Chapter Seven

Environmental Defense, I: Introduction to Interest Group Advocacy in Complex Disputes

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Environmental defense has been a major area for PIL activity. Several of the largest foundation and membership-supported PIL firms, such as the Natural Resources Defense Council and the Environmental Defense Fund, concentrate exclusively on this area, while other firms, such as the Center for Law and Social Policy, devote substantial resources to this type of work. Moreover, environmental defense is a major sphere of activity for mixed public-private firms and for the pro bono activities of private firms.

PIL lawyers have been active on a wide range of environmental fronts. They have challenged dams and other water resource projects, raised questions about nuclear power plants, attacked the pricing policies of electric utilities, stopped the use of dangerous pesticides, and sought to improve enforcement of such major environmental statutes as the National Environmental Policy Act (NEPA), the Clean Air Act, and the Federal Water Pollution Control Act. Hundreds of lawyers have engaged in this type of activity, and thousands of separate environmental defense actions have been brought.

PIL environmental defense has been discussed in many books and articles. Full discussion and appraisal would take volumes, not chapters. We have, therefore, chosen to focus on a few case studies drawn from this rich history. They illustrate the range and variety of PIL environmental work, though that is not the prime reason they have been selected. We have chosen to concentrate on these areas because they represent a general role of PIL in environmental and other areas - that is, the role of PIL organizations as interest group advocates in complex policy disputes.

A principal role of public interest lawyers has been to use legal skills to advocate the interests of groups that wish to influence or change public policy decisions. Frequently this advocacy...

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is conducted in situations involving substantial uncertainty, high costs (and benefits), technological complexity, many parties, and multiple possible outcomes. These are the situations we call "complex policy disputes."

In order to assess the past performance and future potential of public interest law, it is essential to give explicit attention to complex policy disputes for two reasons. First, we see PIL as an institutional response to the problem of the underrepresentation of some groups or interests in policy making. PIL representation frequently will occur in situations involving the kinds of intricacy and indeterminateness that the notion of a complex policy dispute suggests. Second, as Chapters Seven and Eight will demonstrate, this type of dispute poses some very serious challenges to PIL as an institutional response to the problem of underrepresentation.

PIL environmental defense work is as good an area as any in which to examine the nature and problems of interest group advocacy in complex disputes. Environmental defense is not the only area in which PIL firms are engaged in complex disputes, but it is an area where such disputes are the norm, not the exception. Some PIL environmental work does, of course, involve relatively simple controversies, in which two parties may contend for the articulation of a rule of law by one authoritative decision-maker, but much of the work in the environmental area involves much more complex problems and arenas. These efforts to halt dams, highways, nuclear plants, and flights by supersonic transport planes may include classical litigation activities to formulate legal rules, but these activities are rarely sufficient to secure the goals of environmental groups. And while some environmental work—such as challenging a project which has been authorized in violation of some clear procedural requirement—may involve simple issues of fact and law, more frequently environmental defense involves issues in which arguments about complex chemical, biological, ecological, and economic matters lie at the center of the controversy, and in which decision-makers have substantial discretion.

For these reasons, we find it appropriate to look at the problem of advocacy in complex disputes in the environmental area, and, in the evaluation of that area, to select the problems imposed by the complexity of the dispute as the principal focus of our attention. Accordingly, before turning to some specific studies of PIL, environmental defense, it is essential to examine the structure of a typical complex environmental policy dispute.

Environmental Policy Disputes

Environmental policy disputes involve disagreement about public decisions that may affect environmental values. These disputes occur with increasing frequency in modern industrial societies. And the principal role public interest lawyers have played in environmental defense has been to act as advocates for environmental values in conflicts of this type.

We are all familiar with environmental policy disputes; accounts of these controversies fill the daily press. Shall we expand or contract our programs for flood control and stream channelization? Should we allow the Concorde SST to land in the United States? Should we relax or tighten the rules governing air pollution? Should we build a dam on a scenic stream, or allow nuclear energy plants to damage aquatic life in the natural bodies of water they use for cooling?

Environmental policy disputes are controversies over the appropriate behavior of the public sector. They arise where the public sector performs a number of functions which affect the natural environment. Depending on the choices of public decision-makers, public sector activities may yield environmental costs or benefits. Disputes naturally arise over the extent to which the environmental benefits of government action are worth the costs of the action, and whether public action that produces environmental harm is nevertheless "in the public interest."

Environmental policy disputes occur with growing frequency. This is undoubtedly the result of two forces: first, the increase in general public awareness that our civilization causes substantial and possibly irreparable damage to the natural environment; and second, the growing significance of public action affecting the environment. Thus, growing recognition of the costs society pays for environmental damage, and of the failure of private markets to internalize environmental costs, has led to a proliferation of regulatory law designed to protect the natural environment. Many environmental disputes are about the extent to which government should regulate private sector decisions that are thought to cause environmental degradation. At the same time, we have come to realize that government is not only a tool to stop environmental damage; it is also a potential cause of such damage. Public programs of many types, from flood control to mineral leasing, have a potential for environmental harm, and public decision-makers may be no more sensitive to such damage than private industry. Moreover, public regulation of private activity for non-environmental reasons may itself, have environmental implications. For example, one rationale for the existence of utility commissions is the protection of consumers against monopolistic practices of public utilities. But in the process of performing their function, they establish rate structures and make other regulatory decisions that have direct or indirect effects on the environment.

We can identify two principal types of environmental policy disputes: (1) disputes over the nature and scope of public regulation of private behavior that may affect the environment; and (2) disputes over the expenditure of government funds on projects that may harm the environment (dams, highways) or reduce environmental degradation (sewage treatment).

Public choice in these areas leads to disputes because of the nature of the problems and the decision-making process. From an environmental point of view, the principal issue in these situations is whether the environmental costs (benefits) of governmental action are commensurate with the benefits (costs) entailed in proposed policy. Those who advocate maximum environmental protection argue that such government projects as dams are causing environmental damage that exceeds any net social benefits from the project; thus they try to halt or curtail dam construction. Beneficiaries of these activities, such as farmers and those who enjoy the recreational benefits of dams, on the other hand, argue that their benefits outweigh any environmental damage, and they urge construction of the project.

It would be misleading to suggest that all environmental decisions involve disputes, or that all disputes are similar. For our purposes we wish to break environmental decisions into two basic types—those involving disputes and those where no dispute exists. Within these categories major subcategories can be identified.

Let us define a dispute as a situation in which disagreement about public choice exists, is expressed, and is communicated to decision-makers. In some environmental choices there will be disputes in this sense; in others not.

There are many reasons why some environmental decisions do not lead to disputes, even though the decision will have significant environmental impact. Thus, there may be no dispute because the policy has or could secure universal agreement; that is, in these situations all affected groups would, if fully informed, agree on the proposed decision. Decisions may also be undisputed, however, because there are those who would disagree with the choice, but who lack information about the significance of the decision, or lack the resources needed to effectively raise a protest concerning it, or both.

With increasing frequency, however, environmental decisions do also involve environmental disputes. Moreover, these disputes tend to occur in the kinds of complex decisional situations we have discussed. And certainly the bulk of environmental defense work done by public interest lawyers tends to occur in such situations.

We must therefore look more closely at the nature of complex decisions in general and environmental policy disputes in particular. As we shall see, the structure of such disputes both creates a need for the kind of environmental advocacy performed by PIL firms, and determines the type of advocacy that is required if environmental interests are to be adequately represented in the decision-making process.

Complex Decisional Situations

An environmental policy dispute is a controversy about a public decision. The decisional situation confronted by parties and decision-makers may be more or less complex. For purposes of this discussion, a decisional situation will be considered complex to the extent that the controversy involves: (a) questions of scientific and technical complexity; (b) imperfect information; (c) substantial risk; (d) numerous parties; (e) multiple possible alternatives for choice; (f) multiple loci of decisional power; (g) opportunities for significantly different
distributional outcomes. Each of these deserves brief mention.  

Scientific and Technical Complexity. A decision involves technological complexity whenever it requires access to highly specialized bodies of scientific or technical data. Thus, for example, the decision may turn on the biological effects of certain chemical compounds, or the engineering capabilities of certain types of equipment. Often several technical issues may interact. Thus a dispute may involve uncertainty both about the biological effects of some pollutant, and about the likelihood that a given prevention measure will reduce ill effects. These interactions add to the overall complexity of the problem.

Imperfect Information. The state of knowledge about technical and other matters may be more or less perfect. We may know a great deal about complex technical issues, or very little. The criterion of "imperfection" of information is really an expression of the costliness of securing information about relevant decisional variables: the issue is not simply whether the information is "there" in some abstract sense, but at what cost it can be created or brought to bear on the decisional process. Since decisions must frequently be made with imperfect information, choice often involves uncertainty.

Substantial Risk. Even if we have very firm information about the risks in a given situation, we still have a separate problem of evaluating these risks. It may be known that a given chemical can cause certain harms under some conditions: but it is further necessary to determine the value of taking measures to reduce or eliminate such risks.

Numerous Parties. The number of individuals or groups involved in a dispute will affect the complexity of the decisional process. In public policy disputes there may be, and frequently are, numerous "parties," in the broadest sense of individuals or organized groups with a stake in the outcome and some active role in the process. Depending on the nature of the proceeding and the issue, such "parties" may or may not also be actual parties in formal or informal governmental proceedings (rule-making, administrative adjudication, litigation).

Multiple Choices. The possible outcomes of a dispute may be numerous. Thus, for example, if the controversy is one over a specific project, such as a dam, the options open to policy makers may include: (1) abandon the goals the project was designed to achieve; (2) achieve some or all of the original goals but do this through other alternatives; (3) redesign the project; or (4) go ahead as planned.

Multiple Loci of Decisional Power. It may be that there is one body that makes one final, unreviewable decision on a program, project, or policy. But it is much more likely that there are many loci of decision-making authority. Thus a given project may require decisions by several agencies, and may be reviewable by the courts or the Congress or both. The greater the number of possible loci of decisional authority, and the greater the possibility that they will intervene to influence the outcome, the more complex the decisional situation will be.

Distributional Variation. Different alternatives may mean very different distributions of costs and benefits. If we construct a dam, some farmers and recreational interests, plus some landowners will gain. Persons who value the area in its natural state will lose. We do not normally expect the gainers from public decisions to compensate the losers. (Indeed, if we had such a compensation practice, we might have less conflict over these choices.) Our procedures and institutions allow substantial redistributions of this kind. These tradeoffs, which necessarily involve weighing one set of interests against another, add immeasurably to the complexity of the decision. And the greater the range of distributional variation among the options, the more likely it is that there will be conflict over the decision.

Significance of Organization in Complex Disputes  

In all disputes, simple and complex, the parties will attempt to influence the outcome by attempting to persuade decision-makers to make the choices they favor. These efforts may be more or less successful, depending on the capacities of the advocates and the predispositions of the decision-makers. Here we wish to explore the relationship between the organization of those advocating a given interest and the effectiveness of advocacy for that interest. In particular, we wish to determine the significance of organization in affecting advocacy in complex disputes.

Scholars have shown that organizational capacity bears on the effectiveness of advocacy in ordinary civil litigation. In the spectrum we are using, litigation is frequently a "simple" dispute; there are usually two contending parties, a single authoritative decision-making body, and an elaborate process for narrowing questions and limiting the discretion of the decision-makers. Nevertheless, it has been shown that large organizations have substantial advantages in this forum. Since large organizations tend to be involved in repeated conflicts of a similar nature, they can afford to make strategic choices to maximize a long-run position and investments in legal services, which a large number of individual "one-shot" plaintiffs and defendants would not be able or willing to make, even if the total potential benefits to all such individual parties were as great as or greater than, those of the "repeat players."

The relative organizational structure of contending parties is even more important in influencing the outcome of complex disputes. To demonstrate this, let us look at some of the elements that add complexity to a dispute to see how such factors will magnify the organizational advantage. Assume for the moment that the decision-makers are unblinded, in that they have no specific structural or other reason to prefer an outcome that favors any of the contending interests.

While decision-makers may be unblinded, they have limited resources with which to analyze and evaluate all the issues that exist in a complex dispute. The allocation of these resources will affect the way decision-makers perceive and determine the issues present in a dispute. There are many types of decision-makers involved in complex disputes; we wish to focus particularly on the bureaucrats in agencies whose actions have potential environmental effects. Some of this analysis can, however, be extended to other decision-makers (such as courts and legislative bodies) as well.

Theorists of bureaucratic behavior have identified a number of behavioral tendencies of large organizations. Important among these is the tendency to economize the information costs involved in a decision. This tendency leads "bureaucrats" to limit the range of alternatives considered, to prefer a certain alternative over an uncertain one, and to rely on existing information rather than on producing new information. These tendencies may lead decision-makers to continue past policies unless presented with overwhelming evidence of failure, to refuse to consider new issues unless forced to, and to rely heavily on information secured from the parties to the dispute.

The tendency to rely on information produced by affected parties and the reluctance to raise new issues a quo parte has important implications for decision-making in complex environmental disputes. It means that information provided by a party, if undisputed by another party, will be given great weight. And it means that data provided about the effects of alternative decisions, if uncontested, may frequently be taken as definitive, especially if such data tend to support the continuation of past policies.

If the organizational structure of the parties, therefore, affects their relative capacity to raise issues and present data, it follows that organizational factors will, at the margin, determine decisional output. What is crucial here is the relative capacity of the affected interests. If one of the affected interests has some ability to develop data and the other has no such ability, the former's perspective has a higher probability of prevailing. Moreover, if a group has an interest in changing a policy, yet its advocates or representatives lack the capacity to raise new issues effectively, this group is unlikely to prevail.

These variables will affect the outcome of all disputes, but the more complex the dispute, the


more significant the relative capacity of the affected groups for advocacy will be. The more complex the factual issues are, the more the agency will rely on data presented by the parties. And the more disparate the fact-gathering and analyzing capacities of the contending groups are, the more likely it will be that the groups with superior capacity to invest in information and advocacy will prevail.

Organization affects a group's abilities to marshal data. It also determines its abilities to raise new issues—or to keep them from being raised—and it influences the group's abilities to manage disputes involving multiple decision-makers and long time periods. The more organized a group is, the more it can afford to invest in the resources needed to carry out a long-term campaign with multiple decision-makers and to secure the strategic knowledge necessary to select forums, issues, and timing.

Moreover, the advantages of organization should tend to be cumulative as disputes become more complex. Thus better knowledge of appropriate forums will also lead to more efficient decisions governing the investment in new data, since the organized group will know where a given data input will have the greatest effect, and tailor investment to the needs of that forum. Thus, the more complex the dispute, the more significant the relative representational capacity of affected groups will be in determining whose interest prevails.

Since organization is a key variable, it follows that an organized interest can prevail over an unorganized interest even where the "unorganized" are numerous and have a substantial aggregate stake in the outcome of the dispute.

Underorganization of Environmental Interests

The foregoing analysis suggests that if there are barriers to organizing certain interests, then to the extent that efforts do affect outcome, the values of the underorganized will be given less weight than the values of a similar group that is organized. If, moreover, there are certain kinds of groups or interests that face stronger organizational barriers than others, the values of the latter will be preferred to those of the former regardless of the size of the underorganized group or the intensity of its concern. There is reason to believe that environmental values will be underweighted in this fashion.

