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Environmental Inequity: Economic Causes, Economic Solutions

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Environmental Inequity: Economic Causes, Economic Solutions

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Eliminating "environmental racism" has become one of the premier civil rights and environmental issues of the 1990s. Relying on a handful of studies that purport to show patterns of discrimination against minorities and the poor in the siting of industrial activity, federal and state policymakers have attempted to limit further industrial siting in these areas. These "environmental justice" initiatives appear to be premature, however, in light of the substantial problems in current data documenting the prevalence of discrimination. The article examines one such shortcoming: namely, that existing research fails to account for the dynamic nature of the housing market. Analyzing data from the St. Louis metropolitan area, this study finds that economic factors—not siting discrimination—are behind many claims of environmental racism. This phenomenon suggests the need to develop public policies that fit the economic nature of the problem. In particular, a policy that compensates individuals living near industrial sites is the key to securing environmental justice.

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Introduction

Combining the ethical concerns of the civil rights movement with environmentalism's sense of urgency, the environmental justice movement has emerged as a major force shaping contemporary environmental policy. Advocates of environmental justice, or environmental equity as it is sometimes called, assert that discrimination in the siting and permitting of industrial and waste facilities has forced minorities and the poor to bear disproportionately the ill effects of pollution. Furthermore, these advocates contend that the discriminatory application of environmental regulations and remediation procedures has essentially let polluters in minority communities off the hook.

The claims of environmental justice advocates have not fallen on deaf ears. All three branches of the federal government have taken steps to eliminate environmental racism. In February 1994, the Clinton administration issued an executive order on environmental equity, requiring each federal agency to "make achieving environmental justice part of its mission."[1] To comply with the order, agencies must issue detailed reports outlining how they plan to eliminate racially disparate environmental effects.

In the judiciary, federal judges are pursuing environmental justice by applying Title VI of the 1964 Civil Rights Act. Title VI, which prohibits agencies receiving federal funding from taking actions that disproportionately impact minorities, allows plaintiffs to prove discrimination without establishing discriminatory intent.[2] While this provision has not traditionally been used in the environmental arena, in the last year and a half over twenty Title VI suits were filed against various permitting agencies.[3] Naturally, the threat of such suits has strongly discouraged siting and permitting authorities from allowing industrial facilities to operate in minority areas.

In Congress, activity has focused more directly on limiting where industrial activity is concentrated. Over the last three years, Congress has considered a number of environmental justice bills, including the Environmental Justice Act of 1992,[4] the Environmental Equal Rights Act of 1993,[5] and the Public Health Equity Act.[6] All of these bills contained provisions that would prohibit or strongly discourage industries from operating in certain low-

1. *Executive Order Outlining Policy on Environmental Justice Issued February 11, 1994 (Text)*, Daily Rep. For Executives (BNA), at 29 (Feb. 11, 1994).

2. 42 U.S.C. §§ 2000d et seq. (1994). For a discussion of the use of Title VI, see Richard J. Lazarus, *Pursuing "Environmental Justice": The Distributional Effects of Environmental Protection*, 87 NW. U. L. REV. 787 (1993).

3. *Civil Rights Complaint Filed With EPA Says California Dump Siting Is Racist*, Cal. Env't Daily (BNA) 15 (Dec. 20, 1994).

4. H.R. 2105, 103d Cong., 1st Sess. (1993).

5. H.R. 1924, 103d Cong., 1st Sess. (1993).

6. S. 1841, 103d Cong., 2d Sess. (1994).

income and minority communities.[7] Recently, Congress also considered an Environmental Risk Evaluation Act.[8] Had this proposal been enacted, the Environmental Protection Agency (EPA) would have been required to factor environmental justice considerations into its assessment of environmental risk.

Besides the three branches of the federal government, many states are taking steps to combat alleged environmental racism. Various state houses are considering, or have recently considered, at least fifteen different environmental justice bills.[9]

Clearly, in terms of gaining legislative and regulatory attention, the environmental justice movement has been extraordinarily successful. In a short amount of time, what started as a small grassroots movement has blossomed into a powerful national force, influencing many high-level environmental decisions. In spite of this success, however, the movement faces lingering difficulties. There are substantial holes in the data documenting the extent of environmental racism. These research omissions are leading to policy proposals that are unlikely to alleviate environmental disparity in the long run.

This Article examines a primary shortcoming of many environmental justice studies that have been done to date: namely, that they do not account for the dynamic nature of housing markets. Employing an original analysis of data from the St. Louis metropolitan area to separate out the possible causes of environmental disparities, this Article concludes that, to the degree that environmental disparities exist, it is economic factors—not siting discrimination—that are behind many claims of environmental racism. Industrial facilities that were originally sited in white areas often become surrounded by minority residents who are attracted to these neighborhoods by falling housing prices. This phenomenon suggests the need to develop public policies that fit the economic nature of the problem. In particular, a policy that facilitates compensation of individuals residing in communities accepting industrial and waste facilities is the key to securing environmental justice. Such an approach addresses the economic factors that create and exacerbate environmental disparities, promotes justice and efficiency, and offers valuable benefits to impoverished communities.

This Article does *not* address possible bias on the part of regulating authorities given the responsibility of enforcing environmental protection laws or administering environmental clean-up programs. It instead focuses exclusively on charges of bias in private and public sector siting of pollution sources.

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7. For a detailed discussion of these bills, see CHRISTOPHER BOERNER & THOMAS LAMBERT, ENVIRONMENTAL JUSTICE? (1994).

8. S. 123, 104th Cong., 1st Sess. (1995). *See also Moynihan Bill Would Add Equity Concerns to Risk, Cost Evaluations of Programs*, Chem. Reg. Daily (BNA) (Jan. 10, 1995).

9. For a survey of state environmental justice legislation, see BARTON HACKER, ENVIRONMENTAL JUSTICE: LEGISLATION IN THE STATES (1994).

Existing Research on Environmental Racism. The claim that minorities and the poor face discrimination in the environmental arena is not a novel one. For over two decades, small grassroots organizations such as the Mothers of East Los Angeles and Chicago's People for Community Recovery have highlighted what they consider to be systematic discrimination in the siting, regulation, and remediation of industrial and waste facilities.[10]

Detailed empirical analysis of these claims, however, has been limited. While a recent literature survey by the National Wildlife Federation reports to have found sixty-three studies documenting environmental discrimination,[11] the vast majority of these studies are either very limited in scope or suffer from profound methodological difficulties. Indeed, only a handful of major studies specifically address the environmental justice issue.

The first such study was published in 1983 by the sociologist Robert D. Bullard, who was at that time on the faculty of the University of California at Riverside.[12] Examining population data for areas surrounding landfills and incinerators in Houston, Texas, Dr. Bullard found that the vast majority of the city's landfills and incinerators was located in disproportionately black communities. From this finding, Dr. Bullard deduced that environmental racism had made Houston's African-American neighborhoods the "dumping grounds for the city's household garbage."

In 1983, the U.S. General Accounting Office (GAO), the investigative arm of Congress, provided the second widely discussed study documenting environmental disparity.[13] Examining data from four commercial hazardous waste facilities in the Southeast, the GAO found that the populations in three of the four surrounding areas were primarily African-American. The study also found the facilities to be in disproportionately poor areas.

The most widely cited environmental equity study, *Toxic Wastes and Race in the United States*, was published in 1987 by the Commission for Racial Justice of the United Church of Christ (CRJ). Using population data from ZIP codes as well as information gathered from the EPA and other sources, the CRJ discovered a positive correlation between the number of commercial waste facilities in a ZIP code area and the percentage of minority residents in that area. In August 1994, the CRJ released *Toxic Wastes and Race Revisited*, an update of its earlier study. This update, which employed the same methodology as before, claimed to uncover "even greater racial disparities in the placement of toxic waste sites, despite increased attention to the issue of envi-

10. For an overview of grassroots environment organizations and their activities, see Norris McDonald, *Grass-Roots Groundswell: An Introduction*, 175N-92-001 EPA J. 45 (1992); Dorceta Taylor, *The Environmental Justice Movement*, 175N-92-001 EPA J. 23 (1992).

11. BENJAMIN GOLDMAN, NOT JUST PROSPERITY: ACHIEVING SUSTAINABILITY WITH ENVIRONMENTAL JUSTICE (1993).

12. Robert D. Bullard, *Solid Waste Sites and the Black Houston Community*, 53 SOC. INQUIRY 273 (1983).

13. U.S. GENERAL ACCOUNTING OFFICE, SITING OF HAZARDOUS WASTE LANDFILLS AND THEIR CORRELATION WITH RACIAL AND ECONOMIC STATUS OF SURROUNDING COMMUNITIES (1983).

ronmental justice as evidenced by an Executive Order from President Clinton on this issue."[14]

The above studies purporting to provide evidence of environmental discrimination did not go entirely unchallenged. In 1994, the Social and Demographic Research Institute at the University of Massachusetts (UMass) published a study that found no statistical difference between the percentage of minorities living in neighborhoods with commercial hazardous waste facilities and the percentage of minorities in areas without such facilities.[15] The UMass study is unique in that it was the first national study of environmental justice that did not rely on ZIP codes (or larger geographic units) as the primary unit of analysis. Because ZIP codes are often quite large, they can mask demographic differences among smaller areas located within the same ZIP code (e.g., a large, rural ZIP code may be predominately white over all, while the population of one corner of the ZIP code is overwhelmingly nonwhite). In order to account for this possibility, UMass researchers repeated the CRJ study using data from census tracts—geographic units that are smaller than ZIP codes and hence less likely to mask demographic subtleties. The results of the UMass study, however, have been largely ignored in policy discussions. One likely explanation for the study's lack of influence is its primary funding source. The UMass study was funded by a grant from WMX Technologies, the nation's largest waste hauler; it is possible that this funding source raised suspicions that the study's numbers were warped by corporate influence.

The studies discussed above, with the exception of the UMass study, provide most of the available empirical evidence on the extent of environmental racism in the United States.[16] It is thus remarkable that such a limited

14. COMMISSION FOR RACIAL JUSTICE, UNITED CHURCH OF CHRIST, TOXIC WASTES AND RACE REVISITED 1 (1994). For a response to this study, see Thomas Lambert & Christopher Boerner, *Discrimination is Effect, Not Cause*, SAN DIEGO UNION TRIB., Sept. 1, 1994, at B11.

15. Douglas Anderton et al., *Hazardous Waste Facilities: "Environmental Equity" Issues in Metropolitan Areas*, 18 EVALUATION REV. 123 (1994).

16. In addition, evidence of alleged environmental racism has been buttressed by at least one other study focusing not on siting statistics, but rather on racial disparities in EPA enforcement and remediation procedures. Authored by Marianne Lavelle and Marcia Coyle in 1992, this study purportedly found that the EPA levies smaller fines and takes longer to clean up waste sites in minority communities than in white areas. Marianne Lavelle & Marcia Coyle, *Unequal Protection*, NAT'L L.J., Sept. 21, 1992, at S2.

