 2. Whether this estimate is high or low, the figures are small in relation to overall utility cash outflows. For example, just one company, Northern States Power Co., reported net earnings of \$195.5 million on revenues of \$2.1 billion in 1990, leaving a difference of approximately \$1.9 billion attributable to expenses. See Kurschner, *Bright Images Start to Dim as NSP Draws Complaints*, MINNEAPOLIS-ST. PAUL CITY BUS., Feb. 4, 1991, at 1.

construction methods will be rejected by a rate-conscious public fails because even now many citizens, even those not directly affected by construction projects, believe that increased costs may save money and lives in the long run.²¹⁷ One citizen who seems to reflect the opinions of those informed about the EMF controversy stated, "We're going to pay for [power-line construction] if [the lines are] above ground [or] buried [or] here or across town. . . . We consumers are paying for it, and we want to have a say in what happens."²¹⁸ If utilities are seriously concerned about prohibitive costs, they might succeed in passing these costs on to safety-conscious consumers, if they engage in a well-managed public relations campaign.

British Columbia Hydro (BC Hydro) recently undertook the most innovative response to citizen concerns about EMFs along a major power line. It offered to purchase homes along the proposed right of way for fair-market value.²¹⁹ Sixty-four of the 144 residents to whom the utility made the offer accepted.²²⁰ Unlike most power-line construction projects in the United States,²²¹ this project was completed close to schedule.²²² The buy-out offer defused the controversy surrounding the project²²³ and diminished the prospects for future tort liability because those affected by the power line's EMFs now have had the choice of opting out or knowingly becoming exposed.²²⁴ Moreover, future purchasers of these homes from BC Hydro presumably will be informed of the EMF health controversy and can decide for themselves whether or not to assume the risk of living near power lines.

217. See Moon, *supra* note 74.

218. *Id.* at 2, col. 5 (statement of Middletown, New York resident opposed to new power-line construction).

219. *Canadian Utility Offers to Buy Homes Next to Power Line ROW*, MICROWAVE NEWS, May-June 1989, at 1; see also *B.C. Hydro Buy-Out Begins*, MICROWAVE NEWS, Sept.-Oct. 1989, at 3; *Around the U.S. and Canada*, *supra* note 187.

220. *B.C. Hydro Buy-Out Begins*, *supra* note 219, at 3. BC Hydro plans to resell the homes at a later date. *Id.*

221. See *supra* notes 2-5 and accompanying text.

222. *B.C. Hydro Buy-Out Begins*, *supra* note 219, at 3 (reporting that the line was completed and operational less than six months after the buy-out offer was made).

223. See *Canadian Utility Offers to Buy Homes Next to Power Line ROW*, *supra* note 219, at 14 (quoting residents who characterized the offer as a "real victory for us").

224. Presumably the 80 homeowners who stayed made informed decisions after considering information provided by the utility and by public hearings. See *B.C. Hydro Buy-Out Begins*, *supra* note 219; *Canadian Utility Offers to Buy Homes Next to Power Line ROW*, *supra* note 219, at 14.

This approach to the conflict also provides a way out where existing power lines are causing litigation problems for utilities.²²⁵

Conflict between utilities and opponents of both power-line construction projects and standing power lines already has curtailed the necessary expansion of the national electrical transportation network.²²⁶ The EMF controversy is likely to grow regardless of the findings of the studies underway today. The media has seized upon the issue and citizens affected by power-line EMFs know that the parameters of EMF health risks will not be known for many years. If the current trend continues, the conflict will produce increasing delays in power-line construction, more litigation, and the possibility of legislative and administrative intervention curtailing utility autonomy. Such intervention, though well-meaning, would be inept and possibly counterproductive, especially if it is guided by constituent sentiment against power-line construction and inflammatory reports about the dangers of EMFs.

Utilities must act to alleviate community concern and to increase safety, both as a precautionary measure and to ensure that construction of the nation's power transportation network continues at a necessary pace. Reforming public-relations strategies and increasing safety will require some added expense, but this should not hinder their implementation.

Utilities, as publicly held corporations, have a responsibility to protect citizens. Using a combination of the strategies proposed above, utilities can defuse opposition to existing and proposed power-line construction projects while increasing safety and improving their image. They can return to their proper task—assisting the public—rather than fighting the citizens they serve.

225. Nonetheless, BC Hydro has refused requests from citizens living along another proposed power line that the utility buy their homes. *Power Line Talk*, MICROWAVE NEWS, Nov.-Dec. 1989, at 3. The utility cited "the BC Utilities Commission's criticism that it acted 'imprudently' in making its [previous offer]" as a reason for its refusal. *Id.* at 3.

226. See *supra* notes 1-5 and accompanying text. As the economy expands and population growth increases, the nation's need for electrical transmission capacity also grows. Yet such capacity in the United States remains relatively constant and existing transmission systems are increasingly overburdened. The current situation prevents the efficient transportation of less expensive energy to areas with high electrical energy production costs. It also curtails utilities' ability to transport cheap power to areas unable to fulfill their own electrical power needs. These circumstances create unnecessarily high electricity prices in many places throughout the nation. Telephone interview with Stephen Lindenburg of the Electric Power Research Institute (June 12, 1990).

III. CONCLUSION

The controversy over studies indicating that EMFs from power lines adversely affect human health is likely to continue to grow in the 1990s. Without systematic institutional assessment of the issues raised by the controversy, the costs to society from imperfect legal rules and undue restrictions of power-line construction also will increase.

In eminent-domain proceedings, litigants and judges must develop the traditional theories of recovery for diminution in land values so that they adequately address diminution caused by EMF fears. Specifically, courts that allow compensation for fears proven to affect market values must refine their approaches so that inflammatory testimony about unproven links between EMFs and serious health disorders is inadmissible. Yet these courts must allow particularized evidence about the actual effects of fear on property values to improve appellate review. Courts that have not yet developed approaches guaranteeing consideration of EMF fears in eminent-domain proceedings also must adopt this analysis.

Tort theories are another potential avenue of recovery for persons adversely affected by EMFs. Of the three potentially productive theories of recovery—battery, trespass, and nuisance—trespass should be pursued by plaintiffs seeking monetary damages while nuisance theory is likely to provide the best avenue for injunctive relief. These can be adequate and equitable avenues of recovery for consumers adversely affected by EMFs.

The current controversy is expensive for both utilities and consumers. It need not be. The cost of alternative power-line construction techniques represents a small fraction of the total dollars at stake in the construction of electrical transportation devices today. Utilities can use these techniques, coupled with a more accommodating attitude toward consumer concerns, to reduce tort liability and avoid legislative interference with power-line construction. These approaches also will help mend fences with angry consumers.

The fact that the simple approach of BC Hydro is a novelty indicates how entrenched utilities have become in their fight against community opposition to new power-line construction. An examination of the issues surrounding power-line EMF fears indicates that simple solutions to the slowdown in power-line construction exist.