The transactions costs of organizing persons who value environmental amenity can be very high. Of course, small groups directly threatened by a large and visible project like a dam or an airport can often be mobilized, especially if their interests are really property interests. But persons affected by the secondary or indirect environmental impacts of projects, or by less dramatic and less visible activities like air and water pollution, tend to be physically dispersed and sociologically diverse, and to have relatively little information about the potential dangers. Moreover, each has only a very small interest in the issues, and none is likely to act effectively alone. If they could combine to join and pool their resources, they might invest a substantial aggregate sum in data and advocacy, but the costs of making them aware of common interests and of soliciting funds, the uncertainty and instability of such groupings, and the "free-rider" problem all serve as barriers to the effective use of resources.

Effect of Organization - Unbiased Agencies. Organizational capacity affects outcomes, and environmental interests can be hard to organize. That this may lead to decisions which undervalue the environment can be illustrated by a simple example: a dispute over the appropriate level of pollution control.

Schematically, we can see this as a dispute involving three participants: those who gain from pollution control ("environmentalists"); those who lose (polluters); and the government. In analyzing this conflict we want to know how likely is it that the environmentalists will have as much information and "voice" (effective representative) as the polluters, as well as the importance of information and voice to the outcome of the decision.

It is likely that in this situation the "environmentalists" will be less well organized and represented than the "polluters." We can see why this occurs by looking at the nature of the interests of each. "Polluters" are private firms that do not want to internalize pollution costs. The firms are organized institutions, which have decision-making structures that give clear signals about the costs of pollution control to them. "Environmentalists" are large numbers of unorganized individuals who reside in or use the area affected by the pollution. Some of these individuals may have clear information about the costs of pollution and an idea of the benefits that control could bring, but the "environmentalists" as a group cannot easily pool their information to gauge overall impact and are therefore unlikely to invest funds in securing further information or representation.

If we had full information on all the polluting activity that occurs, complete knowledge of the chemical and biological effects of waste discharge, effective techniques to reduce the environmental damage of waste discharge, unambiguous pollution standards articulated and enforced by unbiased agencies, and finally, if no one loses if control is imposed, then the inability of the environmentalists to provide data and advocacy would not affect outcomes and would thus be irrelevant to the public interest. "Pollution," where it might exist, would be banned. The issues become significant where these conditions are not met—and that is most of the time.

The simple fact is that we lack full information on the effects of pollution. Moreover, there is no neutral way to define pollution. Industrial activity emits substances which degrade the environment. From what we know some of these substances are more harmful to man and nature than others. Moreover, we know—just about some substances and very little if anything about others. Further, it is costly to get more information and there are substantial costs involved in curbing waste discharge. Either taxpayers or industry or consumers will have to pay the costs of control.

Thus there is no clear scientific definition of "pollution." Rather there is a concept that defines the maximum amount of waste discharge we think is socially tolerable. To set that standard, public decision-makers must assess data about known and suspected harm from the discharge, alternative methods of reducing the harm, the costs of control, and the incidence of pollution. It is obvious that if the decision involves this type of complexity, if government has limited time and money to assist these matters, and if decision-makers are influenced by the data presented by the parties contending for more or less control, it is likely that the decision will be skewed in favor of the views of the "polluters." If polluters have strong incentives to invest in information and advocacy, and environmentalists have weak incentives, then it is likely that the data that agencies have before them when they resolve complex disputes will underestimate both the environmental damage from waste discharge and the extent of the social preference for waste-free waters or air.

Agency Bias. These factors will "bias" decisions where decision-makers in complex disputes operate in structures that encourage neutrality vis-à-vis conflicting claims. They will, however, have an even stronger effect on decisions made by public officials who have incentives to prefer the solutions that cause environmental damage over those that do not.

Much has been written about the "biases" of government agencies. It has been suggested that regulatory agencies may tend to become biased in favor of the regulated industry. While such biases are important in environmental disputes, we wish to concentrate on another form of "bias," namely, the tendency of mission-oriented government agencies like the Army Corps of Engineers or various highway departments to prefer alternatives which permit them to continue their stated objectives. We set up agencies to carry out programs: build dams, construct highways, or develop nuclear power. Such activities may cause environmental harm; but if an agency recognizes this harm it will be forced to curtail its own activities and thus undermine, at least in part, the justification for its existence. While all forms of biases may affect environmental disputes, this type is worthy of special note because it is perfectly lawful and tends, in most cases, to magnify the advantages of those organized groups that favor development and to increase the obstacles facing environmental groups that set out to challenge agency decisions. In such cases the agency as decision-maker is even less likely to listen to the environmental side of the argument, and it becomes an ally of the proponents of development in other forums.

Environmental Law and Environmental Advocacy

By environmental advocacy, we mean all advocacy by and on behalf of those who value environmental amenity highly. As we have stated, much environmental advocacy occurs in complex policy disputes. And we have seen that in many such disputes the resources available to environmental advocates may be inadequate to ensure that their concerns receive the degree of attention from decision-makers that they would if the full extent of their demands were reflected in their representational resources. Environmental
defense work by PIL lawyers working for or in the interests of environmentalists has been an effort to use the law, particularly the federal courts, as instruments to offset the structural disadvantages set forth above and thus strengthen the case for and position of environmental groups in these disputes. PIL lawyers have used a variety of legal techniques to halt projects, secure their redesign, force agencies to secure more data and make them available to environmentalists, and revise procedures and policies so that they are more favorable to environmental concerns.

We are interested in learning how the complex nature of the disputes PIL lawyers have been involved in has affected their strategies and decisions to allocate resources, and in understanding the potential and limits of the PIL mechanism for effective interest group advocacy in complex policy controversies. To do this, we have selected two case studies for detailed analysis.

In the remainder of this chapter, we shall look at the first of these case studies, the effort to secure the redesign of a nuclear plant at Indian Point on the Hudson River. We isolate one small aspect of a broad challenge to power plant construction on the Hudson, and to nuclear power in general, for detailed scrutiny. This case involved several parties, and presented issues of tremendous factual complexity. Our purpose is to show how one effort at advocacy succeeded under these conditions and to isolate factors that may explain this success. By looking closely at this case, we will try to show what PIL firms may achieve and what it takes to achieve environmental goals in relatively complex disputes.

In Chapter Eight we look at a much larger slice of PIL environmental defense work by studying a five-year litigation campaign brought against the Corps of Engineers, the TVA, and other federal agencies which are charged with developing the nation's water resources by building dams, channeling streams, and the like. PIL firms participated in disputes which present all the factual complexity found in Indian Point. At the same time, the water resources campaign involved PIL in challenges in which the distributional implications of the PIL position were more serious, the effective decision-making bodies were more numerous, the agency biases stronger, and the resource disparities between environmental groups and other interested parties probably greater. Thus the second case permits us to study how increasing complexity of the dispute affects the potential for effective advocacy by PIL-type organizations.

The Battle to Protect the Hudson River Fishery

The first dispute we examine was between environmentalists and a public utility. The Consolidated Edison Company (Con Edison) provides electricity for New York City, and as demand grew, Con Edison began to construct a series of power plants along the Hudson River north of the city. This program was criticized by environmental groups, who felt that the power plant development was harming aquatic life in the river, as well as causing esthetic damage to the undeveloped areas of the Hudson.

Environmental groups attempted to stop some of Con Edison's projects. Noteworthy was the effort to halt the proposed pumped storage plant at Storm King. There, environmental groups secured the aide of some Wall Street lawyers - working at reduced fees - to successfully challenge the Federal Power Commission's decision to license the plant.

Indian Point was another battle in this campaign. In the early 1960s Con Edison began to build a nuclear facility at Indian Point, 24 miles upriver from the city. Criticism of this facility grew as evidence mounted that it was harming fish, and as general concerns over nuclear power became more intense. Finally, environmental groups, represented by PIL firms, challenged the plant. Some, concerned with nuclear safety, wanted the plant shut down. Others, concerned more with harm to aquatic life, asked that the plant be redesigned to minimize environmental damage. The effort to stop the reactor for safety reasons failed. The effort to secure redesign to protect the fishery succeeded to a significant degree.

We shall focus on the design controversy. While the safety issues were of great importance, we do not concentrate on them because our purpose is to illustrate in detail the conduct of successful environmental advocacy. For this reason we concentrate on the separate challenge to the design of the reactor's cooling system.

Those who wanted the plant redesigned were not principally concerned with the issue of nuclear energy. The design feature they objected to was the plant's cooling system. All power plants that generate electricity through steam need systems to cool the steam condensers. Whether the plant is fueled by nuclear or fossil fuels, it must draw large volumes of cool water into the plant and discharge equal volumes of heated water. While all plants require cooling, nuclear plants, being less efficient, discharge more heat per kilowatt of energy generated than conventional plants. Thus a shift to nuclear power increases the need for water.

When generating plants are cooled by drawing water from a lake or river, the plant can have a substantial impact on aquatic life. Two major types of impact are possible. First, the process of drawing the water into the plant leads to "mechanical" damage. This is the harm done to the fish who are caught on the screens that surround the intake pipes ("impingment") and the harm done to organisms that pass through the screens and are drawn through the plant itself ("entainment"). The second impact is that caused by thermal pollution - the discharge of heated waters into the river or lake.

The damage to fish impinged on the screens or to fish larvae or young fish entrained in the mechanism is obvious and reasonably susceptible to measurement. Thermal pollution also affects the fish, but the extent of harm is not as well understood.

10. Most of the research that has been done has been under laboratory conditions. Fish, however, are a part of a food chain involving marine plants and invertebrates, dissolved nutrients, other fish, frogs, etc. As any link is imperiled, so is the survival and well-being of the fish. Even disregarding the unknown effect of heated effluents on other parts of the aquatic ecosystem, the heating of the fish's habitat may destroy the fish in a manner that is not detectable to man. The temperature of the water may not exceed the fish's lethal temperature. Thus, at this point, fish will either go elsewhere or die. But sub-lethal temperatures may take their toll as well. Heating of water decreases the amount of oxygen the water will hold in dissolved form. Thus, as the water is heated above the fish's preferred temperature, the fish's metabolism must increase to adapt to the diminished supply of oxygen. This puts the fish under physical stress and has an adverse effect on its activity, growth, reproduction, and survival. The significance of the stress is increased when it is understood that the emission of heated effluents from power plants is not constant. The emission may cease due to decreased demand, repair, etc. Thus, the temperature of the water may be subject to sudden changes in the area of power plants. Fish are unlikely to be able to adapt to these sudden changes. For discussions of the effects of thermal pollution, see John R. Clark, "Thermal Pollution and Aquatic Life," *Scientific American* (No. 320, March 1969), p. 19; Ronald M. Bush, Eugene B. Welsh, and Brian W. Mai, "Potential Effects of Thermal Discharges on Aquatic Systems," *Environmental Science and Technology*, VIII (1974), pp. 615-68.

The utility believed that it could speak for the interests of power consumers, who were not specifically represented, and the conservationists argued on behalf of commercial as well as sports fishing interests. The commercial fishermen, who are generally small operators in Atlantic ports far from the plant, and who are not organized as an industry, did not appear separately.

The factual complexity of the dispute will become apparent as the history unfolds: suffice it to say now that the parties disagreed on most of the major factual issues that were raised by the utilities' proposal to employ the cheaper open-cycle cooling system. Further, the controversy involved several decisional forums: state courts, the Environmental Protection Agency, and the Atomic Energy Commission were directly involved, and other federal or state agencies participated in the debate over plant design. However, the principal focus of attention was the AEC, whose licensing decision was the crucial event in the struggle.

In order to understand the role PIL lawyers played in this context, we shall examine the history of the dispute in detail. To highlight the PIL role, we start before PIL firms were operating in this area of environmental defense.

The Early History of Indian Point

The environmentalists' battle to protect the Hudson River fisheries really began in 1963, when Con Edison applied to the Federal Power Commission (FPC) for a license to build and operate the Storm King pumped-storage project. Consolidated Edison proposed to pump water into a 240-acre reservoir; during periods of peak power usage, the water would be released to run down Storm King Mountain, near Cornwall, New York, powering the utility's turbines. The FPC routinely granted the license, but an environmental group contested the decision in federal court on the ground that the Commission failed to take into account esthetic damage to historic Storm King Mountain, as well as damage to the fishery caused by entrainment of fish larvae and young fish.

In an historic decision, the Second Circuit set the license aside and remanded the case to the FPC for reconsideration of the items it had failed to take into account. In response, a governmental group undertook a study—financed by the utility—which showed relatively little damage to the fishery. This study—called the Hudson River Fisheries Investigation (FR)—was cited by the FPC when it later reaffirmed its decision to grant the Storm King license.

Despite the findings of the FR—which was published only after the FPC's final decision—environmentalists continued to believe that Con Edison's expansion program was causing serious harm to the fishery. Thus it is little surprise that the issue soon arose again. This time the focus of controversy was the nuclear facility at Indian Point. The Indian Point No. 1 plant, situated on the east bank of the Hudson in Westchester County, near Buchanan, New York, provides power for both New York City and part of Westchester County. Opened in 1962, it was one of the earliest nuclear plants built. It generates 265 megawatts of power, and uses 300,000 gallons of river water per minute in its open-cycle, once-through cooling process.

Within a year after Indian Point No. 1 began operating, it had become apparent that the plant was causing damage to the fish in the river through impingement. Public concern over the damage began to crystallize in 1965 when reports of massive fish kills at the plant appeared. This concern led to the opening rounds of the Indian Point conflict, as environmental groups and public officials sought remedies that might stop the fish kills.

These early challenges had little effect on the plant. Although a number of challenges were mounted, they ran into legal and practical obstacles that severely hampered the environmentalists' search for some form of legal protection for the Hudson fishery.

One abortive effort came soon after the 1965 fish kill. In the fall of that year Con Edison petitioned the AEC for an amendment to its license. The utility sought permission to install a new core and to increase the operating level of the Indian Point plant. Seeing an opportunity to challenge the fish kills, a group of Hudson River sportsmen and commercial fishermen—through an organization called the Hempstead Town Land Resources Council—requested permission to intervene in the license amendment proceeding.

The Council's attempt to intervene was badly mishandled. The Council either totally misunderstood the AEC's rules of procedure, or lacked the manpower to comply with procedural requirements. As a result, it committed almost every procedural mistake imaginable.

First, the Council only requested permission to intervene after the date for such petitions had expired. Moreover, the initial request for permission was in the form of a one-line telegram. It gave little data on the purpose of the intervention, and failed to include the statement of good cause for late filing which was required by the AEC rules. Nevertheless, the AEC allowed the Council to file a formal petition for leave to intervene. Yet once again the Council was unable to meet the Commission's procedural requirements, for its formal petition omitted the required statement of the nature in which the Council's interests would be damaged by the proposed amendment; this omission was a violation of Commission Rule 2.714(a). But this was not the end. When Con Edison moved to dismiss the petition the Council made its third and most damaging procedural error when it failed to answer the motion. Under AEC procedure, failure to respond to a motion to dismiss amounts to

16. The Committee itself was composed of representatives of the New York and New Jersey Conservation Department and of two bureaus of the Interior Department—the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries.
17. The document is undated, but it is available from the New York Department of Environmental Conservation.
18. Hudson River Fishermen's Asm. v. FPC, 498 F.2d 827, 830 (2d Cir. 1974).
must look beyond the legal issues to find additional motives for the AEC's decision to refuse jurisdiction over environmental matters. The AEC had strong bureaucratic as well as legal grounds for refusing to rule on environmental matters. At the simplest level the Commission probably was, like any bureaucracy, reluctant to take on new and complex tasks for which it neither had legislative guidance nor qualified staff. But in this case its resistance was also based on a more concrete conflict between its own view of its mission and the issues raised by the environmentalists. The AEC was set up with a dual mission. On the one hand, it was charged with the development of the peaceful use of atomic energy. Because of the costs, complexities and dangers in atomic power, private enterprise was incapable of developing commercial use of atomic science, and it fell to the federal government, through the AEC, to promote this new area of economic activity. At the same time, the AEC was charged with regulating private use of atomic power to protect the public health and safety against radiological hazards.

