Economic Charges For Environmental Protection: Ocean Dumping Fees

William L. Lahey†

INTRODUCTION

Disposing of the wastes produced by society is a major national problem. Poor management of wastes poses significant threats to public health and environmental quality.¹ The increasing rate of waste generation, particularly in coastal areas, exacerbates the waste disposal problem.² One remedy to the waste problem which is being given widespread consideration is ocean dumping.³ Reliance on the ocean for waste disposal, although expedient, raises issues of public health and environmental quality which the existing federal regulatory system is not equipped to answer adequately.

The ten year history of ocean dumping regulation by the Environmental Protection Agency (EPA) and the Army Corp of Engineers (the Corps)—the agencies with regulatory authority over ocean dumping—has been uneven and at times inequitable, due to the vagaries of court challenges and enforcement. These agencies, moreover, have given scant attention to some statutory provisions and have thereby allowed unnecessary deterioration of the marine environment to occur. Recent and proposed cutbacks in federal appropriations for marine monitoring and research and development of alternative disposal methods increase the difficulty of detecting and preventing degradation of the marine en-

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² The amount of sewage sludge produced in the coastal zone, for instance, is expected to be more than double by the year 2000. D. BASTA, B. CHAMBERS, C. EHLER, & T. LAPOINTE, IDENTIFYING AND EVALUATING ALTERNATIVE OCEAN DUMP SITES: AN OPERATIONAL FRAMEWORK FOR STRATEGIC ASSESSMENT AND ESTIMATES OF SLUDGE GENERATED BY PUBLICLY-OWNED MUNICIPAL WASTEWATER TREATMENT PLANTS 14 (prepared for the National Oceanographic & Atmospheric Administration 1982).

environment from ocean dumping. Imposing a charge on ocean dumping may be a viable alternative to those regulatory defects.

The predominant approach to social problems in the United States is direct regulation, often termed the "command and control" approach. The federal regulatory approach toward environmental problems has been particularly dependent upon direct regulation despite a number of alternative market oriented approaches used by other countries and discussed extensively by economists. One such approach is the use of economic charges to control pollution. Policy makers have considered this approach, with its many aliases, for a number of years, yet Congress has never adopted such a scheme.

Developing and implementing a pollution charge system in a well-defined context such as ocean dumping may encourage more widespread use of economic approaches to environmental problems. This experiment will allow Congress to develop greater knowledge and understanding about the effectiveness of economic charges. Without such a test it is unlikely that Congress will ever try a non-regulatory approach on a widespread scale.

Before evaluating the viability of a charge system for ocean dumping, it is necessary to examine why efforts to create an environmental protection program based on this economic theory have failed in this country. A major reason may be inadequate communication between the proponents of a charge approach and decisionmakers. Legislators, most of whom are lawyers, have a tendency to rely on the familiar regulatory approach based on court enforcement of agency-produced standards, while economists who support the use of economic tools have been unable to communicate basic economic principles to lay people. In the context of economic charges, moreover, the ambiguities caused by the confusion over the many names attached to charge sys-

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5. See generally Organisation for Economic Cooperation and Development, Pollution Charges in Practice (1980) [hereinafter cited as OECD, Pollution Charges].
7. Such terms as "effluent charges," White, Effluent Charges as a Faster Means of Achieving Pollution Abatement, 24 Pub. Pol'y 111 (1976); "pollution taxes," Lane, The Politics of Pollution Taxes: New Opportunities, Tax Notes, Dec. 8, 1975, at 13; and "emission charges," Kneese & Shultz, supra, note 6, at 98-104 are used to describe charges to control pollution.
tems exacerbate the communication problem. It is necessary, therefore, to review the basic theoretical underpinnings of pollution charges and evaluate the similarities and differences among the various charge approaches.

A number of issues arise as one moves from the theoretical discussion of the charge approach to the design of a charge system for a particular environmental problem. Implementing a charge system requires the formulation of a regulatory mechanism to administer the system, legal rules to categorize and allocate the charges, and answers to the political opposition which greets pollution charge proposals.

This article examines the use of economic charges for ocean dumping. Part II provides a background to the ocean dumping problem, including an analysis of the failures of the existing direct regulatory regime. Part III explores the economic theory underlying a charge approach to environmental problems and examines how the theory is applied in different contexts. Part IV discusses the justifications for an ocean dumping charge. Finally, Part V considers a number of issues associated with implementing an ocean dumping charge including administrative, political, and legal questions.

I

BACKGROUND TO THE OCEAN DUMPING PROBLEM

A. Risks Posed by Ocean Dumping

Ocean dumping introduces a variety of chemicals into the marine environment which pose chronic and acute risks. Both sewage sludge and dredge spoils may contain significant concentrations of polychlorinated biphenyls (PCBs). PCBs are toxic to many marine organisms and can adversely affect biological communities, such as

10. The confusion engendered by the different labels given to charge systems was evidenced at a recent Congressional hearing on establishing an ocean dumping user fee. Each of the witnesses seemed to have a different idea of the purpose of this charges system. These ideas included using fees to reimburse the government for costs of site preparation and monitoring, to fund additional research, and to reflect the fair market value of ocean dumping to encourage alternative disposal. Hearings on Reauthorization of the Marine Protection, Research, and Sanctuaries Act, Titles I and II, H. R. 6112 and H. R. 6113 and on Proposed Ocean Dumping User Fees, H. R. 6113 and H. R. 6324 Before the Subcomm. on Oceanography and the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries, 97th Cong., 2nd : 659-749 (1982). (statements of R. Lawrence Swanson, Director, Office of Marine Pollution Assessment, National Oceanic and Atmospheric Administration; Hon. James H. Scheur. Congressman, N.Y.; Edward Osann, Director, Water Resources Program, Resources Conservation District, National Wildlife Federation) [hereinafter cited as Ocean Dumping Hearings].

11. Ocean dumping of sewage sludge contributes approximately 30% of the total PCB in the New York Bight, for instance, and dredge spoil dumping contributes approximately 70%. Ocean Dumping Hearings, supra note 10, at 690.
phytoplankton, vital to marine food chains.12 PCBs are known to accumulate in the marine food chain and contaminate seafood consumed by humans. This "bioaccumulation" of PCBs represents a health risk to humans13 because the chemical is a suspected carcinogen.14

Sewage sludge and dredged material also contain metals such as cadmium, lead, zinc and mercury. In high concentrations these heavy metals can kill marine organisms; in lower concentrations they can cause chronic problems such as reproductive and sensory failure in marine species.15 Dumping of sewage sludge contributes a significant amount of disease-causing pathogens and bacteria to the marine environment. For instance, in 1970 the Food and Drug Administration closed to shellfishing a circular area encompassing a six nautical mile radius around the sewage sludge dumpsite in the New York Bight.16 After fourteen years, the area remains closed.

The concept of "assimilative capacity" is helpful in evaluating the adverse effects of pollutants in the marine environment. The biological, chemical, and physical processes of the ocean are able to render a certain amount of pollutants harmless. The extent to which the ocean can accomodate foreign inputs without suffering unacceptable effects is known as its assimilative capacity.17 For example, the municipal ocean dumpsite twelve miles offshore from New York City suffers from oxygen depletion, the presence of high concentrations of toxic chemicals in the sediments, and elevated bacteria levels.18 When ocean dumping causes such negative effects on the marine environment, the ocean's assimilative capacity is exceeded.

B. Legislative History

In 1972 Congress enacted the Marine Protection, Research and

13. 47 Fed. Reg. 37,345 (1982). New Jersey recently advised its citizens not to eat a number of fish species caught off the northern half of the state's Atlantic coast because studies showed these fish might be contaminated with PCBs. N.Y.Times, Dec. 14, 1982, at B1, col. 1.
17. Id. at 516 (statement of Edward D. Goldberg, Professor of Chemistry, Scripps Institution of Oceanography).
Sanctuaries Act (Ocean Dumping Act, or ODA)\textsuperscript{19} to control the dumping of wastes into marine waters. The ODA prohibited all ocean dumping without a permit. Using this direct regulatory approach, often referred to as "command and control," Congress quickly set out to protect the ocean from degradation caused by dumping. Indeed, the statute indicated that Congress hoped all dumping would be minimized or ended by 1977.\textsuperscript{20}

A number of pollution episodes during the late 1960s and early 1970s prompted congressional action against ocean dumping. In 1970 the United States Army dumped a large amount of nerve gas into the Atlantic Ocean, beyond the continental shelf, approximately 250 miles east of the central Florida coast. The incident received extensive attention in the public and by Congress.\textsuperscript{21} A 1970 report by the Council on Environmental Quality (CEQ) on ocean dumping also focused attention on specific pollution episodes.\textsuperscript{22} The CEQ report, for instance, described in some detail areas which were closed to shellfishing due to bacterial concentrations of sewage sludge. CEQ attributed the degradation to ocean dumping.\textsuperscript{23}

The passage of the ODA in direct response to the nerve gas and other pollution incidents\textsuperscript{24} exemplifies what one commentator has called the "catastrophe theory of planning."\textsuperscript{25} Under this theory, legislation and direct regulatory sanctions are designed as quick fixes to perceived crisis situations. The primary intention is to placate intense public concern.