There are, however, two very substantial difficulties with Lavelle and Coyle's study. First of all, the authors define "minority community" too broadly. Some "minority" communities in the study have a higher percentage of white residents than the nation as a whole. The study, for example, considers Staten Island a minority community, stating that "small fines in minority areas have been lodged against industrial giants: a $22,000 air pollution penalty against Proctor and Gamble Co. in Staten Island, N.Y." *Id.* at S6. Staten Island, however, is *85% white*. It is, in fact, the "whitest" of New York's five boroughs. To call the area a minority community seems absurd.

Secondly, Lavelle and Coyle ignore alternate explanations besides discrimination for disparities in fines. According to EPA Administrator Carol Browner, "When [the EPA] fine[s] companies, when we penalize them for violating environmental laws, we do take into account ability to pay the fine, because not only do we want a fine paid but we want a corrective action taken. We want the pollution cleaned up. And so it is a comprehensive analysis that we are undertaking to ensure that we don't, in fact, have lower

body of knowledge has fueled the policy whirlwind highlighted in the introduction. More importantly, this scant body of knowledge has elevated environmental racism from the status of hypothesis to that of fact. The ethos embraced by officials responsible for environmental regulation is clear: environmental racism unequivocally exists. "Nobody can question," claimed EPA administrator Carol Browner in a press briefing two years ago, "that, for far too long, communities across the country—low income, minority communities—have been asked to bear a disproportionate share of our modern industrial life."[17]

The Economic Causes of Environmental Inequity. All of the studies described above share a common flaw. Professor Bullard's study, the GAO report, and both CRJ studies all examined *current* racial and demographic data around polluting and waste plants. Environmental justice advocates have pointed to the findings of these studies as evidence of discrimination in siting and permitting.[18] Their reasoning seems to be that because polluting and waste facilities are disproportionately located in minority areas, the plants must have been sited in a discriminatory fashion.

The causal explanation for the problem of environmental inequity is more complex, however. Even if a disproportionate percentage of industrial plants are currently located in minority areas (a contention the UMass study questions), this does not imply that these facilities were *sited* in a discriminatory fashion. To determine whether or not the plants were sited proportionately, one would need to consider the demographic and racial conditions of their host communities *at the time the facilities were built.*

It is of course not unusual for demographic conditions around industrial plants to change over time. Facilities originally sited in white areas may eventually become surrounded by minority residents. Those who reason that a disproportionate percentage of minorities and poor people around industrial plants indicates discriminatory siting ignore alternate explanations besides racism for any currently observed disparity.

Many environmental justice advocates insist that the issue of alternative explanations for environmental inequity is inconsequential. In a recent issue of *Environment* magazine, for instance, Professor Robert Bullard criticized an article we wrote on this issue suggesting that the dynamics of the housing market, rather than racism or discrimination, may be behind current environ-

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penalties being applied in certain communities. But it's not as simple as just looking at the dollar amount that may have been applied in a particular event." *White House Briefing on Environmental Justice*, Feb. 11, 1994, *available in* LEXIS, News Library, Archives File.

Seeking to explore alternate explanations for disparities in fines, the authors of this paper requested the data set upon which the *National Law Journal* findings were based. We were told, however, that the data would not be released because the findings were "too controversial."

17. *Id.*

18. *See, e.g.*, Paul Mohai & Bunyan Bryant, *Demographic Studies Reveal a Pattern of Environmental Injustice, in* ENVIRONMENTAL JUSTICE 10 (Jonathan S. Petrikin ed.,1995); Robert D. Bullard, *Overcoming Racism in Environmental Decisionmaking*, 36 ENV'T 4, 11 (1994).

mental disparity. According to Professor Bullard, "Thomas Lambert and Christopher Boerner are engaged in a senseless 'chicken-or-egg' debate—the question of which came first, the community or the waste facilities. The debate is a distraction from the real task of ending environmental injustice wherever and whenever it occurs."[19]

It is impossible, however, to "end environmental injustice wherever and whenever it occurs" without considering what factors are motivating environmental disparity. Rather than being a distraction, an examination of "which came first" is vitally important to creating a long-term policy solution. A static analysis of environmental equity concerns simply does not provide sufficient information to develop workable solutions and may often mistake disparities for discrimination. In fact, the shortcomings of a static analysis were nicely illustrated by Professor Vicki Been in a 1994 *Yale Law Journal* article.[20] Looking at the GAO study and Robert Bullard's account of environmental racism in Houston, both of which failed to factor in data from the time of industrial sitings, Professor Been attempted to refine these analyses by gathering demographic data on the census tracts including and surrounding the relevant facilities from the time the plants were constructed.

Professor Been's extension of the Bullard study reveals that discriminatory siting may not lie behind many instances of current environmental disparity. Considering the racial composition of areas around Houston's landfills and incinerators at the time the facilities were built, Professor Been found that five of Houston's ten landfills and incinerators were originally located in areas with lower percentages of minority residents than Harris County (the jurisdiction covering Houston). The other five facilities were built in areas with above-average percentages of nonwhite residents.[21]

Over time, however, demographic changes occurred around the plants. Minority percentages increased around all the facilities initially located in predominantly white areas, so that by 1990, nine out of the ten landfills and incinerators were located in neighborhoods with above average percentages of minority residents.[22] Professor Been found similar market dynamics to be at work with respect to poverty. At the time they were built, only three of the ten waste plants were located in neighborhoods with substantially higher than average poverty rates. By 1990, however, seven of the ten facilities were found to be in neighborhoods with disproportionately high poverty rates.[23]

On the other hand, Professor Been's analysis of the GAO study failed to show demographic trends similar to those in her extension of the Bullard study. Though the GAO study looked only at four sites, a rather small sample

19. Bullard, *supra* note 18, at 3.

20. Vicki Been, *Locally Undesirable Land Uses in Minority Neighborhoods: Disproportionate Siting or Market Dynamics?* 103 YALE L. J. 1383, 1398 (1994).

21. *Id.* at 1403.

22. *Id.* at 1411 (tbl. 5).

23. *Id.* at 1412 (tbl. 6).

from which to draw significant conclusions, Professor Been's analysis showed that the neighborhoods surrounding these four sites did have higher percentages of minority residents at the time of siting than the overall average for the state in which they were located.[24]

The demographic changes noted in Professor Been's analysis of Houston industrial sites may be understood as instances of "white flight," a demographic phenomenon that can be explained in terms of the dynamics of the housing market. Every year, between 17 and 20% of Americans move to a new home.[25] A primary reason for relocating is dissatisfaction with one's current living conditions. After an industrial or waste facility moves into a neighborhood, the surrounding area is commonly perceived to be less desirable, and real estate prices fall accordingly. Indeed, the UMass study found that the average value of homes in census tracts with commercial hazardous waste facilities was approximately $11,000 less than the value of homes in other census tracts ($47,000 versus $58,000).[26] Over time, the attractiveness of cheap housing draws lower-income homeowners and renters. A racially skewed income distribution, some degree of lingering housing discrimination, and people's tendency to locate near others who are "like themselves" often cause these areas to have a larger share of nonwhite residents.[27]

Moreover, industrial siting tends to beget further industrial siting. As plant construction causes real estate prices in a community to fall, the area becomes more attractive to other businesses seeking to build industrial facilities. The construction of these plants may cause the neighborhood to be perceived as an even less desirable place to live, and real estate prices may fall further, attracting more low-income residents and additional polluting facilities.[28]

Professor Been's study effectively drew attention to the role market dynamics play in creating environmental disparity.[29] Her analysis, which was

24. *Id.* at 1400.

25. *Id.* at 1388.

26. Anderton et al., *supra* note 15, at tbl. 1.

27. For evidence of race differences in income distribution, see James P. Smith & Finis Welch, *Race Differences in Earnings: A Survey and New Evidence*, *in* CURRENT ISSUES IN URBAN ECONOMICS 40 (Peter Mieszkowski & Mahlon Straszheim eds., 1979). For a discussion of discrimination in the housing market, see John Yinger, *Prejudice and Discrimination in the Urban Housing Market*, *in* CURRENT ISSUES IN URBAN ECONOMICS 430 (Peter Mieszkowski & Mahlon Straszheim eds., 1979). For evidence that an individual's decisions to relocate and their choice of neighborhoods is influenced by a desire to be near others who are "like themselves," see WILLIAM M. DOBRINER, CLASS IN SUBURBIA 64 (1963).

28. For a discussion of the local impact of industrial siting, see Vicki Been, *What's Fairness Got to Do with It? Environmental Justice and the Siting of Locally Undesirable Land Uses*, 78 CORNELL L. REV. 1001 (1993).

29. University of Chicago Professor Donald Coursey found similar trends in a study of CERCLA sites in the city of Chicago. At the time of siting, most of Chicago's industrial activity was concentrated in census tracts that were not densely populated and had relatively few, if any, minority residents. As the years progressed, however, concentrations of minority residents living in close proximity to hazardous waste sites increased noticeably. *See* DONALD COURSEY ET AL., ENVIRONMENTAL RACISM IN THE CITY OF

limited to ten sites in the Houston area, pointed to a need for more extensive research of "white flight" in other metropolitan areas. Been's study motivated us to conduct a more comprehensive study examining the extent and possible causes of environmental disparity in the St. Louis metropolitan area.

I. Statistical Analysis of Environmental Inequity in St. Louis

Unlike Professor Been's examination, which was limited to Houston's landfills and incinerators, the following analysis of St. Louis, Missouri considers demographic characteristics around several different types of industrial facilities and waste sites.[30] The facilities examined include three types of pollution sources: permitted commercial and noncommercial hazardous waste treatment, storage, and disposal facilities (TSDFs), which include active industrial plants that handle hazardous waste; permitted solid waste landfills and incinerators; and inactive hazardous waste sites (those regulated by the Comprehensive Environmental Response, Compensation, and Liability Act[31]—often referred to as CERCLA or "Superfund" sites). Geographically, the St. Louis area is taken to include the city of St. Louis and St. Louis County in Missouri, as well as St. Clair and Madison Counties in Illinois. In total, we examined 167 industrial facilities and waste sites, including 73 active facilities and 94 inactive waste sites.

A. *The Evidence of Environmental Disparity*

Our statistical analysis found no significant difference in poverty rates and percentages of minority residents between census tracts with active facilities (TSDFs, landfills, and incinerators) and those tracts without such facilities.[32] Including inactive CERCLA waste sites in the data set, however,

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CHICAGO: THE HISTORY OF EPA HAZARDOUS WASTE SITES IN AFRICAN-AMERICAN NEIGHBORHOODS (1994).

30. CHRISTOPHER BOERNER & THOMAS LAMBERT, ENVIRONMENTAL JUSTICE IN THE CITY OF ST. LOUIS: THE ECONOMICS OF SITING INDUSTRIAL AND WASTE FACILITIES (Center for the Study of American Business,Working Paper No. 156, 1995).