Many observers believed that there was a deep and serious conflict between the Commission's promotional and its regulatory mission. They felt it was more motivated by its desire to build up the industry than by its concern for safety. These fears were sufficiently great that eventually the Congress divided the AEC into two entities, one with exclusively promotional and one with solely regulatory powers; in 1974 the regulatory powers of the AEC were transferred to the Nuclear Regulatory Commission. (For ease of discussion, we will refer to the regulatory agency throughout this chapter as the AEC.)

But this breakup of the AEC was to come only at the end of our story. In 1965, the AEC still had its dual mission, and was encouraging a more rapid development of the nuclear power industry. While it could not reject its responsibilities for nuclear safety, it had no incentives to take into account other issues which might slow down the development of nuclear power or increase the costs of this already very expensive form of power. Thus it is little wonder that it balked when environmentalists tried to get it to expand its concern to issues like fish damage. The environmental movement wanted to stop nuclear plants entirely, or at least to secure substantial and costly redesign of plants and processes; neither the AEC nor the industry which it had spawned and with which it retained close ties was anxious to open up such issues.

The second legal challenge to the environmental damage caused by the Indian Point plant came from the Office of the Attorney General of the State of New York. The Attorney General attempted to bring two actions under state law against Con Edison. One case was based on a somewhat constructive construction of a state statute. The Attorney General argued that by killing fish Con Edison was violating the prohibition on poaching, and was liable for substantial fines. Although this suit was initially successful, it was finally rejected by the Court of Appeals on the grounds that the poaching statute was not broad enough to cover the events at Indian Point.

The second attempt by the Attorney General relied on the concept of public nuisance, its power to abate public nuisances, the Attorney General sought an injunction against further fish kills at Indian Point. In this case the problem was not lack of a defensible theory, but lack of the expert witnesses necessary to establish that the proof was acceptable by a public nuisance standard.

The factual issues in the Indian Point controversy are very complicated. No one doubts some fish are killed by the plant's operation beyond that the several parties have the right to disagree on almost all other factual issues. Thus there is controversy about such issues as the number of fish killed, whether certain low-cost techniques could stop the kills, the importance of the fish to the population, the effects of the fish lost by virtue of the plant's operation on the relative importance of mechanical and natural causes, and the effects on aquatic life. Various kinds of chemical pollution are implicated with the plant. While Con Edison was proscribed to introduce witnesses on all these issues, the environmental section of the Attorney General's office had a very limited budget, and could afford to hire its own expert witnesses. At one point the environmental section was even persuaded to the State Department of Environmental Conservation (DEC) to provide experts who would support its contention. The DEC did not share the Attorney General's view of the seriousness of the kills. Without the necessity of experts by consent, it was not possible to prove the Indian Point plant would cause substantial damage to the state's fisheries. Accordingly the Attorney General was forced to drop the case.

The unsuccessful efforts by environmental...
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to mobilize legal processes to halt fish kills at Indian Point illustrate the barriers to effective environmental defense. There were few clear legal rights that could be invoked. Moreover, even when environmentalists could point to some standard that might be violated, or some rule that required consideration of environmental issues by government agencies, they found it difficult to prove their cases, or to secure effective judicial review of agency decisions.

These problems were not unique. In 1972 Donald Large, in an article plaintively entitled, "Is Anybody Listening? The Problem of Access in Environmental Litigation" catalogued the multiple barriers that face environmental lawyers. Large noted that the typical environmental case is one where environmental groups must challenge decisions by developmentally oriented agencies or by regulatory bodies which are highly sympathetic to the regulated industry. In such situations, administratively law and procedure places a series of obstacles in the way of an effective challenge. Citizen groups challenging agency actions find it almost impossible to get courts to act as referees to agencies from acting before a decision is made, difficult to intervene in administrative processes themselves, and difficult to secure effective judicial review of agency decisions. In such circumstances the courts provide no effective relief from decisions of biased agencies. As we have shown, Large's analysis was clearly applicable to Indian Point.

Large stressed the centrality of factual disputes in environmental controversies. In complex factual disputes, the struggle may come down to a question of who can marshal the most persuasive evidence on these disputed factual matters. Industries have substantial resources to accumulate data supporting their interpretation of these matters. If the government agency lacks resources to independently investigate such issues, or is "blinded" toward the industry's point of view, or both, the burden of proof will in effect be placed on the environmentalists to challenge the industry's view. Meeting this burden will require expert assistance and detailed challenges, through cross-examination, of industry and agency staff positions. Moreover, once the agency has made a factual finding, judicial deference to agency expertise will make it extremely hard to secure effective review of erroneous decisions. Since Large assumed that agencies tended to be biased against the environmental perspective, and since his experience as a litigator had shown that environmental challengers rarely had access to the expertise needed to carry the de facto burden of proof imposed upon them, it is little wonder that he asked, looking back on his trial practice, if anyone had been listening.

The Passage of NEPA and the Expansion of the PIL Environmental Effort

As Large's analysis and the early years of the Indian Point dispute show, the barriers to effective advocacy for environmental interests were substantial. These obstacles contributed to the failure of the first efforts to curb fish damage at Indian Point in the late 1960s. In the early 1970s, however, a number of legal and institutional changes occurred which materially affected the conditions in which environmental advocacy could be carried out. Chief among these were the growth of public interest environmental defense firms, the passage of the National Environmental Policy Act of 1969 (NEPA) and a strenuous effort by environmental groups, assisted primarily by PIL lawyers, to develop a body of case law that would make NEPA an effective tool of environmental defense. These changes would influence the outcome of the second round of the Indian Point controversy, which centered on the design of the second plant in the Indian Point complex. Before returning to the case, therefore, we must examine the effect of the changes that NEPA and the growth of PIL made in the conditions for advocacy.

The Growth of Specialized Public Interest Environmental Defense Firms. The first organization exclusively dedicated to legal action for environmental protection was the Environmental Defense Fund (EDF). Organized in 1967, this group began its operation by attacking the use of the pesticide DDT. The public reaction to this campaign permitted EDF to raise substantial

NRDC quickly assembled a top-flight staff of lawyers and environmental scientists, and secured financial support from the Ford Foundation. Initial operations were hampered, however, when the IRS announced that it was reconsidering its policy of granting tax-exemption to organizations engaged in litigation. The IRS view lasted throughout 1970. Under pressure from private and public groups, the IRS finally reversed its initial decision to deny tax exempt status to PIL firms. When the IRS finally gave the go-ahead, NRDC moved quickly to mount a substantial program. It was no surprise that one of the first clients to approach NRDC was a group devoted to protection of the Hudson River fishery.

The National Environmental Policy Act of 1969. As the public interest environmental defense movement was taking shape in the late 1960s, the United States Congress was undertaking a major review of the effect of federal government programs on environmental issues. Several Congressional committees produced studies on environmental policy and held hearings to investigate the process of federal decision-making. These reports and hearings helped Congress to recognize the importance of the process of agency decision-making as it affected environmental values, and that, as a result, many agencies were taking actions which caused undesirable and unnecessary environmental damage. Out

49. Ibid.
50. It is noteworthy that one of the most vigorous and important proponents of granting tax exemption status to firms like NRDC was the newly established White House Council on Environmental Quality, which argued that PIL litigation was an essential supplement to government efforts at environmental protection. See Lioffe, "EDF and Its Aftermath," p. 35.
52. See Erwin, "EDF and Its Aftermath," p. 35.
54. Interview with Mr. Angus Macbeth.

42. For a confirmation of this, see Ebbin, Citizens Groups, p. 154 and seq.
43. See Large, "Is Anybody Listening?" p. 108.
46. See Lioffe, NEPA and Its Aftermath, Ch. V, n. 2.
47. Interview with Mr. Angus Macbeth.
of this review of environmental policy and decision-making emerged the National Environmental Policy Act of 1969 (NEPA), a broad-reaching statute which was to transform the process by which federal agencies considered environmental issues.\footnote{Sens. (July 11, 1969); and Environmental Quality, Hearings on H. R. 6730 et al., Before the Subcomm. on Fisheries and Wildlife Conservation on the House Comm. on Merchant Marine and Fisheries, 91st Cong., 1st Sess. (1969).}

NEPA is divided into two titles. Title I has three principal features. First, it contains a broad statement of National Environmental Policy. Declaring that "it is the... policy of the Federal Government... to create and maintain conditions under which man and nature can exist in productive harmony," Congress announced that it is the responsibility of the Federal Government to use all practicable means, consistent with other policies, to preserve environmental amenities, assure "safe, healthful, productive and aesthetically and culturally pleasing surroundings," and "attain the widest range of beneficial uses of the environment without degradation."\footnote{52. For a thorough canvass of the legislative history of the National Environmental Policy Act of 1969, see Loretz, NEPA and Its Aftermath, Ch. II, p. 19; also Richard N.L. Andrews, "Environmental Policy and Administrative Change: The National Environmental Policy Act of 1969 (1970-71)," Ph.D. Dissertation, Department of City and Regional Planning, University of North Carolina, 1975, pp. 76-109; and Anderson, NEPA in the Courts.}

These and other broad statements of policy might have gone the way of other hortatory Congressional declarations, if it not for the other features of Title I of NEPA - its "mandate-expanding" and "action-forcing" aspects. The authors of the statute were aware that broad statements of policy would have little if any effect on concrete agency decisions.\footnote{53. 42 U.S.C. §4331(a) (1970); Pub. L. No. 91-190, Tit. I, §101 (January 1, 1970) 83 Stat. 552.}

Accounting for the paucity of data about the environmental effects of federal programs, and with the decisional biases created by traditional cost-benefit and cost-effectiveness analytic techniques, Congress made express its concern, Section 102 included requirements for interdisciplinary analysis and techniques for giving "appreciative decision-making along with economic and technical considerations."\footnote{Footnote continued...}

Section 101(o) of the National Environmental Policy Act instructs the federal government to protect and restore the environment in accordance with a general national policy, declared by the Act, that the government shall endeavor "to create and maintain conditions under which man and nature can exist in productive harmony." The policy itself is spelled out in the specific mandates of Section 101(b) (42 U.S.C. §4321(b) (1970)). These give content to NEPA's substantive policy and ensure that NEPA's lengthy opening passages

The Congress could not prescribe detailed environmental rules for the myriad federal entities affected by NEPA's sweeping language, but it could require agencies to expand their mandates to include the furtherance of NEPA's general goals. Accordingly, Section 102 stated that, to the fullest extent possible, "the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act."\footnote{Footnote continued...}

One gets a general flavor of that reappraisal from a government document that appeared during the congressional debate over NEPA. In July 1969, the House Committee on Science and Astronautics published a report prepared for it by the National Academy of Sciences. This study, entitled "Technology: Processes of Assessment and Choice," dealt with the problem of ensuring that technological developments will, in fact, serve the needs of the human community.\footnote{56. Ibid., at §4332(2) (C).}

The Academy's report came in the aftermath of the flight over the SST. The SST struggle articulated a principle that seemed novel to many Americans, the principle that all technological changes do not necessarily lead to a net improvement in social welfare. The report concludes that current processes of decision-making in private markets and government tend to favor technological change even in cases where society as a whole may be worse off because of the change.\footnote{60. Ibid., at §4332(2) (C) (iii).}

At first reading, there is a curious character to Title I. The Title seems strangely bifurcated, a combination of general policy statements and specific procedural requirements. On the face of the law, there is no immediately obvious connection between the Congress's overall concern with improving the environment and the Title's requirement that all decisions should be preceded by consideration of alternatives to proposed actions, and by determinations whether irreversible and irretrievable commitments of resources are involved in the proposed action; that decisions are to be based on interdisciplinary analysis; and that agencies find ways to quantify previously unquantifiable variables. Yet when we see NEPA against the background of concerns that were voiced in the years prior to its passage, and that were articulated by the several committees that were responsible for it, it is possible to fill this apparent gap. For NEPA indicated a general belief that processes of decision-making in American society were distorted, and that we had become the prisoners of technology because our methods of thinking and evaluation had themselves become the captives of technological forces.

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The Committee articulated several broad objectives for improving national processes of technology assessment. The first was to widen the range of factors considered in making technological decisions, so that all possible impacts be known before irreversible decisions are made.\footnote{66. Ibid., pp. 53-56.}

The second is to preserve options if possible. Noting that we lack both adequate data on the impact of technological change and effective techniques for weighing the costs and benefits of many new programs, the Academy counseled choosing the alternatives that are the most reversible: "Other things being equal, those technological projects or developments should be favored that leave maximum room for maneuver in the future. The reversibility of an action should thus be counted as a major benefit; its irreversibility, a major cost."
The third objective that the Committee articulated is a shifting of the burden of uncertainty. Noting that past practices have placed the burden on those who challenge the wisdom of new technological trends, the panel suggested the advisability of shifting this burden, and casting on the proponents of a new technology the obligation to produce proof that it does not entail excessively high social costs. Finally, the panel pointed to the need to mobilize new constituencies to participate in the debate over technological decisions. Concluding that the present system fails to give all affected interests effective representation in the crucial processes of decision, the Academy called for new institutional arrangements that would correct these biases.

NEPA did not in any sense enact the view of the Academy, but the authors of the statute shared many of the concerns set forth in the report; they stressed the importance of interdisciplinary assessment, of careful consideration of alternatives, of considering unquantified factors, of avoiding biases created by mission-oriented agencies, and so forth. The environmental impact statement provision reflected a belief that a greater investment should be made in environmental information and greater attention should be paid to this information in decisions, thus echoing the Academy’s concern that present systems biased the flow of policy-relevant research and investigation.

While recognizing the parallels between the statute and the report, we should be sensitive to the differences between NEPA and the views of the Academy. NEPA does make clear that agencies must assess a great deal of environmental information, including information on the extent to which irreversible decisions are being taken while less damaging alternatives exist. But the statute contains no precise and explicit guidelines governing agency use of this information. Where the Academy report is specific, as in recommending a policy of avoiding any decision involving irretrievable use of resources, and a shift of the burden of uncertainty, the authors of NEPA were vague and general. They told administrators to get data on such issues, but they left unclear whether and in what ways they had a duty to act on these data.

Moreover, NEPA did not directly address the problem of increasing public participation in agency decisions, a measure the Academy thought essential to bring out the negative effects of technological changes on certain segments of the population. Congress was well aware that many agencies had built-in incentives to underestimate the environmental damage from process, to ignore allegations of environmental harm, to resist efforts by environmentalists to participate in the decisional process, and to avoid considering alternatives that would be more costly in non-environmental terms. Thus its failure to impose specific decisional guidelines or to mandate public participation did leave a gap in the statutory scheme.