The prevailing mood in the country with respect to environmental issues also influenced the strict regulatory approach set out in the ODA. 1970 marked the beginning of what President Nixon declared to be the "environmental decade."\textsuperscript{26} Congress took a protective approach

\textsuperscript{20} The Act states that "[t]he Secretary of Commerce shall conduct . . . research, investigations, experiments, training, demonstrations, surveys, and studies for the purpose of determining means of minimizing or ending all dumping of materials within five years of the effective date of this Act." 33 U.S.C. § 1443 (Supp. V 1981). Congress extended the timetable to "as soon as possible after October 6, 1980." \textit{Id}.
\textsuperscript{23} \textit{Id} at 16.
\textsuperscript{24} Both the nerve gas episode and the CEQ report were often mentioned in the legislative history of ODA. \textit{See}, e.g., 117 \textit{Cong. Rec.} 31,135, 30,854, 30,856, 43,061 (1971).
toward the environment in the early 1970s as well. For example, on a single day in 1972, the President signed into law three major marine protection bills: the Costal Zone Management Act, the Marine Mammal Protection Act, and the Marine Protection Research and Sanctuaries Act.

Under the ODA direct regulatory approach EPA and the Corps jointly administer the dumping permit system. EPA promulgates the criteria for evaluating all permit applications and issues permits for the dumping of all materials except dredge spoils; the Corps issues permits for the dumping of dredge spoils using EPA criteria. In addition, the ODA requires, as a prerequisite to issuing a permit, that these agencies find "dumping will not unreasonably degrade or endanger . . . the marine environment, ecological systems or economic potentialities." Despite the Act's elaborate permit provisions, EPA and the Corps have been remarkably unsuccessful in controlling ocean dumping.

C. Implementation of the Ocean Dumping Act

In 1973 EPA issued its first set of regulations establishing criteria to evaluate applications for ocean dumping permits. The regulations, known as ocean dumping criteria, were later amended in 1977. The regulations reflect the strict approach EPA adopted toward industrial and sewage sludge dumpers during the 1970s. While the ocean dumping criteria established regulations for evaluating permit applications for ocean disposal of radioactive waste, no permits were issued for this type of dumping during the 1970s.

EPA successfully phased out the ocean dumping activities of a number of small municipalities. These dumpers, however, accounted

27. The bills were signed into law on October 28, 1972. 8 WEEKLY COMP. OF PRES. Docs. 1582-83 (Oct. 30, 1972).
32. Id. at 763.
34. See infra text accompanying notes 35-70.
36. Id.
39. EPA, for instance, denied or phased out the permits of over one hundred sewage sludge dumpers between 1973 and 1979. Ocean Dumping: Hearings before the Subcomm. on Oceanography and the Subcomm. on Fisheries and Wildlife Conservation and the Environment
for a very small percentage of the total volume dumped.\textsuperscript{40} In fact, sewage sludge dumping increased about thirty percent between 1973 and 1979.\textsuperscript{41}

EPA’s inability to control ocean dumping of sewage sludge resulted from the agency’s failure to phase out larger dumpers, such as New York City. New York City successfully challenged the EPA requirement that alternatives to ocean dumping be implemented by December 31, 1981. In \textit{City of New York v. EPA}, the district court held that the impact criteria used by the EPA to evaluate ocean dumping permit applications were arbitrary and capricious as applied to New York City.\textsuperscript{42} Showing unusual deference toward an unfavorable district court decision, EPA chose not to appeal.

The decision, by stressing the inadequacy of EPA’s evaluation criteria, required EPA to redraft its ocean dumping criteria. It opened the door, moreover, to increased ocean dumping by New York City and other municipalities. Indeed, in the wake of \textit{City of New York v. EPA} there has been a resurgence of interest in the ocean dumping of sewage sludge. Cities which previously phased-out the use of the ocean for waste disposal are now interested in ocean dumping.\textsuperscript{43} In addition, cities which never dumped before are now exploring the possibility of applying for ocean dumping permits.\textsuperscript{44} Researchers from the National Oceanic and Atmospheric Administration estimate that the amount of sewage sludge dumped will increase by as much as three hundred percent by 1985.\textsuperscript{45}

EPA has been more successful in its efforts to control ocean dumping of industrial waste. Between 1973 and 1980 the volume of industrial waste dumped in the ocean was reduced by almost half.\textsuperscript{46} Credit for reducing ocean dumping of industrial wastes cannot, however, be given to EPA alone. Many of the industries which dumped wastes during the 1970s cut back operations or closed down due to economic conditions unrelated to EPA’s ocean dumping regulations.

\textsuperscript{40} All phase-outs prior to 1979 accounted for only about 3\% of the total volume dumped in 1978. \textit{Id.} at 116.

\textsuperscript{41} In 1973 approximately 4.9 million tons of sewage sludge were dumped in the United States. Dumping increased to approximately 6.4 million tons in 1979. EPA, \textit{ANNUAL REPORT TO CONGRESS (JAN.-DEC. 1979) ON ADMINISTRATION OF THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT} 10 (1980).


\textsuperscript{44} \textit{Id.} at 17.

\textsuperscript{45} \textit{Id.}

\textsuperscript{46} EPA, \textit{EPA ANNUAL REPORT, supra} note 41, at 10.
Although there is still no ocean dumping of low-level radioactive waste, there has been a recent surge of interest in this disposal option. In January of 1982, for instance, the Navy announced it was considering dumping decommissioned nuclear submarine reactor plants into the ocean.\textsuperscript{47} Both the Department of Energy and private industry have recently expressed interest in ocean disposal of low-level radioactive wastes.\textsuperscript{48} This recent interest has no doubt been catalyzed in part by EPA's announcement in the fall of 1981 that it was revising its ocean dumping regulations to permit dumping of low-level radioactive wastes.\textsuperscript{49}

The Corps' efforts to regulate ocean dumping of dredged spoils has also been largely ineffectual, albeit for reasons slightly different from those responsible for EPA setbacks. While EPA has been charged with overzealousness in its regulatory efforts during the 1970s, the Corps has been criticized for its lack of administrative enthusiasm. In 1974, environmentalists informed Congress that the Corps' program fostered, instead of controlled, ocean dumping of dredge spoils.\textsuperscript{50} A number of factors demonstrate the Corps' half-hearted administration of the ODA. They include: the long delay between passage of the ODA and the issuance and implementation of its regulations, the Corps' apparent apathy for its own regulations, and the failure of its district offices to coordinate their enforcement efforts.\textsuperscript{51}

Administrative inefficiency raises further doubts about the Corps' commitment to an ocean dumping regulatory program. The Corps' permit program is a regulatory maze which can take two years to traverse.\textsuperscript{52} In 1978 the Corps came under judicial attack for failing to consider adequately the environmental effects of dredge spoil dumping in its permit process. A New York District Court in \textit{National Wildlife Federation v. Benn}\textsuperscript{53} directed the Corps to make bioaccumulation assessments prior to issuing permits, a factor theretofore unconsidered by the Corps.

The Corps' failure to control effectively ocean dumping of dredge spoils is further illustrated by the fact that the amount of dumped ma-

\textsuperscript{48} The Department of Energy is interested in disposing of radioactive soil in the ocean. Private industry has inquired about ocean disposal of low-level radioactive wastes. \textit{Ocean Dumping Hearings}, supra note 10, at 72.
\textsuperscript{49} 12 \textit{ENV'T REP. (BNA)} 1221 (Jan. 22, 1982).
terial increased throughout the 1970s and is expected to significantly increase during the 1980s. Between 1977 and 1979 the amount of
dredge material dumped in the ocean doubled.⁵⁴ Moreover, the vol-
ume of dredge spoil will increase as deep drift channels are constructed
to increase access to United States ports over the next several years.
The Corps’ lax attitude toward ocean dumping may stem from a con-
flict of interest: the agency is both the regulatory authority of ocean
dumping and the major producer and dumper of dredge spoils.⁵⁵

In addition to ineffectively regulating the volume of materials to
be dumped, EPA and the Corps have failed to address issues such as
designating appropriate dumpsites or encouraging preventative waste
management techniques. The ODA authorizes and arguably requires
EPA and the Corps to designate specific sites at which ocean dumping
can occur with a minimum of environmental risk.⁵⁶ It directs EPA to
consider “appropriate locations” for dumping and the “probable im-
pect of requiring use of such alternate locations.”⁵⁷ Similarly, the
London Dumping Convention,⁵⁸ which the United States signed and
incorporated into the ODA,⁵⁹ directs member nations to consider a
number of physical and chemical characteristics of prospective dump-
ing sites before issuing a permit.⁶⁰ EPA has largely ignored the physi-
cal, chemical, and biological differences between various dumpsites,
choosing instead to select sites primarily on the basis of historical use.
This inattention has unnecessarily increased the environmental costs of
ocean dumping.⁶¹

⁵⁴ Planned expansion of existing coal ports, for example, will involve dredging and
⁵⁶ 33 U.S.C § 1412(a)(C) (1976).
⁵⁸ Convention on the Prevention of Marine Pollution by Dumping of Wastes and
⁶⁰ EPA is not required, however, to prepare an environmental impact statement prior
⁶¹ Preliminary evidence indicates that disposal sites vary significantly in their ability
to assimilate wastes. Studies indicate, for instance, that the site where most of the sewage
sludge dumping has taken place, a site 12 miles southeast of New York City, has very lim-
ited dispersive characteristics and hence a high susceptiblity to oxygen depletion and ac-
cumulation of toxic chemicals. On the other hand, a dumpsite 106 miles offshore from New
York City has particularly good dispersion capabilities; dumping at this site might enable
natural biological and chemical processes to incorporate municipal waste without detrimen-
tal effects. Lahey *supra* note 37 at 417-18, 428.
The National Wildlife Federation sued EPA in 1980 for failing to study the characteristics of all but three of over one hundred forty dumpsites.\(^6\) The settlement agreement established a schedule for completing studies of the most used dredge spoil dumpsites and the Corps agreed not to use unstudied dumpsites whenever possible. EPA agreed to delete sites determined to be unsuitable for dumping.\(^6\) Despite this consent decree, EPA has yet to evaluate adequately dumpsite characteristics. As of 1982, the tenth anniversary of the ODA, only seven sites had been studied and formally designated.\(^4\) The high cost of the studies is one reason for EPA’s minimal progress.\(^6\)

Furthermore, EPA has also failed to make adequate headway in encouraging the production of innocuous municipal waste through industrial pretreatment. The pretreatment process removes industrial contaminants from the waste before releasing them into a publicly owned treatment facility. Under the Clean Water Act,\(^6\) EPA is required to develop standards limiting industrial discharges of toxic pollutants which are not susceptible to treatment at the facility or which interfere with the facility’s operation.\(^6\) Contaminant-free sludge would mitigate the ocean dumping problem. The sludge could be utilized on land without posing a threat to the terrestrial environment or human health, or could be dumped in the ocean without risking toxic contamination of the marine environment. EPA evidence shows that industries are the major source of toxic chemicals in sewage sludge and that industrial pretreatment is a more effective process for removing these chemicals than is treatment at wastewater plants.\(^6\)

Despite the efficacy of pretreatment in protecting the marine environment from toxic contaminants, EPA’s pretreatment program has been unsuccessful.\(^6\) For instance, there are thirty-four categories of industries for which pretreatment standards must be developed. As of

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63. Id.
1982, EPA had developed standards for only two of these industries. Industry complaints that the standards are too stringent are partially responsible for EPA's delay.

