March 1985

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http://dx.doi.org/https://doi.org/10.15779/Z38CZ3P

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National and International Regulation of Ocean Dumping: The Mandate to Terminate Marine Disposal of Contaminated Sewage Sludge

Marc A. Zeppetello*

INTRODUCTION

Much of the world's waste flows into the oceans.1 Pollutants enter the marine environment through coastal runoff, river discharge, marine transportation activity, seabed oil and mineral development, atmospheric fallout, and ocean dumping.2 Even though the amount of waste dumped in the oceans is small compared to the total volume of pollutants reaching the oceans,3 dumping creates a significant marine pollution problem because many wastes entering the oceans contain materials that adversely affect the marine environment.4

Since the early 1970's, individual countries and the international legal community have sought to control ocean dumping. The United States Congress enacted the Marine Protection, Research and Sanctuaries Act5 (MPRSA, also known as the Ocean Dumping Act) in 1972 to

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1. COUNCIL ON ENVTL. QUALITY AND THE U.S. DEP'T OF STATE, THE GLOBAL 2000 REPORT TO THE PRESIDENT—ENTERING THE TWENTY-FIRST CENTURY, A REPORT 300 (1980) [hereinafter cited as CEQ GLOBAL 2000 REPORT]. The oceans receive some "pollutants" from natural geologic processes; however, human activity may increase the rate of accumulation in the oceans of certain substances, such as heavy metals, to several times the natural rate. Id. at 308. In addition, pollution introduces many unnatural and synthetic compounds into the marine environment. See also COUNCIL ON ENVTL. QUALITY, OCEAN DUMPING: A NATIONAL POLICY iii (1970) [hereinafter cited as CEQ OCEAN DUMPING REPORT].

2. The term "ocean dumping" means the deliberate disposal of wastes or other matter at sea. Unlike most other sources of marine pollution, dumping involves deliberate activity and, consequently, it can be regulated relatively easily. Rogers, Ocean Dumping 7 ENVTL. L. 1, 1 (1976).

3. CEQ OCEAN DUMPING REPORT, supra note 1, at iii.

4. Id. at v. Ocean dumping typically occurs in, and most directly affects, coastal waters, the most biologically productive portion of the marine environment. See CEQ GLOBAL 2000 REPORT, supra note 1, at 301 (99% of total fish yield produced in coastal waters).

regulate dumping in the coastal regions of the United States. At about the same time, representatives from over eighty countries completed negotiations on the London Dumping Convention, which established international standards for the disposal of wastes at sea.  

Both the MPRSA and the London Convention recognize that the oceans can assimilate wastes, and neither totally prohibits ocean dumping. Though the assimilative capacity of the oceans is not unlimited, it varies for different types of waste. Consequently, under both national and international law, regulatory treatment of dumping differs according to the type of waste material proposed for ocean disposal.

The oceans can assimilate large quantities of nontoxic and readily biodegradable materials. Thus, under both national and international dumping controls, dumpers can easily obtain permits to dump wastes that will have minimal adverse environmental impact. At the other extreme, highly toxic substances cannot be dumped into the ocean without harming marine communities and potentially causing adverse human health effects. Both the MPRSA and the London Convention totally prohibit the dumping of certain materials such as high-level radioactive wastes, and biological and chemical warfare agents. The London Convention also prohibits ocean disposal of concentrated heavy metals and synthetic chemicals.

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7. The concept of assimilative capacity refers to the amount of waste that can be introduced into ocean waters without causing a deleterious effect on public health or the marine environment.

8. The preamble to the London Convention recognizes that "the capacity of the sea to assimilate wastes and render them harmless, and its ability to regenerate natural resources, is not unlimited." London Convention, supra note 6, at preamble, para. 2.

9. Assimilative capacity also depends on environmental factors such as water depth, currents, and the presence of sensitive marine communities.

10. The MPRSA totally prohibits ocean dumping of certain materials and establishes a permit program for disposal of all other materials, see infra text accompanying notes 74-76. The London Convention follows what has been termed a "black list-grey list" approach to regulating dumping. Ocean disposal of the highly hazardous black list substances is prohibited. London Convention, supra note 6, at art. IV(1)(a). Substances on the grey list require special care and can be dumped only with a special permit. London Convention, supra, at art. IV(1)(b).


12. The MPRSA specifically provides for general permits to allow dumping of materials that will have minimal adverse impact on the environment. 33 U.S.C. § 1414(c) (1982). Similarly, the London Convention allows dumping under a general permit for materials not included on the black list or grey list. London Convention, supra note 6, at art. IV(1)(c).


Sewage sludge,15 dredged spoils,16 and industrial wastes17 are the wastes most commonly dumped in the coastal waters of the United States.18 All three of these wastes may contain highly toxic substances19 which create significant environmental hazards. Although the same dumping controls apply to all wastes contaminated with toxic materials, this Comment focuses on ocean disposal of sewage sludge for several reasons. First, in contrast to other wastes, the amount of sewage sludge dumped in the oceans is actually increasing. Second, the unique opportunities for reducing the concentration of contaminants in sewage sludge through pretreatment make tightening the regulations on sewage sludge a particularly feasible policy. Finally, the controversy over ocean dumping in this country has focused primarily on sewage sludge, and proper disposal of this waste is imperative to a sound national policy on ocean dumping.

Ocean disposal of sewage sludge presents a fundamentally different problem than that posed by other wastes. The amount of industrial waste dumped in the ocean has decreased significantly in recent years,20 and new technology, such as at-sea incineration, is being developed to

15. Sewage sludge is the nonhomogeneous mud-like by-product or residue of municipal wastewater treatment processes.
16. The clearing of harbors and river channels for navigation generates dredged spoils which are dumped at various locations on the Atlantic, Pacific, and Gulf coasts.
19. Dredged spoils may be contaminated with heavy metals, synthetic organic compounds, pesticides, and other materials. See CEQ OCEAN DUMPING REPORT, supra note 1, at 4; Bakalian, supra note 18, at 205-06. Contaminants in industrial wastes vary because of the diversity of industrial processes involved, but can include highly acidic compounds, synthetic hydrocarbons, and heavy metals. CEQ OCEAN DUMPING REPORT, supra, at 4; see also NAT'L RESEARCH COUNCIL, NAT'L ACADEMY OF SCIENCES, DISPOSAL IN THE MARINE ENVIRONMENT: AN OCEANOGRAPHIC ASSESSMENT 5 (1976). The chemical composition of sewage sludge varies with the source and content of the wastes and the method of treatment. NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, THE ROLE OF THE OCEAN IN A WASTE MANAGEMENT STRATEGY 44-45 (1981). The primary constituents of sludge include nutrients, heavy metals, chlorinated and petroleum hydrocarbons, and pathogens. Id.
20. The amount of industrial waste dumped in the oceans decreased from about 5.1 million tons in 1973 to about 0.3 million tons in 1983. 1984 EPA REPORT, supra note 17, at 9.
destroy certain highly toxic industrial wastes at high temperatures in order to minimize effects on the marine environment. Although dredged spoils represent the largest single source of waste dumped in the ocean, the volume of this material did not increase during the last decade. In contrast, the amount of sewage sludge dumped in the ocean continues to increase. Most importantly, not all dredged spoils are contaminated with pollutants, whereas virtually all sewage sludge dumped in the ocean contains high concentrations of heavy metals and synthetic organic compounds.

Ocean disposal of dredged spoils presents fewer opportunities for regulation than disposal of sewage sludge. The dumping of contaminated material dredged from harbors basically relocates material already present in the marine environment. The main sources of contamination of marine sediments are polluted runoff and river discharges, but because runoff is contaminated by an indefinite number of non-point sources, preventing contaminants from reaching the sediments may be impossible. In contrast, most contaminants enter sewage effluent from industrial sources discharging into municipal wastewater treatment systems. Industrial pretreatment can reduce the amount of contaminants.

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23. The volume of dredged spoils generated annually varies with storm activity and the amount of dredging associated with particular local projects. Between 1973 and 1980, the amount of dredged material dumped in the oceans ranged from a high of 98.7 million cubic yards in 1974 to a low of 41.3 million cubic yards in 1977, with a mean of 67 million cubic yards. Bakalian, supra note 18, at 204-05.

24. Since EPA began regulating ocean dumping in 1973, sewage sludge disposal has increased by 70%, from 4.9 million tons to 8.3 million tons in 1983. 1984 EPA REPORT, supra note 17, at 9. The construction of large numbers of sewage treatment plants, especially those built with secondary capacity, has generated higher volumes of sewage sludge.

25. In 1968, the Army Corps of Engineers estimated that about 34% of all dredged spoils were contaminated. CEQ OCEAN DUMPING REPORT, supra note 1, at 3. Not all dredged spoils are dumped in the oceans, however, and the proportion of contaminated dredged spoils disposed of in this manner is unknown. Compare D. Brooks, supra note 22, at 131 (much of the dredged material dumped in the oceans is "highly contaminated") with NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 47 (Army Corps of Engineers believes that no more than five percent of the dredged material dumped in the oceans exceeds permissible levels of contaminants as defined by the stringent bioassay testing procedures). The primary impacts of the disposal of uncontaminated dredged spoils are burial of marine organisms and increased levels of suspended sediments. Bakalian, supra note 18, at 205.

26. The contaminants in sewage sludge account for EPA's special regulatory treatment for this waste. See infra notes 88, 114, 122. See also Bakalian, supra note 18, at 201.

27. CEQ OCEAN DUMPING REPORT, supra note 1, at 3.

28. See infra note 348.
Implementation of the pretreatment requirements mandated by the Clean Water Act would remove most of the toxic chemicals in the sludge and allow the biodegradable organic component of sludge to be dumped in the ocean with minimal adverse impact.

Ocean disposal of sewage sludge has generated considerable controversy in this country. In 1981, a federal district court ruled, in City of New York v. EPA, that EPA's ocean dumping regulations prohibiting all dumping that could potentially degrade the marine environment are an improper interpretation of the MPRSA because the Act permits "reasonable" dumping. The court concluded that not all materials that fail to satisfy the regulatory environmental impact criteria would unreasonably degrade the environment and found that the MPRSA requires the Agency to consider other relevant factors. EPA's failure to appeal City of New York signaled an end to the Agency's earlier efforts to halt all ocean dumping of sewage sludge.

While EPA reassesses its ocean dumping policy, court orders are allowing ocean disposal of increasing amounts of contaminated sewage sludge. If the Agency revises its ocean dumping regulations to sanction ocean disposal of contaminated sewage sludge, dumping will probably increase significantly and be viewed as a long-term solution to the sludge disposal problem. Any change in the regulations may also encourage increased reliance on the oceans for disposal of industrial waste and other materials.

In the context of suggesting a preferable sewage sludge policy, this Comment discusses national and international efforts to regulate ocean dumping. Part I traces the development of national and international regulatory controls. Part II describes recent judicial interpretations of EPA's regulations implementing the MPRSA. Part III suggests that although EPA's current regulations prohibiting sludge dumping are not in effect as a result of the City of New York decision, they are consistent with the MPRSA; furthermore, continued ocean dumping of sewage sludge violates both the London Convention and EPA regulations that prohibit dumping of certain prohibited materials as "other than trace contaminants." Part IV evaluates the effectiveness of the London Convention as an international control on ocean dumping. Part V discusses
recent developments in the control of ocean dumping, including EPA's policy reassessment and various amendments to the MPRSA that Congress has considered. Part VI examines the validity of the presumption against ocean dumping of toxic substances and concludes with suggestions for developing an integrated approach to the problem of sewage sludge disposal.

I

DEVELOPMENT OF OCEAN DUMPING CONTROLS

A. The CEQ Report

In 1970, the President's Council on Environmental Quality (CEQ) published a comprehensive report which examined the problems of waste disposal at sea and demonstrated the critical need for national and international controls on ocean dumping. CEQ identified toxicity, oxygen depletion, and the potential for ecological change as detrimental impacts of wastes on the marine environment. The report further listed public health problems, damage to aesthetic values, and economic losses as direct effects of dumping on human activities. CEQ acknowledged that ocean dumping was not then a serious national problem, but predicted that increased reliance on ocean disposal would lead to widespread environmental damage. CEQ recommended legislation to give EPA regulatory control over ocean dumping activities. The CEQ report also recommended that the United States initiate the development of international controls on ocean dumping.