To the extent that Congress saw this gap, its response was in Title II of NEPA. This Title established an agency to further NEPA’s goals and to monitor agency compliance with the statute’s requirements. The Council on Environmental Quality (CEQ) was established in the Executive Office of the President, and charged with preparing an annual Environmental Quality Report, analyzing environmental trends and conditions, reviewing and appraising Federal programs.

In the hearings on national environmental policy conducted in the late 1960s there was considerable skepticism about the real value of a measurement without action-forcing aspects, “which will compel or reinforce or assist . . . executive agencies . . . to take the kind of action which will protect and reinforce the life support system of this country.” Hearing on S. 1075, S. 257, and S. 1752 Before the Senate Committee on Interior and Insular Affairs, 91st Cong., 1st Sess. (April 1969). As the late Chairman Henry M. Jackson continued along the same lines: “realistically, what is needed in restructuring the governmental role is that of this proposal creates those situations that will bring about an action-forcing procedure the departments must comply with.” See also Cont. Rep. 91-765, 91st Cong., 1st Sess., 2 U.S.C. Code Cong. and Admin. News, pp. 2767, 2770.

The CEQ’s powers were clearly limited. It had neither direct responsibility for environmental decision-making in the executive branch, nor any power to delay or halt projects. Moreover, its role was ambiguous. For some, the Council might seem to be an environmental “ombudsman,” bringing to public attention federal decisions that seemed in conflict with NEPA. For others, it looked more like a confidential advisory board to the President, working within administration channels to further environmental goals where possible. Limited in power, and torn by the conflicts between these two goals, the Council took a relatively low-key stance in its early years, choosing to work within the executive branch to improve the process of environmental decision-making rather than to attempt direct confrontation with mission-oriented agencies or to mobilize public concern about substantive or procedural issues.

One of CEQ’s major functions was to structure the process of preparing the environmental impact statement (EIS) called for by Section 102 (2) (c) of NEPA. The EIS was the most concrete requirement imposed by NEPA, but the statute left many questions about the nature and scope of the EIS requirement unclear. Although it was clear that each agency was charged with developing the statute’s broad mandate for procedural review, the overall task of defining the EIS process fell initially to CEQ.

Section 102 (2) (c) had indicated that the EIS must identify the environmental impact of any “major federal action,” and must specify any adverse effects which are unavoidable should the project be implemented. Additionally, the statute required identification of alternatives to the proposed action, clarification of the “relationship between local short term use of man’s environment and the maintenance and enhancement of long-term productivity,” and identification of any “irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” Finally, the statute indicated that other federal agencies should be consulted before the detailed statement is made.

Although the statute made clear that the statement was to be comprehensive, and that it was to be a vehicle for inter-agency communication, Section 102 was silent on all other aspects of the EIS process. Nothing was said about such issues as the effect of the Act on projects already in the pipeline, its applicability to regulatory decisions such as AEC licensing, the nature and scope of public participation in the EIS process, the range of alternatives that had to be analyzed, and so on. Moreover, the statute gave no explicit guidance on the weight agencies should give to environmental values: while it was clear that these must be identified, NEPA did not tell an agency much about the nature of its obligations (if any) to modify activities that were shown to have adverse environmental impacts.

CEQ assumed initial responsibility for clarifying the scope of the EIS requirements. Its guidelines have developed the broad statutory provisions to make it clear that all agencies must comply with NEPA, that NEPA evaluation must begin early in any project or program development process and continue throughout the cycle of review and decision, and that the maximum opportunities should be provided for public and interagency comment and participation.

The CEQ guidelines answered many but not all the key questions about NEPA. For example, they gave only general guidance on which kinds of actions require statements, the analysis that must be included, the timing of the statement, preparation, and public involvement. The CEQ

82. Executive Order No. 11514 (35 Fed. Reg. 4247, March 17, 1970) clarified that primary responsibility for shaping the environmental impact statement process would be in the hands of CEQ, and not OMB. For elaboration of OMB’s role, see Liroff, NEPA and Its Aftermath, pp. 90-91 (1970).
84. The second major revision (38 Fed. Reg. 20549) injected the component of public participation in the evaluation of environmental impacts, an element “that was implicit in the actions of NEPA’s architects.” See Executive Order No. 11514, §2(b) and comments of Liroff, NEPA and Its Aftermath, p. 62.
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attempted to provide more detailed answers to those questions through its reaction to the NEPA procedures prepared by each agency. But the CEQ was limited in its ability to secure agency compliance with some of its views on the process that should be followed. For example, the CEQ and the FPC disagreed on whether the FPC had a responsibility to conduct an independent environmental analysis in its regulatory proceedings, or whether it could rely on the studies prepared by applicants for licenses. The CEQ could not convince the FPC to prepare its own studies, 88 and the Commission only accepted this responsibility when ordered to do so by the courts. 89

The CEQ's powers were limited, and it had to proceed with caution. 90 In part as a result of disappointments with the CEQ, environmental groups turned to the courts to secure definitive interpretations of NEPA and binding orders that would force agencies to comply with its procedural requirements. In the years after the statute was passed, environmentalists initiated hundreds of lawsuits raising a wide range of issues. In general, the judicial response was favorable to the environmental claims, and this litigation effort created a corpus of law which made it crystal clear that NEPA's procedural requirements were to be strictly enforced, and that agency actions that failed to satisfy the emerging procedural requirements would be overturned by the federal courts.

Interpreting and Implementing NEPA: The Role of Courts and PI Lawyers. As one federal judge put it, NEPA is at the same time broad and opaque. 91 Its potential thrust is enormous, yet its precise implications for agency decisions are uncertain. In establishing NEPA procedures and in determining how NEPA affects prior agency missions and priorities, hundreds of questions had to be answered. Although the CEQ tried to develop solutions to these issues that furthered the act's broadest purpose, the Council's capacity to influence individual agency decisions was limited.

88. See Lioyf, NEPA and Its Aftermath, p. 56.
90. See Lioyf, NEPA and Its Aftermath, p. 88.

Thus the ultimate impact of NEPA would depend to a large extent on the attitude the agencies themselves took to the statute, and on external pressures from entities other than the CEQ.

Agency response to NEPA varied. Some agencies moved with relative dispatch and adopted a liberal interpretation of the statute's impact on their processes. Others moved very slowly to implement the statute's mandate, and took every opportunity to construe it narrowly. 92 While they were aware of substantial variation in agency response, environmentalists were, overall, disappointed with the reaction of the agencies. 93 Faced with an overall pattern of response that suggested agency resistance to the sweeping reappraisal of programs, projects, and procedures that the environmental movement had hoped would follow from NEPA, and aware that the statute provided the best — and often the only — tool to halt specific projects that they opposed, the environmentalists had to seek some source of external pressure to secure what they felt was full compliance with NEPA.

For a variety of reasons, they chose the courts as the principal arena in which to challenge agency decisions, and the results were initially encouraging. The court's directive in the CEQ and the Environmental Protection Agency, 94 was unwilling to press for full compliance with the broad reading of NEPA that the environmental movement favored, and while the Congress was willing to play only a limited over.

92. See discussion in Lioyf, NEPA and Its Aftermath, Ch. IV.
94. See Calvert Cliffs.

When NEPA became law, the AEC was forced to make two basic decisions. First, it had to file a statement, required by Section 103, indicating whether it felt that it was in any way precluded by statute from complying with NEPA. Since the AEC had previously taken the position that

sight role," the federal judiciary responded favorably to the environmentalists' demands. In literally hundreds of cases, the federal courts issued broad interpretations of the statute, and ordered agencies to comply with its requirements for development of precise data about environmental impact, and for integration of environmental assessment into specific decisions.

A detailed description of all the NEPA cases brought by the environmental movement is beyond the scope of this study. 95 We shall, however, look at a few major decisions that illustrate the nature of the judicial response, and at some other cases that were of special significance to the controversy at Indian Point.

For our purposes, the most significant case to examine is the decision of the Court of Appeals for the District of Columbia in Calvert Cliffs Coordination Committee v. Atomic Energy Commission. 96 This case has fourfold interest for us. First, it was the first major pronouncement on NEPA by a Circuit court, and the first of a stream of decisions that manifested judicial williness to read NEPA broadly and to scrutinize AEC interpretations of the statute. Second, Calvert Cliffs set forth a detailed description of the kind of decision-making that NEPA requires agencies to follow; its view has come to be widely accepted by the courts and the case has been called "the definitive judicial gloss on NEPA." 97 Third, Calvert Cliffs is an example of the kind of litigation public interest lawyers were bringing in the early years of NEPA. And, finally, the case dealt specifically with the AEC, and had a direct impact on the Indian Point controversy.

When NEPA became law, the AEC was forced to make two basic decisions. First, it had to file a statement, required by Section 103, indicating whether it felt that it was in any way precluded by statute from complying with NEPA. Since the AEC had previously taken the position that

its mandate did not allow it to consider environmental factors when making licensing decisions, and since NEPA's impact on this mandate was not clear on the face of the statute, the AEC might have contended that it could not comply with NEPA. But it chose not to raise these issues, indicating that it accepted an obligation to conduct the required environmental analyses and consider their results. 98

While the AEC's response to the Section 103 inquiry showed a willingness to accept some duties under NEPA, its interpretation of those duties suggested that the Commission was far from a total convert to the environmental cause. Like all agencies covered by the act, the AEC was required to develop procedures for NEPA compliance. It did not rush to produce these procedures — indeed, it took almost a year to publish a formal NEPA amendment (designated as Appendix D) to its regulations. Moreover, when the amendment was finally issued, it contained several provisions that were strongly criticized by the environmental movement. This criticism crystallized in a lawsuit brought by The Environmental Defense Fund and a number of other environmental organizations. The environmentalists were represented by Anthony Rosman of Bedlin, Rosman and Kestler. At least some of the legal costs of the case were paid by EDF. 99

The environmentalists contended that the AEC procedures violated the letter and the spirit of NEPA. They challenged the Commission's views on the nature of the evaluative process it must undertake, and the effect of NEPA on on-going projects. Specifically, they questioned its refusal to consider ordering any construction halts, redesign and backfitting for plants that had been granted construction permits but that had not been authorized to begin operations prior to NEPA's enactment. They objected to the rule that precluded analysis of environmental issues in

95. See Lioyf, NEPA and Its Aftermath, pp. 69-71, 174-175.
96. For a full discussion of NEPA litigation, see Anderson, NEPA in the Courts; Anderson, "The National Environmental Policy Act," p. 256; and Lioyf, NEPA and Its Aftermath, Ch. V.
97. See Calvert Cliffs.
99. Section 101 (42 U.S.C. §4321, 1970) provides: "All agencies of the Federal Government shall review their present statutory authority, administrative regula-
hearings for licensing any plant if the hearing notice was published before March 1971. And they opposed the Commission's decision to refuse to allow hearing boards to consider environmental issues not raised by a party to the proceeding, or to take account of any issue such as thermal pollution on which another agency had indicated satisfaction with some aspects of the environmental impact of the plant.

These regulations would have severely hampered the environmental effort to use NEPA to challenge nuclear plants. The rules narrowed the issues that could be raised and made it necessary for environmental groups to intervene in many proceedings to ensure full consideration of environmental issues. But perhaps most importantly, the regulations meant that the AEC did not have to conduct an environmental analysis for eighty on-going projects, including Indian Point Nos. 1 and 2, and thus that environmentalists would be unable to use NEPA as a device to challenge the construction or design of these facilities. By excluding the existing plants from NEPA's purview, the regulations made the statute a dead letter in just those cases where the controversies were most acute, and in which the environmentalists had hoped to employ it to mount a major challenge to nuclear plants. It is, therefore, small wonder that they felt impelled to challenge the regulations.

The Circuit Court agreed with all the objections raised by the environmentalists. Although the CEQ had previously accepted all the rules in controversy, Judge J. Sikely Wright found that they violated NEPA. Writing for a unanimous panel, Wright took the occasion to produce a detailed and sweeping opinion on the nature of an agency's obligations under NEPA, to spell out the role of judicial review in overseeing NEPA compliance, and to chastise the AEC for what he called a "crabbed interpretation" of NEPA which "makes a mockery of the Act." In this and other passages Wright made clear his view that NEPA mandated sweeping changes in agency procedures, his feeling that the federal bureaucracies could be expected to try to defeat Congress's intent by delay and narrow interpretation of the statute, and his conviction that it was the task of the federal courts to stop any such whittling away of NEPA. "Our duty," he said, in a masterful rhetorical introduction to the opinion, "is to see that important legislative purposes, heralded in the halls of Congress, are not lost or misdirected in the vast highways of the federal bureaucracy." The most significant features of the opinion dealt with Wright's views on how that duty was to be performed.

The potential barrier to judicial scrutiny of agency response to NEPA was the doctrine of agency discretion. Under the Administrative Procedure Act, courts cannot review questions which are "committed to agency discretion by law." If Congress had left expressly to the agencies and to the CEQ the task of defining the nature of the EIS, the timing of its preparation and the circumstances under which environmental findings were to be made, then the courts would be unable to police the agency response. Thus the first and major issue that Wright had to address was the problem of discretion.

Since NEPA dictated no clear or specific result to any federal decision, it obviously left the agencies with some degree of discretion. The court could not assert that the act uniquely determined any or all issues, yet if the courts were to play the role Wright had identified for them, he would have to hold that NEPA did definitely settle certain matters so that a court could overturn the decision of an agency. Wright resolved this by creating a distinction which has haunted NEPA litigation ever since; he divided NEPA into substantive and procedural provisions. The "general substantive policy of the Act" he said, "is a flexible one. It leaves room for a responsible exercise of discretion and may not require particular substantive results." But, the judge went on, "the Act also contains very important procedural provisions." These latter are not flexible, but rather "establish a strict standard of compliance." Thus, whatever limits there may be to judicial review of substantive decisions -- such as a decision whether to require cooling towers for nuclear plants -- the courts have the final say on what constitutes compliance with NEPA's requirements that agencies adopt new procedures for environmental assessment.

Having introduced this substance-procedure distinction and made clear that the courts will look very closely at the procedures agencies follow, Wright went on to describe the kind of procedure that is mandatory under NEPA. In so doing, he proceeded to blur the very line he had created, thus giving rise to the long controversy over the question of judicial review of "substantive" agency decisions under NEPA.

NEPA's "procedural" provisions require, the court said, that agencies secure information about environmental acts and consider this information. And the obligation to consider the information, being procedural, is just as obligatory as the requirements to secure information about environmental impacts and to include a statement about these impacts in all proposals for major federal actions that affect the environment.

But, the opinion went on, the statutory obligation to consider environmental impact means more than just reading the environmental reports -- and perhaps marveling at the damage to be done. It necessarily entails giving the factor of environmental damage weight in framing decisions. Wright reasoned that when Congress said that an agency must consider environmental amenities along with other factors, it had to mean a balancing process in which the environmental amenities are given some value and their loss assessed in terms of gains that the project would produce. Moreover, he indicated that a court could review an agency decision if "the actual balance of costs and benefits that was struck was arbitrary or clearly gave insufficient weight to environmental values." In this suggestion that "consideration" of environmental loss means "give weight to," and the hint that courts could say in particular cases that too little weight was given, we can see the nose of a substantive rabbit peering over the rim of Wright's procedural hat.