31. 42 U.S.C. §§ 9601 et seq.

32. BOERNER AND LAMBERT, *supra* note 30, at 10-14. The statistical analysis identified six variables that provide useful information about the socioeconomic and demographic characteristics of census tracts: Median housing values (MDHV), the percentage of male residents employed in the labor force (WORK), the percentage of residents below the poverty line (POV), the percentage of nonwhite residents (MINOR), the percentage of residents with a high school education or higher (PCTEDU), and the percentage of residents employed in manufacturing (PCTMANF). While this subset of variables is far from perfect, it does allow us to glean important information about the racial, ethnic, and industrial composition of census tracts. In addition, we created a dummy variable for whether or not a facility was located in a given tract (PLANT). This variable was coded either 0 (no facility present) or 1 (facility present).

We began our analysis by examining how census tracts with polluting facilities differed from those without facilities in 1970, 1980, and 1990—the three years for which socioeconomic and demographic information was readily available. Using these seven variables, we ran two statistical tests: the t-test for a difference of means, and a two-sample Wilcoxon Rank-Sum test for the equality of distributions. Both

uncovered weak evidence that the percentages of poor and minority residents living near industrial and waste sites are significantly higher than the corresponding percentages living in tracts without facilities.[33] It would therefore seem that proponents of environmental discrimination theories could, upon a first glance, find evidence to support their theories in our St. Louis study.

Such a conclusion, however, would be a premature one. This difference may be partly or even entirely attributable to factors unrelated to discriminatory siting of facilities. For instance, the median housing values of tracts hosting polluting facilities are significantly lower than housing values in tracts without plants.[34] It is only when significant disparities in housing values arise that differences in the percentages of poor and minority residents become noticeable.[35] This finding provides empirical support for the theory that housing values are closely related to existing environmental inequities, raising the possibility that siting decisions caused an influx of minority and poor residents, as opposed to the contrary causation assumptions made by environmental discrimination theorists.

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tests were used to test the null hypothesis that the socioeconomic and demographic characteristics of census tracts with facilities are essentially the same as those without facilities.

Tables 1a, 1b, and 1c, *infra,* provide the results of these tests when TSDFs, landfills, and incinerators are examined. In each of the three years analyzed, the percentage of minority residents in census tracts containing polluting facilities is approximately the same as in tracts without such facilities (see T-scores and Wilcoxon Z-statistic in tables 1a, 1b, and 1c). Similarly, our tests found no significant difference in poverty rates between census tracts with and without TSDFs. These two conclusions are sufficient to raise serious questions about environmental justice advocates' claims of disproportionate impact—at least with respect to TSDFs in the St. Louis area.

The most consistent result of tables 1a, 1b and 1c concerns the occupation of residents surrounding St. Louis TSDFs. While no clear differences were found in employment rates, the percentage of residents employed in manufacturing was found to be significantly higher in census tracts with TSDFs than in other tracts for one or both of the tests in each of the years examined. This should not be surprising given that many TSDFs are located in industrial areas where a larger percentage of residents would naturally be employed in manufacturing. This result is consistent with the TSDF research conducted by the University of Massachusetts in 1994.

33. *Id.* at 11-14. The addition of CERCLA sites to the data set changed our results noticeably. *See* Tables 2a, 2b & 2c, *infra.* First, the percentage of residents employed in manufacturing is no longer significantly larger for tracts with facilities than for other census tracts. This makes sense given that Superfund sites are inactive and, hence, not employing workers. Second, there is weak evidence that the percentages of poor and minority residents living near polluting facilities are significantly larger than the percentages of such individuals living in tracts without such facilities. (The Wilcoxon Z-statistic for the percentage of minority residents is significant at the 5% level in 1970 and 1980 and at the 10% level in 1990. Similarly, the Z-statistic for poverty is significant at the 5% level in 1980 and at the 10% level in 1970 and 1990.) There is also very weak evidence that the residents of census tracts with CERCLA facilities, TSDFs, landfills, and incinerators are somewhat less educated than the residents of other tracts.

34. *See* Tables 2a, 2b & 2c, *infra.* The median housing values of tracts hosting polluting facilities are significantly lower than tracts without plants for each of the three years examined. (The Z-statistic is significant at the 1% level for 1970 and 1980, and at the 5% level in 1990).

35. *See* BOERNER & LAMBERT, *supra* note 30, at 15. These results may also suggest that industrial facilities tend to be sited in neighborhoods where property values are quite low. Naturally, industry executives will be expected to minimize costs by locating where property values are low.

B. *The Evidence of "White Flight"*

1. *Racial Dynamics Around Active Facilities*

In order to test the possibility that the housing market prompts poor and minority individuals to move into industrial areas, we examined how the racial characteristics of communities containing active industrial and waste facilities changed over time. We were able to identify the start-up dates for 68 of the 73 locatable TSDFs, landfills, and incinerators in the area.[36] Historical census data were available for the areas surrounding sixty-two of these sixty-eight plants.[37] An examination of the racial characteristics of these tracts from the census taken closest to the time the facilities were built revealed that only fourteen of these sixty-two facilities (23%) were initially sited in census tracts with greater minority percentages than that of the overall St. Louis area.[38] Thus, close to 80% of active facilities in St. Louis were originally sited in census tracts that were either uninhabited or contained higher than average percentages of nonminority (white) residents.

Unlike Vicki Been's Houston study, this analysis did not find that the majority of the host communities subsequently developed higher than average minority concentrations. By 1990, still only seventeen of the St. Louis area sites (27%) were in census tracts with higher-than-average percentages of nonwhite residents.[39] Nevertheless, percentages of minority residents did increase at a disproportionate rate around hazardous waste TSDFs, landfills, and incinerators. Census data were available for fifty active facilities that were constructed prior to 1985. Between the time they were built and 1990, minority percentages around 84% of these facilities (fourty-two out of fifty) grew at a substantially faster rate than did the minority percentage in the overall area.[40] In other words, "white flight" occurred more quickly around the vast majority of TSDFs, landfills, and incinerators than it did in the overall St. Louis area.

36. This information was obtained by phoning the owner of each facility and requesting a contact with access to records of the date that the facility opened for operation. In many cases, multiple owners had to be contacted before records with this information could be obtained. Also, we compared the address from the owner's records and our records to ensure that we were obtaining the startup date for the appropriate facility.

37. Census information is, of course, only available for areas that are designated into census tracts or "tracted." Six of the sixty-eight facilities were in areas that were not tracted near the time of siting. For the thirteen facilities sited before 1935, the 1930 census (the first census broken into tracts) was used to determine community demographics at the time of siting. Several of these plants were sited significantly earlier than 1930, but the 1930 information is the earliest available data.

38 *See* BOERNER & LAMBERT, *supra* note 30, at 16.

39. *Id.*

40. *Id.*

2. *Demographic Changes Around All Sites (1970-1990)*

In most cases, it was impossible to determine start-up dates for inactive hazardous waste (CERCLA) sites. It was, therefore, impossible to trace demographic changes around those sites from the time they came to exist. This analysis does, however, trace changes in residential patterns around those sites from 1970 to 1990. We assume that St. Louis area CERCLA sites were established prior to 1970, and can therefore be safely included in this analysis. Virtually all of the EPA's descriptions that were available for these sites referenced operations that were taking place prior to 1970. Thus, even though precise start-up dates for St. Louis area CERCLA sites were not available, they are included in this analysis of changing residential patterns from 1970 forward.

Moreover, changes in residential patterns around industrial and waste facilities are likely to have been more pronounced after 1970 because public perception of pollution as unhealthy and undesirable dramatically increased during this time.[41] Prior to these years, pollution was seen as a nuisance, but not necessarily as a significant health risk. Hence, one would expect the effects of pollution on land values and residential patterns to be most noticeable beginning in the early 1970s.

This is not to say that the presence of pollution did not motivate demographic changes around these facilities prior to 1970. Many CERCLA sites (as well as active facilities) in place before 1970 may have been viewed as nuisances by their neighbors and may have motivated demographic trends such as falling housing values, "white flight," and increasing concentrations of poor residents. Indeed, higher percentages of minority residents and impoverished families, as well as lower family incomes and housing values, around facilities in 1970 may indicate that the presence of industrial and waste sites had already led to demographic transitions in those areas.[42] Nevertheless, because public perception of pollution's risks greatly expanded in the 1960s and early 1970s, one would expect to see the greatest demographic changes occurring after the 1970 census.

The findings of this analysis support the theory that environmental disparities are exacerbated as minority and poor individuals voluntarily move into areas surrounding industrial and waste sites. Between 1970 and 1990, concentrations of poor and minority individuals increased disproportionately around the St. Louis area's CERCLA sites, TSDFs, and nonhazardous land-

41. Many events occurred in the 1960s and early 1970s increasing the public's concern about the negative effects of pollution. For a discussion of the rise of the environmental movement during this period, see NORMAN J. VIG & MICHAEL E. KRAFT, ENVIRONMENTAL POLICY IN THE 1990S 11-13 (1990).

42. Such data could also, of course, indicate that the facilities were sited disproportionately in lower income, minority areas. The purpose of examining trends from 1970 to 1990 is to compare rates of demographic changes around facilities with those for the overall area, to determine which of these explanations is more likely.

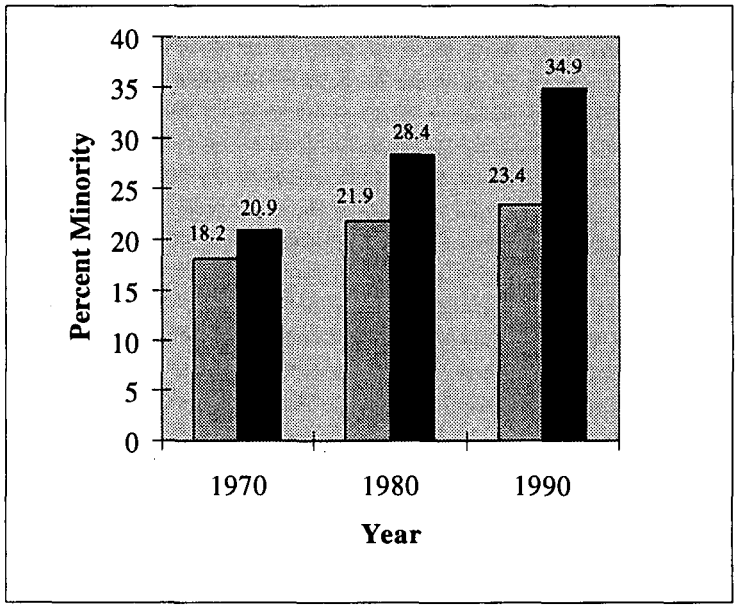
fills and incinerators. Furthermore, mean real family incomes fell in these areas during the twenty-year period, and median real housing values increased at a slower rate around these facilities.[43] While the concentration of minority residents in a given census tract in the overall St. Louis area increased, on average, by 29%, concentration of minority residents in tracts containing industrial facilities increased by 67% (see Figure 1.) This evidence suggests that, in this twenty-year period, minority individuals were disproportionately moving to (or remaining in) areas surrounding industrial and waste sites.