B. The London Dumping Convention

Countries concerned about the environmental consequences of marine pollution developed international ocean dumping controls in the early-1970's. In 1971, Norway invited a number of European countries to attend the Oslo Conference, which drafted the first international dumping convention. Ocean dumping became the object of greater interna-
tional discussion in the summer of 1971 when the United States prepared a draft global dumping convention. The United States developed the draft in preparation for the United Nations Conference on the Human Environment (UNCHE) scheduled for mid-1972. Many observers considered adoption of a global dumping convention at the UNCHE, which was convened to formulate principles and guidelines for environmental protection, as an opportunity to take concrete action of great symbolic value. The UNCHE recommended, but did not achieve, the adoption of a global dumping convention. Negotiations continued during 1972, however, and culminated in the London Convention on Dumping.

The countries at the 1972 London Convention developed the first global agreement on ocean dumping. The general principles in the preamble and introductory articles of the London Convention emphasize the obligation of contracting parties to prevent pollution of the sea by dumping. Article IV sets out the regulatory framework of the Convention by generally prohibiting the dumping of wastes, but allowing certain exceptions. The primary factor in determining whether, and under what conditions, a waste may be dumped is its content. Different legal treatment is given to various substances in the detailed Annexes to the


50. Id. The United States draft was prepared for the UNCE even though two major international conferences scheduled in 1973 (the Law of the Sea Conference, and the International Maritime Consultative Organization Conference on Marine Pollution) would address specifically the issue of marine pollution. Id. at 180-81.

51. Id. at 183. Presentation of the United States draft may also have been motivated by the scheduled Oslo Conference on Dumping. One commentator has suggested that the United States took the initiative in order to prevent the Oslo negotiations (which included only European nations) from influencing the content of a subsequent global convention. Id. at 181-82.


54. The preamble balances the sovereign right of states to exploit their natural resources against their responsibility to ensure that their activities do not cause damage to the environment of other states or to areas beyond the limits of national jurisdiction. London Convention, supra note 6, at preamble, para. 3.

55. Article I requires the contracting parties "to take all practicable steps to prevent the pollution of the sea" by the dumping of materials which may create hazards to human health or the marine environment. Id. at art. 1. Article II states that contracting parties shall take effective measures "according to their scientific, technical and economic capabilities" to prevent marine pollution by dumping. Id. at art. II.

56. The prohibition on dumping was a distinct departure from traditional international law which allowed countries to dispose freely of waste subject to few limitations. G. Timagenis, supra note 49, at 210.
Convention.\textsuperscript{57} Annex I prohibits dumping of listed materials,\textsuperscript{58} while Annex II requires a prior special permit for the disposal of other substances.\textsuperscript{59} A general permit is required to dump materials not listed in Annexes I or II.\textsuperscript{60} Two exceptions to Annex I allow dumping of otherwise prohibited materials. Annex I does not apply to substances which are "rapidly rendered harmless"\textsuperscript{61} or to wastes containing prohibited materials as "trace contaminants."\textsuperscript{62}

The London Convention places the responsibility for implementation of the dumping permit system on individual countries. The Convention requires each contracting party to designate an appropriate authority to issue permits and keep records of dumping activities.\textsuperscript{63} Each contracting party may enforce the Convention against all vessels registered or loading wastes in its territory, or vessels under its jurisdiction and believed to be engaged in dumping.\textsuperscript{64}

To allow continuing review of the agreement, the Convention provides for periodic meetings of the contracting parties.\textsuperscript{65} Meetings may be held to amend the Convention and its annexes,\textsuperscript{66} to consider scientific or technical information relevant to ocean dumping, and to promote cooperation among the contracting parties. The Convention deferred resolution of certain matters, such as designation of a secretariat organization\textsuperscript{67} and development of procedures for the settlement of disputes,\textsuperscript{68} for con-

\begin{itemize}
\item \textsuperscript{57} London Convention, \textit{supra} note 6, at art. IV.
\item \textsuperscript{58} Annex I prohibits the dumping of organohalogens, mercury, cadmium, persistent synthetic materials, oil products taken on board for the purpose of dumping, high-level radioactive matter, and biological and chemical warfare agents.
\item \textsuperscript{59} Annex II regulates the dumping of wastes containing significant amounts of various metals, cyanides, fluorides, pesticides, and radioactive materials not covered by Annex I.
\item \textsuperscript{60} See \textit{supra} note 12. Annex III lists factors to be considered in issuing any permit. These factors include: characteristics and composition of the waste; dumpsite characteristics and method of deposit; and general considerations including possible effects on amenities, marine life, and other uses of the sea, and the practical availability of land-based methods of disposal or treatments to render the waste less harmful.
\item \textsuperscript{61} The "rapidly rendered harmless" exception applies if the waste does not make edible marine organisms unpalatable or endanger the health of humans or domestic animals.
\item \textsuperscript{62} The Convention does not define trace contaminants, but interim guidelines adopted at the Third Consultative Meeting of the Contracting Parties to the Convention elaborate on the meaning of this term. See \textit{infra} note 181 and accompanying text.
\item \textsuperscript{63} London Convention, \textit{supra} note 6, at art. VI(1)(a)-(c).
\item \textsuperscript{64} \textit{Id.} at art. VII(1)(a)-(c).
\item \textsuperscript{65} \textit{Id.} at art. XIV(4). The eighth consultative meeting of the contracting parties was held in February 1984.
\item \textsuperscript{66} \textit{Id.} at art. XV.
\item \textsuperscript{67} The secretariat keeps records, conveys information, and makes recommendations to the contracting parties. \textit{Id.} at art. XIV(3). At the first consultative meeting, held in 1976, the Intergovernmental Maritime Consultative Organization (now International Maritime Organization) was designated as the secretariat organization.
\item \textsuperscript{68} Article X commits the contracting parties to develop procedures to assess liability and settle disputes under the Convention. These issues were discussed at the first and second consultative meetings. In 1978, the third consultative meeting endorsed an amendment to the Convention for settlement of disputes, including arbitration procedures. See McManus, \textit{Ocean...}
C. The Marine Protection, Research and Sanctuaries Act

Congress enacted the MPRSA\textsuperscript{69} in 1972 to "prevent or strictly limit the dumping into ocean waters" of potentially harmful material.\textsuperscript{70} Congress acknowledged that ocean dumping offers the cheapest form of waste disposal for many coastal cities, but also recognized that dumping entails significant noneconomic costs such as visual blight, the depletion of fisheries, and potentially adverse effects on human health.\textsuperscript{71} Congress was particularly concerned about the potential effects of highly toxic materials and chemicals on the marine environment.\textsuperscript{72}

Title I of the MPRSA regulates the transportation of material destined for ocean dumping.\textsuperscript{73} No material may be dumped except as authorized by a permit issued pursuant to the Act.\textsuperscript{74} The Act specifically prohibits ocean disposal of radiological, chemical, and biological warfare agents, as well as high-level radioactive waste.\textsuperscript{75} EPA administers the permit program for all wastes except dredged materials; the program for dredged materials is supervised by the Army Corps of Engineers.\textsuperscript{76} EPA may issue permits only if it determines that the proposed dumping would not "unreasonably degrade or endanger human health, welfare or amenities, or the marine environment, ecological systems, or economic potentialities."\textsuperscript{77} The MPRSA requires EPA to establish regulatory criteria for evaluating permit applications and to determine whether dumping may cause unreasonable degradation.\textsuperscript{78} In developing these criteria, EPA must consider a number of statutory factors related to the effects of and


69. See supra note 5 and accompanying text. For a general description of the MPRSA, see Lumsdaine, Ocean Dumping Regulation: An Overview, 5 ECOLOGY L.Q. 753 (1976).


73. 33 U.S.C. §§ 1411-1421 (1982). Title II provides for a comprehensive and continuing research program to assess the possible long-range effects of pollution, overfishing, and human activity on ocean ecosystems. See infra note 73.


75. Id. § 1412(a).

76. Id. § 1413.

77. Id. § 1412(a).

78. Id. § 1412. These regulatory criteria also must be applied by the Corps of Engineers in evaluating applications to dump dredged materials, id. § 1413, and by EPA in designating recommended dumpsites, id. § 1412(c).
need for ocean dumping. In 1974, Congress amended the MPRSA to require consideration of additional factors by directing EPA to establish regulatory criteria that apply the standards binding upon the United States under the London Convention.

D. EPA Regulations

EPA regulations to evaluate ocean dumping permit applications and to classify waste materials have been in effect since 1973. In 1976, EPA proposed changes to the original ocean dumping regulations to incorporate the requirements of the London Convention and to reflect advances in technical knowledge. The revised regulations, issued in January 1977, reaffirmed "EPA's intent to eliminate ocean dumping of unacceptable materials as rapidly as possible."

The regulations provide three permit categories for large-scale dumping programs: general, special, and interim. To determine eligi-

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79. In establishing or revising the criteria, EPA must consider:
   (A) The need for the proposed dumping.
   (B) The effect of such dumping on human health and welfare, including economic, aesthetic, and recreational values.
   (C) The effect of such dumping on fisheries resources, plankton, fish, shellfish, wildlife, shore lines and beaches.
   (D) The effect of such dumping on marine ecosystems, particularly with respect to—
      (i) the transfer, concentration, and dispersion of such material and its byproducts through biological, physical, and chemical processes,
      (ii) potential changes in marine ecosystem diversity, productivity, and stability, and
      (iii) species and community population dynamics.
   (E) The persistence and permanence of the effects of the dumping.
   (F) The effect of dumping particular volumes and concentrations of such materials.
   (G) Appropriate locations and methods of disposal or recycling, including land-based alternatives and the probable impacts of requiring use of such alternative locations or methods upon considerations affecting the public interest.
   (H) The effect on alternate uses of oceans, such as scientific study, fishing, and other living resource exploitation, and nonliving resource exploitation.


81. For a detailed description of the 1973 ocean dumping regulations, see Lahey, Ocean Dumping of Sewage Sludge: The Tide Turns from Protection to Management, 6 HARV. ENVTL. L. REV. 395, 403-05 (1982).


85. 40 C.F.R. § 220.3 (1984). The regulations also provide for research permits, id. § 220.3(e), emergency permits, id. § 220.3(c), and at-sea incineration permits, id. § 220.3(f).
bility of the waste for a particular type of permit, EPA evaluates the content of the waste and its potential impact on the marine environment based on specific regulatory criteria. General permits authorize ocean disposal of materials that will have a minimal adverse impact and which are generally disposed of in small quantities. Wastes that contain certain types and concentrations of contaminants, but that still satisfy the regulatory criteria, may be dumped under a special permit. Interim permits allow, for a limited period, the dumping of contaminated wastes, such as sewage sludge, that cannot meet the criteria for a general or special permit. Under the regulations, interim permits could be issued only until December 31, 1981. By that date, EPA expected interim permittees to either terminate ocean disposal or comply with the requirements necessary to receive a special permit.

The regulatory criteria used to evaluate permit applications contain several subparts which assess environmental impact, the need for ocean dumping, the impact on aesthetic, recreational and economic values, and the impact on other uses of the ocean. The environmental criteria assess the effect of dumped materials on marine ecosystems and seek to prevent significant deterioration of the biota. Compliance with these criteria, as demonstrated by the results of bioassay tests, means that ocean dumping of the materials will not unduly degrade the marine envi-

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86. Id. § 220.3(a).
87. Id. § 220.3(b).
88. Id. § 220.3(d). To receive an interim permit, valid for only one year, the applicant must develop an implementation plan either to eliminate dumping or to bring the waste into compliance with the criteria for acceptable ocean disposal. See id. § 227.23-.26. Sewage sludge generally contains certain "prohibited materials," such as cadmium and mercury, in excess of allowable concentrations and is usually ineligible for a special permit. Lahey, supra note 81, at 404. Because sewage sludge may only be dumped under an interim permit, both the 1973 and 1977 regulations effectively established a policy of phasing out all ocean disposal of sewage sludge. Id. at 405, 408. Under these regulations, EPA successfully terminated ocean dumping of sewage sludge by the City of Philadelphia. See City of New York, 543 F. Supp. at 1099-100; Lahey, supra note 81, at 406-07.
89. 40 C.F.R. § 220.3(d) (1984).
90. When the 1977 regulations were promulgated, all interim permits issued to municipalities required compliance with the requirements for a special permit or termination of dumping by the end of 1981. 42 Fed. Reg. 2462, 2463 (1977). EPA assumed that the technology existed to enable municipalities dumping sewage sludge to meet the 1981 deadline. Id.
92. Id. § 227.14-.16 (subpart C).
93. Id. § 227.17-.19 (subpart D).
94. Id. § 227.20-.22 (subpart E).
95. 42 Fed. Reg. 2462, 2466 (1977). The emphasis on measuring the effects of wastes on marine organisms contrasts with the earlier regulations which only considered the concentration of contaminants in the wastes. See id; Lahey, supra note 81, at 407.
96. Bioassays are laboratory experiments which measure the effects of various concentrations of pollutants on marine organisms. Bioassays more accurately measure impacts on marine ecosystems than the methods used under the earlier regulations which only determined the total amounts of specific constituents. 42 Fed. Reg. 2462, 2466 (1977).
The environmental impact finding is the most critical in evaluating permit applications and determines the importance of the other regulatory criteria. Unless no need for ocean disposal exists, or dumping will cause unacceptable adverse effects, EPA issues general or special permits to dump materials that comply with the environmental impact criteria. In contrast, EPA can issue an interim permit for wastes which do not satisfy the environmental impact criteria only after determining either that a sufficient need for the dumping exists or that the adverse effects of permit denial will be greater than the potential harmful effects on the marine environment.