Wright's rejection of the AEC's rules of procedure followed directly from his concept of the decisional process demanded by NEPA. The "balancing" had to be both finely tuned and particular to each project. Therefore, the AEC could not rely exclusively on other agencies to determine such things as acceptable levels of thermal pollution, since their decisions would have been considered outside of the context of the overall project. And since the environmental analysis had to be an integral part of the decision, the AEC could not exempt its licensing boards from making any environmental findings, even on issues not raised by the parties. Finally, since NEPA imposed an obligation to add environmental protection to the AEC's mandate as of the statute's effective date, the Commission had to look at NEPA issues in all cases in which its action might avoid environmental damage, and thus in all cases where final operating licenses had not yet been issued.

The decision that the AEC had to apply NEPA to all such projects had immediate effect on Indian Point. The AEC did not appeal the Calvert Cliffs decision. Rather, it chose to comply with the opinion, and shortly issued new procedures which set up a revised decisional process consistent with the opinion. This process required a NEPA assessment for all plants "in the pipeline," including a cost benefit analysis of environmental damage, and it allowed environmental intervenors to raise issues of environmental damage in all licensing procedures.
Thus it became possible for the intervenors to raise the fish-kill and cooling tower issues in the hearings for an operating license in Indian Point, which were pending when the Calvert Cliffs decision came down.

Other PIL Environmental Litigation Affecting Indian Point No. 2

Before returning to the discussion of Indian Point, let us look briefly at another PIL litigation in the environmental area that shaped the Indian Point controversy and that resurfaced after Calvert Cliffs. In the period between the passage of NEPA and the licensing hearing at which the Indian Point cooling towers question came to a head in AEC decisional processes, PIL lawyers brought hundreds of NEPA cases. Out of this litigation a large body of law defining the NEPA obligations of government agencies emerged. Although this litigation only indirectly affected Indian Point, the growing case law set the tone for the later debates over the design of the Indian Point plant. In this section, we look at a few of the principal issues that were settled in this period.

In this string of litigation, issues were decided that did not have to be redetermined in the Indian Point case. This prior litigation may have affected the Indian Point case in two ways: by directly influencing the AEC staff's views on its obligations; or at least by eliminating legal issues which might have been disputed in Indian Point. In this respect, prior litigation reduced the cost to PIL lawyers of penetrating to the essence of the dispute without having to first settle tangential matters. The relevant issues already litigated by the time of the licensing hearing on Indian Point No. 2 are the following.

Substantive Review. Several cases developed the Calvert Cliffs dictum on so-called "substantive review," thus nudging Wright's rabbit a little further out of the hat. These cases, when applied to Indian Point, said, in effect: despite agency compliance with NEPA's procedural requirements in preparation and circulation of EIS's, if you give too little consideration to the fish killed in the intake process, the decision might be reversed.102

Overview Statements. Must the agency EIS discuss an integrated set of projects of which the present project is a part, albeit the only part near the construction stage? While not dealing with precisely that question, the court in Natural Resources Defense Council v. Morton seemingly provided the answer.103 The court in that case held that the agency must discuss alternatives that the agency by itself is unable to bring into existence. If the agency must discuss projects it cannot affect — on the ground that that is the only way the Congress, the public, and others can properly assess the cost of the planned project — then the same full disclosure idea must apply to elements of an overall program within the control of the agency. As applied to Indian Point, this means that the agency's initial decision to limit the analysis to the impact of the plant itself had to be reversed, and the impact assessed in terms of the entire program of power development on the Hudson.

Who is to prepare the EIS? In Greene County Planning Board v. FCC, a case which the Sierra Club and others represented by PIL counsel entered as intervenors, the Second Circuit Court decided — in what appears to be the definitive statement on the issue — that an agency may not delegate the preparation of the EIS to its "client," in this case the FCC was barred from relying on data produced by an applicant for a power license.104 Accordingly, the AEC in Indian Point had to carry out its own independent investigation; it could not rely completely on Con Ed's environmental reports. This created a major staff obligation for the AEC, and contributed to a decision that had important implications in the dispute, namely, the decision to contract the preparation of the Indian Point No. 2 EIS to the relatively autonomous scientific group at Oak Ridge National Laboratory.

Full Disclosure. In Environmental Defense Fund v. TVA (Telllico Dam), the court said that the basis of the agency's decision must be clearly set forth.105 Thus it follows, as another judge observed, that officials must give more than cursory consideration to the suggestions and comments of the public in the preparation of the final impact statement. The proper response to comments that are both relevant and reasonable is to either conduct the research necessary to provide satisfactory answers, or to refer to those places in the impact statement that provide them. If the final impact statement fails substantially to answer those questions, it will not meet the minimal statutory requirements.106 Thus the AEC was required to take heed of the detailed comments offered by the intervenors and of their remarks in meetings with agency officials.

Similarly, if the public is to comment, the "EIS must be written in language that is understandable to non-technical minds and yet contains enough scientific reasoning to alert specialists to particular problems within the field of their expertise."107 In the same vein, the agency may not attempt to use the EIS simply as a vehicle for communicating its conclusions on the merits of its project. The conclusions must be based on articulated premises. Under a rule set down in NRDC v. Morton, supporting data must be included in the EIS; it cannot be supplied afterward, for example, at a hearing on agency compliance with NEPA.

Unknown Environmental Effects. According to cases decided prior to September 1972, the agency is not prevented from taking action, either in favor of or against the environmentalists, by the fact that the environmental effects of its project are uncertain. The Gilliam Dam case presented facts in this regard analogous to those in Indian Point.108 The construction of Gilliam Dam would destroy a free-flowing river and sever all the fish of the living there. But, since an inventory had never been taken of river biota, the magnitude of the impact of the dam was not certain. Such an inventory and a follow-up study would take several years. But that fact alone would not require that construction be postponed. The agency could have to weigh the costs of postponement plus those of obtaining exact data against the risk of proceeding on incomplete information.109 Applying similar reasoning to Indian Point, even if Con Edison was correct in saying that too little was known about the ultimate impact of once-through cooling upon the ecology of the estuary, the staff was still free to recommend — as it did — the installation of cooling towers based on its present (inexact) perception of the likely effects of the two cooling systems.

Discussion of Alternatives. By the time the Indian Point No. 2 EIS was issued, the Second Circuit Court had issued a comprehensive statement on the AEC's obligation to discuss alternatives to the proposed project in NRDC v. Morton.110 The holding was twofold: the agency may not limit its discussion to those alternatives wholly within its power to effectuate; and it may not disregard alternatives simply because they accomplish less than the original proposal. The second prong of the case is relevant here. The AEC, under this holding, could not dismiss cooling towers on the ground that they reduce the output of the power plant and that therefore a plant with cooling towers does not accomplish what a plant without such towers does.

Commenting Procedures. It was already clear by mid-1972 that the requirement that comments be solicited and received on draft EIS's was a formal requirement, the flaunting of which would likely result in a judicial rejection of the EIS as a whole. This follows from Judge Skelly Wright's statement in Calvert Cliffs: "The Section 102 duties [NEPA's main procedural provision] are not inherently flexible. They must be complied with to the fullest extent, unless there
is a clear conflict of statutory authority. Considerations of administrative difficulty, delay or economic cost will not suffice to strip the section of its fundamental importance.'

Judge Wright's language was applied to the Interior Department's failure to solicit comments on amendments to a previously issued EIS. The District Court in *NRDC v. Morton* accordingly rejected the addendum. Similarly, the burden is on the agency to prove that the proper commenting procedure has been carried out.

These cases reflect an appreciation of NEPA's major premise: that more information and more diverse information will lead to a change in the substantive results of agency decision-making. The intervenors in Indian Point took repeated advantage of that NEPA theory to prevent the AEC with technical information even before the issuance of the Indian Point No. 2 draft EIS, and especially before the distribution of the final EIS in the fall of 1972.

The Challenge to the Second Nuclear Plant at Indian Point

In the period following the unsuccessful efforts to halt Indian Point No. 1, three major changes had occurred in the conditions for environmental defense in nuclear plant controversies: PIL environmental defense firms had been established; NEPA had been passed; and the courts, largely at the behest of PIL lawyers, had accepted the responsibility for oversight of NEPA compliance and had developed a series of rules and doctrines defining agency responsibilities. After *Calvert Cliffs*, environmentalists knew that they could intervene in licensing proceedings and raise substantive issues and objections to AEC analysis and conclusions. They knew that the AEC would have to investigate major areas of environmental damage, and in some as yet undefined fashion, account for these in its final decisions. They knew that the requirements for inter-agency comments on the EIS and for a hearing on NEPA issues offered opportunities to mobilize other agencies and public groups to oppose plants like Indian Point.

The NEPA litigation facilitated a full and open debate on issues like cooling towers, and obligated the AEC to invest in information regarding the issues raised. But it still was not clear if anyone was listening; there were no guarantees that these opportunities to be heard would result in changes in AEC decisions. The only thing that was clear was that procedural opportunities had been established and certain information would be produced; it was not at all clear whether, how, and at what cost those opportunities could be transformed into actual environmental gains. We now return to the story of the Indian Point controversy, and describe how the environmental movement succeeded in exploiting the opportunities in this case.

In the late 1960s Con Edison built a second and larger nuclear plant at Indian Point. The AEC construction permit was issued on October 17, 1966. Owing to construction delays, the company was not ready to apply to the Commission for an operating license until the end of the decade. Hearings on the license began in 1970. In December 1970 the Hudson River Fisherman's Association (HRFA) represented by NRDC, petitioned to intervene in the licensing proceedings.

HRFA alleged that NEPA applied to Indian Point No. 2, and that given the plant's impact on the fishing, it would be a violation of the statute for the AEC to license the facility for operation unless it required the installation of closed-cycle cooling.

The emergence of HRFA added a new actor to the Indian Point dispute. The group had been organized in 1966 by sport and commercial fishermen and conservationists, principally as a vehicle to attack the proposed Storm King plant. It had already successfully attacked several industries that were dumping industrial wastes into the Hudson, and had secured large recoveries under the *Refuse Act*. These funds helped the group finance continued activities in defense of the Hudson fishery, including participation in the Storm King case and intervention in the Indian Point No. 1 licensing proceedings. Thus when the Indian Point No. 2 licensing proceedings began, HRFA had both financial resources and some expertise in the factual issues of the Hudson River battle. After deciding to intervene, it sought legal assistance from NRDC. Angus MacBeth, the NRDC lawyer who was to handle the Indian Point No. 2 case, agreed to represent HRFA, but insisted that the group pay for the experts who would be needed to develop the case that the plant would cause serious biological harm.

Although at this point the AEC was still taking the position that NEPA did not apply to its licensing procedures and that it was not required to take account of environmental values, it did grant the HRFA's petition to intervene in January 1971. Little happened, however, until mid-1971 when *Calvert Cliffs* was decided, and it became clear that the AEC must consider environmental costs in its licensing proceedings.

At this point the Commission began the EIS process on the Indian Point No. 2 application. Since the Commission lacked the biological expertise to do the statement at its Washington, D.C. area office, it assigned the task to its research arm, the Oak Ridge National Laboratories in Tennessee.

At about the same time, HRFA hired John Clark, a biologist and former Department of Interior official, to serve as its technical expert. HRFA began by conducting a thorough analysis and criticism of the IFI, the study of power plant impact on fish that had been prepared in connection with Storm King, and on which the FCC's decision to license that plant had been based. Clark's criticism of that study formed the basis for a report of preliminary findings of fact and conclusions of law, filed with the Commission in December of that year. In the middle of December, representatives of HRFA, Con Edison, and the AEC met to discuss the issues raised by the environmentalists. At this point the environmentalists were contending that up to 35 percent of the estuary's young-of-the-year would be killed by once-through cooling.

On April 13, 1972, the AEC issued its draft EIS on Indian Point No. 2. The draft EIS did recognize the validity of HRFA's contention that long-term irreparable damage to the fisheries could arise from the continued use of once-through cooling. The AEC staff did not agree, however, that closed-cycle cooling was necessary. It merely recommended as a license condition Con Edison's continued monitoring of the environmental effect of its cooling process, study of various cooling tower alternatives, and due care on the utility's part in adapting its present intakes apparatus for minimum fish-kills.

The draft EIS proposed to postpone consideration of closed-cycle alternatives for two years.

As counsel for HRFA, NRDC immediately took issue with the AEC's analysis and conclusions. Relying on Clark's analysis, MacBeth developed a detailed criticism of the draft EIS. NRDC's essential argument was that the AEC had underestimated the extent of potential harm to aquatic life, and had overestimated the cost of the closed-cycle alternative design. NRDC pointed out that the draft EIS admitted that Indian Point No. 2 could kill a million fish a year through mechanical damage, and that 15 to 20 percent of the annual striped bass population – the species about which most was known and whose economic value was highest – would be killed, leading to "substantial reductions" in the striped bass population in the Hudson and the Atlantic fishery.

This, it reasoned, should be sufficient evidence of a substantial risk of irreversibly harm to justify the investment in cooling towers. Such an investment, they argued, was even more necessary when one took into account factors other than the fish-kills. Thus, the NRDC argued, the AEC estimates were based on theories of the extent of damage from Indian Point No. 2 that might well underestimate the harm. And they did not take into consideration the damage to the fish that would be done by other plants that were about to begin operating. If these were considered, it was suggested, the case for towers was overwhelming.

NRDC took a number of steps to bring these arguments to the attention of the AEC staff, in order to persuade them to reconsider the
The final EIS was released in early October 1972. It reflected the impact of NRDC's campaign. The analysis of potential plant impact on aquatic life had been revised to indicate the staff's view that the potential harm was greater than they had thought at the time of the draft EIS. And, most important, in place of a recommendation for open-cycle cooling and monitoring, they proposed that the license be conditioned on the installation and operation of cooling towers by January 1, 1978.  

Needless to say, the utility was not satisfied with the staff's recommendation and disputed its findings before the Commission's Atomic Safety and Licensing Board. Con Edison questioned the factual basis of the staff's findings and contended that the cooling towers were unnecessary. The environmental intervenors, on the other hand, took the position that the impact of the plant on aquatic biota was even greater than the staff's estimate, and demanded that the towers should be installed by December 1, 1976 (HRFA and EDF), or January 1, 1977 (State of New York), about one year earlier than the staff had recommended.  

Hearings before the Licensing Board were exhausting and protracted. They took more than twenty-five days of hearing time over a span of more than nine months and resulted in approximately 20,000 pages of testimony. While John Clark spent five full days on the stand, much of the testimony on the environmental side came from the AEC staff, principally from Dr. Goodyear.  

The principal environmental (as opposed to nuclear safety) issues at the hearings were the effect of the plant on thermal pollution of the river and the mechanical impact of the plant on the fish population. The parties disagreed on the extent of possible thermal pollution, and on the total effect of the plant on fish in the estuary and in the Atlantic. The main focus was the impact on fish, and most attention was given to the impact on the striped bass, the species which had the greatest commercial and sports fishing value. At the hearings Con Edison, HRFA, and the AEC staff each produced its own study of the impact on bass. The AEC's study, conducted at Oak Ridge, highlighted the defects of the F1, upon which Con Edison's Storm King license was based. The AEC study utilized a computer model analyzing the course of the young fish under various flow conditions; it thus gave full weight to the fact that the Hudson at Indian Point is a tidal estuary, ebbing and flowing, where the F1 was inconsistent on that point. Unlike the F1, the AEC report undertook to analyze the relationship between the Hudson River fish population and that of the coastal fishery. The AEC study concluded that the Indian Point No. 1 and No. 2 plants together would destroy between 30 and 50 percent of annual striped bass production, and that the diminution would not be replenished naturally as each generation matured.  