Poverty rates similarly increased more quickly around industrial and waste facilities. From 1970 to 1990, the average census tract in the St. Louis area experienced a 10% net increase in its poverty rate, compared to a 53% increase in tracts containing industrial and waste facilities (see Figure 2). While St. Louis's mean family income rose 5.6%, in real terms, from 1970 to 1990, this figure actually fell 1.4% around industrial and waste sites (see Figure 3). Relative increases in poverty rates and decreases in family incomes indicate that a higher percentage of low-income families were moving to (or remaining in) these areas from 1970 to 1990.

43. Unlike family income, median housing values increased, in real terms, around St. Louis's industrial and waste sites—but the growth was slower than for St. Louis overall. Between 1970 and 1990, the median real housing value for St. Louis overall grew 8.7 percent. However, average growth in the median housing value around industrial and waste facilities was substantially slower. The average facility in the St. Louis area was located in a census tract whose median real housing value grew only 3.9 percent between 1970 and 1990 (see Figure 4). This finding supports the "market dynamics" theory which predicts that growth in housing values will be slower around industrial and waste facilities than in nonindustrial areas.

Figure 1

Comparison of Minority Concentration Around Industrial and Waste Sites to the Concentration in the St. Louis Area as a Whole, 1970-1990



▩ Average for all Census Tracts in St. Louis Area

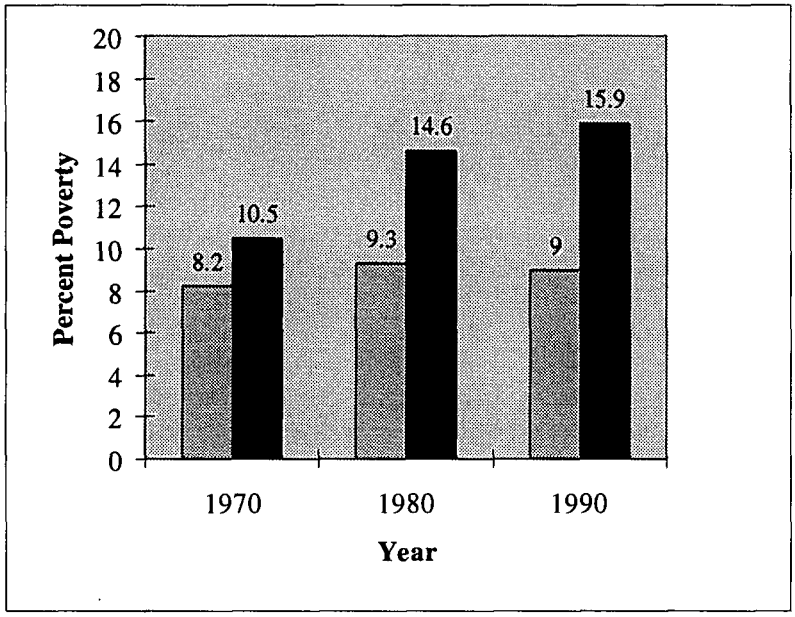
■ Weighted Average for Census Tracts Containing Industrial or Waste Facilities (TSDFs, Landfills, Incinerators, and CERCLA Sites)[a]

Source: Authors' calculations.

a. For each facility, the minority concentration for its host census tract is entered. The sum of these figures is divided by the total number of facilities to produce a weighted average for census tracts hosting facilities.

Figure 2

Comparison of Poverty Levels Around Industrial and Waste Sites to Rates in the St. Louis Area as a Whole, 1970-1990



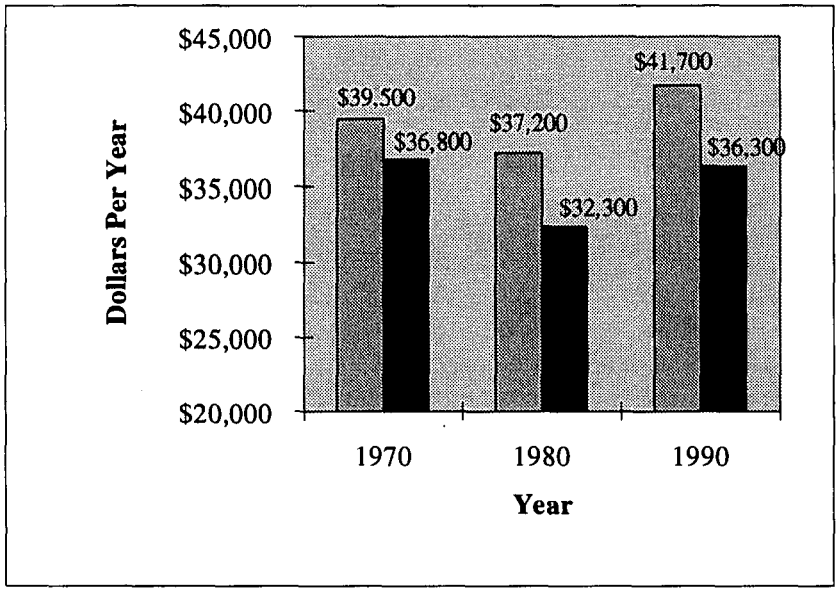
▨	Average for all Census Tracts in St. Louis Area
■	Weighted Average for Census Tracts Containing Industrial or Waste Facilities (TSDFs, Landfills, Incinerators, and CERCLA Sites)[a]

Source:Authors' calculations.

a. For each facility, the minority concentration for its host census tract is entered. The sum of these figures is divided by the total number of facilities to produce a weighted average for census tracts hosting facilities.

Figure 3

Comparison of Mean Family Income (1990 Dollars) Around Industrial and Waste Sites to Income in the St. Louis Area as a Whole, 1970-1990



▨ Average for all Census Tracts in St. Louis Area

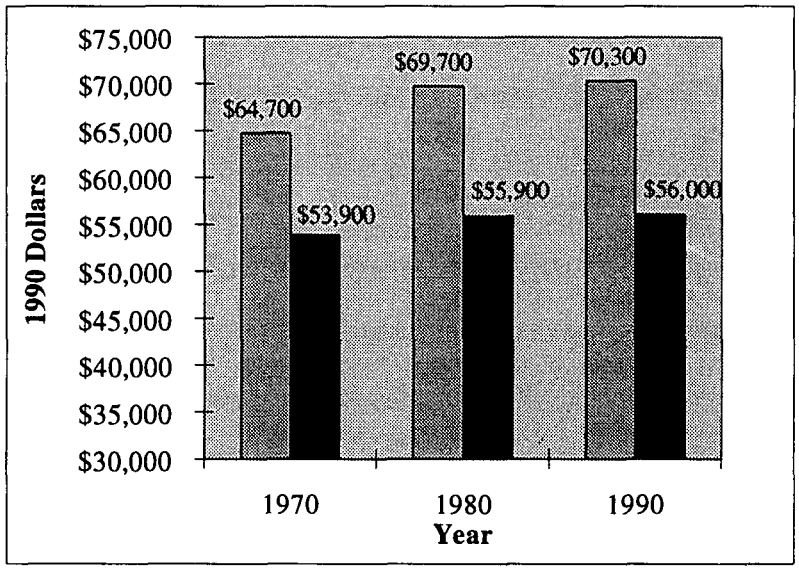
■ Weighted Average for Census Tracts Containing Industrial or Waste Facilities (TSDFs, Landfills, Incinerators, and CERCLA Sites)[a]

Source:Authors' calculations.

a. For each facility, the minority concentration for its host census tract is entered. The sum of these figures is divided by the total number of facilities to produce a weighted average for census tracts hosting facilities.

Figure 4

Comparison of the Median Housing Value (1990 Dollars) Around Industrial and Waste Sites to the Value in the St. Louis Area as a Whole, 1970-1990



▩ Average for all Census Tracts in St. Louis Area

■ Weighted Average for Census Tracts Containing Industrial or Waste Facilities (TSDFs, Landfills, Incinerators, and CERCLA Sites)[a]

Source:Authors' calculations.

a. For each facility, the minority concentration for its host census tract is entered. The sum of these figures is divided by the total number of facilities to produce a weighted average for census tracts hosting facilities.

It should be noted that the conclusions drawn from this study may provide an incomplete picture of the environmental justice issue in a number of respects. First, this study looks at only one major metropolitan area.[44] Research in other cities and rural areas may provide valuable insight into other factors that might contribute to existing environmental disparities. Second, while there is no evidence that the owners of industrial facilities willfully sited them in minority or poor neighborhoods, other forms of racial discrimination *may* have been a factor influencing the subsequent migration of these residents to communities hosting polluting facilities. Future research should attempt to identify the factors which influence demographic trends surrounding environmental nuisances. Finally, our statistical tests do not include a host of factors which may affect a company's decision to site in a given area. Geographic factors such as zoning restrictions and access to transportation routes are likely to be important in determining the location of industrial facilities. Future work on environmental equity should also consider these issues, which may allow the importance of race in siting decisions to be isolated with greater precision. Even with these limitations, however, this study does provide substantial empirical support to the theory that existing inequities are primarily caused by economics rather than siting discrimination, suggesting that the environmental justice movement could be more effective by focusing on these underlying economic causes.

II. Solutions

A. *Proposed Environmental Justice Policies*

The failure to propose concrete remedies for environmental inequities has been the environmental justice movement's most obvious shortcoming. While environmental justice advocates often suggest creating various offices, councils, and task forces, they rarely detail how these entities should influence the pollution allocation process.[45] Instead, they primarily advance gen-

44. It should be noted, however, that St. Louis is an especially salient focus for an environmental justice study such as this. The city is ranked among the most segregated cities in the United States. *See* STATISTICAL RECORD OF BLACK AMERICA 376 (Carrell P. Horton & Jessie Carney Smith eds., 1990). As such, to the extent that a statistically interesting correlation between race and proximity to polluting facilities exists anywhere, St. Louis would seem to be a likely candidate.

45. *See, e.g., Environmental Justice: Hearings Before the Subcomm. on Civil and Constitutional Rights of the House Comm. on the Judiciary,* 103d Cong. 5-6 (1993) (statement of Dr. Benjamin F. Chavis, Jr., Executive Director, Commission for Racial Justice, United Church of Christ); *id.* at 56-62 (statement of Deeohn Ferris, Program Director, Environmental Justice Project, Lawyer's Committee for Civil Rights Under Law). *See also* FIRST PEOPLE OF COLOR ENVIRONMENTAL LEADERSHIP SUMMIT, PRINCIPLES OF ENVIRONMENTAL JUSTICE (1991) (copy on file with authors). This lack of specific recommendations is also seen in the following description of the objectives of environmental justice from Benjamin Goldman. According to Mr. Goldman, "Environmental justice requires proactive shifts in consciousness, greater responsibility to and respect for diversity, and raising equity and fairness objectives to a par with efficiency goals. A roundtable approach to decision-making is needed to ensure destructive

eral concepts of equality, not wishing to endanger their coalition by specifying the precise methods of achieving "justice," "fairness," or "equity."