E. 1977 MPRSA Amendment

In November 1977, Congress amended the MPRSA and directed EPA to end sewage sludge dumping by December 31, 1981. The amendment reflected congressional dissatisfaction with the slow progress made by EPA in curbing harmful dumping. Based on good faith efforts by municipalities to end dumping, EPA had routinely granted interim permits to dump sewage sludge containing excessive amounts of proscribed materials. EPA had responded to the fiscal pleas of municipalities without fully ascertaining the need for dumping. Congress disapproved of EPA’s issuance of interim permits which allowed continued dumping of wastes that failed to meet the established regulatory criteria, and the MPRSA amendment attempted to end the granting of permits merely because municipalities acted in good faith. Congress recognized that EPA had planned to end unreasonably harmful ocean dumping by the end of 1981, but decided to reinforce this regulatory deadline with a specific statutory prohibition. EPA interpreted the 1977 amendment to require an end to all dumping of sewage sludge that...
violated the environmental impact criteria.\textsuperscript{107}

II

JUDICIAL REVIEW OF EPA'S OCEAN DUMPING REGULATIONS

As the 1981 MPRSA deadline approached, municipalities in New Jersey and New York filed lawsuits in federal court challenging EPA's authority to terminate ocean dumping of sewage sludge. In February 1981, a district court in New Jersey upheld EPA's refusal to issue a permit for continued ocean disposal of sewage sludge.\textsuperscript{108} In August 1981, however, a district court in New York issued an extensive opinion invalidating EPA's ocean dumping regulations.\textsuperscript{109} The latter decision has caused EPA to modify significantly its ocean dumping policy and has allowed ocean disposal of sewage sludge to continue to the present.\textsuperscript{110}

A. Bergen County Utilities Authority v. EPA

In Bergen County Utilities Authority v. EPA,\textsuperscript{111} a New Jersey utilities authority challenged EPA's discretion to deny ocean dumping permits under the revised regulations.\textsuperscript{112} In 1979, the utilities authority applied for a renewal of its interim dumping permit for the year 1980.\textsuperscript{113} EPA denied the permit application because the utilities authority had failed to establish a schedule that would either phase out ocean dumping or comply with the environmental impact criteria by the December 1981 deadline.\textsuperscript{114} The utilities authority claimed that EPA acted arbitrarily and sought a writ of mandamus to compel EPA to grant the requested permit.\textsuperscript{115}

The district court declined to substitute its judgment for that of the Agency.\textsuperscript{116} The court held that in denying the interim permit EPA did not act in an arbitrary or capricious manner. In fact, the court held that denial was the only decision consistent with the regulations.\textsuperscript{117}

\textsuperscript{107} City of New York, 543 F. Supp. at 1108.
\textsuperscript{108} See infra notes 111-19 and accompanying text.
\textsuperscript{109} See infra notes 120-41 and accompanying text.
\textsuperscript{110} See infra notes 142-49 and 239-51 and accompanying text.
\textsuperscript{112} Id. at 782. Although this Comment discusses only the Bergen County case, five other New Jersey authorities brought similar suits against EPA. The New Jersey cases were not formally consolidated, but all were assigned to the same judge. National Wildlife Fed'n v. Gorsuch, 744 F.2d 963, 965 (3d Cir. 1984).
\textsuperscript{113} 507 F.Supp. at 784.
\textsuperscript{114} Id. The sludge did not comply with the regulatory criteria for a special permit. In addition, the utilities authority was unable to present an alternative disposal plan because it could not secure site approval from the State of New Jersey for a proposed sludge management facility.
\textsuperscript{115} Id.
\textsuperscript{116} Id.
\textsuperscript{117} Id. at 784-85.
court noted that the 1981 deadline provided the impetus to solve the ocean dumping problem and that an extension would only delay necessary action. The court gave little weight to the utilities authority's claim of good faith effort to comply with the regulatory requirements.

B. City of New York v. EPA

In 1980, New York City sued EPA, claiming that the 1977 ocean dumping regulations fail to comport with the MPRSA. The city had been dumping its sewage sludge at the twelve-mile site in the New York Bight under an interim permit since 1973. Pursuant to its permit, the city had developed a two-stage implementation plan to phase out ocean dumping by the end of 1981. The city contended, however, that the adverse consequences and costs of the proposed land disposal scheme exceeded the adverse effects of continued dumping at the New York Bight, and it requested a permit to continue ocean dumping beyond 1981. When EPA denied the city's request for a new interim permit, citing the 1981 statutory deadline, the city brought suit to compel EPA to consider its evidence of the need for continued ocean dumping.

The district court granted summary judgment in favor of New York City and held the ocean dumping regulations defective. The court

118. Id. at 781.
119. Id. at 785. The court's opinion granting EPA's motion for summary judgment was filed in February 1981, six months before the final decision in City of New York, see infra notes 120-41; however, the five New Jersey cases, see supra note 112, were not terminated until May 1982. Consent judgments entered in the New Jersey cases allow continued sewage sludge dumping under terms established by the City of New York decision. National Wildlife Fed'n v. Gorsuch, 744 F.2d at 965-66; see infra note 144 and accompanying text.
120. City of New York, 543 F. Supp. at 1086. See also Lahey, supra note 81, at 419; Bakalian, supra note 18, at 220.
121. The New York Bight is an 11,000 square-nautical-mile area in the Atlantic Ocean from Cape May, New Jersey to Montauk Point, New York, running about 100 nautical miles seaward to the edge of the Continental Shelf. The Corps of Engineers, EPA, or federal court orders authorize dumping at six active dumpsites in the Bight. Sites are designated for dredged material, cellar dirt, sewage sludge, acid and industrial waste, and wood incineration. The sewage sludge (twelve-mile) dumpsite was originally established in 1924, and in 1983, it received sludge generated at twenty-six sewage treatment plants in the New York-New Jersey metropolitan area. 1984 EPA REPORT, supra note 17, at 6. See also Anderson, Current Status—Ocean Dumping in the New York Bight, PROCEEDINGS OF THE NATIONAL CONFERENCE ON MUNICIPAL AND INDUSTRIAL SLUDGE UTILIZATION AND DISPOSAL 14 (1983).
122. Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 62-65. Because its sludge contained high concentrations of toxic heavy metals and other contaminants, the city was ineligible for a special permit. Lahey, supra note 81, at 419.
123. 543 F. Supp. at 1085. As a short-term alternative, the city proposed to compost sludge and spread it as ground cover and fill on land throughout the city. Due to the limited amount of suitable land, the city also planned to implement an undetermined long-term disposal alternative by 1988 or 1989. Id. at 1085-86.
124. Id. at 1086.
125. Id.
126. Id. at 1115.
127. Id. at 1098-108.
concluded that section 1412(a) of the MPRSA, which lists the factors for EPA to consider in establishing the dumping regulations, imposes a balancing requirement on EPA to determine whether proposed ocean disposal would cause unreasonable degradation. While recognizing that the Act does not specify a particular balance, the court found that Congress intended EPA to promulgate regulations that would require a comprehensive consideration of all relevant statutory factors in evaluating each permit application.

The court held that EPA's conclusive presumption of unreasonable degradation of the environment, established by the failure of sewage sludge to comply with the environmental impact criteria, was arbitrary and unreasonable and could not form the basis for an order that the city terminate dumping by the end of 1981. The court criticized the Agency's casual approach to evaluating the potential adverse impacts of land-based disposal methods. In short, the court implied that to deny a permit application, EPA must determine that land disposal would be less harmful than ocean dumping.

The district court examined the 1977 MPRSA amendment and found that the statutory deadline on dumping of sewage sludge was governed by the same standard of unreasonable degradation as in the original Act. The court explained that the 1977 amendment simply reiterated Congress' prohibition of harmful dumping because EPA had improperly issued interim permits, to municipalities acting in good faith to implement alternatives to ocean disposal, without determining that no unreasonable degradation would occur. The court concluded that Congress did not intend the amendment to deny any form of permit to

128. Id. at 1089; see supra note 79.
129. 543 F. Supp. at 1089, 1092. EPA acknowledged that it must consider all statutory factors in formulating dumping regulations, but asserted that the statute does not require a comprehensive evaluation of all factors in assessing each permit application. Id. at 1086, 1092.
130. Under EPA's analysis, the failure of sewage sludge to satisfy the environmental impact criteria precluded a consideration of all other statutory factors, including the need for dumping and the availability of alternative disposal methods. Id. at 1100. EPA claimed that before 1977 it had the discretion to deny dumping permits for sludge that failed bioassay tests, but that the 1977 MPRSA amendment required EPA to adopt this stricter approach. Id. at 1086.
131. Id. at 1103. The court noted that even if the environmental impact criteria were theoretically defensible, EPA had ignored the characteristics of particular dumpsites in evaluating permit applications. Id. at 1100. The court found that EPA was required to consider individual site characteristics to determine environmental effects. Id. at 1102. In light of the already heavily polluted condition of the New York Bight, the court directed EPA to consider the city's claim that dumping would not result in unreasonable degradation at that site. Id. at 1103.
132. Id. at 1107.
133. Id. at 1108, 1115.
134. Id. at 1109.
135. Id.; see supra notes 102-05 and accompanying text.
prior interim permit holders. The court suggested that EPA reappraise the requirements for a special permit and review all future dumping applications under revised criteria appropriate to a regulatory scheme without interim permits.

In granting summary judgment on behalf of New York City, the court stressed that the 1981 deadline remained intact, but only for dumping that would unreasonably degrade the environment considering all of the relevant statutory factors. Therefore, the court ordered EPA to establish regulatory criteria that did not include a conclusive presumption of unreasonable degradation, and to reevaluate the city's application for a new special permit to continue ocean dumping. In addition, the court enjoined EPA from taking enforcement action against New York City, so long as the city conducts dumping in accordance with the conditions of the last interim permit, until the Agency acts on the city's petition to redesignate the twelve-mile site for continued disposal of sewage sludge.