The AEC thus concluded that the value to the environment of building cooling towers to protect the fish balanced the cost of doing so. The HRFA presented its own field research study reaching the same conclusions as the AEC staff.  

The utility, on the other hand, reintroduced the F1 data into the case, along with its interpretation of the data, based on a different analytical model. Con Edison contended that: (1) diminution in fish population at the juvenile stage and younger — by entrapment or otherwise — does not entail a proportionate diminution as that generation matures, meaning that a reduction in fish density operates to increase the survival rate among fish in the less dense environment; (2) the Hudson River fishery is not a major contributor to the coastal fish stock; and (3) research on the impact of the water intake process of fish population was inconclusive at that time.  

Con Edison originally opposed the cooling towers altogether; after hearings it changed its position, proposing to undertake a research program to be completed in 1977. If that research did not show that use of measures less costly than closed-cycle cooling would result in acceptable levels of fish diminution, then cooling towers would have to be in operation by September 1, 1981.  

The arguments were thus highly technical, scientific ones, but in quasi-judicial proceedings technical arguments need effective and orderly presentation in a lawyer-like manner. If the environmentalists relied on the AEC for development of the technical, factual case, they relied on the public interest lawyers for presentation of those facts. The intervenors presented only three witnesses of their own. The bulk of the examination of agency witnesses and the cross-examination of industry witnesses was performed by the NRDC attorney.  

In the end, the Licensing Board did not seem to adopt per se any of the cost-benefit figures offered by the parties. Instead, it concluded simply that "the benefits, to the extent they can be quantified, to be derived from installation of a closed-cycle cooling system on Unit No. 2 are unlikely to approach the cost." Yet unquantifiable benefits must be given due weight. In fact, reasoned the Board, NEPA "requires that a natural resource like the Hudson River be protected from serious damage if economic means having less adverse environmental impact are available to provide such protection." Based on that analysis of NEPA requirements, the Safety and Licensing Board granted Con Edison its license, but conditioned its issuance on a requirement that the company cease a closed-cycle cooling system in operation by May 1, 1978.  

All parties, with the exception of the Environmental Defense Fund, appealed the decision. On appeal the Atomic Safety and Licensing Board focused almost exclusively on the fishery issue. The proper interpretation of NEPA was the first issue debated. Con Edison contended that the Licensing Board had erroneously interpreted NEPA as a requirement that the agency give environmental considerations paramount weight in its decisions. Citing Colbert Cliff, the Appeals Board stressed that NEPA merely requires that environmental factors be weighted in the decision process, and balanced against other values.  

In turning to the facts of the case, the Appeals Board severely chastised both the staff and the Licensing Board. The staff and the intervenors, it...
found, had not met their burden of proof on several crucial issues:
(1) The hearing record did not support the staff position on the magnitude of the Hudson River’s contribution to the coastal fishery.181
(2) The record did not support the proportion of eggs and young fish the staff and the HRFA found would be entrained in the open-cycle mechanism.182
(3) The record did not support the staff’s analysis of the compensatory effect of the destruction of young fish, that is, the thinning out effect.183
(4) In all, the Board found such deficiencies in the staff’s technical justifications for its position as to require a “fresh look” at those justifications and “reconsideration of the portions of the Final Environmental Statement to which they relate.”184
The Board did apparently concede, however, that its “balancing” view of NEPA notwithstanding, values protected by NEPA may not be amenable to weighing in a strictly quantified cost-benefit analysis. Despite the lower Board’s finding that, insofar as the costs and benefits connected with the project are quantifiable, the cost of building the towers outweighs the benefits of doing so, and despite its own findings that crucial elements of the environmentalists’ case were missing, the Appeal Board ordered the company to have cooling towers in operation by May 1, 1979,185 subject to extension on two conditions: (1) if the construction could not be completed on time, an extension would be allowed “for good cause,”186 and (2) if the utility is able to adduce additional empirical data collected during the interim justifying an extension, it may apply to the Commission for such extension.187
Thus, although the Appeal Board made a point of the staff’s and the interveners’ failure to introduce convincing proof on certain issues, the outcome indicates that as AEC rules provided, the burden of proof was on the utility from the beginning, and the environmentalists benefited from this allocation of the burden.
Indian Point No. 3. The AEC’s position was further clarified in subsequent proceedings on the third plant at Indian Point. On April 25, 1967, Con Edison applied for a license to construct its third and largest nuclear facility at the site. Three intervenors, the Citizens Committee for the Protection of the Environment, the state through its Atomic Energy Council, and an individual, challenged the application on safety grounds. Nonetheless, the license was issued in the summer of 1969.188 By the time Con Edison was to apply for an operating license for the plant, NEPA had gone into effect. Accordingly, the AEC staff compiled an extremely detailed and thoroughly documented study of, among other things, the impact of the proposed once-through cooling system on estuarial and coastal fish stock. Like preceding studies, however, the Indian Point No. 3 final EIS did not attempt to measure the effect of the intake system on species other than the striped bass. As we pointed out, the striped bass had the highest commercial and sports fishing value, but it should be noted that white perch constitute approximately 70 percent of the fish impinged on Indian Point power plant cooling systems.189
While the staff’s cost-benefit analysis will be discussed at length later in this chapter, it is worthwhile to note at this stage that the staff found that on the basis of the data available, and using standard cost-benefit methods, the quantifiable costs connected with building cooling towers for Indian Point No. 3 exceeded the benefits of doing so.190 However, in an approach reminiscent of that of the Licensing Board in Indian Point No. 2, the staff felt that when the limits of the data and the methods were taken into account, and benefits they could not quantify were considered, the cooling towers were cost-justified. While the staff’s analysis contained ambiguities that could have had by Con Edison, it did constitute a basis for negotiation between the utility and the intervenors including HRFA. Save Our Stripers (SOS, a group with interests similar to those of HRFA), the New York Attorney General, and the State Atomic Energy Council. As a result of these negotiations, the parties entered into a stipulation providing that Con Edison would receive an operating license for Indian Point No. 3, but requiring that cooling towers be installed by 1980.
Summary. This was the status of the Indian Point controversy when research for this study terminated in mid-1976.191 The debate over the impact of power development on the Hudson continued. Some of the issues discussed here were still unresolved; for example, no final decision had been made on the kind of cooling towers to be used. Other issues might be raised again if new data were made available. Some observers expected Con Edison to reopen the whole cooling tower question if its research program yielded data to contradict the AEC’s findings. Finally, new issues will continue to come up that will affect the future of these plants and the Hudson fishery. There are, for example, two additional plants in the planning stages, and there will be debate on their design and impact. And other developments, such as new evidence of nuclear radiation dangers at Indian Point No. 2, and the discovery that chemical substances discharged into the river by the General Electric Company were killing large numbers of fish, will also undoubtedly influence the continuing struggle for preservation of the Hudson fishery.
At this point, it is impossible to say precisely what effect the work of NRDC has had or will have on the Hudson River environment. To do that in a definitive way, we would have to know what would have happened in Indian Point if NRDC had not intervened, and we would have to predict the outcome of numerous future decisions in the Indian Point project and on other plants along the river.
It is, however, possible to say that the Indian Point controversy led the AEC to articulate a new policy governing the environmental impact of the plants it licenses, and that this policy will continue to affect decisions in the area. For it seems clear that through the controversy over Indian Point, the AEC came to understand more about the environmental risks involved in power development, and, as a result, it developed and implemented a policy that places on the proponents of development the burden of proving that risks involved in a proposed undertaking are low. Moreover, it is clear that the decision to shift this burden to the utilities made a big difference in the decision on the Indian Point license, and will
181. In the Matter of Consolidated Edison Company of New York, Inc. (Indian Point Station, Unit No. 2), 7 A.E.C. 323, 406 (April 4, 1974).
182. Ibid.
183. Ibid. p. 407.
184. Ibid., pp. 325, 407.
185. Ibid. p. 408.
186. Ibid.
187. Ibid.
189. IP 3, Final Environmental Statement, Summary and Conclusions, p. v.
190. Ibid., pp. 102-103.
probably affect the final design of that and all future plants in the area.

If we take this change in policy as the principal result of the Indian Point controversy to date, we then are led to ask what extent the change can be attributed to the work of NRDC, and whether the change can be said to be in the public interest, as that term is used in this study.

The historical study of the decision gives us reason to believe that PIL intervention was significant in bringing this policy change about. Without the prior work by PIL litigators who caused the courts to flesh out NEPA's vague mandate, it is doubtful that the AEC would have prepared the thorough environmental impact statement that it did. And without specific intervention and advocacy by HRFA and NRDC in the licensing proceeding, it seems equally unlikely that the conditional requirement for cooling towers would have been placed in the license.

We surmise that NRDC action was a significant factor in the outcome, but was the outcome one that could be said to further "the public interest"? Clearly, the decision increased by a substantial degree the chances that funds would be spent to protect the fishery. But would such expenditures be more efficient or more equitable than open-cycle cooling? In the next section we shall attempt to answer these questions.

**Evaluating the Performance of the PIL Lawyers in Indian Point**

In order to determine whether the decision to make cooling towers a condition of the license was an efficient change, as well as to understand why PIL intervention might be necessary to secure such a move, we must first understand why it is unlikely that private market decisions will lead to optimal design of facilities with potential environmental impact, as well as why government licensing agencies may not be expected automatically to correct any such private market failures.

**Private Market Failure**

Can we expect that there is a private market failure in this case? We know that decentralized decisions in markets may not lead to the most efficient allocation of resources, and that some form of collective action may increase welfare through an allocation that would not prevail in the private market. To determine if this is the case, in a given situation, we must first ask if there is a potential private market failure — if, for example, there are institutional barriers that keep consumer demands from being translated into producer decisions to satisfy these demands.

The market in this case certainly contains such barriers. Because of information, communication, and transaction costs, it seems unlikely that bargaining will occur between the parties affected by the decision in a fashion that would permit us to say that the market solution constitutes an efficient allocation of resources.

To demonstrate this, let us assume that there are only two groups affected by the cooling tower decision: fish lovers and the utility. Fish lovers include all those who derive some welfare from the fishery, and the utility stands for all those who benefit from more and cheaper power. Assume further that the utility is free to choose between open-cycle and closed-cycle cooling and that there are no barriers to bargaining. In this case the utility would choose the open-cycle system since it leads to lower costs and since the utility is under no obligation to consider the harm to fish or fish lovers. If, however, the fish lovers feel that the value they place on the fish that will be killed without cooling towers exceeds the cost of having the towers, they might organize and try to bribe the utility to build the towers. If they were not able to bribe the utility, then it would be clear that the value of fish killed would be less than the cost of eliminating the kills. On these assumptions it would follow that if, after an opportunity for bargaining, the utility decided to maintain open-cycle cooling, then this must be the most allocatively efficient design for the plant.

But it should be obvious that there are enormous barriers to the kinds of bargaining envisioned in this ideal model. A close look at the nature of the groups affected and the problems of assessing the losses to fish lovers caused by the open-cycle system makes clear the high potential for private market failure in this case.

The potential impact of Indian Point No. 2 on the environment is very great. The plant will kill many species of fish through entrainment and implantation. It will raise river temperature and will have some effect on all forms of river life. The plant will damage some species of fish that are commercially fished and sold, some that are caught by sportsmen, and some that are not consumed by man. It will affect the level of the fish population in the Hudson and in Long Island Sound, but it may also affect the entire Middle Atlantic fishery.

We can divide the "fish lovers" — those concerned with these effects — into two groups: fishermen and environmentalists. Fishermen include sport anglers and commercial fishermen. Environmentalists include all persons who place a value on fish and the entire Hudson River ecology over and above any value derived from current sport and commercial use. In this latter category fall at least four groups:

Those who believe that the present economic value of a resource like the bass fishery understates its value to future generations.

Those who believe that we should preserve not only those aquatic species we use — like the striped bass — but also those for which man has no significant use, like the white perch, since future generations may find a value for them.

Those who think that fish kills may do unknown damage to the entire ecology of the river, and believe that these potential losses should be eliminated at all costs.

Those who think that man has an obligation not to harm any natural species regardless of whether man is now or ever will be directly benefited by the existence of that species.

To show the nature of the private market failure in this case, let us start by making the assumption — to be relaxed later — that all affected persons have perfect information. That is, assume that all the people who currently fish for sport or profit, or who might do so during the life of the nuclear plant, as well as all persons who value fish preservation for other reasons, know the exact impact of the plant on all the species of fish. Assume further that they know the probability that the plant will cause the depletion of a species, and that they can predict the effect of the fish population decline on their activities or on other aspects of the environment that concern them. In this case, each angler or potential angler can decide what he would pay to be able to continue to fish in waters with current fish population levels and each commercial fisherman can assess the decline in income caused by the reduction in the fish population and thus in his catch. Moreover, "environmentalists" can assess the cost to them from the decline in fish population, the risk of species extinction, and other environmental damage.

The first thing we realize is that even on these assumptions it is highly unlikely that the fish lovers could actually aggregate the amounts they would be willing to pay to have the cooling towers installed. First, the costs of identifying and informing these dispersed groups and individuals are immense. The commercial fishermen number in the thousands and are not organized; other users of the fish resources are numerous and geographically dispersed. There are, for example, currently about 450,000 sport anglers fishing for striped bass in the area in which the plant's impact may be felt. Moreover, we must take into account all those who might want to fish these waters in the future. In addition to the costs of informing and securing agreement of all affected parties, there may be "free-rider" effects which would cause some potential beneficiaries from the towers to refuse to help finance their construction.

But the likelihood of private market failure increases even more if we relax the wholly unrealistic assumption of perfect information. When the Indian Point controversy began, no one had any accurate data about the impact of these power plants on fish life. The only study that had been done — the Fisheries Investigation (FI) — was subsequently discredited, and Con Edison had not anticipated the large fish kills of the 1960s. During the controversy, substantial sums had to be invested in studies that tried to determine the number of fish that would be killed by the plant, and the effect of these deaths on the total fish population in the Hudson and the Atlantic. Even after this investment many questions remained unanswered; Con Edison is currently spending $15 million on a program designed to close the gaps in knowledge about plant impact. Moreover, even if we had much better information about these issues, it would be difficult to diffuse this information to all groups and individuals affected.

There are also structural barriers to producing the needed information. All the fish lovers have
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AEC Decision-Making Prior to NEPA. Prior to NEPA, at least, the very factors that made for potential private market failure in a case like Indian Point also made it highly probable that there would be a government failure. To understand this, we must look more closely at how the AEC approached nuclear licensing matters before NEPA. At that time, AEC had the legal authority to regulate all aspects of nuclear plant design. There was nothing in its statutory authority that explicitly precluded it from requiring design changes that would reduce negative environmental effects. It was not, however, specifically obligated to consider environmental harm in making its decision, and the AEC took the position that it had no legal authority to require private firms to make design changes solely on environmental grounds.