Given the ineffective enforcement of the ODA and the continued degradation of the marine environment by ocean dumping, alternatives to the direct command and control approach should be considered. The charge approach is one promising alternative.

II
ECONOMIC THEORY AND APPLICATION

Economists have devoted extensive attention to the concept of effluent charges. Indeed, it is one of the most studied policy options for pollution control. While the idea has been considered for use at the national level in this country for nearly two decades, it has never been implemented in a significant way. However, various examples of effluent charges can be found in state environmental legislation as well as in the national legislation of numerous foreign countries. An effort to devise a national charge system for regulating ocean dumping which failed to consider this extensive body of learning would be an exercise comparable to reinventing the wheel. This section first summarizes the economic rationale behind the concept of pollution charges, and then critically examines how the theory has been and can be applied in practice.

A. Economic Rationale

Predictably, economists see the problem of pollution as a market failure. They view environmental resources, such as air and water, as common property resources. Such resources cannot be readily re-

71. 14 ENV'T REP. (BNA) 1306 (Feb. 12, 1982).
73. See, e.g., infra text accompanying notes 102-103.
74. To this extent, environmental amenities are “collective goods.” Collective goods share the common feature of nonexcludability:

Take, for example, clean air in a large urban area. While a source of air pollution could provide cleaner air by installing control equipment or other steps, the bene-
duced to individual ownership, for the market exchange system does not attach a price for their use. In addition, some common property resources (e.g., the use of air for breathing) are very extensive and can accommodate a large number of users without imposing costs on others.

At some level of use, however, a point is reached where accommodating additional users will impose costs on others. Economists label such costs "spillover" or "external" costs. For example, costs of congestion are external in that, unlike market resources such as labor or materials, they are not accounted for in the cost calculations of users. In the absence of effective government regulation, individuals have no incentive to limit their use of these common property resources. People discharge wastes into the air and water not because of malevolence, but because the resources are "free." From an economic perspective, one solution is to bring these public resources into the market system by charging a fee for their use.

However, this does not necessarily lead to the conclusion that market mechanisms provide the best solution to the problem of environmental pollution. Economists must justify the use of charges to control pollution in terms of the relative benefits compared with a direct regulatory approach, such as the ODA's effluent limitations. Probably the most frequently cited argument in support of the charge approach is that it is more cost efficient than direct regulation. Most regulatory approaches require all individuals to reduce their discharges to a given level, while charges allow individuals to reduce their discharges according to their particular pollution control costs. Under the charge system, those with low control costs will reduce their pollution more than those with higher control costs. Thus, the fee system's incentives will induce dischargers to choose the least costly methods of reducing the overall pollutant discharge. Kneese and Schultze, two well known economists, claim that "the difference between inefficient and efficient control policies can mean scores, perhaps hundreds, of billions of dollars released for other useful purposes over the next several decades."
Economists also frequently cite defects inherent in a direct regulation system to support the superiority of a charge system. For instance, dischargers have numerous opportunities to avoid or delay compliance with direct regulation, including such tactics as stalling, using threats, and controlling information.79 Furthermore, the specific standards developed under the direct regulatory approach generally require extensive and detailed information, which often is known and controlled by the regulated industry. Under the direct regulatory approach, the regulated industry obviously has an incentive to be recalcitrant with the information in order to slow agency rule-making and enforcement. In addition, many legislative provisions require standards to be “practical” or technically or economically “feasible.”80 Agency regulations interpreting these general terms are often subject to court challenges.81 The agency is often at a disadvantage in such cases because it requires evidentiary information principally known only to industry sources to justify its regulations. On the other hand, under the charge approach, the fee would provide a disincentive to lengthy delaying tactics by the industry since it would be paying for the discharge during the delay.82

Another benefit of market approaches often mentioned by economists is the incentive it creates to develop alternative, and presumably more socially desirable control technologies. Economists claim that direct regulation provides no incentive for a firm to develop technology to abate more pollution than the standard requires. A charge approach, on the other hand, creates a continual incentive for the firm to search for innovative control measures because the charge would be imposed on even small amounts of discharge.83

A charge system may also lead to more efficient investments than those prompted by a system of regulatory standards. To comply with the standard, the regulated firm has a theoretical incentive to develop less expensive pollution control technology. In practice, however, many standards prompt the development of inefficient technologies.

83. Anderson, supra note 79, at 34.
Standards with rigid compliance timetables, for instance, have been shown to encourage the development of relatively costly, albeit immediate, technologies. A charge system, in contrast, gives the polluter the flexibility as well as the incentive to develop less expensive and more reliable alternative waste systems. However, the effect of a charge approach on technological innovation may be overstated. The correlation between investments in research and development and the financial return from innovation is not well understood. Also, our understanding of the relationship between existing regulatory programs and technical innovation is fragmentary and uncertain. The claim that a charge approach will encourage innovation relative to direct regulation therefore has not been substantiated.

Economists also support the charge system as a flexible and diverse approach toward government intervention. Supporters of market based pollution control systems assert that the highly specific command and control approach tends to stifle new ideas and imaginative solutions. Finally, some commentators endorse effluent charges on ideological grounds by pointing to the less coercive nature of market solutions.

B. Application of the Charge Approach

While there is widespread support among economists for the concept of an effluent charge, there is considerably less agreement regarding how this approach should be implemented. A number of different charge approaches for environmental improvement are available. The variety of charge approaches and the numerous labels given to these tools have caused confusion and have, no doubt, frustrated legislative

84. Automobile emission standards are an example of this counter productive innovation incentive created by some standards. The 1970 Clean Air Act established a 1975-76 deadline for 90% reduction in car emissions. To comply with this regulation and to avoid the stiff sanctions for non-compliance, automobile companies adopted the unreliable and expensive "bolt-on" technology instead of more efficacious technology which was not ready by the deadline. Mills & White, Government Policies Toward Automobile Emission Control, in APPROACHES TO CONTROLLING AIR POLLUTION 348 (A. Friedlander ed. 1978).

85. Rose-Ackerman, Market Models for Water Pollution Control, 25 PUB. POL'Y 383, 399-400 (1977) [hereinafter cited as Rose-Ackerman, Market Models].


88. Charles Schultze, for example, builds a two-pronged ideological case for market solutions to environmental pollution by pointing out how these measures harness selfish motives to promote social good and allow people freedom to chose rather than relying on coercion. C. SCHULTZE, THE PUBLIC USE OF PRIVATE INTEREST 16-18 (1977). But see infra notes 161-165 and accompanying text discussing ideological opposition to charges based on the absence of moral blameworthiness.
efforts to create a pollution charge system. The following section attempts to sort out the confusion over environmental levy systems.

There are three different approaches to a charge system. The distinguishing feature is the economic variable which is chosen to determine the charge: social cost, attainment of an environmental standard, or revenue generation. It should be noted at the outset that discussing these three categories separately is somewhat artificial. The optimal approach for a charge, at least for ocean dumping, is some combination of all three approaches.89

1. Social Cost Approach

The economically ideal approach sets effluent charges at the social cost of the pollution. When the charge equals the external costs created by the discharger, the charge reflects the pure price of pollution. The government, in determining the charge, must therefore determine the amount of harm caused by each marginal unit of discharge.90

This method of charge assessment requires two difficult steps. First, the amount of environmental damage caused per unit of emission must be calculated. In other words, a dose-response curve must be calculated. The difficulty lies in the number of complicating factors, including possible synergistic effects from various combinations of pollutants, the frequent similarity between natural fluctuations in the environment and human-induced changes, and the latency of some pollution effects. Second, the environmental damage must be valued. This is very difficult because economists have not yet devised an effective way of quantifying environmental damage.91 For example, trying to place a value on environmental amenities using the economists' traditional approach of estimating willingness to pay is fraught with complications.92

However, a traditional regulatory approach does not solve the problem of quantifying pollution damage; rather, it obscures the issue. Standards must be based on implicit judgments regarding the magnitude of environmental risks and the value of reducing them. Thus, uncertainties about environmental damage present obstacles to pollution control under either the direct regulation or charge approach.