III

OCEAN DISPOSAL OF CONTAMINATED SEWAGE SLUDGE VIOLATES NATIONAL AND INTERNATIONAL LAW

EPA Administrator Gorsuch reversed the Agency's established policy to terminate ocean dumping of sewage sludge when she elected not to appeal the City of New York decision. Thus, dumping of sewage

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137. Id. at 1113. The court found EPA's assumption that interim permits would be available enabled the Agency to adopt stringent environmental standards for special permits in the 1977 regulations. The court reasoned that absent the interim permit device, the criteria for special permits would have been less rigorous. Id. at 1112.
138. Id. at 1115. Technically, the court remanded EPA's ocean dumping regulations for revision. EPA may still use its current regulations, however, and simply interpret them as not establishing a conclusive presumption of unreasonable degradation. City of New York v. EPA, 12 ENVTL. L. REP. (ENVTL. L. INST.) 20,184 (1982) (final judgment). EPA repeatedly announced plans to revise the dumping regulations to reflect the changes required by the court. See, e.g., [12 Current Developments] ENV'T REP. (BNA) 930 (Nov. 27, 1981), 1217 (Jan. 22, 1982), 1266 (Jan. 29, 1982). See also Hearing 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, 98th Cong., 2d Sess. 54 (1984) (statement of Jack Ravan, EPA Assistant Administrator for Water) [hereinafter cited as Ocean Dumping Hearing]. However, proposed revised regulations had not been published as of June 1985.
139. City of New York v. EPA, 12 ENVTL. L. REP. (ENVTL. L. INST.) 20,184 (1982) (final judgment). The court acknowledged that EPA had final authority to assess the validity of the city's evidence on the environmental consequences of ocean dumping compared to land disposal, but held that EPA must at least allow the city an opportunity to present its claims. 543 F. Supp. at 1115.
140. See infra note 148.
142. [12 Current Developments] ENV'T REP. (BNA) 1266 (Jan. 29, 1982). Then EPA
sludge continues at the New York Bight despite the December 31, 1981 statutory deadline. In May 1982, a federal district court in New Jersey issued consent decrees to allow continued ocean dumping by the sewage authorities involved in Bergen County Utilities Authority v. EPA. Similar consent decrees or administrative orders allow continued sludge dumping by Westchester and Nassau Counties in New York. As of December 1983, the twelve-mile dumpsite received sludge generated by twenty-six sewage treatment plants in the New York-New Jersey metropolitan area.

The City of New York decision has forced both EPA and Congress to reexamine national ocean dumping policy. The court order required EPA to take final action on petitions to redesignate the existing sewage sludge dumpsite in the Bight before considering new dumping permit applications. EPA was involved in the administrative process of designating a sewage sludge dumpsite for over three years.

Before discussing the current status of ocean dumping policy in the United States, this Comment suggests that continued dumping of contaminated sewage sludge violates national and international dumping controls. Continued ocean disposal of sewage sludge violates the ocean dumping controls for two reasons. First, the language and intent of the MPRSA, as accurately reflected in existing EPA regulations, indicate that the sewage sludge dumped in the New York Bight may unreasonably degrade the marine environment. Second, sewage sludge contains excessive quantities of prohibited materials which cannot be dumped.

Administrator Gorsuch said that the court decision gave the Agency needed flexibility to modify its regulations. EPA declined to appeal even though a congressional delegation, led by Representative Norman D'Amours, the Chair of the Subcommittee on Oceanography of the House Merchant Marine and Fisheries Committee, which had developed the 1977 MPRSA Amendment, met with the Administrator to urge her to seek review of the case by a higher court. Representative D'Amours termed the EPA decision a "devastating blow" to efforts to halt harmful ocean dumping and a "betrayal of congressional trust." See 1984 EPA Report, supra note 17, at 6-10.


In 1983, a total of 8.3 million tons of sewage sludge were dumped at the twelve-mile site. See infra notes 248-57 and 274-307 and accompanying text. See supra note 141. Until a dumpsite has been "designated," i.e. approved, EPA cannot evaluate the relative risks associated with land-based and ocean disposal as required by the court's interpretation of the MPRSA in City of New York. For this reason, EPA did not act on new permit applications submitted by existing dumpers during the site designation process. See Anderson, supra note 121, at 17. See also 12 Current Developments] ENV'T REP. (BNA) 930 (Nov. 27, 1981). New York City and six New Jersey sewage authorities submitted petitions to redesignate the twelve-mile site. 47 Fed. Reg. 56,665-66 (1982).

See infra notes 239-47 and accompanying text. See infra notes 152-74 and accompanying text.
under the EPA regulations or the London Dumping Convention in greater than trace amounts.\textsuperscript{151}

\textbf{A. EPA Regulations Are Consistent with the MPRSA}

The \textit{City of New York} decision to the contrary, considerable support exists for the proposition that EPA’s ocean dumping regulations, including the conclusive presumption of unreasonable degradation, are consistent with the MPRSA. The Act addresses potential harm to the marine environment\textsuperscript{152} and does not require a comprehensive balancing of risks between ocean dumping and land-based disposal alternatives.\textsuperscript{153}

The CEQ Ocean Dumping Report, which both the House and Senate credited as the basis for the MPRSA,\textsuperscript{154} probably provided the source for EPA’s conclusive presumption against potentially harmful dumping. In stating principles to guide EPA, the CEQ Report recommends that dumping of materials clearly identified as harmful to the marine environment be terminated.\textsuperscript{155} The report continues:

When existing information on the effects of ocean dumping are inconclusive, yet the best indicators are that the materials could create adverse conditions if dumped, such dumping should be phased out. When further information conclusively proves that such dumping does not damage the environment . . . ocean dumping could be conducted under regulation.\textsuperscript{156}

\begin{footnotes}

\footnote{151. See \textit{infra} notes 175-213 and accompanying text.}

\footnote{152. The Act’s declaration of national policy to "prevent or strictly limit" ocean dumping emphasizes protection of the marine environment. 33 U.S.C. § 1401(b) (1982). The colloquy between two Senators, considered in \textit{City of New York}, also reflects the MPRSA’s primary concern with the impact of dumping on the marine environment. Senator Moynihan asked whether New York City might be able to continue dumping beyond the 1981 deadline if EPA determined that its dumping "does not unreasonably affect any of these characteristics of the water." Senator Muskie responded that an extension was possible, but that the test is a strict one. "The sludge may not have a deleterious effect on the marine environment." \textit{See City of New York}, 543 F. Supp. at 1111-12, \textit{quoting} 123 \textit{Cong. Rec.} S17,420 (daily ed. Oct. 20, 1977) (emphasis added).}

\footnote{153. In establishing ocean dumping regulations, EPA must consider the probable impact of requiring alternative disposal options. 33 U.S.C. § 1412(a)(G) (1982); see \textit{supra} note 79. The legislative history of the MPRSA, however, does not support the view that EPA can allow harmful ocean dumping upon a determination that such action will be less detrimental to the environment than land-based disposal alternatives. In 1980, the House Committee on Merchant Marine and Fisheries rejected a proposed amendment to the MPRSA that would have required EPA to balance the impacts of ocean dumping and land disposal of sewage sludge and to select the least harmful alternative. 1 \textit{H.R. Rep. No. 894}, 96th Cong., 2d Sess. 3 (1980). Such an amendment would not have been proposed if the MPRSA already required a comprehensive evaluation of waste disposal options.}

\footnote{154. The CEQ Report, see \textit{supra} notes 37-47 and accompanying text, “forms the basis for this legislation, and points up the immediacy and the severity of the problems that have been created and the critical need for a national policy on ocean dumping.” \textit{H.R. Rep. No. 361, supra} note 70, at 9. \textit{See also S. Rep. No. 451, supra} note 11, at 8.}

\footnote{155. CEQ \textit{OCEAN DUMPING REPORT, supra} note 1, at vi.}

\footnote{156. \textit{Id.} (emphasis added). The report specifically recommends that ocean dumping of sewage sludge be phased out. CEQ acknowledged that continued dumping may be necessary
OCEAN DUMPING OF SEWAGE SLUDGE

The MPRSA places the burden of proving that proposed dumping will not cause unreasonable degradation on the permit applicant. The applicant must satisfy this burden before EPA can issue a permit. The statutory language requires a clear showing that proposed dumping will not cause harm and indicates that no permit should be granted for dumping that could cause unreasonable degradation.

EPA’s regulations were promulgated to implement the MPRSA’s goal to terminate ocean dumping of potentially harmful wastes. In developing the environmental impact criteria, the Agency estimated the levels of pollutants expected to cause environmental harm and then applied a “safety factor.” This conservative approach to establishing standards for special permits, founded on the lack of firm scientific conclusions about the impacts of wastes in the ocean, effectively prevents dumping that could potentially be harmful. EPA concluded that any modification of the criteria to make special permits more easily available, rather than continuing temporarily with the interim permit device, would have been arbitrary and a pretext for avoiding the issue of unreasonable degradation.

EPA’s ocean dumping regulations address all statutory factors listed in the MPRSA. The environmental impact criteria determine the eligibility of a given waste for a particular type of permit, but do not pre-
vent consideration of other relevant factors.\textsuperscript{166} EPA has discretion in implementing the MPRSA to use the environmental impact criteria in determining regulatory treatment.\textsuperscript{167} Reliance on these criteria is appropriate because the MPRSA suggests that the potential for harm to the marine environment should be the key factor in evaluating dumping permit applications. Wastes that contain high concentrations of prohibited materials and cannot satisfy the environmental impact criteria may justifiably be treated differently than more innocuous wastes.

By amending the MPRSA to ban the dumping of harmful sewage sludge, Congress reinforced its original legislative intent to protect the marine environment. EPA's regulations allowed interim disposal of materials which did not satisfy the environmental impact criteria if a need for ocean dumping existed.\textsuperscript{168} The regulations established a 1981 deadline on the use of interim permits based on EPA's determination that alternatives to ocean dumping are available.\textsuperscript{169} Congress responded, however, to concern over the use of interim permits to allow continued

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\footnote{166. See supra text accompanying notes 98-99.}
\footnote{167. The District of Columbia Court of Appeals affirmed the authority of EPA to develop different criteria for dredged and non-dredged material. National Wildlife Fed'n v. Costle, 629 F.2d 118 (D.C. Cir. 1980). Rejecting the contention that the regulations must apply all statutory factors to each permit application, the court held that EPA has "unqualifiedly broad authority" to weigh and consider the statutory factors in establishing its regulatory criteria. Id. at 131-32.}
\footnote{168. See supra text accompanying note 99.}
\footnote{169. 42 Fed. Reg. 2462, 2463 (1977). "The 1981 deadline is based on the implementation schedules contained in current interim permits, all of which provide for compliance or phasing out by the end of 1981 . . . . The deadlines contained in this section are based on current projections of technological feasibility, and it is reasonable to expect dumpers to meet them." Id.}

The fact that about 96% of municipal sewage sludge is disposed of on land demonstrates the availability of alternatives to ocean dumping. See Ocean Dumping Hearing, supra note 138, at 5 (statement of Rep. Thomas R. Carper). The three commercially available land-based alternatives are landfilling, landspreading, and incineration; all have been used safely and successfully. Lahey, supra note 81, at 411. Landspreading uses waste as fertilizer or as soil conditioner and may be the most effective way to manage sludge. Environmental Effects of Sewage Sludge Disposal: Hearings Before the Subcomm. on Natural Resources, Agriculture Research and Environment of House Comm. on Science and Technology, 97th Cong., 1st Sess. 42 (1981) (statement of Dr. Allan Hirsch, EPA Deputy Assistant Administrator for Environmental Processes and Effects Research) [hereinafter cited as Hearings on Environmental Effects].

Many cities, including Chicago, have applied sludges with a metal content comparable to New York City's sludge to parkland. Hearings on Environmental Effects, supra, at 84 (EPA responses submitted for the record). Sludge can also be used to revegetate mined lands in an environmentally safe manner. Based on successful demonstration projects, a full-scale reclamation program was developed for disposal of Philadelphia's sewage sludge. Between 1978 and 1983, about 2500 acres of land were reclaimed under this program. Ocean Dumping Hearing, supra note 138, at 67-68 (statement of Professor William Sopper, Land and Water Research, Pennsylvania State University).

In addition to traditional disposal methods, recent advances in sludge processing technology indicate promising new techniques for composting large volumes of sludge, burning garbage and sludge simultaneously to produce energy, and combining sewage sludge with solid waste to create road paving material. Lahey, supra note 81, at 427.
dumping of materials that did not satisfy the environmental impact criteria,170 by adding the statutory deadline for the dumping of sewage sludge which may unreasonably degrade the environment.171 The amendment clearly prohibits the dumping of potentially harmful sludge even if the original language of the MPRSA is interpreted to prohibit only dumping that is actually demonstrated to be harmful.172

The 1977 MPRSA amendment effectively prohibits the use of interim permits to allow dumping of sewage sludge that cannot comply with the environmental impact criteria. As the court recognized in City of New York, Congress did not expressly preclude revision of the regulatory criteria when it amended the MPRSA.173 No evidence exists, however, that Congress expected a major change in EPA’s regulatory approach to make special permits more easily available. In fact, the House report accompanying the 1977 MPRSA amendment provides that, in determining whether sewage sludge may cause unreasonable degradation, EPA “shall apply the criteria which were established by such agency in . . . 1977. If the sewage sludge . . . does not satisfy such criteria, it shall be deemed . . . to fall within the definition of ‘sewage sludge,’ ”174 which may not be dumped after December 31, 1981.