Even if the AEC prior to NEPA had had the power to require such changes, three features of AEC decision-making tended to make it relatively insensitive to environmental issues in general. These are (1) its “promotional” and industry-oriented biases, (2) its tendency to a “satisficing” decisional process, and (3) the procedural arrangements for licensing.

First, as an agency designed to promote nuclear power, the AEC saw its mission as furthering the industry. Thus it favored cheap nuclear power and was not sympathetic to arguments that would delay construction of nuclear plants or raise the cost of nuclear power. Moreover, as a regulatory agency substantially influenced by the industry views, AEC tended to listen more to the utilities than to their critics. Thus its industry orientation tended to make it less than sympathetic to environmentalist concerns. Environmentalists claimed that the impact of nuclear plants on the environment was greater than either the AEC or the industry was prepared to admit. AEC had little incentive to secure information on such matters, since this information could prove harmful to the industry with which it identified.

Secondly, like all agencies, the AEC engaged in what March and Simon call “satisficing” rather than “maximizing” decision-making. That is, it looked for the first solution to a problem that seemed to meet its decisional criteria, but did not search for the best of several solutions that might meet these criteria. Imagine a problem for which we know there are two solutions. Both benefit the industry but the second also benefits environmentalists. The theory of “satisficing” tells us that an agency will spend no resources on investigating the second solution if the first is adequate given its criteria. We would expect that this is what AEC was doing before NEPA.

Finally, AEC procedures and the weakness of environmental groups combined to make it difficult for environmental issues to be effectively injected into the licensing decision. Prior to NEPA the AEC made no independent appraisal of environmental impact. Moreover, it was difficult for citizen groups wishing to raise environmental issues to secure access to AEC decision-makers. AEC licensing procedures are complex, both legally and technically. Effective intervention requires substantial time and resources as well as technical and legal expertise.

We have suggested that AEC decision-making processes may contain structural features that bias the Commission against giving full consideration to a case in which the environmental harm of a given design outweighs the gain to power users of that design. In a sense, that allegation is hard to prove, since it was rare, at least before NEPA, that such cases could even be made, given the obstacles confronting environmentalists. But this fact alone suggests the likelihood of a government failure. For if an agency’s action might benefit a group, yet the group is unable to demonstrate the existence of such potential benefits, it seems likely that some opportunities for efficient action will be overlooked.

To see how this may work in practice, let us return to the case we have been examining. The fish-lovers may be the group best able to assess the nature of the damage, and they certainly are best able to indicate the amount of harm that it would cause to them and thus to society. But for the very reasons that we found a private market failure here, the fish-lovers are unlikely to present this information to the public agency. First, consider information. To make an effective case, the fish-lovers must know what impact the decision will have on the fish, how many persons it will affect, and the value those people place on the damage. But this information is lacking, and since the fish-lovers are dispersed, it will be difficult for them to aggregate resources to produce it.

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Even if the information—or at least some of it—were available, the fish-lovers lack resources to present it to the agency. Effective intervention requires the services of expensive professionals over substantial periods of time; in cases like Indian Point the market value of such services (exclusive of the cost of producing information) could well exceed $500,000. (Con Edison spent over $1,000,000 in legal fees on Indian Point No. 2.) Unless some small and organized subgroup among the fish-lovers stands to gain enough to warrant these expenditures, it is unlikely that the advocacy resources will be available.

In contrast, the industry can afford to develop its case in detail. Expenses for these purposes are easily recaptured through tax deductions and rate increases. The utilities are also “repeat players” in the sense that they engage in numerous controversies involving plant licenses and may secure benefits in one case that will be of value in other controversies. Fish-lovers, on the other hand, may be “one-shot players,” who are only concerned with the outcome of a single controversy. To the extent that this is the case, the utilities will be more likely to invest in advocacy services than the fish-lovers.

In summary, then, prior to NEPA there were no effective incentives for the AEC to develop or seriously consider data about environmental damage from plant design. The AEC did not believe that it had the legal power to correct the private market failure we have identified, and in any event it had no incentive to do so. For substantially the same reasons that there was a private market failure, the government failed to correct allocative biases of the private sector.

The Effect of NEPA. As we have explained, NEPA was designed in part to correct such defects in government decision-making. The authors of NEPA had decided that agencies like the AEC were underinvesting in information about the environmental impact of their decisions, and were giving too little weight to the information they did have. Thus, they established a requirement for more careful environmental analysis before action was taken, and mandated fuller consideration of environmental impact in decision-making.

163. See Galanter, Why the ‘Haves’ Come Out Ahead.
NEPA's passage created an opportunity to correct the government failures it has identified. NEPA, in combination with judicial interpretation of the statute, eliminated any doubt that the AEC had the legal power to require design changes that would reduce environmental damage. But mere passage of the statute did not guarantee that the Commission would change its decisional processes such that it would make effective use of that power. Since no mechanism was created for effective policing of NEPA's mandate, it is little surprise that the AEC, like many other agencies, responded very slowly to the new requirements. NEPA did little to change the agency's promotional orientation, its responsiveness to industry views, or its dislike of expensive processes of search for "optimal" as opposed to satisfactory policies.

But NEPA did make one major change in the structure of decision-making about power plant design. Until NEPA, groups such as our fish-lovers had no substantial leverage over the AEC or the utilities. They could protest decisions but they could neither delay them nor force the agency or the corporation to invest in more data. Once NEPA was passed and it became clear that citizen groups could intervene in agency processes to secure enforcement of the statute, and that the courts would, at the very least, require agencies to prepare thorough environmental impact statements, groups like our fish-lovers were armed with a potentially powerful tool.

This weapon was useful, however, only to the extent that the environmentalists could get access to licensing procedures and effectively invoke the courts if NEPA requirements were not complied with. Moreover, environmentalist intervention would cure the government failure only if the environmental impact statement in fact produced full and complete data about impacts and if the data were used. For this to occur, the environmentalists would have to be able to grasp the technical issues and gain access to the decisional arena so that they could effectively evaluate the environmental data and advocate its "proper" interpretation.

Given the pre-NEPA Agency biases, the complexity of the issues and the reluctance of agencies to invest time and money in thorough environmental assessment, the environmentalists' task would be a hard one, even in cases where environmental protection was clearly the efficient choice. But this task became more difficult—and thus perhaps more crucial—in those cases where even a relatively extensive environmental analysis failed to point unambiguously to one solution. To understand this, let us look more closely at the nature of the decision in Indian Point No. 2.

### Evaluating the Indian Point Decision

We have seen from the case study that in Indian Point the environmental groups successfully exploited the opportunities NEPA created. Although it is impossible to say that PIL participation was the cause of the decision to require the cooling towers, clearly it was an important factor in that decision. But what can we say about the question whether this decision itself was an efficient one?

To attempt to answer the efficiency question, we must first determine what was actually decided by the AEC in Indian Point No. 2 and the reasons for the decision. On close analysis we can see that the decision is more complex than a requirement that the cooling towers must be built; accordingly, evaluating the role of PIL lawyers requires a more complex analysis than an effort to determine if cooling towers are more efficient (or more equitable) than open-cycle cooling or some other alternative. Indeed, as we shall see, the most significant aspect of the Indian Point case is the fact that no one can say with certainty what is the most efficient choice.

The real problem posed by the Indian Point controversy is the determination of the appropriate rule of decision under conditions of uncertainty. For despite the vast efforts of both sides to secure factual data on the impact of the plant on the environment, and to assess the implications of the several alternatives open, the data were insufficient to determine conclusively that one solution was clearly preferable.

### Impact

We have two estimates. The low estimate is that damage of $50,000 will be done, while the high estimate is that damage will be $500,000. We do not, however, have any way of knowing which estimate is most likely to be correct.

3. We know that cooling towers could be built that would eliminate all damage to aquatic life and whose cost (including anyesthetic harm) is $300,000.

Given these data, what choice should be made? First, let us see the possible outcomes.

<table>
<thead>
<tr>
<th>Low Damage</th>
<th>High Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No plant</td>
<td>(950)</td>
</tr>
<tr>
<td>Closed-cycle</td>
<td>700</td>
</tr>
<tr>
<td>Open-cycle</td>
<td>950</td>
</tr>
<tr>
<td></td>
<td>700</td>
</tr>
</tbody>
</table>

**In this example it is clear that the decision to build the plant is efficient as long as the damage does not substantially exceed the high estimate. But the issue whether the cooling towers are the most efficient design depends on which of the estimates is correct. If the low estimate of environmental harm is correct, the decision to construct the towers would not be efficient, since they cost $250,000 more than the benefits they yield. But, on the other hand, if the high estimate is right, the towers should be built, since they will result in an efficiency gain to society of $200,000.**

The example indicates that under conditions of uncertainty, cost-benefit analysis may yield no determinate answers. Of course, there are ways to narrow the range of indeterminacy. Thus, for example, if we have data on the relative probabilities of the high and low estimates in the example, a determinate solution can be secured. And even without such data, game theory provides techniques that can yield a single answer to the problem in our example. But as E. J. Mishan has pointed out, all such techniques imply certain judgments about the degree of risk we are prepared to assume. In this case, these judgments are about the relative value of the risk of environmental harm versus the value of the potential loss of other benefits. Accordingly, even in simple examples with a known range of possible costs and benefits, subjective factors of risk preference must be included in the calculus before a single solution can be selected.

If cost-benefit analyses requires an essentially subjective judgment about risk preference under the simple conditions of uncertainty present in the foregoing example, it will entail even more subjective decisions in complex environmental disputes like that in Indian Point No. 2. For in situations like this there are so many points of uncertainty, and so many aspects of the situation that cannot even be reduced to a quantitative dimension, that even the most sophisticated cost-benefit study will require innumerable choices in areas with no objective guide. The Licensing Board caught the complexity of the situation well when it lamented that:

No one knows in detail what activities of life go on in the unseen depths of the Hudson River nor what the future response to changing inputs is going to be. Under these conditions the experts are free to choose those alternatives which best fit their beliefs about what may go on, and the arguments that follow produce thousands of pages of testimony and documents without providing answers that can be agreed upon, or that can give clear guidance to a Board.

In Indian Point No. 2 the data available and accepted by the AEC were sufficient to show that some damage would be caused by the plant and that much of this damage could be avoided by requiring cooling towers. The cost of the cooling towers was known. Moreover, the data made it possible to identify the worst possible form of damage that could occur. But there was no way to quantify the losses that would occur if this worst case occurred, or to estimate the probability of its occurrence. Thus, in deciding the cooling tower issue, the AEC had to have some criteria for determining the social preference for risk.

In its effort to grapple with the situation, the Licensing Board explicitly recognized that the principal issue in the case was how to allocate the burden of uncertainty. Con Edison argued that the data which the AEC had introduced were insufficient to justify the finding that cooling towers were required. The Board agreed that the

towers would only be justified if there was sufficient evidence to justify a finding that the costs of building the towers were less than the benefits they would yield. And it accepted the validity of the utility’s claim that the evidence did not show to a certainty that this was the case. Nevertheless, it held that there was adequate evidence to support the finding that tower construction was warranted. Accordingly, it explicitly recognized that the issue at stake was which party should bear the burden of proof.

The data were far from precise. Each of the parties had different estimates for key figures; the range of estimates is presented graphically in Figure 7.1. This figure shows the positions of the parties, and the Board, on two key variables: the percent of Hudson River striped bass that would be killed by all plants on the river after Indian Point No. 2 was operating, and the percent of the fish in the Middle Atlantic fishery that were produced by the Hudson River estuary.

These variations led to very different estimates of the monetary value of the environmental damage that would be done by operating Indian Point No. 2 with once-through cooling; these ranged from Con Edison’s estimate that the annual value of the loss would be as low as $940,000, to HRFA’s estimate that damage would be in the vicinity of $3,000,000 per year.

The Board made findings on the probable range and the value of damage from the plant. It concluded that the monetary value to the fishery would range from $1.4 million to $5.6 million annually. It also found that the cooling towers would cost $16,000,000 per year. Thus the range of the Board’s estimates, and also the difference between the quantifiable benefits and their cost, is shown in the following tabulation (figures are millions of dollars per year):

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate of loss to fishery (QB)</td>
<td>1.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Cost of towers (C_p)</td>
<td>16.0</td>
<td>16.0</td>
</tr>
<tr>
<td>(C_p) QB</td>
<td>14.6</td>
<td>10.4</td>
</tr>
</tbody>
</table>

The Board recognized that the cost of the towers would be greater than its own estimate of the largest possible quantifiable loss to the striped bass fishery. Nevertheless it concluded that NEPA required that the cooling towers be constructed. Since it assumed that this would be required only if the benefits of environmental protection outweighed the costs of the towers, we must conclude that the Board felt that it had before it sufficient data to justify a finding that Indian Point No. 2 would do at least $10.4 million in damage over and above the estimate for quantifiable losses to the striped bass fishery (that is, unquantified benefits, UQB, were greater than \(C_p\) QB). Why did the Board think this conclusion was justified?

The explicit discussion of this point is brief and unclear. The Licensing Board admitted that, using the losses that could be quantified and the known cost of environmental protection, the benefits of protection would be unlikely to approach the costs. That is, given the highest estimate of quantified damage, the costs of the towers will be larger than the monetary loss. But, the Board went on, NEPA “requires that a natural resource like the Hudson River fishery be protected from serious damage if economic means having less adverse environmental impact are available.” The Board found that Indian Point No. 2 had the potential for causing serious long-term damage to the fishery, and noted that the AEC staff considered the fishery a “priceless resource.” It further observed that the cooling towers would remove the potential for such damage. On this reasoning it concluded that the cooling towers must be built.

The key issue is what the Board meant by “economic means.” The Board rejected one possible interpretation: that an environmental protection measure is justified (is “economic”) only if its dollar costs are less than the quantified environmental savings it would create under the “worst case” assumptions about the extent of damage. All the various AEC bodies that dealt with Indian Point No. 2 (the staff, the Licensing Board, and the Appeals Board) agreed that there were benefits from the towers that could not be quantified, so that the quantitative figures for any estimated degree of impact would underestimate the total social benefits from protection. In addition, all agreed that NEPA required that these benefits be taken into account. But the AEC was less clear on the criteria to be used to decide if protection was or was not warranted in this case.

The tasks here are to determine the appropriate risk preference and the probabilities of environmental damage, and to estimate the amounts attributable to unquantified damage. One approach to these tasks would be to act on the assumption that the “worst case” estimate is correct and to use the highest conceivable estimate of the sum of quantified and unquantified losses, and to require protection if this would begin to approach the cost of protection.

This approach was rejected by the Appeals Board. Con Edison had argued that this was, in fact, the test used by the Licensing Board and staff, and that it was erroneous under NEPA to use any test like this which employed the “worst-case” estimates. The Appeals Board agreed with the utility’s argument that such a test, if employed, would not be consistent with the Calvert Cliffs notion of “finely tuned and systemic balancing.” It said that a “rule of reason” must be used to arrive at the most reasonable expectation as to the predicted environmental effects of a proposed course of action.” However, the Appeals Board did not accept Con Edison’s contention that the Licensing Board had

Figure 7.1 Range of Estimates on impact of Indian Point No. 2 Plant on Striped Bass Fishery
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erred in its analysis. The Appeals Board, while recognizing that the Licensing Board decision was unclear, decided that the decision rested on application of an appropriate rule of reason. The Appeals Board agreed with the Licensing Board's decision although it did question some of the Board's findings and did modify the deadline for installation of closed-cycle cooling. The Appeals board, then, accepted the lower tribunal's basic conclusion that on the evidence then available, the proper decision was to require installation of the cooling towers.