89. See supra notes 116-121 and accompanying text.
92. Estimates of willingness to pay are based on answers to hypothetical questions given to individuals to ascertain how much they would be willing to spend to secure a given level of environmental quality. The difficulties involved include the need to determine who chooses the values worthy of being priced and the fact that attempts to price values often confuse what an individual wants with what he thinks is best for the community. See generally Sagoff, Economic Theory and Environmental Law, 79 Mich. L. Rev. 1393 (1981).
2. **Ambient Standards Approach**

Many economists, recognizing the difficulties associated with the social cost approach to effluent fees, advocate what they consider the second best alternative—the ambient standard approach. First, a desired level of air or water quality is established presumably through legislative and administrative processes. Second, effluent charges sufficient to bring about this ambient standard are imposed.93

This approach encourages the polluter to reduce emissions to the level where the cost of reducing another unit of pollution, the marginal treatment cost, is greater or equal to the unit emission charge. The fee setting authority must predict the discharger's level of cleanup in reaction to the fee. Thus, the governmental body needs data on the relative costs of abatement technologies or alternative disposal measures. This sort of data is assertedly much easier for an agency to obtain or determine than the data needed to set specific standards.94

The ambient standards approach is currently in use in a variety of contexts. Czechoslovakia, for instance, uses effluent charges to achieve ambient water quality levels.95 East Germany and Hungary also use effluent fees in conjunction with ambient standards.96 The ambient standards approach, however, while widely advocated in the legal and academic literature, has never been tested on a national level in the United States.97

The primary difficulty with the ambient standard approach is determining with precision how dischargers will react to different fee levels.98 Most likely, the amount of the fee will have to be set, to some extent, by trial and error.99 Frequent adjustments in the level of the fee, however, would create a climate of uncertainty which would disrupt private decision-making about long-term investments in pollution control technologies.100 Hungary has developed an iterative process which seems effectively to manage adjustments in its emission fees. A

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95. *Id.* at 60. For a general assessment of charges and water pollution control in Europe, see R. Johnson, & G. Brown, *Cleaning up Europe's Waters: Economics Management and Policies* (1976).
97. For instance, there are a number of discussions in the legal literature of the ambient standards approach. *See, e.g.*, Delogu, *A State Approach to Effluent Charge*, 23 Me. L. Rev. 281 (1971).
central authority proposes a fee scale for each polluter. Based on this scale, the polluter provides the central authority with an estimate of the amount of effluent he will discharge and his anticipated pollution abatement expenditures at each fee level. The central authority then uses this information to calculate a new fee schedule. This procedure continues until an optimal pollution level is achieved.

3. Revenue Generating Approach

The third approach to effluent charges bases the level of the charge on its revenue generating capabilities. It should be noted, however, that some economists do not view revenue oriented fees as true effluent charges. Revenue based charges can be classified into three subgroups according to the use to which the resulting income is put: financing environmental protection efforts, compensating victims damaged by the discharges, and reimbursing the government for special services rendered to the chargee.

First, pollution charges have been used to finance environmental protection efforts in Europe for many years. France, for example, distributes the revenue generated from charges to polluters with low treatment costs in order to achieve desired water quality levels at a lower cost. This is called redistribution. West Germany has used an effluent charge to generate revenue to maintain or improve water quality in its rivers since 1930. Basin-wide agencies, called Genossenschaften, have the authority to set water quality standards, raise revenues by exacting an effluent charge, and use the revenues to fund water treatment projects.

In the United States similar fees financed environmental protection efforts. In 1978, for instance, Congress amended the Outer Continental Shelf Lands Act (OCSLA) to establish an oil pollution compensation fund to help pay for the cleanup of oil spills occurring in connection with offshore oil development. The fund is financed by a three cent per barrel fee on oil drawn from the outer continental shelf. In 1980 Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) which estab-
lishes a fund for hazardous waste cleanup operations, known as "Superfund." The fund is primarily funded by a tax on petroleum and forty-two specified chemicals. Pursuant to CERCLA many states established their own funds to clean up dangerous waste dumps; many of these funds are financed by charges imposed on the generators of the waste or the owner/operators of the disposal facility.

Second, charges generate revenue to compensate victims of pollution. In 1973 Japan enacted legislation taxing industries based on the amount of sulphur dioxide emitted into the air. The revenue generated by this levy goes into a fund to compensate individuals suffering from pollution-related respiratory diseases. Similarly, in the United States, Congress moved to supplement the Black Lung Benefits Act, a compensation fund for miners with black lung disease (pneumoconiosis). In order to maintain the preexisting fund, Congress imposed a flat tax on coal mine operators based on the amount of coal mined.

Finally, revenue oriented charges, often referred to as user fees or service charges, are used to reimburse the government entity for services rendered. State and local governments frequently charge users of a public facility or publicly managed resource a fee to cover costs incurred in providing the resource or service. Examples include sewer charges, motor vehicle taxes, and harbor fees. In addition, federal agencies are authorized to charge a fee for their services under the Independent Offices Appropriations Act. The act urges agencies to try to become financially self-sustaining by charging a fee for services which benefit individual recipients. In addition federal agencies levy fees in a variety of contexts such as federal aviation services and use of federal lands.

107. As of 1982, for instance, 19 states had established funds which were financed by fees imposed on the waste generator or the operator of the facility. NATIONAL CONFERENCE OF STATE LEGISLATURES, HAZARDOUS WASTE MANAGEMENT: A SURVEY OF STATE LEGISLATION III-1 (1982).
115. The Secretary of Interior may establish fees for the use of conservation areas and wildlife refuges, 16 U.S.C. § 460 K-3, or for the use of federal dams. See Vanceburg v.
4. Hybrid Approach

The distinctions made between the three approaches described above are, in a word, artificial. In practice each approach is rarely limited to accomplishing a single goal. For instance, a levy on discharges intended to generate income for pollution control will simultaneously create an incentive to reduce the discharge. The West German water emission charge, while designed primarily to generate revenue, induces polluters to reduce discharges through process changes and recycling.116 A fee based on the ambient standards approach will also incidentally generate revenue which could be used for environmental improvement or payment of government services. Indeed, in 1937 the Supreme Court recognized that it was impossible to draw a clear distinction between a strictly revenue raising tax and regulations intended to discourage an activity, stating "[e]very tax is in some measure regulatory. To some extent it interposes an economic impediment to the activity taxed as compared with others not taxed."117

A charge system designed to accomplish several objectives can be viewed as a hybrid approach. There are a number of instances where this hybrid approach has been implemented. The French designed a complex levy system for waste discharge which exemplifies the use of a multiple purpose charge. The fee serves a revenue generating function by channelling funds to the water basin commissions and to water improvement projects. Indeed, the fee levels are set to cover the cost of regional water quality management projects. The fee is variable, depending on a variety of factors. The levy for an individual discharger is modified according to the efficacy of the water pollution control technology employed and the conditions of the receiving waters. Discharge into waters with high dispersive characteristics, for instance, would be charged less than other discharge into shellfishing areas. These variable fees, therefore, encourage water pollution control.118

As Justice Brandeis noted in 1932, states serve as important laboratories for legislative experiments: "It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."119 Multiple purpose environmental charges prove his point. To help control hazardous

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wastes, seventeen states have passed statutes to generate funds to finance waste cleanup as well as to encourage environmentally sound disposal practices.120 Kentucky, for instance, imposes a graduated fee on generators of hazardous waste according to the efficacy of their treatment technology; the more effective the treatment, the lower the fee. The income generated from this fee is put in a fund to clean up and monitor spills and abandoned hazardous waste sites.121

III
RATIONALE FOR AN OCEAN DUMPING CHARGE

Charging a fee for ocean dumping of wastes would mitigate many of the problems currently associated with this waste disposal method. A dumping fee could have beneficial regulatory effects, and the revenue generated could be used for valuable functions. There are, moreover, a number of other justifications for an ocean dumping charge.

A. Regulatory Effects.

The ocean, especially beyond the territorial sea, is the paradigmatic common property resource. Efficient allocation in the normal market system is thus impossible. One manifestation of inefficient allocation is overuse of certain dumpsites, exceeding the ocean’s assimilative capacity. An ocean dumping fee calculated in light of alternative waste disposal costs would reduce the volume of wastes dumped into the ocean to a level within the ocean’s assimilative capacity.

A charge system would counterbalance the growing political and economic pressure to dispose of wastes into the ocean. The oceans, unlike our backyards and local groundwater supplies, do not have strong political constituencies. Thus, pressure mounts to dispose of our wastes in the ocean because it is in the path of least political resistance, not because of scientific or technical considerations.122 Further, oceans are also the path of least economic resistance. The failure of the market exchange system to attach a price for the use of oceans makes dumping an economically attractive disposal option. In economic terms, waste producers use the ocean because the internal costs of ocean dumping are much less than costs of alternative disposal methods.123 A charge system could bring ocean waste disposal into political

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120. NATIONAL CONFERENCE OF STATE LEGISLATURES, supra note 107 at IV-3.
122. For example, public opposition to a composting plant for municipal waste in Nassau County, New York caused public officials to abandon the land-based disposal plan. At the time of the decision $14 million had already been spent on the project. Officials made this decision despite strong evidence that the composting plant provided a safe and relatively inexpensive disposal alternative. See Lahey, supra note 37, at 414-15.
123. There is a marked cost differential, for instance, between ocean dumping of munici-
and economic parity with other disposal methods. Consequently, waste disposal decisions would likely be based on environmental and public health risks, rather than political or economic expediency. In essence the fee system would encourage a multi-media management approach to waste disposal.\textsuperscript{124}

A fee would also create an incentive to develop alternative waste disposal techniques such as waste reduction and recycling.\textsuperscript{125} Dumpers would consider disposal alternatives which may become cheaper as the technique is improved. Recycling, for instance, could become less expensive or even profitable as the technique is refined.\textsuperscript{126}

A charge system could be designed to reduce the amount of certain harmful substances dumped in the ocean. The fee would vary according to the types and concentrations of contaminants in the waste. Thus, innocuous materials, such as cannery wastes, would be ascribed low dumping fees, if any, since uncontaminated organic materials pose few threats to the marine environment.\textsuperscript{127} Graduating the fee based on contaminant concentrations would create an incentive for dumpers to either reduce the volume of waste dumped or implement methods to reduce the contaminant concentrations. The variable fee would encourage the reduction of contaminants in sewage sludge through increased reliance on pretreatment.\textsuperscript{128}

\textsuperscript{124} This approach is characterized by choosing the waste disposal medium which poses the least serious environmental and health risks. \textit{National Academy of Sciences, Multimedium Management of Municipal Sludge} 4 (1978); \textit{National Advisory Comm. on Oceans and Atmosphere; The Role of the Ocean in a Waste Management Strategy} 92-97 (1981).