EPA regulations establishing and implementing the conservative environmental impact criteria follow the congressional intent expressed in the MPRSA to terminate all dumping that could harm the environment. Therefore, EPA’s refusal to permit the dumping of sewage sludge that did not comply with the environmental impact criteria was not only reasonable, but was compelled by the MPRSA’s objective to protect the marine environment.

B. Sludge Dumping Violates Trace Contaminants Provisions of the London Convention and the EPA Regulations

Continued disposal of sewage sludge at the New York Bight violates provisions of both the London Convention and the EPA regulations that

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172. The House Report accompanying the 1977 amendment states, “it is necessary to codify EPA’s stated goal of ending the ocean dumping of sewage sludge which is harmful to the marine environment . . . . Further, the committee wants to terminate the ocean dumping of sewage sludge which may be harmful . . . .” H.R. REP. No. 325, supra note 101, at 3 (emphasis added). The Report notes that “Congress has been criticized for not stating specific goals and objectives in the Ocean Dumping Act of 1972. Some of the agencies have stated that the act was unclear in its intent to phase out the dumping of potentially harmful sewage sludge into ocean waters. By the adoption of this Act the congressional policy will be clearly set forth for all concerned.” Id. at 4.
prohibit dumping of wastes containing certain contaminants in greater than trace amounts.  Both the London Convention and the MPRSA prohibit the dumping of some wastes regardless of the need for, or the cost of, alternative disposal methods. However, the London Convention provides an exception to the absolute prohibition on dumping of organohalogens, mercury and cadmium compounds, persistent synthetic materials, and oil products if these substances are present in a waste at only trace levels. Similarly, under EPA regulations, the dumping of organohalogens, mercury and cadmium compounds, oil products, and known or suspected carcinogens, mutagens, or teratogens is allowed if these materials are present only in trace amounts.

Neither the London Convention nor EPA regulations precisely define the term "trace contaminants." During the 1972 negotiations preceding the London Convention, little serious scientific discussion occurred over the issue of what quantities of prohibited materials constitute trace amounts. In 1978, however, the Third Consultative Meeting of the Contracting Parties to the London Convention adopted interim guidelines which elaborate on the trace contaminants provision. According to the interim guidelines, otherwise prohibited materials fail to qualify as "trace contaminants" if: (1) they have been added to otherwise acceptable wastes for purposes of dumping; (2) they occur in such amounts as could cause undesirable effects on marine organisms or human health; and (3) it is practical to reduce their concentration further by technical means.

EPA provided a "broad narrative interpretation" of the term "trace contaminants" in the final dumping regulations issued in 1977. EPA's attempt to define the term was a response to the many comments it received criticizing the lack of a definition for "trace contaminants" in its 1976 proposed revisions to the ocean dumping regulations. The final regulations provide that certain prohibited materials constitute "trace contaminants." In implementing the Convention pursuant to 33 U.S.C. § 1412(a) (1982), EPA incorporated the term into its ocean dumping regulations. See infra text accompanying notes 182-85.

The City of New York decision fails to address either the trace contaminants issue or the general implications of the London Convention. See supra notes 126-41 and accompanying text. 

175. The London Convention, not the MPRSA, uses the term "trace contaminants." In implementing the Convention pursuant to 33 U.S.C. § 1412(a) (1982), EPA incorporated the term into its ocean dumping regulations. See infra text accompanying notes 182-85. The City of New York decision fails to address either the trace contaminants issue or the general implications of the London Convention. See supra notes 126-41 and accompanying text.
176. See supra text accompanying notes 13-14.
177. London Convention, supra note 6, at Annex I, para. 9.
179. Rogers, supra note 2, at 15. Most marine scientists would not assume that the amounts of mercury, cadmium, and organohalogens contained in sewage sludge are usually at "trace" levels. Id. at 19.
181. Interim Guidelines, supra note 180, at 522.
183. Id.
184. See supra text accompanying note 178.
contaminants" when they are present in wastes otherwise acceptable for ocean dumping in such amounts that dumping will not cause "significant undesirable environmental effects," including the possibility of bioaccumulation in marine organisms.\footnote{185}

Ocean dumping of sewage sludge violates the London Convention and EPA regulations because prohibited materials in sewage sludge do cause adverse environmental effects. Both empirical evidence and the failure of sewage sludge to comply with the regulatory criteria support the argument that contaminants in sewage sludge cause adverse environmental impacts.

1. Empirical Evidence of Adverse Effects

Certain contaminants in sewage sludge have significant adverse environmental effects. Experts agree that harmful substances in sewage sludge generally may alter benthic habitats, reduce fish stocks, increase the incidence of fish and shellfish disease, and result in bacterial contamination.\footnote{186} Because of the complexity of interactions in the marine environment, however, scientists cannot easily establish precise cause and effect relationships between observed environmental changes and particular pollutants.\footnote{187} Thus EPA cannot isolate the adverse effects of prohibited contaminants in sewage sludge at a particular dumpsite.\footnote{188} Despite these empirical difficulties, scientists have documented the adverse effects on the marine environment of at least two materials present in sewage sludge: polychlorinated biphenyls (PCBs) and heavy metals.

About one-quarter of the PCBs entering the New York Bight comes from sewage sludge.\footnote{189} PCBs, a common organohalogen, adversely affect phytoplankton communities.\footnote{190} PCBs also are readily transferred up the food chain because they persist in the environment.\footnote{191} PCBs cause reproductive problems, tumors, and possibly cancer in animals, and are

\footnote{185} 40 C.F.R. § 227.6(b) (1984).
\footnote{186} See City of New York, 543 F. Supp. at 1102 n.21.
\footnote{187} Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 71. See also D. Brooks, supra note 22, at 136.
\footnote{188} Contrary to the City of New York decision, neither the MPRSA nor EPA regulations require the Agency to consider actual dumpsite characteristics in determining the environmental effects of dumping. 543 F. Supp. at 1102. If the actual impacts of dumping specific wastes at a particular site could be assessed directly, EPA might have incorporated such an approach in its revised regulations which "reflect recent advances in scientific knowledge." 42 Fed. Reg. 2462 (1977). Instead, EPA indicated that impacts on marine ecosystems could be measured best by bioassays. Id. at 2466.
\footnote{189} Hearings on Environmental Effects, supra note 169, at 22 (statement of James Walsh, Acting Administrator of NOAA); Swanson & Devine, The Pendulum Swings Again: Ocean Dumping Policy, 24 Environment 14, 17 (1982).
\footnote{190} Lavey, supra note 81, at 398.
\footnote{191} Ocean Dumping Hearing, supra note 138, at 126 (statement of the National Wildlife Federation on the impacts of dumping organohalogen-contaminated sewage sludge in the New York Bight).
suspected carcinogens in humans.\footnote{192} Fin erosion and other fin diseases are associated with high levels of PCBs.\footnote{193} Benthic invertebrates exposed to this pollutant exhibit exoskeleton erosion and gill clogging.\footnote{194}

About one-half of the mercury entering the New York Bight comes from sewage sludge.\footnote{195} Other toxic metals commonly found in sludge include cadmium, lead, and zinc.\footnote{196} Heavy metals in high concentrations can kill marine organisms and in lower concentrations can reduce species vitality and growth, induce reproductive failure, and interfere with sensory functions.\footnote{197} In addition, ingestion and retention of heavy metals by shellfish and other benthic organisms can concentrate these contaminants thousands of times.\footnote{198} These benthic animals may be eaten directly by other fish, concentrating the metals further,\footnote{199} or ultimately by people,\footnote{200} resulting in human health problems.

As indicated above,\footnote{201} it is difficult to isolate the precise effect of particular contaminants in the ocean. The known adverse effects of PCBs and toxic metals, however, and the high proportion of these materials entering the New York Bight in sewage sludge, support the conclusion that sewage sludge contains these contaminants in greater than trace amounts.

2. Regulatory Criteria

The failure of sewage sludge to satisfy EPA's environmental impact criteria and to qualify for dumping under a special permit also indicates that sludge contains prohibited materials in greater than trace amounts. Section 227.6 of the dumping regulations, entitled "Constituents prohibited as other than trace contaminants," supports this conclusion. Section 227.6(b) broadly defines trace contaminants as prohibited materials pres-

\footnote{192} Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 2. Thus PCB is a prohibited material which cannot be dumped in other than trace amounts both because it is an organohalogen, 40 C.F.R. § 227.6(a)(1) (1984), and a suspected carcinogen, id. § 227.6(a)(5).\footnote{193} Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 71.\footnote{194} Hearings 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, 96th Cong., 1st & 2d Sess. 140 (1979-1980) (statement of James Walsh, Deputy Administrator of NOAA) [hereinafter cited as Ocean Dumping Oversight Hearings].\footnote{195} Hearings on Environmental Effects supra, note 169, at 22 (statement of James Walsh, Acting Administrator of NOAA).\footnote{196} Lahey, supra note 81, at 397-98.\footnote{197} Id. at 398.\footnote{198} Rogers, supra note 2, at 14.\footnote{199} Id.\footnote{200} Shellfish beds at some ocean dumpsites are highly contaminated by toxic metals and suspected pathogens. Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 43.\footnote{201} See supra text accompanying notes 187-88.
ent in amounts which "will not cause significant undesirable effects." The very next paragraph, section 227.6(c), states that the "potential for significant undesirable effects due to the presence of these constituents shall be determined by application of results of bioassays." The subsection then describes the only conditions under which prohibited materials will be found environmentally acceptable for ocean dumping. No basis exists to infer a difference in the potential for significant undesirable effects due to the failure of sludge to satisfy the bioassay tests under section 227.6(c) and the presence of materials as other than trace contaminants under section 227.6(b).

In addition to violating the "trace contaminants" provision of the EPA regulations, sewage sludge fails to comply with the "limiting permissible concentration" requirement of the environmental impact criteria. The limiting permissible concentration requirement generally prohibits dumping of materials that, after allowing for initial mixing, exceed a toxicity threshold shown to be acutely toxic to sensitive marine organisms in a bioassay test. The limiting permissible concentration and the trace contaminants requirements are interrelated; both are measured by bioassays and depend on the concentration of particular materi-

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203. Id. § 227.6(c). EPA acknowledged, in issuing the 1977 regulations, that "§ 227.6 has been revised to use . . . bioassays as the basis for determining trace contaminants." 42 Fed. Reg. 2462, 2466 (1977). The procedures for interpretation of the trace contaminants provision under the London Convention include bioassays. See Interim Guidelines, supra note 180, at 524 (Appendix I).
204. The subsection describes bioassay procedures for liquid, suspended particulate, and solid phases of waste and the maximum allowable concentration of certain materials. The provisions for bioassays on suspended particulates, 40 C.F.R. § 227.6(c)(2) (1984), solids, id. § 227.6(c)(3), and organohalogens, id. § 227.6(c)(4), all note that concentrations must fall below levels that cause significant undesirable effects attributable to chronic toxicity or bioaccumulation.
205. According to EPA, § 227.6(c) merely evaluates the acceptability of dumping under a special permit, but does not provide a quantitative definition of trace contaminants. 42 Fed. Reg. 2462, 2466 (1977). In developing the regulations, however, EPA held a technical workshop specifically "concerning the trace contaminants and dredged material criteria." Id. at 2462. Given that the workshop discussed the trace contaminants criteria, one would expect the regulations to provide more than a broad interpretation of this term. EPA also noted that "[i]f materials are in trace quantities or less, or if they comply with special permit conditions, then one need not rely on interim permits for continued dumping." Id. at 2464. This indicates that EPA intended to use interim permits to authorize the dumping of wastes that contained prohibited materials in greater than trace amounts.
206. 40 C.F.R. § 227.27 (1984). Sewage sludge fails to satisfy the limiting permissible concentration requirement both because of contaminants in the waste and the limited amount of initial mixing which normally occurs. EPA has acknowledged that, based on the results of bioassay toxicity data, the sewage sludge dumped at the New York Bight is discharged at rates that cause violations of the limiting permissible concentration criterion. Complaint for Declaratory Judgment and Mandatory Injunction at 28, National Wildlife Fed'n v. Ruckelshaus, No. 82-4314, slip op. (D.N.J. Aug. 11, 1983) (quoting Chief of the EPA Marine Protection Program at a 1979 ocean dumping permit hearing) [hereinafter cited as NWF Complaint].
als after initial mixing. If dumping could occur in the Bight at a slower rate than present conditions allow, sewage sludge might comply with the limiting permissible concentration requirement. Even if this condition for a special permit were satisfied, however, the potential for adverse effects from the failure of sewage sludge to comply with the trace contaminants bioassays would remain a critical failing.