So far, environmental justice policies have focused primarily on limiting industrial siting in low-income and minority neighborhoods. The use of Title VI of the 1964 Civil Rights Act,[46] for example, strongly discourages authorities from allowing industrial and waste facilities to operate in minority areas. Moreover, the threat of being involved in discrimination suits encourages facility owners to build away from poor and minority neighborhoods.

Legislative proposals similarly seek to restrict where facilities may operate. The environmental justice bills mentioned in the introduction to this report—the Environmental Justice Act, Environmental Equal Rights Act, Public Health Equity Act, as well as many state proposals[47]—would effectively prohibit or discourage the operation of polluting and waste plants in minority areas.

Under executive order to develop strategies for achieving environmental justice, federal agencies have also focused on influencing where facilities operate. Region I of the EPA (comprised of the New England states) recently discouraged industrial and waste firms from operating in low-income and minority communities by committing to triple the number of environmental inspections in such areas.[48] Furthermore, the EPA's Office of Solid Waste and Emergency Response called for the agency to "form a siting work-group to evaluate location standards" and "develop a siting guidance document . . . on how to best site a hazardous waste facility in light of environmental justice concerns."[49] While the agency did not specify how location and siting standards might change, it is likely that any evaluation of location standards and development of guidelines for siting facilities "in light of environmental justice concerns" will have the effect of encouraging facility owners to operate away from poor and minority areas.

The empirical evidence from the study of St. Louis suggests that these environmental justice policies are misguided. To the extent that the dynamics of the housing market lead minorities and the poor to move to the "nuisance", policies that regulate where polluting and waste facilities may operate do not provide lasting solutions. Forcing industrial development into wealthier white

disproportionate impacts do not occur. Workers, communities, and others who have been left out of decisions about what goods and services corporations produce and how they are produced need to be brought into such decision-making processes in the future if environmentally-sustainable and socially-just economic activities are to happen." Goldman, *supra* note 11, at xxx. Mr. Goldman, like many other environmental justice advocates, often speaks in generalities. Rarely, however does he specify the precise public policies that will achieve "shifts in consciousness, greater responsibility to and respect for diversity, and raising equity and fairness objectives to a par with efficiency goals." *Id.*

46. 42 U.S.C. §§ 2000d et seq. (1994).

47. *See supra* notes 4-9.

48. *Region I Plans to Increase Inspections for Low-Income, Minority Neighborhoods*, Daily Env't Rep. (BNA), May 10, 1994.

49. OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, U.S. ENVIRONMENTAL PROTECTION AGENCY, OSWER ENVIRONMENTAL JUSTICE TASK FORCE DRAFT FINAL REPORT 43 (1994).

areas may alleviate environmental disparity in the short run, but the trends observed in Houston and St. Louis indicate that these communities will not retain their racial and demographic characteristics. Eventually, real estate prices around the facilities will likely fall or rise at a slower rate that in the overall area, and concentrations of poor and minority residents will increase around the plants.

B. *A Compensation-Based Solution*

1. *Eliminates "White Flight"*

A better long-term solution would focus on providing compensation to those who live near locally undesirable facilities, so that, on balance, the surrounding property is not rendered less desirable. The specific nature of these offsetting benefits may vary and should remain in the purview of the potential host community and the prospective developer. Some possible forms of compensation include: (1) direct payments to affected landowners, (2) host fees which are paid into a community's general revenue fund to be used to finance a variety of public projects or to lower property taxes, (3) grants for improving local health-care delivery and education, and (4) the provision of parks and other recreational amenities.

In some cases, developers can actually guarantee property values near their sites, promising to reimburse residents whose land becomes less valuable after a facility moves in. Browning Ferris Industries (BFI), the nation's second largest waste management company, frequently makes such a guarantee.[50]

Providing compensating benefits to the neighbors of industrial and waste plants decreases the incentive for these members of the community to relocate, thereby stabilizing property values around facilities. In this way, compensation can eliminate much of the white flight that appears to underlie many cases of alleged environmental racism.

2. *Addresses Root Problem*

Besides dealing with the practical problem of white flight, a compensation-based solution to environmental disparity, unlike proposals that focus on restricting facility sitings, gets to the very heart of environmental injustice. Ultimately, the environmental justice issue boils down to the question of who should bear the costs of industrial processes.

Economists refer to pollution as an external cost or a negative externality: negative because it is undesirable, and an externality because it affects those

50. Telephone Interview with William Ruckelshaus, Chief Executive Officer, Browning Ferris Industries (Apr. 28, 1995).

who are outside the process that creates it.[51] Air and water pollution are both examples of costs that are involuntarily borne by individuals outside the production process. Likewise, industrial and hazardous waste facilities may impose external costs on their neighbors in the form of unpleasant noise, foul odors, increased traffic, or greater perceived health risk.

Many critics of compensation-based approaches insist that it is euphemistic to refer to the health risks imposed by industrial facilities as negative externalities or external costs. These individuals criticize the attempt to place a dollar value on human safety and health.[52] The classic economic response explains that individuals implicitly perform such calculations all the time. For instance, in exchange for pay, many people are willing to undertake serious safety risks as part of their employment. Examples include high-rise construction workers, window washers, and police officers. Critics should also realize that the stringency of present environmental regulations greatly reduces the prevalence of health risks typically associated with permitted industrial and waste facilities. Under current regulations, the risk of developing cancer from living for seventy years at the fence line of a properly constructed waste-to-energy plant is estimated to be one in a million.[53] This risk is equivalent to the odds of getting cancer from drinking one can of beer every eight years.[54] Moreover, the economic benefits of living near an industrial plant often yield health benefits that far outweigh the minute risks that the facility imposes.

In essence, environmental justice concerns rest on two distinct premises: (1) that a few individuals (i.e., the neighbors of a polluting or waste facility) are forced to bear the external costs of industrial processes from which the public at large receives benefits; and (2) that a disproportionate percentage of these individuals are minority or low-income citizens. Policies that simply inject racial and socioeconomic considerations into siting and permitting procedures address the latter concern, but not the former. These "solutions" seek to guarantee that the few individuals who are adversely affected are not minority or poor residents. Such measures, however, do nothing to alleviate the first concern—the fact that a few citizens must disproportionately bear the costs of processes that benefit everyone.

A compensation-based approach would remedy this fundamental injustice by shifting the burden of external costs from the few neighbors of industrial plants to all the individuals who share the benefits of those facilities—a

51. *See, e.g.*, TOM TIETENBERG, ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS 51-59 (3d ed. 1992).

52. *See, e.g.*, Luther J. Carter, *The Mescarlero Option: Storage of Nuclear Waste at Mescalero Apache Tribe Reservation in New Mexico*, 50 BULL. OF THE ATOMIC SCIENTISTS 11 (1994); *Texas County Tempted by Financial Rewards of Dumps*, *in* ALL THINGS CONSIDERED (National Public Radio, Transcript No. 1428-6, Mar. 21, 1994).

53. CHRISTOPHER BOERNER & KENNETH CHILTON, WHO IS "RESPONSIBLE" FOR GARBAGE? 13 (Center for the Study of American Business, Occasional Paper No. 140, 1994).

54. *Id.*

process economists refer to as internalizing external costs. Under such an approach, facility owners view the adverse local impacts of their plant as part of their operating costs, charge prices sufficiently high to cover these costs, and use the added revenue to compensate local residents.[55] As a result, pollution costs are no longer borne solely by those outside of the production process, but are equitably distributed among those using the facility's services.

If the offsetting benefits are of a continuing nature—the provision of parks, better schools or roads, or enhanced medical care, for example—the plant's neighbors have far less motivation to relocate. Hence, a compensation approach is just since no group of individuals, regardless of race and income status, is bearing an unfair share of industry's costs. By stabilizing property values with offsetting benefits, a compensation approach is also able to prevent the white flight that exacerbates environmental disparity.

3. *Balances Economics and Environment*

The third key advantage of a compensation approach is that it helps move toward a socially optimal level of pollution and industrial activity. Reckless polluting is obviously not in the best interest of society. Complete pollution prevention, however, would entail the elimination of many socially valuable products and processes. In most cases, phasing out particular products is more costly to society than accepting and treating the pollution required to create those products. Since reckless polluting is undesirable and complete pollution elimination is virtually impossible, decisionmakers must attempt to determine the socially optimal level of pollution abatement.[56]

As pollution is reduced, the incremental cost of reducing each unit of pollution tends to rise and the incremental benefit associated with each unit of reduction tends to fall. The optimal level of pollution reduction occurs at the point at which the added cost of abating another unit of pollution equals the added benefit derived from that unit of abatement. Eliminating pollutants beyond this point imposes costs on society greater than the costs of the pollution removed.[57] Negotiating compensation arrangements creates a process by which developers and host communities internalize social costs that would otherwise remain unaccounted for. As such, compensation arrangements en-

55. Presumably, the facility would be the only one of its type in the area, so that higher prices would not motivate residents to stop using its services. This inelastic demand would ensure that increased revenue from higher prices would not be offset by a decrease in demand for the facility's services.

56. *See, e.g.*, JAMES LIS & KENNETH CHILTON, THE LIMITS OF POLLUTION PREVENTION (Center for the Study of American Business, Contemporary Issues Series No. 52, 1992).

57. Consider, for example, the increasing incremental costs and decreasing incremental benefits of cleaning up the industrial effluent of paper factories. Between 1970 and 1978, it cost the pulp and paper industry $3 billion to achieve a 95% reduction in its water effluents. To reach a 98% reduction level by 1984, a goal proposed by the EPA at the time, the industry would have had to spend an additional $4.8 billion. MURRAY L. WEIDENBAUM, BUSINESS, GOVERNMENT, AND THE PUBLIC 354 (2d. ed. 1981).

able decision makers to increase the efficiency of pollution-reduction decisions.

Consider, for example, hypothetical negotiations to site an incinerator. Throughout the negotiation proceedings, the proposed host community gathers information concerning the local impact of the incinerator's operations. Using this information, it determines the compensation its citizens would deem fair to host the facility. The developer must then decide whether to: (1) accept the community's compensation demands; (2) implement additional pollution abatement devices so as to reduce the level of pollution exposure and the consequent compensation requirement; or (3) focus on an alternative site. In some instances, the costs associated with siting a proposed project may be so high as to make it unprofitable in any location. A compensation approach helps weed out such ill-conceived industrial projects.[58] In any case, negotiating compensation agreements causes firms to fully internalize costs that would otherwise be thrust upon a site's neighbors.