\textsuperscript{125} Two of the most important criteria by which to evaluate alternative waste disposal policies are the extent to which waste reduction and recycling are encouraged. \textit{Office of Technology Assessment, Technologies and Management Strategies for Hazardous Waste Control} 29 (1983).


\textsuperscript{127} Uncontaminated organic material, such as fish waste, may have some deleterious effects on the oxygen levels in the receiving water, but this is not likely to be a significant problem. Champ, O'Connor & Park, \textit{Ocean Dumping of Seafood Wastes in the United States}, 12 \textit{Marine Pollution Bull.} 241, 243-44 (1981).

\textsuperscript{128} Municipalities charged for heightened levels of toxic substances in their sludge
Another regulatory end that a variable fee system would encourage is the use of appropriate ocean dumpsites. Dumpers using sites having heightened capacities to assimilate waste would be charged less than those dumping at sites with limited pollution tolerance.\(^\text{129}\) A variable fee structure could, moreover, help reverse the existing incentive to dump at less appropriate sites. In many cases the sites with heightened assimilative capacity are further from shore than less dispersive sites.\(^\text{130}\) Because of transportation costs, dumpers prefer those sites closer to shore.\(^\text{131}\) Tailoring a variable fee system to reduce dumping in overused sites could therefore reduce the net environmental effects of ocean dumping without curtailing the volume of materials dumped.

**B. Revenue Uses**

Revenue generated by an ocean dumping fee could be used for a number of important functions. First, the revenue could help finance the ocean monitoring program. Even those marine scientists who advocate increased ocean dumping emphasize that ocean dumping must be accompanied by a monitoring program to assess and predict the effects on the marine environment, especially if the volumes dumped continue to increase. These scientists reason that although past studies suggest the ocean is capable of assimilating a significant amount of waste, our current knowledge of the marine environment is rudimentary and incapable of accurately predicting the long-term effects of ocean dumping.\(^\text{132}\) The problem, however, is that while dumping is

\(^{129}\) The scientific knowledge necessary to characterize a site according to its assimilative capacity is still quite crude. It will be necessary, therefore, to insure that scientific research in this area proceeds in conjunction with the development of a fee structure. See text accompanying notes 132-133 infra, which describes the funding mechanism for this enterprise.

\(^{130}\) Sites further from shore are often in very deep and active waters and there tends to be less biological productivity in these areas. The differences between sites 12 miles and 106 miles from New York City support this observation. See Champ & Park, *Ocean Dumping of Sewage Sludge: A Global Review*, SEA TECHN., Feb. 1981, at 18, 22.


\(^{132}\) Four scientists intimately familiar with waste disposal in the marine environment recently stated:

One of the most serious mistakes that could be made about disposal of wastes in the oceans is to decide now that we have sufficient knowledge to establish regulations for twenty or even thirty years. We do not. Our present knowledge of the ocean teaches how complicated oceanic processes can be; it is rudimentary compared to the questions asked.
increasing, no corresponding increases are expected in monitoring efforts. In fact, cutbacks in federal funding will significantly reduce the amount of scientific work conducted in this area. Revenue generated by an ocean dumping user fee, therefore, could present a vital source of funding for these monitoring programs.

Second, revenue from dumping fees could help finance site designation studies. As discussed earlier, the deleterious effects of ocean dumping could be reduced merely by dumping at sites with appropriate characteristics. EPA has failed to make any significant progress in conducting the studies necessary to determine appropriate dumpsites. One of the major stumbling blocks has been the cost of the site designation studies. In an era of declining federal expenditures for environmental programs, it seems unlikely that adequate federal funding will be available for these studies. On the other hand, it is equitable to require those who make the studies necessary in the first place—the dumpers—to incur the cost. Indeed, extensive precedent supports passing the costs to parties who receive special governmental services. Financing site designation studies through ocean dumping fees is therefore both necessary and reasonable.

Fee revenues could also be used to fund research and development of alternative waste disposal techniques. Many wastes which are currently dumped into the ocean could, through the application of certain scientific or technical processes, be transformed into valuable resources. Municipal sewage sludge, for instance, can be a safe and useful fertilizer when properly managed. Many alternative uses of sludge have been developed as a result of federal research money. Significant engineering advances in sludge processing technology, moreover, have occurred recently. These two factors suggest that cutbacks in federal research and development money could retard the implementation of safe and useful alternatives to disposal of wastes by ocean dumping.


133. The 1983 NOAA budget for marine assessment, for instance, is approximately half the size of the 1982 budget for these programs. Ocean Dumping Hearings, supra note 10, at 134.

134. See supra note 61 and accompanying text.

135. See supra text accompanying notes 113-115.


137. Three examples of recent advances in sludge processing technology are: 1) development of techniques to remove chemicals, such as cadmium, from sludge, 2) tapping the energy in sludge by burning garbage and sludge simultaneously and 3) combining sludge with solid waste to create a road paving material. Lahey, supra note 37, at 427.
However, cutbacks in federal funding of research and development have occurred recently and can be expected to continue in the future. Furthermore, scientific research on alternative disposal methods would help mitigate public opposition to certain land based disposal techniques.

C. Other Justifications

If managed correctly, a dumping charge would be more equitable than the current regulatory system. The enforcement history of the ocean dumping regulations has been inconsistent; while EPA systematically phased out the small volume municipal dumpers during the 1970s, most of the large volume dumpers continue to dump. Such unequal treatment resulted more from the vagaries of direct regulation than from a response to differences in the merits of dumping applications. A charge system would eliminate this inequity, as the uniform imposition of a fee would be relatively easy.

A charge approach to ocean dumping also offers valuable regulatory flexibility. Since our knowledge of the effects of ocean dumping is rudimentary, future scientific findings may prompt us to rethink completely our ocean dumping policy. The need for disposing of wastes in the ocean will not remain static. Factors such as advances in alternative disposal technologies and demographic changes will alter the need for ocean dumping in the future. Given these uncertainties, it seems important to adopt a regulatory program able to respond to changing conditions.

138. It has been estimated that the EPA will make available only about one third of the money that is needed for sludge management research. According to one expert, "[t]o almost eliminate the amount of funding for sludge management research when there are many important unresolved technical, scientific, health and economic issues would be a disservice to the nation and ultimately could have an adverse impact on the resolution of the nation's water quality problems." The Research Needs of the Clean Water Act: Hearings Before the Subcomm. on Natural Resources, Agricultural Research and Environment of the House Comm. on Science and Technology, 97th Cong., 2d Sess. 68 (1982) (statement of Dr. Raymond Loehr, Cornell University).

139. Much of the political opposition to land-based waste disposal is based on unsubstantiated fears of public health threats from ground water contamination. Government funded studies of the efficacy of alternative disposal techniques could significantly mitigate these public fears. See generally EPA, OFFICE OF WATER & WASTE MANAGEMENT, SITING OF HAZARDOUS WASTE MANAGEMENT FACILITIES AND PUBLIC OPPOSITION iii-v (1979) (for a number of case studies on local sitings by EPA).

140. Professors Stewart and Krier also emphasize the importance of regulatory flexibility:

The changes in our understanding of and reaction to environmental problems over time, as well as uncertainties over the impact of any given approach suggest that a heavy premium should be placed on flexibility in environmental policies—the capacity to respond to changed conditions, knowledge or preferences—and on experimentation with alternative approaches in order to expand and test out our institutional repertoire.

Finally, developing and implementing a charge system for ocean dumping is an ideal opportunity to test this regulatory tool on the national level. Ocean dumping is a discrete, well defined environmental problem of national significance which has been ineffectively addressed by direct regulation. Congress is unlikely to adopt economic disincentives in any systematic way until this approach has been tested on a national level.

IV
IMPLEMENTATION ISSUES

Despite a decade of widespread support for pollution charges in the economic literature, all attempts to establish a hybrid charge system at the national level have faltered early in the legislative process. Past pollution charge proposals have encountered difficult questions involving administration of the system. Unanswered questions concerning the size of the charge, who would set the fee, and how the revenues would be distributed have caused many to withhold support for the proposals. Another hurdle to overcome is the ideological opposition mounted against economic disincentives. Finally, a number of legal questions must be addressed prior to implementing a national ocean dumping charge. In short, there will be little progress in establishing national pollution charges as long as the discussion remains primarily conceptual.

The following section develops and frames the questions which must be addressed prior to implementing an ocean dumping charge. It does not, however, attempt to design a fee system. Instead, the implementation issues are presented and the salient arguments concerning those questions are analyzed.

A. Administrative Issues

The political viability as well as administrative workability of the dumping charge proposal depends on who, or what body, sets the level of the fee. Congress could determine the charge much as it sets traditional taxes. A charge system requiring Congress to modify charges would be a very inflexible regulatory tool. Indeed, such a system would negate one of the primary assets of a dumping charge—an ability to respond easily to environmental, economic, or technological changes.