Section 227.4 of the regulations, which discusses the implications of dumping wastes that comply with the environmental impact criteria, supports the conclusion that prohibited materials are present in greater than trace amounts when these criteria are not met. If a waste complies with the environmental impact criteria, EPA determines that no unacceptable adverse effects will result from ocean dumping. Conversely, this implies that the failure of wastes to satisfy these criteria will lead to unacceptable adverse effects—the same test for concluding that prohibited materials are present in greater than trace amounts.

In summary, then, application of EPA's ocean dumping regulations to the sewage sludge being dumped in the New York Bight demonstrates that prohibited materials are present in greater than trace amounts. EPA has avoided this conclusion by reasoning that the regulations distinguish between wastes containing prohibited materials in greater than trace amounts and wastes that fail to satisfy the requirements of a special permit. An interim permit can authorize dumping of wastes that fail to satisfy the environmental criteria for a special permit, but technically cannot authorize dumping of wastes containing prohibited materials in

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208. Bioassay measurements, after an allowance for initial mixing, determine whether a material satisfies the limiting permissible concentration requirement. Id. § 227.27. Similarly, after an allowance for initial mixing, bioassays determine the potential for adverse effects of prohibited materials, i.e. whether or not they may be deemed trace contaminants. Id. § 227.6(c).

209. The sewage sludge dumpsite in the Bight is in an area of heavy commercial and recreational navigation, which limits the time barges may occupy the site to dump wastes. 49 Fed. Reg. 19,042, 19,044 (1984). Coast Guard regulations governing the operation of dumping vessels require that wastes be dumped relatively rapidly, thereby preventing sufficient initial mixing. Interview with Dr. Peter W. Anderson, Marine & Wetlands Division, EPA Region II, (Jan. 3, 1984).

210. One plausible interpretation of the trace contaminants provision is that it need not be considered if sewage sludge exceeds the limiting permissible concentration. Under the regulations, the trace contaminants definition only applies to wastes which are otherwise acceptable for dumping; failure to satisfy the limiting permissible concentration requirement provides an independent basis for concluding that sewage sludge is not acceptable for dumping under a special permit. This reasoning, however, ignores the important fact that sewage sludge cannot comply with either the trace contaminants or the limiting permissible concentration bioassays for the same reason—the high concentrations of prohibited materials. This argument also ignores the obligation of the United States under the London Convention to consider whether contaminants are present in greater than trace amounts.


212. Id. § 227.3.
greater than trace amounts. However, the regulations do not support any distinction between the trace contaminants provision and special permit requirements; failure of sewage sludge to qualify for dumping under a special permit indicates that prohibited materials are present in greater than trace amounts.

IV
EVALUATION OF THE LONDON DUMPING CONVENTION

This section examines effectiveness of the Convention as an international control on ocean dumping. Although the London Convention does not provide for enforcement by private parties, it represents an important mechanism for the international control of marine pollution because it sets a common standard for national behavior.

A. Enforcement of the Convention

The London Convention is not "self-executing." The Convention requires implementation by domestic procedures and institutions. Each contracting party to the Convention must designate a national authority to evaluate dumping applications and to issue permits. In addition, the Convention requires each sovereign to implement enforcement procedures to prevent violations within its jurisdiction.

The Convention allows only contracting nations the right to enforce international controls against ocean dumping. The 1978 amendment to the Convention, which provides procedures for the compulsory settlement of disputes, applies exclusively to the rights of contracting parties. The Convention remains silent with respect to private enforcement; it does not include any waiver of sovereign immunity that would permit citizens of a country which was allegedly violating the Convention, or citizens of any other country, to sue for redress. Thus,

213. See id. § 227.3(a), .6(a). "[N]o event does this section [describing interim permits] authorize dumping . . . above trace contaminant levels of materials proscribed above trace levels." 42 Fed. Reg. 2462, 2463 (1977).
215. London Convention, supra note 6, at art. VI.
216. Id. at art. VII.
217. Article XI of the London Convention, as amended, provides that: "Any dispute between two or more Contracting Parties concerning the interpretation or application of this Convention shall, if settlement by negotiation or by other means has not been possible, be submitted by agreement between the parties to the dispute to the International Court of Justice or upon the request of one of them to arbitration . . . " Amendments to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter Concerning Settlement of Disputes, 18 I.L.M. 517 (1979). The United States Senate ratified this amendment to the Convention on September 17, 1980. 126 CONG. REC. 25,717-18, 25,721 (1980). The amendment is not yet in effect, however, because the requisite two-thirds of the contracting parties have not formally agreed to the proposed provision.
while another country could bring an action against the United States—"for example, alleging that dumping in the New York Bight violates the Convention"—the compulsory settlement of dispute procedures would not apply to a similar suit by a private citizen.

In theory, a private right of action to enforce the London Convention exists under the MPRSA. The MPRSA requires EPA to apply the standards and criteria binding upon the United States under the Convention in formulating ocean dumping regulations. A private party could challenge EPA’s failure to enforce the Convention’s prohibition on the dumping of Annex I materials in greater than trace amounts under the citizen suit provision of the MPRSA. The theory of such a suit would be that EPA’s failure to apply properly the Convention’s trace contaminants standard violates the MPRSA.

In reality though, a citizen suit under the MPRSA to enforce the London Convention would have little chance of success. A court probably would not find that EPA’s regulatory interpretation of the London Convention’s trace contaminants provision violates the requirements of the MPRSA. In National Wildlife Federation v. Costle, the District of Columbia Court of Appeals held that the MPRSA imposes an obligation on EPA to apply the Convention’s standards in establishing ocean dumping regulations, but does not require the Agency actually to apply those standards to the permit application or site designation processes. Based on this limited reading of the statutory provision enacted specifically to implement the Convention, a court probably would find that EPA adequately applied the Convention standards simply by including a general definition of trace contaminants in the regulations.

Thus, neither the London Convention itself nor a citizen suit under

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218. Disputes concerning "interpretation or application" of the Convention would be subject to the compulsory settlement procedures once the amendment enters into force. See supra note 217. The amendment does not explicitly require an allegation of transnational damages to initiate the dispute resolution process. It is unlikely, however, that the compulsory dispute procedures would be used very often, given each contracting party's self-interest in autonomy and flexibility. McManus, supra note 68, at 134.

219. If another contracting party to the Convention challenged continued dumping of sewage sludge in the Bight, alleging a violation of the trace contaminants provision, the United States' obligations would be uncertain. The legal significance of the interim guidelines which elaborate on the term trace contaminants, see supra notes 180-81 and accompanying text, is probably minimal. McManus, supra note 68, at 134.


221. Id. at § 1415(g).

222. 629 F.2d 118, 126 (D.C. Cir. 1980).

223. Id.

224. This Comment suggests that the ocean dumping regulations provide more than a general definition of "trace contaminants," and that, properly applied, EPA's regulations would effectively implement the trace contaminants provision of the Convention. See supra text accompanying notes 202-13.
the MPRSA provide a private mechanism for enforcing the United States' international obligations to control ocean dumping.

B. Effectiveness of the London Convention

Even though the London Convention does not allow for private enforcement actions, most commentators agree that adoption of the Convention represented a positive step toward universal control of marine pollution. Commentators have, of course, pointed out a number of deficiencies in the London Convention. For example, they have criticized the Convention for granting too many exceptions to the total prohibition on dumping, and for having ambiguities in the text. A more rigorous ocean dumping agreement may not have been possible, however, considering the context in which countries adopted the Convention and their intent to achieve widespread international agreement. The Convention, a multilateral treaty, involved the negotiation of many interrelated problems among countries which naturally sought to protect their own individual interests. The participants acted by consensus, and the resulting Convention inevitably reflects political compromises among the various interests involved.

Although it emphasizes the prevention of marine pollution, the London Convention also recognizes the need for national flexibility and discretion in implementing its mandate. The Convention does not establish rigid standards to prevent all ocean dumping. The agreement implicitly recognizes that economic or policy considerations should be allowed to influence national decisions. This allowance for national flexibility helped achieve broad international support which, in the context of establishing a global agreement, may be the best way to achieve overall effectiveness.

Despite its inherent flexibility, the Convention makes a number of positive contributions to the regulation of ocean dumping. The Convention establishes controls over a wide variety of pollutants and completely prohibits ocean dumping of certain substances, including various toxic materials. Thus, the Convention reflects an unprecedented willingness

226. Id. at 287.
227. McManus, supra note 68, at 135.
229. Id. at 289. See also C. Pearson, International Marine Environment Policy: The Economic Dimension 67 (Studies in Int'l Affairs No. 25, 1975). The "convention leaves a major discretionary element to national authorities, and its effectiveness will be determined in large measure by the vigor with which national governments . . . act in this area." Id.
230. C. Pearson, supra note 229, at 70.
231. G. Timagenis, supra note 49, at 287.
on the part of the international community to control a source of pollution because of its potential for damaging the global commons. The behavior of individual contracting parties may be affected by the great symbolic value of the Convention. Beyond that, the Convention provides a model for national administrators to use as a basis for domestic regulatory controls, and the secretariat organization serves as a clearinghouse for scientific information to facilitate domestic implementation.

Besides controlling ocean dumping, the London Convention also regulates relations between nations. The amendment to the Convention that provides for the compulsory settlement of disputes reflects this procedural function of the Convention. Even if countries fail to use the settlement procedures, the negotiation of these provisions furnishes a precedent for the resolution of other international environmental questions. Thus, the Convention established a framework for an evolutionary system of international marine pollution control.

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233. Finland's decision in 1975 to abstain from dumping several tons of arsenic wastes in the South Atlantic demonstrates the pressure on individual nations to conform to the minimum norms established by the Convention. At the time, Finland had ratified the Oslo Convention, see supra note 48, which did not apply to the South Atlantic, and had signed the London Convention, which was not then in effect. Citing the two treaties Finland had signed, Brazil and Argentina exerted diplomatic pressure on Finland, which eventually abandoned its ocean dumping plans. The strong diplomatic action by Brazil and Argentina may have been primarily responsible for Finland's acquiescence. However, development of international standards, such as those of the London Convention, provide important legal support for this type of diplomatic pressure. McManus, supra note 68, at 135-36.

234. Id. at 135. The Convention's central requirement of a national permit program will positively affect domestic law. Bureaucratic self-interest will motivate officials in charge of domestic programs to measure their effectiveness in terms of how much dumping they prevent, irrespective of how much leeway the Convention may allow. Id. at 136.

235. Id. at 135.

236. G. Timagenis, supra note 49, at 287.

237. See supra notes 217-18.

238. G. Timagenis, supra note 49, at 289. The institutional mechanisms established by the Convention were useful in developing controls to address at-sea incineration, a potentially serious environmental problem that was not foreseen by the delegates to the London negotiations in 1972. McManus, supra note 68, at 131-33. A resolution adopted at the First Consultative Meeting of the Contracting Parties directed the development of special provisions for at-sea incineration. In 1978, the Third Consultative Meeting considered draft guidelines and adopted portions as amendments to the Convention annexes. See Amendments to Annexes to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter Concerning Incineration at Sea, 18 I.L.M. 510 (1979). EPA intends to supplement its ocean dumping regulations to cover at-sea incineration. 50 Fed. Reg. 8222 (1985) (proposed ocean incineration regulation). See also 1984 EPA REPORT, supra note 17, at 30; [15 Current Developments] ENV'T REP. (BNA) 1763 (Feb. 22, 1985).

V RECENT DEVELOPMENTS IN NATIONAL DUMPING POLICY

Despite its impact on international ocean dumping policy, the London Convention does not provide an effective remedy to terminate sewage sludge disposal in the New York Bight. Assessing the future of sewage sludge dumping in the United States requires an examination of recent developments at the national level. Although litigation has not succeeded in eliminating ocean disposal of sewage sludge, both EPA and the House of Representatives have reexamined national ocean dumping policy in light of the City of New York decision.