Critics of negotiated compensation often assert that host communities are at a disadvantage in negotiations because they do not have adequate information on the possible health risks and other costs a facility will impose.[59] This problem of information asymmetry, however, can easily be overcome. As part of the compensation offers they extend to host communities, developers frequently provide money for these communities to hire professional consultants to study the costs and benefits of the proposed facility.[60] Concerned communities can request such grants at the start of compensation negotiations. In addition, wealthy environmental organizations, which are increasingly demonstrating concern over environmental racism, could provide the resources that low-income communities need to conduct risk analyses and feasibility studies.[61]

4. *Provides Local Benefits*

Finally, a compensation approach can provide substantial economic benefits to residents of poor communities, actually leaving them *better off* than they would have been without an industrial plant in their neighborhood. Consider, for example, the village of Robbins, Illinois. Like too many other predominantly minority communities around the country, this town on Chicago's South Side suffers from a variety of social and economic ills. The per

58. Some critics argue that a compensation-based approach allows communities to halt industrial development by raising their minimum compensation demands to a level that is too high for developers to pay. However, because potential host communities risk losing benefits if they require too much compensation, they have an incentive not to inflate their compensation demands.

59. For a discussion of the problems associated with information asymmetry and potential solutions, see MICHAEL O'HARE, FACILITY SITING AND PUBLIC OPPOSITION (1983).

60. *Id.*

61. *Id.*

capita income in the town (just over $8,000 in 1990)[62] ranks 262 out of 263 communities in the Chicago metropolitan area;[63] almost one-quarter of the town's families live below the poverty line.[64] Between 1980 and 1991, the town's population fell 15% to 8,000.[65] Robbins has no gas station, no bank, no laundromat, and no restaurant that stays open later than 6 p.m. Even basic police and fire protection operate at a bare minimum. Churches (thirty-four) outnumber tax-paying businesses (twenty-six).[66] With such obvious social and economic problems, it is no wonder that the efforts of town leaders to entice more "desirable" businesses to Robbins were without success.

Twelve years ago, the town's mayor and the board of trustees, recognizing South Chicago's need for a large capacity waste facility,[67] announced that Robbins was interested in hosting an incinerator. After months of negotiations, the town secured $400 million in financing to fund the project.[68] Residents of Robbins saw the economic boost that the incinerator would provide as a first step to regaining economic viability and repairing the town's crumbling infrastructure. After months of battling environmentalists who opposed the project, the persistence of Robbins' residents paid off. In 1994, Reading Energy and village officials cleared the final hurdles to the incinerator's construction.[69]

With the completion of the project still many months away, Robbins has begun reaping a number of benefits. In late November 1994, Mayor Irene Brodie received the first of several payments from the incinerator developers.[70] Among other things, this $800,000 disbursement will be used to replace a thirty-year old firetruck (one of two currently owned by the village), heat the police station, purchase a generator for the town's pump house so that residents no longer lose water pressure during power outages, and expand Robbins' inadequate sewer system. Later payments will be used to further improve the town's infrastructure and to establish a college scholarship program for Robbins' high school graduates.

In addition to these direct payments, the incinerator project will provide Robbins with increased employment opportunities and tax revenue. The project promises to create 600 jobs during the construction phase and more than eighty permanent positions.[71] Town representatives estimate that, once opera-

62. U.S. BUREAU OF THE CENSUS, SOCIAL AND ECONOMIC CHARACTERISTICS—ILLINOIS 20 (1993).

63. Bonnie Miller Rubin, *Robbins Has Many Uses for Windfall*, CHICAGO TRIB., Dec. 2, 1994, at MSS 1.

64. *See* U.S. BUREAU OF THE CENSUS, *supra* note 62, at 20.

65. *See* Rubin, *supra* note 63.

66. *Id.*

67. Telephone Interview with Rudolph Bouie, Chairman, Robbins' Citizen's Advisory Committee (Aug. 1, 1994).

68. *See* Rubin, *supra* note 63.

69. *Id.*

70. *Id.*

71. *Id.*; Bouie, *supra* note 67.

tional, the incinerator will increase Robbins' tax base by a minimum of 63% ($2 million a year). It is hoped that with this added employment and tax revenue will come new businesses and, in turn, more job opportunities. Already, Sea Way National Bank, the largest black-owned bank in the nation, has plans to open a branch in the town. But for the citizens of Robbins, a new bank is just the beginning. The incinerator project has seemingly breathed new life into this community. For the first time in years, the people of Robbins have hope for their town's future.

The simple fact is that industrial plants can provide economically disadvantaged communities with benefits that far outweigh the costs that the facilities impose on local residents. Consider, as another example, the advantages residents of Sumter County, Alabama have reaped from the controversial Emelle landfill. Because Sumter County residents are poor and predominantly African-American, outside observers often refer to the Emelle landfill as a prime example of environmental injustice.[72] In actuality, Emelle ended up in Sumter County because of the area's sparse population, arid climate, and location atop the Selma chalk formation—700 feet of dense, natural chalk. These factors, along with millions of dollars of state-of-the-art technology, make Emelle one of the world's safest landfills.[73]

Furthermore, the landfill provides over 400 jobs (60% of which are held by county residents), a $10 million annual payroll, and a guaranteed $4.2 million in annual tax revenue.[74] This money has enabled the community to build a fire station and a town hall, improve schools, upgrade the health-care delivery system, and begin reversing rates of illiteracy and infant mortality.

Not surprisingly in light of these economic benefits, African-American officials in Sumter County are apparently quite happy hosting the landfill. The county commission has opposed state proposals that would have reduced the amount of waste that the Emelle landfill accepts. "Financially, the landfill's been positive, very positive for the county," states Robert Smith, an African-American elementary school principal who now chairs the county commission.[75]

While it is clear that industrial facilities that provide compensating benefits to their neighbors can improve the quality of life in the community, some may charge that it is immoral to pay individuals to expose themselves to health risks. As mentioned above, this criticism ignores two important points.

First, it is important to keep in mind the regulatory environment in which compensation agreements are negotiated. Current environmental standards are designed to guarantee a base level of health protection in which the exposure

72. *A Place at the Table*, SIERRA, May-June 1993, at 52; Robert Bullard, *The Threat of Environmental Racism*, NAT. RESOURCES & ENV'T, Winter 1993, at 25.

73. Charles McDermott, *Balancing the Scales of Environmental Justice*, 21 FORDHAM URB. L.J. 689, 697 (1994).

74. *Id.*; Tom Arrandale, *When the Poor Cry NIMBY*, GOVERNING, Sept. 1993, at 40.

75. Arrandale, *supra* note 74, at 40.

risks associated with polluting and waste facilities are minor. Consider, for example, the theoretical risks that the Robbins incinerator will impose. According to Dr. William Hallenbeck, a University of Illinois environmental health specialist who assessed the Robbins project, the risks associated with living near the proposed incinerator for a lifetime are comparable to the risks of such activities as living in a brick house for two months, having one chest X-ray, or traveling ten miles by bicycle.[76]

Many environmental justice advocates discount such risk analyses. Instead, they recite anecdotes of high disease mortality rates (especially cancer mortality rates) around industrial facilities.[77] Yet in careful studies of even the worst areas, such as Louisiana's so-called "Cancer Alley" south of Baton Rouge, cancer incidence rates have been shown to be normal, or even below national averages. Only the cancer death rate is high, indicating that a lack of timely medical attention—not environmental contamination—is the root of the problem. Consider the findings, summarized in a report to the U.S. Commission on Civil Rights, of a study conducted by the Louisiana State University Medical Center:

> [I]n contrast to the State's well-documented high cancer mortality rates, incidence rates for all cancers combined in south Louisiana are either the same as, or lower than, the national rates. According to the 1991 report, south Louisianans have a lower risk of developing the most common cancers, with one exception—lung cancer in white men. The study points to smoking as being primarily responsible (90%) for the high incidence and mortality of lung cancer among males, both black and white, in south Louisiana. For cancers other than lung, the report says that *the major problem appears to be a lack of early detection and limited access to needed health care.*[78]

These findings in "Cancer Alley" highlight the second difficulty with the contention that compensating individuals for accepting industrial facilities forces them to sacrifice their health: The deleterious health effects of poverty and unemployment can far outweigh the health hazards from the facility itself. Agreeing to host an industrial facility in exchange for compensating benefits can improve a community's public health by enabling residents to

76. Daniel John Sobieski, *Burning Fears*, CHICAGO TRIB., Sept. 7, 1993, at 20.

77. Consider, for example, the congressional testimony of activist Pat Bryant of the Gulf Coast Tenants Association: "Cancer Alley remains one of the most poisoned areas anyplace . . . . Despite denials of petrochemical industry financed studies, we know that cancer incidence in this corridor is higher than the national average. Cancer is so commonplace that almost every family is touched." *Environmental Justice: Hearings Before the Subcomm. on Civil and Constitutional Rights of the House Comm. on the Judiciary*, 103d Cong. 9, 10 (1993).

78. LOUISIANA ADVISORY COMM. TO THE U.S. COMM'N ON CIVIL RIGHTS, THE BATTLE FOR ENVIRONMENTAL JUSTICE IN LOUISIANA: GOVERNMENT, INDUSTRY, AND THE PEOPLE 38 (1993) (emphasis added).

combat such economically based health problems as inadequate nutrition and inaccessible health care.

Since the Emelle landfill was built in 1977, economic growth in Sumter County, Alabama has brought about improved health care and led to a decline in infant mortality rates. For the years 1975-1977, Sumter County's infant mortality rate was twenty-seven deaths per thousand, while the overall state average was 18.8 per thousand. For the years 1985-87, the rate in Sumter County had fallen to 14.4 per thousand, while Alabama's was 12.7 per thousand. By 1991, when the state infant mortality rate stood at 11.4 per thousand, Sumter County's had fallen to 8.5 per thousand.[79] Such an impressive gain in public health casts doubt on the notion that a compensation approach requires communities to sacrifice health for economic gain.

Negotiated compensation agreements can substantially improve the quality of life in low-income areas. Environmental justice advocates, however, have typically not supported a compensation approach, arguing instead for restrictions on industrial development in poor and minority areas.[80] In some cases, environmental justice concerns have actually been used to stop developments that would have benefited both the developer and the host community.[81] Individuals truly interested in helping impoverished communities should encourage win-win compensation agreements.

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79. McDermott, *supra* note 73, at 698.

80. For a discussion of the concerns that environmental justice advocates typically raise with respect to compensation programs, see Been, *supra* note 28, at 1040-46. The emphasis environmental justice advocates place on siting issues can be seen in their public statements before Congress, *see supra* note 77, as well as in the environmental justice legislation that has been introduced at both the state and federal levels. *See, e.g.*, legislation cited *supra* notes 4, 5, 6 & 9 and accompanying text.