Alternatively, charges could be set and the revenue managed by a special institutional body. In fact, a quasi-governmental commission to

141. See, e.g., the exchange between Senators Proxmire and Muskie concerning a proposed amendment to the Federal Water Pollution Control Act which would have established an effluent charge. 117 CONG. REC., 38,828 (1971).
manage revenue generated from an ocean dumping user fee was proposed in Congress in 1982. A special charge setting authority has both advantages and drawbacks. If representatives from both industry and government comprise the institutional structure, the plan may inspire wider political acceptability and cooperation from industry. The fee setting and collection authority for the Japanese air emission tax, for instance, is a quasi-governmental agency made up of representatives from industry. Students of the Japanese system found that this institutional structure encourages industry cooperation and political acceptability. The Genossenschaften, the German fee collection and management agencies, are managed by representatives from both the polluting industries and affected cities. Commentators have concluded that, on the whole, this institutional structure functions well.

On the other hand, there are drawbacks to creating a special fee setting authority. It would, for one, unnecessarily duplicate many of the activities now being conducted by federal agencies. For instance, setting the charge level, especially if the charge varies according to waste characteristics and environmental conditions, will entail the collection and evaluation of large amounts of technical information. Three federal organizations already conduct these activities: the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the U.S. Army Corps of Engineers. The National Advisory Committee on the Oceans and Atmosphere also provides policy and technical advice on ocean dumping.

The logical choice for a fee setting body, in terms of administrative flexibility and institutional competence, is EPA. Under this proposal Congress would delegate to EPA the authority to set the level of charge. Drafters of the legislative proposal should be cognizant of political opposition to a broad delegation of charge setting authority. If delegation of authority to EPA is couched in vague legislative language, litigation will likely ensue over the reasonableness of the charge EPA subsequently sets. A possible solution to this problem is to build

142. A proposed amendment to H.R. 6324 would have added a new section to the Ocean Dumping Act to create an Ocean Waste Management Commission. The Commission would have been funded by fees on sludge dumpers and would have been responsible for coordinating research activities associated with ocean dumping. The Commission was to be made up of individuals representing dumpers, the Council on Environmental Quality, and the National Academy of Sciences. Ocean Dumping Hearings, supra note 10, at 640-50.


145. A coalition of municipal sewerage agencies, for instance, was opposed to a dumping fee amendment to the Marine Protection, Research, and Sanctuaries Act largely because it gave broad authority to the EPA to set fees and distribute the revenue. Ocean Dumping Hearings, supra note 10, at 725-27. (statement of James Borberg).
some sort of arbitration arrangement into the legislation.146

A legislative proposal granting both charge setting authority and a significant portion of the generated fees to one agency may be criticized for what some commentators have called a danger of “revenue addiction.”¹⁴⁷ That is, commentators fear that the charge system will be perverted if the institution that sets the fee also receives a percentage of the revenue it generates. In the context of dumping charges, however, revenue addition is not a concern. If, in trying to maximize its income, EPA made the cost of ocean dumping more expensive than alternative disposal methods, dumpers would stop ocean dumping and EPA’s income would decline.

A second prerequisite to implementing a dumping charge is determining who should be charged. A 1982 Congressional bill, for instance, proposed a fee against industrial and municipal waste dumpers but not against federal agencies.¹⁴⁸ This bill excluded the largest volume of ocean dumping—dredge spoils. The current Corps of Engineers policy requires local sponsors of dredging projects to provide the property and easements for land disposal of dredge material or to pay the cost for these facilities.¹⁴⁹ Since the costs of land-based disposal of dredge material are borne by the local sponsors of navigation projects, it is entirely reasonable to pass the costs of ocean disposal to these local sponsors. This would create a parallel responsibility and minimize the Corps’ bias toward ocean dumping.¹⁵⁰

Drafters of a dumping charge must also decide how to structure the charge. Decisions about whether charges should be fixed or variable and, if variable, how frequently they should be adjusted are necessary. Uniform charges, such as a dollar per pound fee, are attractive because they are easy to establish and administer. A variable fee, however, could be designed to accomplish significant objectives not attainable with a fixed charge. The benefits of a variable charge, with its high administrative costs, must be weighed against the simplicity of a less expensive uniform fee structure.

The decision to impose a dumping charge could vary according to different factors such as contaminant concentrations in the waste and the assimilative capacity of the dumpsite. A dumping charge scaled to the presence of different types of contaminants in the waste, as well as

¹⁴⁶ Such an arbitration arrangement was suggested during the Congressional hearing on proposed user fees for ocean dumping. Id. at 727.
¹⁴⁷ ANDERSON, supra note 79, at 45.
¹⁵⁰ Ocean Dumping Hearings, supra note 10, at 737-40 (statement of Edward R. Osann, director of water resources program, Resources Conservation Dep't, National Wildlife Federation)
to the concentrations of these contaminants, acknowledges that different substances affect the environment in different ways. Higher administrative costs for dumping these substances, because of the need for more extensive environmental monitoring, also justify raising dumping charges for substances which pose more serious threats to the marine environment. The charge could also vary depending on the assimilative capacity of the dumpsite, as a means of minimizing the environmental damage caused by dumping without necessarily reducing the amount of waste dumped. France, for instance, has a pollution charge system which varies according to the geographical location of the discharge.

While a dumping charge which varies according to the chemical constituents in the waste and the characteristics of the receiving waters can be a sensitive regulatory tool, the rules governing the variation of charges must not be too complex. The Organization for Economic Co-operation and Development, which has watched closely the use of pollution charges in Europe, suggests that simplicity is one of the essential elements of any charge system. The dumpers must be able to understand why the particular regulatory parameters have been selected. This simplicity not only facilitates administration but also minimizes lengthy legal disputes over the charge.

Experiences with similar systems counter the argument that a detailed system of charges would require major administrative expenditures. When EPA studied the costs of administering several complex federal excise tax programs, it concluded that the administrative costs averaged less than one percent of the revenue collected. The administrative costs of running the pollution charge system in the Seine-Normandy basin in France, a relatively complex system based on a number of parameters, is an estimated five percent of the agency's budget. An ocean dumping charge would be easier to administer than an effluent charge, since dumping is a discrete event, whereas effluents usually

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151. The French typically base their pollution charges on four factors which affect water quality: suspended solids, oxidizable matter, soluble salts, and toxic substances as measured in a bioassay test on an aquatic species. OECD, POLLUTION CHARGES, supra note 5, at 22.


153. OECD, POLLUTION CHARGES, supra note 5, at 30-33.

154. Id. at 21.

155. Smith, supra note 126, at 93.

156. OECD, POLLUTION CHARGES, supra note 5, at 42.
discharge continuously. Moreover, because existing licensing procedures require assessment of the chemical constituency of wastes to be ocean dumped,\textsuperscript{157} calculating a dumping charge based on chemical parameters will not require extensive additional administrative expenditures.

A further structuring issue concerns how flexible the amount to be collected from an individual dumper should be. While flexibility is a primary virtue of the charge approach, frequent adjustments in the charge may be counterproductive. Most waste treatment technologies and processes require large capital expenditures and long-term planning. A climate of economic uncertainty created by frequently fluctuating dumping charges would therefore create a disincentive for dumpers to invest in alternative waste disposal measures.\textsuperscript{158} Thus, a balance must be struck between an unpredictable, frequently changing charge system, and one that is unable to adjust to significant environmental, technological, or economic changes.

Before a charge is implemented, a crucial administrative question is how the revenue generated by the charge will be used. Possibilities include merging the money with general federal revenue, giving it to EPA and the Corps, or earmarking the funds for certain activities. The user fee concept suggests that the revenue should support the federal agencies which provide special services to the dumpers; EPA and the Corps would receive money for administering the dumping program and the National Oceanographic and Atmospheric Administration would receive money for monitoring and research. Part of the revenue could be used productively for research and development of alternative waste disposal methods. At least one state has implemented such a distribution scheme, using part of the revenue generated by a fee imposed on hazardous waste site operators to fund waste recycling and research into disposal alternatives.\textsuperscript{159} Another possible use of the revenue, redistribution, is used by some European countries to reduce the net cost of pollution control by giving part of the charge income to polluters with low treatment costs. This technique is more acceptable to dischargers and, therefore, enhances the political acceptability of the

\textsuperscript{158} Rose-Ackerman, Market Models, supra note 85, at 390.
\textsuperscript{159} Illinois, for instance, uses part of the revenue from its hazardous waste fee to fund research and development into safe disposal alternatives. ILL. ANN. STAT. ch. 111 1/2, § 1022.2 (Smith-Hurd Supp. 1983). In contrast, New York operates a state-wide program to compile research results and investigate the market potential of alternative disposal techniques, but funds for the program are derived from bond sales and general state revenue. N.Y. PUB. AUTH. LAW §§ 1285g, 1290 (McKinney 1982). See also National Conference of State Legislatures, supra note 107, at IV-3 (chart showing the policies of various states regarding alternatives to hazardous landfills).
charge system generally.  

B. Political Issues

Ideological opposition presents a significant obstacle to establishing a pollution charge. Prior attempts to legislate a charge system have encountered widespread yet subtle resistance based on concerns over the type of behavior society is willing to condone, rather than on issues of economic or administrative efficiency. The economists who have promoted pollution charges in the past have failed to respond adequately to this resistance.

One frequent argument is that pollution charges will create a "license to pollute." For instance, Senator Muskie was one of the chief opponents to Senator Proxmire's 1971 proposal to amend the Federal Water Pollution Control Act to create an effluent charge; Muskie complained that the charge would be mistaken for selling a license to pollute.  