A. EPA Administrative Action

Although City of New York was decided in 1981, EPA did not complete the process of selecting a dumpsite for the continued ocean disposal of sewage sludge until 1985. New York City and six New Jersey sewage authorities submitted petitions to redesignate the twelve-mile dumpsite in the New York Bight.239 Furthermore, EPA itself proposed to designate the 106-mile dumpsite for the disposal of aqueous industrial wastes and municipal sewage sludge.240 Until EPA finally acted on the municipalities' petitions to redesignate the twelve-mile dumpsite, it could not evaluate the special permit applications submitted by municipalities currently dumping under administrative and court orders.241

EPA intends to move sewage sludge dumping from the twelve-mile site to the 106-mile site. In December 1982, EPA requested additional information in support of the petitions to redesignate the twelve-mile dumpsite and solicited public comments on the petitions.242 In May 1984, EPA announced its tentative decision to deny the petitions to redesignate the twelve-mile site.243 EPA based this decision on a finding that redesignation of the site would be inconsistent with the purposes of the MPRSA, and would result in further degradation to the area, includ-

and Article 193 preserves the sovereign rights of states to exploit natural resources; these articles are modeled on paragraph 3 of the preamble to the London Convention. Compare also Article 194 of the UNCLOS (measures to prevent, reduce and control marine pollution) with Article I of the London Convention. Article 210 of the UNCLOS specifically applies to ocean dumping.

241. See supra notes 141, 148 and accompanying text.
ing adverse ecological and public health effects. In conjunction with its tentative decision not to redesignate the twelve-mile site, EPA did designate the 106-mile site, effective June 4, 1984. Ultimately, in April 1985, EPA took final action to deny the petitions to redesignate the twelve-mile site.

After the court in City of New York ordered EPA to revise the ocean dumping regulations, the Agency decided to be more flexible and view the oceans as a legitimate disposal option. Although EPA has not yet revised the ocean dumping regulations as required by the City of New York opinion, Agency officials have indicated that EPA has at least reinterpreted its regulations in accordance with the court's rational. EPA will evaluate future permit applications under regulations that do not include a conclusive presumption of unreasonable degradation for failure to satisfy environmental impact criteria. EPA intends to consider all relevant factors, including technical feasibility, environmental and health impacts, and the costs of alternative disposal methods.

Despite its failure to revise the ocean dumping regulations in the wake of City of New York, EPA did attempt to formulate a policy on

244. 49 Fed. Reg. 19,042, 19,044 (1984); [15 Current Developments] ENV'T REP. (BNA) 47 (May 11, 1984). Recent studies show that the twelve-mile New York Bight dumpsite has particularly poor dispersion and is ill-suited for dumping. Lahey, supra note 81, at 417-18, 428. The twelve-mile site also is unsuitable for dumping because it is adjacent to fishing and shellfishing areas, and is used heavily for commercial and recreational navigation. 1 H.R. REP. No. 766, 98th Cong., 2d Sess. 12 (1984). EPA initially selected sites on the basis of historical usage, without conducting scientific studies of alternative sites to determine more suitable locations. See 1984 EPA REPORT, supra note 17, at 17; 1 H.R. REP. No. 766, supra, at 17. For a discussion of EPA efforts to designate ocean dumpsites, see Bakalian, supra note 18, at 235-48.


246. 49 Fed. Reg. 19,005 (1984). The shift of sewage sludge dumping from the twelve-mile to the 106-mile site is consistent with the language of the MPRSA which requires that dumpsites be located beyond the edge of the continental shelf wherever feasible. 33 U.S.C. § 1412(a)(I) (1982); see supra note 79.


248. [12 Current Developments] ENV'T REP. (BNA) 1216-17 (Jan. 22, 1982) (speech by Steven Schatzow, Director, EPA Office of Water Regulations and Standard); see also supra note 142 and accompanying text (EPA Administrator Gorsuch explains refusal to appeal City of New York decision).

249. See supra note 138.


251. Id. Despite this apparent shift in policy, EPA has continued to phase out ocean dumping of sewage sludge. EPA terminated sewage sludge dumping by Middletown Township, New Jersey in 1982, and Glen Cove City and Northeast Monmouth, New Jersey in 1983. 1984 EPA REPORT, supra note 17, at 13; see also [15 Current Developments] ENV'T REP. (BNA) 415 (July 13, 1984). These continuing efforts indicate that EPA implicitly recognizes the harm caused by ocean disposal of contaminated sewage sludge. There is no basis to conclude that only the sewage sludge still being dumped does not cause unreasonable degradation.
waste disposal in the oceans. In April 1984, however, the Office of Management and Budget (OMB) ordered EPA to abandon efforts to issue a comprehensive policy statement. OMB rejected EPA’s proposed policy because it allowed dumping only in cases where ocean disposal was considered “environmentally preferable” to other alternatives. OMB insisted on language requiring EPA to consider all disposal media to be equally appropriate.

The OMB directive reduced EPA’s position on ocean dumping to a three-part Agency “approach” to ocean disposal. Using this approach, EPA will attempt to protect the oceans from significant adverse effects of waste disposal and assure that the oceans are not used on the basis of short-run economic considerations alone. EPA also wants to encourage environmentally beneficial approaches to waste disposal, such as recycling and reductions in the amount of waste generated. Finally, EPA has determined that ocean disposal should occur only when no practicable alternatives are available that would have less adverse impact on the total environment.

B. Litigation

EPA’s refusal to appeal the City of New York decision ended judicial involvement in ocean dumping policy, at least until EPA or Congress takes further action. The MPRSA provides a number of remedies for violations of the Act or the regulations promulgated thereunder, including civil suits by private persons for injunctive relief. Despite the

253. Id.
254. Id.
255. Id.
256. EPA’s “approach” to ocean disposal contains three components:
   (1) The Agency will, as an overall principle, protect the oceans from significant adverse effects of waste disposal. EPA will particularly assure that they are not used for “cheap” waste disposal as a matter of short-run economic considerations alone;
   (2) In any specific case, the Agency will allow ocean disposal only if the applicant can show that no practicable alternatives are available that have less impact on the total environment. EPA will apply a rule of reason in determining practicability; and,
   (3) For the long run, the Agency will actively encourage environmentally beneficial approaches such as waste minimization, recycling, or reuse.

258. 33 U.S.C. §§ 1415(g), 1415(f). The MPRSA also authorizes EPA to assess civil penalties of up to $50,000 for each violation, id. §§ 1415(a), and provides for criminal penalties, id. §§ 1415(b), injunctive relief in actions brought by the federal government, id. § 1415(d), and permit revocation. Id. § 1415(f). No private remedies exist apart from the expressly authorized citizen suit provision. See Middlesex County Sewage Auth. v. National Sea Clammers Ass’n, 453 U.S. 1, 17 (1981) (Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1376 (1982), and the MPRSA held to fully preempt the federal common law of nuisance in the area of water pollution).
availability of a statutory cause of action, however, private parties have not successfully challenged continued ocean dumping in the New York Bight.\(^{259}\) In 1982, the National Wildlife Federation (NWF) sued EPA, the State of New Jersey, and six New Jersey sewage authorities, basing jurisdiction, in part, on the citizen suit provisions of the MPRSA.\(^ {260}\) NWF sought to end the disposal of contaminated sewage sludge in the New York Bight, alleging that continued dumping conflicted with the London Convention and violated the MPRSA.\(^ {261}\) Without addressing the merits, the district court dismissed the complaint on all counts.\(^ {262}\)

The court held that the suit was an impermissible collateral attack upon consent decrees entered in the individual actions between EPA and the sewage authorities.\(^ {263}\) The court based its refusal to consider NWF's claims on the rationale that consent decrees are final judgments and may not be disturbed except for narrowly prescribed reasons.\(^ {264}\) The court reached this decision even though NWF had tried unsuccessfully to intervene in the negotiation of the decrees\(^ {265}\) and despite the fact that the decrees were not the result of adjudicatory proceedings.\(^ {266}\)

\(^{259}\) In some cases, citizen suits have successfully challenged EPA and the Corps of Engineers over ocean dumping activities. See, e.g., National Wildlife Fed'n v. Costle, 629 F.2d 118, 133 (D.C. Cir. 1980) (EPA's failure to adequately explain rationale for disparate treatment of dredged and nondredged waste in ocean dumping regulations deemed fatal to regulations); Manatee County v. Gorsuch, 554 F. Supp 778, 796 (M.D. Fla. 1982) (plaintiffs entitled to injunction restraining Corps from dumping dredged material at an interim ocean disposal site); see also 1984 EPA REPORT, supra note 17, at 17 (National Wildlife Federation suit challenging interim site designations resulted in consent agreement requiring EPA to prepare 22 environmental impact statements for 46 sites.)


\(^{261}\) NWF Complaint, supra note 206, at 1-2. NWF also alleged that EPA violated the Federal Water Pollution Control Act by failing to enforce statutory pretreatment requirements, id. at 32-34, and that the sewage authorities violated grant conditions that required development of land-based alternatives to ocean dumping. Id. at 34-35.


\(^{263}\) National Wildlife Fed'n v. Ruckelshaus, slip op. at 6. EPA entered court-approved consent decrees in May 1982 which allow continued dumping of sewage sludge by the New Jersey authorities in conformity with the City of New York decision. See supra note 144 and accompanying text; see also National Wildlife Fed'n v. Gorsuch, 744 F.2d 963, 966 (3d Cir. 1984).

\(^{264}\) National Wildlife Fed'n v. Ruckelshaus, slip op. at 6-7. The court of appeals assumed that unusual circumstances are necessary to preclude a third party from collaterally attacking a consent decree. Nevertheless, after considering a number of atypical aspects of NWF's litigation strategy, the court of appeals found that the interest in finality should prevail. National Wildlife Fed'n v. Gorsuch, 744 F.2d at 971-72.


\(^{266}\) The district court judge approving the consent decrees emphasized that the decrees were not based on adjudications of fact or law and that he was making no findings in that regard. Reply Brief for Appellants at 13-14, National Wildlife Fed'n v. Gorsuch, 744 F.2d 963.
The court accepted EPA's argument\textsuperscript{267} that judicial review was premature because the Agency had made no final decisions with respect to site designation or the new permit applications submitted by the authorities.\textsuperscript{268} The court held that dismissal of the suit would not violate due process because NWF had the opportunity to be heard in the administrative proceedings being conducted in compliance with the \textit{City of New York} order and the consent decrees.\textsuperscript{269}

Further litigation over dumping by the New York and New Jersey authorities may be initiated now that EPA has completed the site designation process. The final judgment in \textit{City of New York} specifically states that if EPA fails to designate the twelve-mile site for further ocean disposal of sewage sludge, the city "shall retain its full right and discretion . . . to seek judicial review of such decision."\textsuperscript{270} On the other hand, environmental groups or other interested parties could challenge EPA's designation of the 106-mile site.\textsuperscript{271}

With site designation completed, EPA now must evaluate special permit applications to determine whether sewage sludge dumping will "unreasonably degrade" the environment.\textsuperscript{272} EPA's determination of unreasonable degradation with respect to individual permit applications may be challenged within the context of adjudicatory hearings under the ocean dumping regulations\textsuperscript{273} and could easily generate further litigation.