81. Consider, for example, Brooksville, Mississippi. Federated Technologies Industries (FTI) of Mississippi offered a compensation package to this small, predominantly African-American town in exchange for permission to site an incinerator and hazardous waste landfill. The company agreed to pay $250,000 every year into the county's general revenue fund and $50,000 a year for roadway construction and maintenance. FTI also agreed to build a civic center, to finance a research center, and to allot between 70 and 80% of the proposed facility's jobs to local residents, at starting wages of at least $7.00 an hour. The response: the local chapter of the National Association for the Advancement of Colored People (NAACP) actively lobbied for the plant's approval. The plant was opposed by three local groups claiming "environmental racism": an environmental organization (Protect the Environment of Noxubee County); a group of middle-class black educators and ministers (African-Americans for Environmental Justice); and a group of local business owners, most of whom paid employees minimum wage or slightly above. *See* Keith Schneider, *Blacks Fighting Blacks on Plan for Dump Site*, N.Y. TIMES, Dec. 13, 1993, at A12; Telephone Interview with Richard Brooks, Alderman of Brooksville, Miss. and President of the local NAACP (Dec. 14, 1993). The local NAACP argued that these individuals were trying to prevent a new employer from altering the area's low wage scale, thus keeping poor blacks "socially and economically oppressed." Schneider, *supra*. *See also New Mexico Asks Clinton to Block Effort to Develop Private MRS*, INSIDE ENERGY, June 6, 1994, at 3 (noting how environmental justice concerns, among other things, motivated New Mexico Governor Bruce King to seek moratorium on actions furthering the Mescalero Indians' attempt to host temporary nuclear waste facility).

C. *Encouraging Compensation Negotiations*

There are a variety of methods that can be employed to encourage compensation negotiations between developers and the residents of potential host communities. Three specific types of approaches will be examined below: (1) voluntary approaches such as those already being used by many companies and host communities; (2) a common law approach that requires returning to a legal paradigm that emphasizes the rights-based doctrines of nuisance, trespass, and strict liability; (3) statutory approaches that require legislation by state or local governing bodies.

1. *Voluntary Approach.*

Policymakers may find that no changes in the political economy are necessary to encourage negotiated compensation. In recent years, voluntary compensation has replaced the traditional siting process as the preferred method of locating industrial and waste facilities.

Traditionally, developers sited their plants using what may be termed the "DAD" paradigm: decide, announce, and defend. Developers decided the best location for their facility, took out options on the land, announced to the political leaders of the community their intention to site, and then defended their decision from attacks by local opposition groups. Increasingly, however, private developers are finding that negotiating compensation agreements with potential host communities offers a more efficient siting process and better long-term community relations.[82] Dissatisfied local citizens represent a threat to expedient issuance of state and local permits and can disrupt construction or operation of waste management facilities. In short, it pays to be a good neighbor.

Browning Ferris Industries (BFI) certainly prefers negotiated compensation over the DAD paradigm. According to BFI Chief Executive Officer and two-time EPA administrator William Ruckelshaus, BFI's policy in recent years has been to provide host fees whenever siting new waste facilities. Mr. Ruckelshaus notes that, while the company is not typically required by any statute to negotiate compensation agreements, BFI has found that such an approach speeds up the siting process and improves community relations in the long run. Often, the company approaches community leaders (not necessarily public officials) with the suggestion, "let's look for a site together." In Ruckelshaus's view, the key to getting the community "on your side" is "choice"—being involved in the siting process.[83]

82. *See, e.g.*, Herbert Inhaber, *Of LULU's, NIMBYs, and NIMTOOs*, 107 PUB. INTEREST 52 (1992); Michael O'Hare, *"Not on My Block You Don't": Facility Siting and the Strategic Importance of Compensation*, 25 PUB. POL'Y 407 (1977).

83. Interview with William Ruckelshaus, CEO, Browning Ferris Industries (Apr. 28, 1995).

BFI's experience indicates that the current political economy may already be producing voluntary solutions to alleged environmental injustice. Nevertheless, policymakers may believe that the politics of the situation demand a more direct approach. To some, the question is: How can the legal/regulatory environment encourage industrial developers to negotiate compensation packages with their neighbors?

2. *Common Law Approach*

Perhaps the most fundamental way to encourage compensation would be to return to a common law system of environmental regulation. Prior to the passage of the major federal environmental statutes in the 1960s and 1970s, environmental pollution was primarily regulated through such common law doctrines as nuisance, trespass, and strict liability for abnormally dangerous activities.[84] These and similar doctrines are grounded in the premise that individuals cannot legitimately use their property in any way that harms or devalues their neighbors' property.[85]

Under the common law approach to environmental protection, plaintiffs who could demonstrate that their property rights were legitimately violated in some way could receive judicial remedies ranging from an order enjoining the defendant's operation to the imposition of monetary damages. Grounding environmental protection in the property rights of others ensured that no one could get away with harming his neighbors' property—*even if the neighbors were poor or the polluting activity was otherwise legal and socially beneficial.*[86]

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84. A "private nuisance" is defined as a substantial and unreasonable interference (either intentional or reckless) with the use and enjoyment of an interest in an individual's land. *See, e.g.*, Ryan v. City of Emmetsburg, 4 N.W.2d 435, 438 (Iowa 1942); Lederman v. Cunningham, 283 S.W.2d 108, 111 (Tex. Civ. App. 1955).

The tort of "trespass" is defined as an unlawful interference with one's person, property or rights. BLACK'S LAW DICTIONARY 1502 (6th ed. 1990).

Strict liability for abnormally dangerous activities may also be understood in terms of property rights. The theory behind this doctrine is generally credited to *Rylands v. Fletcher*, 3 L.R. 330 (H.L. 1868). In this case, a mill owner in a coal mining area constructed a water reservoir upon his property. The water burst through the filled-up shafts of abandoned mines and flowed into adjoining mines, causing damage. Justice Blackburn stated, "We think that the rule of law is that a person who for his own purposes brings on his land and collects and keeps there anything likely to do mischief if it escapes, must keep it at his peril, and if he does not do so, is *prima facie* answerable for all damage which is the natural consequences of its escape." *Id.* Under this rule, an individual conducting dangerous activities on his property is accountable for damage he inflicts on his neighbor's property.

85. The ancient common law maxim *sec utere tuo ut alienum non laedas*, or "one is so to use his own as not to injure another's property," underlies these common law doctrines. For an example of the explicit application of the maxim in a modern pollution case, see *International Paper Co. v. Maddox*, 203 F.2d 88, 90 (5th Cir. 1953).

86. In *Hurlbut v. McKone*, for example, the court enjoined a nuisance-creating lumber operation, even though the business was per se lawful, and the factory's neighbors were themselves tradesmen used to industrial activity. 10 A. 164 (Conn. 1887). In reaching this conclusion, the *Hurlbut* Court quoted with approval the opinion of an early New Jersey Equity Court:

If developers are liable to have their activities enjoined if they violate their neighbors' property rights, they will be much more likely to consider beforehand the effects of their actions and obtain, in exchange for providing compensating benefits, the neighbors' permission to operate. Put simply, the threat of injunction (and/or having to pay damages for devaluing neighboring property) encourages voluntary compensation agreements.[87]

Compared to the common law approach to environmental regulation, the current statutory system is less likely to encourage developers to negotiate voluntarily compensation agreements. The present environmental regulatory paradigm is often referred to as a command and control system.[88] Under such a paradigm, legislators *command* a standard of environmental cleanliness (e.g., the Clean Water Act's "fishable/swimmable" standard for water quality[89]) or a level of technology to be used (e.g., the Clean Water Act's reference to "Best Practicable Control Technology"[90]) and delegate authority to bureaucracies to *control* the activities of individual polluters in order to meet this standard. Bureaucrats typically control polluting activities by issuing operating permits.

> I find no authority that will warrant the position that the part of town which is occupied by tradesmen and mechanics for residences and carrying on trades and business, and which contains no elegant or costly dwellings, and is not inhabited by the wealthy and luxurious, is a proper or convenient place for carrying on business which renders the dwellings there uncomfortable to the owners and their families . . . . There is no principle in law or reason which would give protection to the large comforts and enjoyments with which the wealthy and luxurious are surrounded, and fail to secure to the artisan and laborer and their families the fewer and more restricted comforts which they enjoy.

Hurlbut, 10 A. at 167 (quoting Ross v. Butler, 19 N.J. Eq. 294 (1835))

See also Whalen v. Union Bag Co., 101 N.E. 805, 806 (N.Y. 1913) ("Although the damage to plaintiff may be slight as compared to the defendant's expense of abating the condition, that is not a good reason for refusing an injunction. Neither courts of equity nor law can be guided by such a rule, for if followed to its logical conclusion it would deprive the poor litigant of his little property by giving it to those already rich."); Hulbert v. California Portland Cement Co., 118 P. 928, 933 (Cal. 1911) ("If the smaller interest must yield to the larger, all small property rights . . . would soon be absorbed by the large, more powerful few . . . .").

87. Under the common law, developers were certainly expected to know their neighbors' property rights and be accountable for how their actions affected those rights. In *Whalen*, 101 N.E. at 806, for example, the Court pointed out that

> [b]efore locating the plant the owners were bound to know that every riparian proprietor is entitled to have the waters of the stream that washes his land come to it without obstruction, diversion, or corruption, subject only to the reasonable use of the water, by those similarly entitled, for such domestic purposes as are inseparable from and necessary for the free use of their land; they were bound also to know the character of their proposed business . . . and to determine for themselves at their own peril whether they should be able to conduct their business upon a stream . . . without injury to their neighbors.

To avoid litigation, the mill owners could have contracted for riparian rights from downstream land owners—a *de facto* compensation agreement. *See* Roger E. Meiners & Bruce Yandle, *Constitutional Choice for the Control of Water Pollution*, 3 CONST. POL. ECON. 359, 363 (1992).

88. *See, e.g.*, O'HARE, *supra* note 59; Inhaber, *supra* note 82.

89. 33 U.S.C. §§ 1251(a)(1) - (2) (1994).

90. 33 U.S.C. § 1311(b)(1)(A) (1994).

In a command and control system, a polluter operating within permit guidelines is in the clear; it is the *permit*—not the neighbors' rights—that limits a polluter's actions. The case of *City of Milwaukee v. Illinois* illustrates how environmental statutes take the focus of environmental protection off property rights.[91] In this 1981 case, the Supreme Court ruled that because the EPA had granted the City of Milwaukee a permit under the Clean Water Act, the city could dump its sewage into Lake Michigan—Chicago's water supply.[92] This decision overturned the Court's earlier ruling in *Illinois v. City of Milwaukee*, a case decided before the passage of the Clean Water Act, in which the Court held that Milwaukee's dumping was a nuisance to Illinois and must be stopped.[93]

To the extent that environmental statutes have not formally displaced the common law, they have certainly weakened it. A nearly insurmountable defense for any firm charged with creating a nuisance is that the firm is in compliance with all required permits. In contrast, the common law's grounding of environmental protection in rights rather than in legislative fiat guaranteed that a developer's permit could not enable him to ignore the effects of his activities on his neighbors. In *Hurlbut v. McKone*, for example, a lawful but nuisance-creating lumber operation was enjoined from practices that made its neighbors "uncomfortable." The Court stated:

> [I]t is suggested that the defendants' business was per se lawful, and the use made of their own property was reasonable. We concede that the law will not interfere with a use that is reasonable. But *the question of reasonable use is to be determined in view of the rights of others*.[94]

To the extent that the current environmental statutory paradigm encourages developers to focus solely on meeting the demands of their permits, rather than on mitigating the effects that their activities have on their neighbors, the command and control system exacerbates environmental injustice. Returning to a common law system of environmental litigation using rights-based doctrines of nuisance, trespass, and strict liability for abnormally dangerous activities would encourage developers to negotiate the compensation agreements that are the key to securing environmental justice in the long run.