Steven Kelman, a social scientist who has looked closely at the political opposition to pollution charge schemes, views the "license to pollute" argument as shorthand for a deeper ideological opposition. Traditional regulation establishes standards and sanctions for exceeding them; the polluter who exceeds these standards is thus stigmatized by society as a wrongdoer. Pollution charges, on the other hand, do not attach a stigma to polluting behavior.

The difference between direct regulation and economic tools in terms of identifying moral blameworthiness is considered significant by many national environmental policymakers. In 1978 Kelman surveyed a broad range of environmental policymakers in order to determine their attitudes about the use of economic tools to control pollution. He found that a large number of survey participants considered these ideological issues important. Despite such widespread ideological discomfort with pollution charges, many economists advocating pollution charges view these ideological arguments with disdain. The failure of charge system proponents to respond adequately to ideological argu-

160. OECD, POLLUTION CHARGES, supra note 5, at 41.
163. Id. at 9.
164. See, e.g., the comments of William Baxter, a prominent welfare economist:

To me one of the most disturbing features about the ecology movement is the totally irrational response that many of the environmental enthusiasts give to effluent tax proposals. Such proposals are brushed aside with the cavalier opposition that they constitute a 'license to pollute.' If such comments have any intellectual, as opposed to emotional, content at all, they can only suggest that the speaker has in mind some alternative system of control that would result in a zero pollution rate. And there is no such system.

W. BAXTER, PEOPLE OR PENGUINS: THE CASE OF OPTIMAL POLLUTION 78 (1974)
ments has, no doubt, abetted the political opposition. One response to the ideological opponents of ocean dumping charge proposals is that, in actuality, no stigma attaches to polluting behavior under the current system of direct regulation. Instead, violations of the ocean dumping standards have been occurring on a systematic basis for years.\textsuperscript{165} Violations of EPA's dumping regulations are viewed as a technical misfeasance, not a morally blameworthy act.

\section*{C. Legal Issues}

An ocean dumping charge designed to generate revenue and to regulate dumping activity does not precisely fit the traditional definitions of a tax, user fee, or regulatory standard. Some legislative characterization, however, of the dumping charge will be necessary. The label chosen will be significant because of the legal constraints which accompany each characterization. The architects of a dumping charge must therefore consider the legal implications which result from these characterizations early in the drafting process.

\subsection*{1. Characterization as a Tax}

Congress, of course, has the power to levy and collect taxes.\textsuperscript{166} Although the chief purpose of taxation is to raise revenue to cover government expenses, taxes are frequently intended to serve non-revenue generating objectives. The extent to which Congress may pursue other objectives along with revenue gathering will determine the effectiveness of a dumping charge system based on the taxing power.

Courts have deferred to Congressional taxation to accomplish non-revenue regulatory objectives. For instance, in 1937, the Supreme Court upheld the National Firearms Act of 1934 which imposed an annual license tax of two hundred dollars on dealers of certain objectionable firearms.\textsuperscript{167} Finding that the law did not infringe on the State's police power, the Court further noted that every tax is in some way regulatory, and that it was not free to inquire into legislative motives as long as some revenue is generated.\textsuperscript{168} In 1950 the Supreme Court sustained the Marijuana Tax Act which placed a one hundred dollar an ounce tax on the sale of marijuana.\textsuperscript{169} The court said the tax was valid even though Congress was primarily interested in restricting the traffic of marijuana and only secondarily interested in raising revenue.\textsuperscript{170}

\textsuperscript{165} See supra text accompanying notes 35-71.
\textsuperscript{166} U.S. CONST. art. I, § 8, cl. 1.
\textsuperscript{167} Sozinsky v. United States, 300 U.S. 506 (1937).
\textsuperscript{168} \textit{Id}. at 513-14.
\textsuperscript{169} United States v. Sanchez, 340 U.S. 42 (1950).
\textsuperscript{170} \textit{Id}. at 44.
If Congress enacted a dumping tax it would no doubt authorize an administrative agency to set the level of tax according to changing conditions. Such authorization could be challenged as an unconstitutional delegation of legislative power. At first blush, the likelihood of persuading a court that such a delegation is unconstitutional appears extremely low; the last time the Supreme Court invalidated federal legislation based on the non-delegation doctrine was in 1935. A number of commentators believe the doctrine has no modern day vitality; one commentator has referred to non-delegation cases as "neanderthal residues."

The non-delegation doctrine, however, may still be viable when delegations of the taxing power are at issue. A 1974 Supreme Court case narrowly construed an administrative charge as a fee to avoid the question of whether the charge constituted an unconstitutional delegation of taxing authority. The Court said delegating the power of taxation would be a "sharp break with our traditions." Numerous lower court decisions prohibit legislatures from delegating taxing authority to non-elected bodies.

Over-broad delegations of authority can generally be avoided with an intelligible legislative standard for guiding agency discretion and enabling judicial determinations of whether the agency is operating within its authority. Some commentators suggest that it may not be possible to develop intelligible standards with respect to certain aspects of taxation. They argue that setting the amount of tax involves a number of competing social goals whose political, social, and economic factors cannot be reduced to meaningful standards.

The view that the development of intelligible legislative standards for delegating taxing authority is impossible is belied, however, by a 1928 Supreme Court decision, Hampton v. United States, quoted favorably by the Supreme Court in 1974. In Hampton the Court reviewed the tariff law which gave the Federal Tariff Commission authority to set the level of custom duties. Congress established guide-

171. U.S. CONST. art. I, § 1 states that "All legislative power . . . shall be vested in a Congress of the United States."
175. Id. at 341.
179. Id. at 1246-47.
180. 276 U.S. 394.
lines for the determination of the tax and provisions for review of the duty by the President. The Court upheld the delegation, stating: "If Congress shall lay down by legislative act an intelligible principle to which the person or body authorized to fix such rates is directed to conform, such legislative action is not a forbidden delegation of legislative power."\textsuperscript{182}

The possibility of state and local governmental immunity from an ocean dumping charge makes it difficult to characterize the charge as a tax. Immunity might exempt all sewage sludge dumping from the charge, since sludge is generated by municipally owned treatment facilities. States and their political subdivisions have received immunity from federal taxation where the tax would unduly interfere with the performance of functions unique to a sovereign government. This immunity stems from the Tenth Amendment and the reciprocal immunity between federal and state governments implied in the Constitution and first articulated by Chief Justice Marshall in 1819.\textsuperscript{183} Justice Marshall’s statement that “the power of taxing . . . may be exercised so as to destroy,”\textsuperscript{184} reflected a strong wariness of the taxing power.

In 1905 the Supreme Court articulated a test to determine which state functions were immune from federal taxation, stating that constitutional immunity applied only to "state agencies and instrumentalities . . . of a strictly governmental character."\textsuperscript{185} In 1937, the Court determined that a city’s water supply was an “essential governmental function” and hence the income of a city water engineer was immune from taxation.\textsuperscript{186} A major criterion for the decision was the importance of the municipality’s water service to the public interest. In the context of an ocean dumping tax, this analysis suggests that a municipal wastewater treatment facility would be immune from the charge; sewage treatment services resemble water supply services in that both are necessary to the functioning of modern cities and are important to the public interest.

The contours of the state immunity doctrine, however, have been narrowed by the Supreme Court since 1937.\textsuperscript{187} In \textit{New York v. United States}, Justice Frankfurter, speaking for the plurality, said state generated revenue was not immune from a non-discriminatory tax unless

\begin{itemize}
  \item \textsuperscript{182} Hampton v. United States, 276 U.S. at 409; National Cable Television Ass’n, 415 U.S. at 342.
  \item \textsuperscript{183} McCulloch v. Maryland, 17 U.S. (4 Wheat.) 316 (1819). There is also a statutory immunity from federal income taxation for income derived from essential state functions. I.R.C. § 115 (1) (1976).
  \item \textsuperscript{184} McCulloch v. Maryland, 17 U.S. (4 Wheat.) at 427.
  \item \textsuperscript{185} South Carolina v. United States, 199 U.S. 437, 461 (1905).
  \item \textsuperscript{186} Brush v. Commissioner, 300 U.S. 352, 362, 370 (1937).
\end{itemize}
"uniquely capable of being earned only by a state."\textsuperscript{188} This decision illustrated an interest in narrowly circumscribing the doctrine of state immunity since it impaired the ability of the federal government to raise revenue.\textsuperscript{189} The view that state tax immunity should be narrowly construed was also underscored in dicta in a 1978 Supreme Court decision.\textsuperscript{190} Despite the narrowing of the state immunity doctrine, a municipal wastewater facility still may be found immune from federal tax since it is a service which could be considered unique to state operations.

An exception to state immunity, however, may apply in the context of an ocean dumping charge. In 1938 the Supreme Court upheld a federal tax on employees of the Port of New York Authority because the taxation burden was absorbed primarily by private persons.\textsuperscript{191} The Court said that the state's immunity was not infringed merely because the state government incurs extra expenses in administering the tax. In 1949 the Court upheld a federal tax on municipal revenues from local park admission fees since the tax could be readily passed on to the park's private users.\textsuperscript{192} Both cases stand for the proposition that a tax on a state entity which is easily passed on to private persons does not infringe on a state's constitutional immunity. Since municipalities could readily pass on a dumping tax to private users of the wastewater facility it appears unlikely that a court would find the city immune from this tax.