None of the three AEC decisions — those of the staff in the Final Environmental Impact Statement, the Licensing Board, and the Appeals Board — contains a clear statement of the process of decision that was followed. But if we take them as a whole, and also look at the final EIS for Indian Point No. 3, where the staff explained the analysis, it is possible to construct the reasoning process that lay behind the decision. Briefly, the procedure seems to have been as follows:

1. Determine all possible impacts of the plant on the environment.

2. Identify the range of impact that is possible.

3. Quantify the loss to the environment from this range of impacts, which will yield high and low quantifiable benefits from environmental protection (QB).

4. Compare these figures with the costs of eliminating the damage ($C_p$).

5. If the quantified environmental damage is greater than the cost of protection, regardless of the range of estimates, require the protective measure.

6. If the quantified damage is greater only on the high estimate, or if it is lower on both, then follow procedures set forth below.

(a) Determine how large the unquantified damage would have to be to make total environmental damage greater than the costs of protection; that is, calculate $C_p - QB$.

(b) Identify all unquantified benefits (UQB) to see what likelihood there is that they could exceed the difference between $C_p$ and $QB$, using the following criteria: (i) place a low value on protection measures that can be discontinued if data show they are unwarranted; (ii) place a high value on any impact on the environment that will lead to an irreversible change in natural conditions; (iii) where there is any evidence to support the high damage estimate, use this figure (or magnitude) unless the preponderance of contrary evidence proves it wrong.

(c) Compare, using orders of magnitude at least, the potential loss on the high estimate with the cost of securing the protection if the low estimate is correct. If the ratio is high, require the protective measure.

If this is what the AEC was in fact doing, its conclusion makes a great deal of sense. For Indian Point No. 2, steps 1-4 were carried out and this led to the decision that the cooling towers would be justified if UQB were $14.6 million on the low damage estimate and $10.4 million on the high. It was clear that there were at least three reasons for UQB's: (1) an underestimation of QB, since there was reason to believe that the figures used to estimate QB were low; (2) the value of harm caused to species other than fish; and (3) what the AEC called the "non-consumptive value" of fish. Moreover, if the high estimate were correct, there was a possibility that the striped bass population would decline permanently, and that other permanent ecological damage would be done. Since Con Edison could not disprove the possibility that damage would occur at the high estimate level, it seemed reasonable to assume that UQB would exceed $10.4 million a year, and thus that the cooling towers were an "economic" alternative if the high estimate were correct.

But this would not, under the rule of reason, have resolved the issue since it was not certain that the high estimate was correct. Thus it was also necessary to see what would be the social cost of requiring the towers if the low estimate were proven to be right. It was clear that there were some UQB's, but the low estimate, since estimates of QB were low for bass and since other species were not included in these estimates. However, the magnitude of UQB would be lower if the low damage estimate were right, since on that assumption the danger of irreversible damage — which has a high weight — was much less. Thus if the low estimate proved to be right, the cost of having chosen the cooling towers would be something less than $14.6 million per year.

Let us assume that if the low estimate of damage is correct, the towers will cost $10,000,000 per year more than the environmental benefits they will yield. This calculation gives us the highest possible opportunity cost of building the towers. The issue becomes whether it is worth running the risk that this loss from possible overprotection will occur, in order to be certain that society will not have to pay the cost involved if no protection measures are taken and if the high estimate proves correct. It permits the decision-maker to determine whether the possible cost of overprotection exceeds the possible benefits of requiring protection against harms whose ultimate magnitude cannot be quantified.

The AEC decided that in this case protection was worth this possible risk. The decision was made easier because the AEC's decision itself was not irreversible. That is, until construction actually starts, Con Edison is free to bring in new data to show that the high estimates are incorrect. What the decision does is place the burden of proving that the cooling towers are inefficient on the utility; the decision requires that the towers be built unless that burden can be met in the near future.

The decision was also made easier because the costs of the "insurance" factor can be spread among the power consumers. To the extent that all costs go into the rate base of the utility, and eventually they all should be included in the rate base, they will be passed on to all of Con Edison's customers. Given the size and heterogeneity of that group, it may have seemed to the AEC that the costs of this "insurance" would not fall on any one social group or class. Another cost of having the towers — esthetic degradation — will fall on those who live near the plant, but the Commission obviously thought these costs to be relatively small, and hoped they could be minimized by imaginative design.

Was this, then, an efficient decision? If it was, then the AEC's original position could be cited as an instance of "government failure." The Licensing and Appeals Board explicitly held that the ultimate decision was "efficient," in the sense that it was based on sufficient evidence to warrant a finding that the benefits of the towers exceeded their costs. But as the analysis shows, this conclusion rested on acceptance of a number of choices and decisions about risk preference and the possible magnitude of unquantified benefits whose validity cannot be subjected to objective evaluation. Thus it is ultimately up to the reader to decide if he or she agrees, as this observer does, that closed-cycle cooling was more efficient than the open-cycle system.

What Did the PIL Firm Do? Our analysis gives us reason to assert that the final decision was "efficient." Moreover, we do not believe that the decision entailed any large or systematic distributive effects that could be labeled "regressive." We have suggested that PIL intervention helps explain the agency's ultimate decision to select this solution, and thus can be seen as contributing to the correction of a government failure. But we have not yet identified the unique contribution of PIL to this outcome.

We have noted that agency biases may lead to governmental failures in the area of environmental analysis, and we have suggested that NEPA opened the door to some correction of these biases. But we have also suggested — and the history of Indian Point confirms it — that although NEPA was a necessary condition for effective correction of biases, the statute by itself was far from sufficient to insure that any governmental failure attributable to undervaluation of environmental protection measures would be corrected.

We saw that PIL lawyers had to employ the courts to make NEPA work. This litigation campaign helped clarify ambiguities in the legislation and made credible to recalcitrant agencies the threat that they would face litigation if they failed to conduct the analysis that NEPA called for, and also, perhaps, if they failed to give due weight to environmental values in their decisions. The discussion of the Indian Point case has shown how the overall PIL litigation effort to make NEPA workable reflected the AEC's decision to invest substantial resources in analyzing the costs and benefits of environmental protection.

Thus we can see that the PIL litigation under NEPA established a set of rules for agencies that would, if complied with, require them to conduct thorough environmental analyses and to make use of the data they gathered in their decision-making. If agencies internalized these
rules, the early PIL litigation would lead to better information and would increase the likelihood of efficient public decisions. Even if agencies did not voluntarily accept their NEPA obligations as defined by the courts, the case law made it relatively easy for those PIL firms that monitored agency behavior to secure court orders requiring more thorough environmental analysis.

But the Indian Point case shows that much more is at stake than making rules or securing compliance with rules about environmental analysis. For as that controversy makes clear, even when a thorough study is done, there is no guarantee that the investment in information will lead to more efficient agency decisions. Thus in all decisions, but especially in trial-type proceedings like AEC licensing or rate cases, the information must not only be compiled and analyzed but must also be effectively presented to decision-makers in complex proceedings. Usually private firms with economic incentives to minimize environmental protection participate fully in these proceedings, employing costly advocacy services. Moreover, agency staff frequently will be as resistant to environmental protection as private industry. Where, as in Indian Point, the agency staff does eventually come to favor protection, the interested private party will still have opportunities to challenge staff findings and conclusions.

But ever more significantly, as Indian Point also demonstrates, even the most thorough environmental assessment—and the Indian Point studies are considered models of their kind—may, and frequently will, fail to provide an unambiguous answer to the question whether environmental protection measures are efficient. It is in situations such as this that the PIL firms may make their most substantial contribution to furthering the public interest. Agencies have no legal discretion to avoid NEPA's mandate to prepare an EIS and to "consider" it, and if NEPA has some "substantive" thrust in addition to its procedural authority, agencies may have no discretion to refuse to take environmental protection measures, at least in clear cases where such measures are unambiguously efficient. Nevertheless, on any theory of NEPA, the agencies still have substantial legal discretion in complex and ambiguous areas like the Indian Point No. 2 case. And since all monitoring efforts are limited, agencies have de facto discretion in a wider range of situations.

In some instances, agencies may attempt to narrow the range of choice by making presumptions and allocating burdens of proof, so that decisions can be made when evidence is conflicting. We have seen how the AEC apparently used a specific allocation of the burden of proof in its analysis of closed-cycle cooling systems at Indian Point.

But devices such as presumptions or a burden-of-proof rule require close scrutiny of complex issues and the exercise of judgment, so that even when such decisional rules are used they are not self-executing. Further, the complexity of many of the decisions is such that presumptions will narrow the range of choice, but will not point unambiguously to one choice. Thus many environmental decisions are, in the last analysis, made in murky areas where no single "right" solution is evident, where data are in conflict, and where subtle tradesoffs and weightings that defy quantification must be made. It is in decisions like this that PIL lawyers may play their most important role.

In areas like this, questions of fact, value, and law begin to merge, and even unbiased decision-makers lack any certain guides to choice. In these gray areas where such neutral techniques as cost-benefit analysis fall to give conclusive guidance, the likelihood that the agency will make an "efficient" choice may depend on its capacity to secure the benefits of more informal and direct participation by affected groups in the decisional process itself. Cost-benefit analysis is a way to secure data that the private market has failed to provide. But it is a tool of limited value. Behind apparent "hard data" lie many educated guesses about the preferences of groups whose voice is not heard in the decisional process. This process may distort the information being communicated. Moreover, even when information is present, decision-makers may lack incentives to act on it. In such cases, effective presentation of issues may depend on a substantial degree on the advocacy skills of those who argue for the various affected groups and interests, and on their capacity to change decision-makers' incentive structure. To the extent that these efforts are influential in shaping the decision, and to the extent that an agency is limited in its capacity to consider for itself all the possible implications of a decision, decisions will be affected by the quality of advocacy and the degree of coercive sanctions advocated may resort to.

In complex environmental disputes environmental advocates can perform the following roles:

1. Monitor agency decisions to be sure all relevant factual data have been considered.

2. Where factual issues are in controversy, provide data which would support the case for environmental protection and prove the evidence underlying the opposing case.

3. Where the issue is the value, rather than the degree of harm, make the case for full consideration of all unquantified harms.

4. Where decisions turn at least in part on the interpretation of presumptions and burdens of proof, scrutinize preferred evidence to insure that weak cases are not accepted by decision-makers.

5. Where the issues turn on the appropriate risk that society should take with regard to potential environmental harm, marshal the legal, political, and moral arguments for avoiding risks of environmental damage.

6. Where the agency fails to heed information that is presented, mobilize all available external forces that might change the decision-makers' incentive structure.

In Indian Point, these roles were performed by the PIL lawyers. The bulk of this task fell to the lawyers in large measure because of the type of proceeding principally involved—a complex, trial-like agency procedure. In other cases where peculiarly legal skills were not so much at a premium, other specialists might have effectively advocated the environmental cause. The issue is whether effective environmental advocacy was a significant factor in securing the outcome that was achieved. We believe that it was.

Assessing the Costs and Benefits of PIL Participation. We know approximately what the direct costs of PIL activity in this area were. NRDC spent approximately $89,000 on lawyers' time, and we can roughly estimate that related costs were about $40,000. About $25,000 was spent for experts. Although other PIL lawyers and New York officials participated in the proceedings, they were of minor significance.

It has been argued that another cost of PIL activity is delay in starting the plant. Because of PIL intervention, environmental analysis was more detailed than it might otherwise have been, and so the licensing process took substantially longer than it otherwise would have. Also, the total investment in data collection by AEC and Con Edison was undoubtedly greater because of the presence of the PIL lawyers.

The direct PIL costs were, then, very small, and it would seem that the gains far outweighed these expenditures. The indirect costs are harder to measure and more difficult to assess. There is evidence that the delay caused by agencies' consideration of the environmental impact of nuclear plants on the average does not add significantly to the time required to construct the plant. And, to a degree, the foregoing analysis suggests that the information costs were justified. But even if we assume that several million dollars were spent on data, this seems like a rational investment given the possibility that the savings from the towers for the life of the plant and perhaps in perpetuity could well be millions of dollars per year.

Assessing Indian Point: The Conditions of Successful Advocacy in Complex Disputes. PIL advocacy in Indian Point forced an initially reluctant agency to take a hard look at the factual and legal premises of its decision. Armed with NEPA precedents that were the result of a substantial PIL litigation effort, the NRDC lawyers, assisted by technical experts, were able to persuade the AEC to impose protective measures even though those measures were opposed by a private firm that could marshal substantial resources in its efforts to resist the requirement for cooling towers.

Without the PIL resources, it seems likely that despite NEPA, the AEC might not have conducted the studies that led Dr. Goodyear and others at Oak Ridge to conclude that there were real risks of substantial environmental damage if protection measures were not taken. PIL lawyers monitored the research, raised issues that the AEC could not duck, developed support outside the agency for more protection, and assisted the staff in defending its final position. Given the
Complexity of the Indian Point dispute, effective environmental advocacy required the explicit and implicit subsidies that were involved. For the provision of these services PIL resources were available at prices that were well below market prices for similar legal and technical skills.

The costs of the PIL activity in Indian Point were low relative to the potential gain to society from the resulting change in AEC. But the question remains whether the conditions of this dispute were such that a victory was relatively easy for PIL, and thus whether we can generalize from Indian Point to other forms of advocacy in complex environmental disputes.

That Indian Point was complex no one could doubt. It has lasted for 10 years and is not over yet. It took several man-years of PIL effort, and involved scientific, engineering, and economic issues that are as yet not fully understood. Nevertheless, there are some features of Indian Point that make it a relatively simple dispute when compared with other controversies PIL lawyers have engaged in in the environmental area.

First, the options considered in the cooling tower controversy were relatively narrow. NRDC never argued that the plant should not be built, so the AEC was not presented with a serious argument against the plant itself on purely environmental (as opposed to radiological) grounds. Thus the cooling tower issue never presented a clear conflict between environmental demands and agency mission. Second, the distributional consequences of alternative choices were not as large as they have been in other controversies. The tradeoffs involved were a slight increase in all power bills and a tower that would be seen by a few residents in a small town, on the cost side, against the gains to a small but sophisticated group of environmentalists and the more diffuse — yet potentially large — group of commercial fishermen, sportsmen, and other environmentalists that HRFA and other groups represented, on the benefit side.

These factors may also help to explain another feature of Indian Point that differentiates it from many other PIL environmental efforts: the adoption by the agency of the views of the PIL firm at a relatively early stage in the proceedings. This meant that NRDC avoided the combined opposition of the agency and private firms — a coalition that occurs all too frequently in other areas. And it meant that all PIL work could be done at the administrative level. Since the AEC found in favor of the cooling towers in its administrative proceedings, the benefits of this favorable administrative finding redounded to the environmentalists and placed the burden of seeking judicial review on the utility. Thus NRDC did not have to resort to the courts before it could get the agency to consider its case, and was spared the burden of overcoming judicial reluctance to second-guess agencies that have made considered judgments in complex and indeterminate areas.