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91. 451 U.S. 304 (1981).

92. *Id. See also* People v. New Mines, Inc., 28 Cal. Rptr. 337 (1963) (holding that state Attorney General's claim against corporation for acid mine drainage was precluded by statute establishing administrative bodies to address water pollution).

93. Illinois v. City of Milwaukee, 406 U.S. 91 (1972).

94. Hurlbut v. McKone, 10 A. 164, 165 (Conn. 1887) (emphasis added).

3. *Statutory Approach*

A return to common law environmental protection may, however, be politically unfeasible in the short term (or even the long term). An intermediate solution between the status quo and a return to common law protection might be flexible statutes designed to motivate widespread compensation agreements. A brief examination of Wisconsin's landfill siting statute[95] demonstrates how legislators can encourage compensation negotiations without becoming too heavy handed.

Wisconsin's landfill negotiation/arbitration statute was adopted in 1981 with the intent of making the siting of waste facilities more efficient and accommodating the legitimate concerns of local residents and municipalities.[96] The principal mechanism by which the legislation accomplishes both of these goals is the requirement that any developer wishing to site a landfill must first negotiate with the affected municipalities upon their request.[97] During these negotiations, any subject is open for discussion "except the need for the facility" and any "proposal that would make the [developer's] responsibilities under the approved feasibility report or plan of operation less stringent" than required by the Department of Natural Resources.[98] In principle, negotiations can continue until all of the parties' concerns are resolved. If a settlement has not been reached after a "reasonable period," however, one or both of the parties can request that the case be turned over to binding arbitration.

Thus far, the Wisconsin program seems to have worked rather well. One measure of its success is the lack of sitings calling for arbitration. Since the law took effect in 1982, only three of the 152 submitted permit applications have been arbitrated.[99] Officials with waste management organizations appear to be satisfied with the landfill arbitration/negotiation statute. According to Joe Suchechi, manager of government affairs for WMX Technologies, Inc., requiring compensation negotiations makes it "much easier" to site and expand waste facilities in Wisconsin.[100] In other states, developers and potential host communities often become deadlocked, preferring to appeal to government officials in a winner takes all political battle. By involving the local

95. WIS. STAT. ANN. § 144.445 (West 1989).

96. § 144.445(2).

97. §§ 144.445(6),(7). Failure on the part of a developer to participate in negotiations will result in the denial of necessary licenses and operating permits. 144.445(8)(e). On the other hand, if local communities refuse to negotiate or negotiate in bad faith, a developer may petition the Waste Facility Siting Board to be relieved of the negotiation requirement and proceed with the project via traditional regulatory channels. *See* Peter Ruud & Dean Werner, *Wisconsin's Landfill Negotiation/Arbitration Statute*, WIS. B. BULL., Nov. 1985, at 17-19, 64-65.

98. WIS. STAT. ANN. §§ 144.445(8)(a)(1),(2) (West 1989).

99. Telephone Conversation with Jane Furst, Program Assistant, State of Wisconsin Waste Facility Siting Board (Apr. 4, 1994).

100. Telephone Conversation with Joe Suchechi, manager of government affairs, WMX Technologies Inc. (Mar. 3, 1994).

community and formalizing negotiation procedures, the Wisconsin law, states Suchechi, creates a "process that gets everyone to the right place."[101]

The virtue of the Wisconsin legislation is that it includes several principles that are necessary for successful compensation agreements. First, the Wisconsin statute clearly specifies who is to negotiate with whom. Developers must notify a potential host community of their interest in siting in that community, and, if the community wishes to negotiate, both parties are required to establish negotiating committees according to guidelines set forth in the statute. [102]Secondly, the legislation not only establishes the negotiation process, but also ensures that the results of their negotiations will be legally binding. The fulcrum of the legislation is its prohibition against constructing or operating a new facility without a "siting agreement."[103] This document records the conditions and compensation to be exacted by the community from the developer, any voluntary commitments of the developer, as well as the promises made by local government officials. Without such legally binding authority, the parties have fewer incentives to negotiate in good faith. Finally, the Wisconsin statute provides a back-up plan, providing for the arbitration of siting decisions should negotiations fail or should one party refuse to cooperate.[104] Each of these criteria is crucial if negotiated compensation agreements are to be effective in addressing environmental justice concerns.

Conclusion

As the environmental justice movement is transformed from a predominantly grassroots force into an insider in the environmental policy arena, advocates should endeavor to keep sight of their ultimate goal of eliminating environmental injustice. Achieving this objective requires an understanding of the processes creating environmental inequity. Data from Houston and the St. Louis area indicate that observed environmental disparities are, at least to a significant extent, motivated by economics: industrial and waste plants have a propensity to impose costs on their neighbors, thereby lowering property values and attracting poorer individuals to the neighborhood. Since economic forces, rather than discriminatory siting and permitting decisions, underlie most instances of environmental disparity, a workable policy solution should be based on economics.

Compensating individuals for the costs that industrial facilities impose upon them directly addresses these economic forces. When a facility offers its neighbors sufficient offsetting benefits, the neighbors will be less likely to

101. *Id.*
102. WIS. STAT. ANN. §§ 144.445(6) - (7) (West 1989).
103. § 144.445(9).
104. § 144.445(10)(a-b).

view its presence as a liability to the community, and fewer families will relocate. Moreover, a compensation approach promotes justice and efficiency and can provide economic revitalization to impoverished communities. Advocates in the environmental justice movement would do the most justice by recognizing the economic factors underlying environmental disparities and embracing compensation as the appropriate remedy.

APPENDIX
(From Footnotes 32-34)

Table 1a

INDEPENDENT SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION.
1970 CENSUS TRACTS / TSDFs, LANDFILLS & INCINERATORS ONLY

	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	12,685	16,614	19	334	2.00**	-2.3043**
WORK	93.7418	95.0531	21	359	1.45	-1.0005
POV	10.4872	12.2276	21	359	0.64	-0.2034
MINOR	7.1619	17.9621	21	359	1.55	-0.3928
PCTEDU	24.3616	25.9035	21	359	0.62	-0.9392
PCTMANF	11.9114	10.4587	21	359	-1.89*	-2.5396**

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
WORK = Percentage of Male Residents Employed in the Labor Force
POV = Percentage of Residents Below the Poverty Line
MINOR = Percentage of Nonwhite Residents
PCTEDU = Percentage of Residents with a High School Education or Higher
PCTMANF = Percentage of Residents Employed in Manufacturing

Table 1b

INDEPENDENT-SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION.
1980 CENSUS TRACTS / TSDFs, LANDFILLS & INCINERATORS ONLY

	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	39,204	40,504	42	329	0.31	-0.8029
WORK	91.3476	90.2255	42	330	-0.98	-0.3131
POV	91.3476	90.2255	42	330	-0.98	-0.3131
MINOR	15.6076	26.7039	42	332	1.92*	-0.4098
PCTEDU	35.0164	37.2376	42	331	1.12	-1.3172
PCTMANF	10.3876	9.2927	42	332	-2.08**	-2.1875**

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
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Table 1c

INDEPENDENT-SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION.
1990 CENSUS TRACTS / TSDFs, LANDFILLS & INCINERATORS ONLY

	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	63,163	68,395	52	327	0.68	-1.2892
WORK	91.5618	89.6081	49	324	-1.24	-0.5736
POV	14.8867	15.8891	49	324	0.41	-0.0348
MINOR	22.8303	30.7280	50	325	1.44	-0.5297
PCTEDU	46.0836	47.8853	50	325	0.94	-1.2403
PCTMANF	8.2045	7.5250	50	325	-1.45	-1.8001*

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
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PCTMANF = Percentage of Residents Employed in Manufacturing

Table 2a

INDEPENDENT-SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION. 1970 CENSUS TRACTS / ALL FACILITIES						
	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	15,132	16,788	83	280	1.59	-2.8763***
WORK	94.3424	95.1845	92	288	1.75*	-1.5166
POV	13.8305	11.5886	92	288	-1.56	-1.6687*
MINOR	17.7516	17.2418	92	288	-0.14	-2.2665**
PCTEDU	23.5138	26.5544	92	288	2.33**	-2.6052***
PCTMANF	10.9875	10.3957	92	288	-1.44	-1.7962*

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
WORK = Percentage of Male Residents Employed in the Labor Force
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PCTEDU = Percentage of Residents with a High School Education or Higher
PCTMANF = Percentage of Residents Employed in Manufacturing

Table 2b

INDEPENDENT-SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION. 1980 CENSUS TRACTS / ALL FACILITIES						
	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	37,445	41,209	84	287	1.20	-2.7427***
WORK	89.5762	90.5820	85	287	1.17	-1.1415
POV	16.4234	12.7500	85	287	-2.12**	-2.4420**
MINOR	26.5301	25.1424	85	289	-0.32	-2.1457**
PCTEDU	34.9055	37.6020	85	288	1.80*	-2.0951*
PCTMANF	9.6980	9.3326	85	289	-0.92	-0.8840

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
WORK = Percentage of Male Residents Employed in the Labor Force
POV = Percentage of Residents Below the Poverty Line
MINOR = Percentage of Nonwhite Residents
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Table 2c

INDEPENDENT-SAMPLE T-TEST FOR A DIFFERENCE OF MEANS AND TWO-SAMPLE WILCOXON RANK-SUM TESTS FOR EQUALITY OF DISTRIBUTION.
1990 CENSUS TRACTS / ALL FACILITIES

	TRACT MEAN		CASES		T	WILCOXON
VARIABLE	PLANT	OTHER	PLANT	OTHER	TEST	Z-STATISTIC
MDHV	63,117	69,118	91	288	0.97	-2.2460**
WORK	89.0247	90.1242	88	285	0.88	-0.5723
POV	18.2934	14.9744	88	285	-1.71*	-1.7130*
MINOR	32.0284	28.9426	89	286	-0.71	-1.8084*
PCTEDU	46.1298	48.1167	89	286	1.30	-1.4848
PCTMANF	8.0259	7.4879	89	286	-1.44	-1.3913

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

MDHV = Median Housing Values
WORK = Percentage of Male Residents Employed in the Labor Force
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