2. Characterization as a Regulatory Charge

An ocean dumping charge could be authorized by the Commerce Clause power.\textsuperscript{193} The Supreme Court has interpreted this clause to give Congress sweeping power to regulate the means of producing goods which will enter interstate commerce,\textsuperscript{194} interstate transportation, including the instrumentalities of transportation,\textsuperscript{195} and the activities affecting interstate commerce.\textsuperscript{196} In fact, the Commerce Clause was the basis upon which Congress established the current regulatory regime under the Ocean Dumping Act.\textsuperscript{197}

Prior court decisions clearly indicate that the Commerce Clause

\textsuperscript{188} New York v. United States, 326 U.S. 572, 582 (1946).
\textsuperscript{189} Id. at 589-90 (Stone, C.J., concurring).
\textsuperscript{190} Massachusetts v. United States, 435 U.S. 444, 456-60 (1978).
\textsuperscript{191} Helvering v. Gerhardt, 304 U.S. 405, 420-22 (1938).
\textsuperscript{192} Wilmette Park District v. Campbell, 338 U.S. 411, 419-20 (1949).
\textsuperscript{193} U.S. CONST. art. I, \S 8, cl. 3.
\textsuperscript{194} United States v. Darby, 312 U.S. 100 (1941).
\textsuperscript{195} Houston E. & W. Texas Ry. Co. v. United States, 234 U.S. 342 (1914).
\textsuperscript{196} Wickard v. Filburn, 317 U.S. 111 (1942).
gives Congress authority to choose the means used to regulate commerce. A 1940 Supreme Court decision, for example, upheld a charge on coal designed to enforce the regulatory provisions of a federal statute.\textsuperscript{198} The Court said that Congress could use a charge similar to a tax in the exercise of its other powers. In 1943 the Sixth Circuit upheld a charge on farmers who marketed cotton in excess of their farm quota\textsuperscript{199} against a challenge asserting an unconstitutional delegation of taxing power and a violation of the state tax immunity doctrine. The court concluded that even though the charge raised revenue it was not a tax, because regulation was the primary purpose of the statute establishing the charge. The court held that the charge was a legitimate way to regulate interstate commerce, explaining that “[t]he power of Congress to ‘regulate commerce’ is the power to prescribe the rules by which commerce is to be governed and the Congress is at liberty to adopt any method which it deems effective to accomplish the permitted end.”\textsuperscript{200}

As with the taxing power there is some question of state immunity from federal Commerce Clause regulations. State immunity in this context, however, is much more circumscribed than in the taxation context. The Supreme Court, in \textit{National League of Cities v. Usery},\textsuperscript{201} set out a clear standard for testing whether a particular state activity is immune from federal taxation. Justice Rehnquist, speaking for the majority, said that federal regulations under the commerce clause which “operate to directly displace the States’ freedom to structure integral operations in areas of traditional government functions” are unconstitutional.\textsuperscript{202} An ocean dumping charge which applied to municipally owned treatment facilities does not displace the municipality’s freedom to structure its integral operations. In fact, a charge approach toward controlling ocean disposal would be less restrictive than the current command and control regulatory approach.

3. Characterization as a fee

Characterizing an ocean dumping charge as a user fee presents no legal ambiguities with respect to potential state immunity. The Supreme Court has clearly held that states enjoy no constitutional immunity from fees designed to recover the costs of operating a federal program.\textsuperscript{203} Nonetheless, some significant legal limitations attach to

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\textsuperscript{198} Sunshine Anthracite Coal Co. v. Adkins, 310 U.S. 381, 393-94 (1940).
\textsuperscript{199} Rodgers v. United States, 138 F.2d 992 (6th Cir. 1943)
\textsuperscript{200} \textit{Id.} at 994.
\textsuperscript{202} \textit{Id.} at 852.
\textsuperscript{203} Massachusetts v. United States, 435 U.S. 444 (1978).
those costs which can be recovered when they are characterized as user fees.

The Independent Offices Appropriation Act (IOAA)\(^\text{204}\) authorizes federal agencies to charge a fee for their services. The Act encourages agencies to be “selfsustaining to the full [sic] extent possible” by charging for services provided.\(^\text{205}\) On its face, the IOAA gives agencies broad discretion to levy user fees, including the discretion to forego fees.\(^\text{206}\) The Act sets out four criteria agencies are to take into consideration in setting the fee level: 1) the direct and indirect costs to the government; 2) the value to the recipient; 3) public policy or interests served; and 4) other pertinent facts.\(^\text{207}\)

The Supreme Court narrowly construed the IOAA as the Act applied to a particular agency’s recoverable costs. The Court first considered the validity of a fee levied pursuant to the IOAA in 1974 in *National Cable Television Ass’n v. United States.*\(^\text{208}\) In that case, the Court focused on the “value to the recipient” criteria for assessing fees. The Court invalidated a Federal Communications Commission (FCC) fee on cable television outlets because the fee covered costs for services which the Court felt benefitted the public as a whole, not just the cable television operators. Since many of the functions performed by the FCC safeguarded the public interest, the Court reasoned that charging a fee to recoup the costs of these functions was not justified under the IOAA. A charge which required the licensee to pay for government services which benefitted the public as a whole would, moreover, be a tax; the Court chose to avoid the constitutional questions of taxation by federal agencies.\(^\text{209}\)

In a companion case to *National Cable*, the Court invalidated a Federal Power Commission fee levied against all natural gas pipelines and electric utilities.\(^\text{210}\) The Court held that fees can only be levied against specific, identifiable recipients who request specific governmental services.\(^\text{211}\) Before an agency can impose a fee, therefore, some vol-


\(^{205}\) *Id.*

\(^{206}\) The IOAA gives authority to agencies to prescribe a user fee but does not require the establishment of a fee. 31 U.S.C. § 483a (1976). This permissive approach is mirrored in a circular issued by the Office of Management of Budget (then the Bureau of the Budget) in 1959, which states that agencies “should” levy a charge in appropriate circumstances. *Bureau of the Budget, Circular No. A-25 1* (1959). *See Recent Decision,* 48 Geo. Wash. L. Rev. 791, 793 n.11. *See also* Aeronautical Radio, Inc. v. United States, 335 F.2d 304, 306 (7th Cir. 1964), *cert. denied,* 379 U.S. 966 (1965) (FCC licensing program supported by user fees held not unconstitutional).


\(^{209}\) 415 U.S. 340-44. For a discussion of the constitutional issues associated with federal agencies establishing tax rates *see, supra* text accompanying notes 171-182.


\(^{211}\) *Id.* at 349-51.
untary act, such as applying for a permit, must take place.

A review of the Nuclear Regulatory Commission (NRC) fee schedule by the Fifth Circuit in *Mississippi Power and Light Co. v. United States Nuclear Regulatory Comm'n*\(^\text{212}\) provides more guidance as to what fees can be legitimately charged for government services under the IOAA. Based on the Supreme Court's construction of the IOAA in *National Cable and New England Power*, the Fifth Circuit approved the NRC fees designed to cover the agency costs incident to issuing and policing a permit. The court in *Mississippi Power* held that even though the work of the NRC conferred substantial benefits to the public in terms of public safety, the mere fact that a license is required from the NRC to operate a nuclear facility means that the licensee is receiving a benefit not shared by the public at large.\(^\text{213}\) Once a private benefit was shown, the court said that the NRC could recover the full costs of providing a service regardless of whether that service also incidently benefitted the public.\(^\text{214}\) In so holding, the court rejected the petitioners' claim that the agency was required to allocate costs in a way that distinguished between the public and private benefits conferred.

The court approved NRC charges for the costs of a number of services. It upheld a charge for routine power plant inspections,\(^\text{215}\) and for environmental reviews and environmental impact statements,\(^\text{216}\) pointing out that these services made it possible for a power plant operator to obtain and keep a license. The court also approved a charge for the cost of mandatory pre-licensing public hearings, and for the administrative and technical services associated with processing a license application, saying that these costs are an integral part of the license review process, and would not be incurred but for the company's application.\(^\text{217}\)

Under the *Mississippi Power* test, an ocean dumping fee could recoup the entire cost of agency activities which passed the "value to recipient" test. That is, all agency costs incident to issuing and policing statutorily required permits would be recoverable. An ocean dumping fee, therefore, could recoup the cost of assessing permit applications, the costs of operating the dumpsite monitoring program, and costs of other necessary components of the licensing procedure. Since site designation studies are required under the ODA and the London

\(\text{212. 601 F.2d 223 (5th Cir. 1979), cert. denied, 444 U.S. 1102 (1980).}\)
\(\text{213. Id. at 227-29.}\)
\(\text{214. Id. at 230.}\)
\(\text{215. Id. at 231.}\)
\(\text{216. Id.}\)
\(\text{217. Id. at 229-32.}\)
Dumping Convention,\textsuperscript{218} it is likely that the costs of this program could also be recovered under the \textit{Mississippi Power} test. However, the costs of research and development of alternative waste disposal techniques would probably not be recoverable under the IOAA concept of authorized fees, because the value of such research to dumpers is remote.

\textbf{CONCLUSION}

Many justifications compel the creation of a charge system for ocean dumping. In an era of declining federal expenditures for environmental programs, a charge system could provide a vital source of funding for government programs associated with ocean dumping. This alternate funding source is particularly important in light of the anticipated increases in ocean dumping during the next decade. A charge system could also act as an effective regulatory tool to encourage sound waste disposal practices. Finally, the ocean dumping context provides an ideal opportunity to test the concept of economic disincentives on a national scale. Such an experiment would provide Congress with valuable information concerning the effectiveness of pollution charges in practice.

The development and implementation of a viable and effective charge system requires that a number of administrative, political, and legal questions be answered. An examination of the salient administrative question indicates that the development of an effective charge system for ocean dumping is feasible. The past political opposition to pollution charge proposals can and should be mitigated by directly addressing the ideological arguments against the charge systems.

The charge system envisioned for ocean dumping does not neatly fit into a traditional legal category, yet a number of significant legal consequences which flow from the characterization of the charge will determine the structure and viability of the charge system. Close attention, therefore, must be paid to how the charge is characterized.

\textsuperscript{218} See supra notes 58-60.