\textbf{C. Proposed Amendments to the MPRSA}

The House of Representatives remains strongly opposed to ocean dumping and has introduced several bills in recent years to strengthen the MPRSA. In May 1982, the House Committee on Merchant Marine

\footnotesize{(3d Cir. 1984) \cite{NWF Reply Brief}; see \textit{National Wildlife Fed'n v. Gorsuch}, 744 F.2d at 967, 971. \textsuperscript{267} Federal Defendants' Memorandum of Law in Support of Motion to Dismiss Complaint at 20, \textit{National Wildlife Fed'n v. Ruckelshaus}, No. 82-4314, slip op. (D.N.J. Aug. 11, 1983). \textsuperscript{268} NWF claimed the decision to allow dumping under the consent decrees constitutes a final agency action in violation of the statutory and regulatory provisions implementing the London Convention and in violation of the 1981 MPRSA deadline. \textit{NWF Reply Brief}, \textit{supra} note 266, at 14-16. EPA's decision to adopt the \textit{City of New York} cost-benefit balancing test is also final; all future administrative proceedings will comply with that decision. \textit{Id.} at 19. See \textit{supra} text accompanying notes 250-51. \textsuperscript{269} \textit{National Wildlife Fed'n v. Ruckelshaus}, slip op. at 9; \textit{National Wildlife Fed'n v. Gorsuch}, 744 F.2d at 971. \textsuperscript{270} \textit{City of New York v. EPA}, 12 \textit{ENVTL. L. REP. (ENVTL. L. INST.)} 20,184 (1982) (final judgment). \textsuperscript{271} Although no formal action has yet been taken to challenge EPA's final designation of the 106-mile site for sewage sludge disposal, Delaware Lieutenant Governor Michael Castle has said that Delaware would "pursue every legal means of blocking the selection of the 106-mile site." [\textit{14 Current Developments} ENV'T REP. (BNA) 166 (June 3, 1983). \textsuperscript{272} \textit{City of New York v. EPA}, 12 \textit{ENVTL. L. REP. (ENVTL. L. INST.)} 20,183 (1982) (final judgment). \textsuperscript{273} See 40 C.F.R. § 222 (1983).}
and Fisheries reported H.R. 6113 to amend the MPRSA. The bill required EPA to undertake formal procedures for designating ocean dumpsites and directed EPA and the Army Corps of Engineers to recover a "user fee" for costs associated with permit applications. The bill allowed federal district courts to issue writs of mandamus to compel EPA to expedite the site designation requirements and sought to bind the United States to the requirements of the London Convention. The House of Representatives approved H.R. 6113, in a modified form, in September 1982 but the Senate failed to act.

In May 1983, the Merchant Marine and Fisheries Committee reported H.R. 1761, a bill similar to the one approved by the House the previous year. H.R. 1761 required mandatory site designation by EPA, clarified United States obligations to comply with the London Convention, and authorized writs of mandamus by federal district


279. After the Merchant Marine and Fisheries Committee reported H.R. 6113, the bill was referred to the House Public Works and Transportation Committee. This committee revised the user fee provision, which originally gave EPA the authority to recover costs associated with monitoring and site designation studies, and limited it to recovery of reasonable administrative costs incurred in processing the permits. 2 H.R. Rep. No. 562, 97th Cong., 2d Sess. 11 (1982). The Committee also modified a mandatory dumpsite monitoring provision in the original bill and gave EPA discretion to determine whether monitoring is appropriate at each site. Id. See also [13 Current Developments] ENV'T Rep. (BNA) 328-29 (July 2, 1982).


281. The Reagan Administration opposed the legislation because it believed that existing law adequately protected the marine environment and that the writ of mandamus requirement would burden the Agency. [13 Current Developments] ENV'T Rep. (BNA) 203 (June 18, 1982). The Army Corps of Engineers opposed the bill because it hindered the Corps' dumping of dredged materials at unauthorized sites. The Administration also balked because the bill appropriated more than the Administration requested for EPA to implement the MPRSA and because the bill limited EPA's discretion to manage the ocean dumping program. Id. at 717 (Sept. 24, 1982).


283. H.R. 1761, supra note 282, at § 2(a)(2)(c)(1). The bill provided criteria for EPA to consider in designating dumpsites, including the types and quantities of wastes proposed for dumping, the ability of the site to assimilate wastes, the biological importance of the site, and the immediate and cumulative effects of dumping. See 1 H.R. Rep. No. 200, supra note 282, at 22.

284. H.R. 1761, supra note 282, at § 4. The bill added the following subsection to 33 U.S.C. § 1416: "To the extent that they may do so without relaxing the requirements of this
courts to compel EPA to designate dumpsites in a timely manner. The bill required EPA to develop monitoring programs for ocean dumpsites and directed EPA and the Corps to recover "reasonable administrative costs" incurred in processing permit applications. The bill also authorized EPA and the Corps to impose on permit applicants "any special provisions deemed necessary . . . to minimize harm from dumping." The Public Works and Transportation Committee reported this bill unchanged in July 1983, and the House passed it in October. Again, however, the Senate failed to consider MPRSA amendments.

The House of Representatives has continued its attempts to amend the MPRSA. In May 1984, the Merchant Marine and Fisheries Committee reported a new bill, H.R. 4829, which contained the major provisions of the bills passed in previous years by the House, but also

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285. H.R. 1761, supra note 282, at § 7; 1 H.R. REP. No. 200, supra note 282, at 16-17. H.R. 1761 modified the writ of mandamus provision found in H.R. 6113. The modified provision applied only to sites where designations were incomplete and at which EPA or the Corps authorized dumping. This change foreclosed the possibility that EPA could be compelled, by prospective dumpers, to initiate studies at a site that it does not intend to designate. Bakalian, supra note 18, at 250 n.410. The mandatory site designation and mandamus provisions would force EPA to determine whether historically-used dumpsites are suitable for continued dumping. H.R. 1761 also required EPA to establish a schedule for completing site designation studies at all sites currently used under interim designations or court order. H.R. 1761, supra, at § 8; 1 H.R. REP. No. 200, supra, at 17.


288. H.R. 1761, supra note 282, at §3(1)(a)(5); 1 H.R. REP. No. 200, supra note 282, at 13. Special provisions may require the applicant to develop and implement alternatives for the disposal of the waste and processes to reduce or eliminate contaminants.


293. H.R. 4829 contained mandatory site designation provisions and provided criteria, similar to those in H.R. 1761, see supra note 283, for EPA to consider in designating dumpsites. H.R. 4829, supra note 292, at § 2(a)(2)(c)(1). Like its predecessors, H.R. 4829 authorized writs of mandamus to compel EPA to designate dumpsites, id. at § 8, and required EPA
incorporated a number of new ideas for the control of ocean dumping. For example, in addition to a mandatory user fee provision directing EPA to collect permit processing costs, H.R. 4829 required EPA to implement a special fee to recover costs directly associated with the issuance of permits, including the expense of performing site designation studies, monitoring, and enforcement activities. Most importantly, H.R. 4829 recognized the need to enforce industrial pretreatment standards and specifically addressed continued dumping of sewage sludge in the New York Bight.

H.R. 4829 did not contain an absolute deadline for halting ocean disposal of sewage sludge, but required a reduction in contaminant levels for any dumping after 1986. The bill required permit applicants to satisfy two conditions to continue dumping sewage sludge after December 1986: the sewage treatment plant that generates the sludge must comply with all pretreatment requirements of the Federal Water Pollution Control Act, and the governor of the state in which the treatment plant is located must certify that no suitable land-based alternative to ocean disposal exists. The bill directed EPA to end the dumping of “harmful municipal sludge” within eighteen months and limited ocean disposal of such sludge to those parties presently dumping pursuant to court orders in the New York Bight. The bill expressly defined harmful sewage sludge as municipal waste that fails to meet the environmental impact criteria of EPA’s ocean dumping regulations.

H.R. 4829 added a new section to the MPRSA to address dumping occurring under court order by “eligible authorities” in the New York Bight. The bill prohibited all dumping of sewage sludge at the twelve-mile site within eighteen months, unless EPA determined sooner that such material could reasonably be dumped at another site. H.R. 4829 also required that EPA prepare a New York Bight Restoration Plan within three years. The purpose of the restoration plan was to assess
the impact of pollutants affecting water quality and marine resources in the Bight; to identify technologies, management practices, and costs necessary to control those pollutants; and to develop a schedule of economically feasible projects to implement the recommended controls. The bill authorized annual appropriations of forty million dollars from 1986 to 1991 for restoration of the Bight.

The Transportation and Public Works Committee made one significant change in H.R. 4829 as reported by the Merchant Marine and Fisheries Committee. The Public Works Committee added a provision to provide New York City and the affected New Jersey municipalities with federal funds to cover the difference in the cost of transporting sewage sludge from the existing twelve-mile site to the 106-mile site designated by EPA. The Congressional Budget Office estimated that the federal subsidy would cost about twenty-five million dollars per year. As amended by the Public Works Committee, H.R. 4829 was passed by the House in October 1984. Once again, the Senate failed to act.

The three consecutive bills passed by the House contain a variety of provisions that significantly would strengthen and improve the MPRSA. The provision authorizing writs of mandamus to compel EPA to complete site designation activities and the language clarifying federal agency obligations under the London Convention would provide additional remedies to allow enforcement of the United States' domestic and international obligations to protect the marine environment. The fee provisions, requiring EPA to recover costs associated with permit processing and related regulatory activities, would discourage continued

4829 also directed EPA to prepare a report assessing the feasibility of establishing quality standards for the disposal of municipal sludge for both ocean and land-based methods. The quality standards would set maximum permissible concentrations of heavy metals, PCBs, and other contaminants. H.R. 4829, supra, at § 11.

308. EPA opposed the provision pertaining to the London Convention because the amendment would allow court challenges to agency action on each permit, rather than restricting public input to the promulgation of regulations. Ocean Dumping Hearing, supra note 138, at 54 (statement of Jack Ravan, EPA Assistant Administrator for Water).
reliance on ocean dumping. The most recent bill, H.R. 4829, reinforced congressional intent that EPA use the regulatory environmental impact criteria to determine harmful dumping, and would require municipalities dumping sewage sludge to institute an effective pretreatment program. Finally, although a legislative mandate to end sewage sludge dumping at the twelve-mile site would accomplish little since EPA has declined to redesignate the site, preparation of a New York Bight Restoration Plan would provide a means to improve the water quality of this degraded area.

Despite the concern for continued protection of the marine environment demonstrated by the House of Representatives, passage of a bill substantively amending the MPRSA in the near future appears unlikely. The Senate has not only failed to consider the House bills, but has not held hearings on the MPRSA in recent years. Even if the Senate did approve MPRSA amendments similar to those passed by the House, opposition by the Reagan Administration would probably kill such legislation.

VI
POLICY CONSIDERATIONS

For reasons identified fifteen years ago by the Council on Environmental Quality, the pressure continues for some coastal communities to look to the oceans as a permanent disposal alternative: municipal treatment plants generate increasing amounts of sewage sludge; ocean dumping remains less expensive than land-based alternatives; and the number of available land disposal sites is dwindling. These factors, and growing public concern over potential hazards associated with land

309. In commenting on H.R. 4829, EPA officials indicated that a fee system may encourage municipalities to terminate ocean disposal. Id. at 51 (statement of Jack Ravan, EPA Assistant Administrator for Water). See generally Labey, Economic Charges for Environmental Protection: Ocean Dumping Fees, 11 ECOLOGY L.Q. 305 (1984).
310. See supra text accompanying note 174.
311. See supra notes 281, 291; see also Ocean Dumping Hearing, supra note 138, at 53 (statement of Jack Ravan, EPA Assistant Administrator for Water).
312. CEQ projected that sludge generation would increase significantly by the year 2000, and pointed to the scarcity of land disposal sites, increasing costs, and political obstacles to obtaining new sites as the main pressures on coastal communities. CEQ OCEAN DUMPING REPORT, supra note 1, at 10.
314. For coastal communities, ocean dumping has historically been cheaper than land-based disposal alternatives. When sewage sludge is barged a long distance, however, ocean and land dumping costs may become comparable. See CEQ OCEAN DUMPING REPORT, supra note 1, at 22.
315. See id. at 19-20.
disposal of contaminated wastes, indicate that continuation of some minimum level of sewage sludge dumping may be inevitable.

EPA's decision with respect to continued sewage sludge disposal by New York City and the New Jersey municipalities will affect the future of ocean dumping at the national level. Now that EPA has completed the site designation process to shift dumping to the 106-mile site, the Agency will evaluate special permit applications under the balancing test mandated by the City of New York decision. Existing dumpers may not be the only parties to submit permit applications; several municipalities not presently dumping sewage sludge are considering ocean dumping as a disposal option. Thus dumping may increase significantly in the future.

Assuming that ocean disposal of sewage sludge will continue to some extent, Congress and EPA should fulfill their responsibility to establish appropriate limits on this use of the oceans. In evaluating sewage sludge disposal alternatives, policymakers should compare ocean dumping to other disposal methods, but because of the difficulties inherent in assessing adverse impacts on the marine environment, a presumption against ocean disposal should continue. In addition, before legitimizing dumping as a disposal option, EPA should develop definitive criteria to determine what constitutes unreasonable degradation. The high concentration of contaminants normally present in sewage sludge should provide the basis for a determination that unreasonable degradation will occur, and municipalities that desire to dump sewage sludge in the ocean should be required to institute an effective pretreatment program.

A. Continuing the Presumption Against Dumping Contaminated Waste

An integrated approach to waste management, which would allow disposal of sewage sludge in the medium that poses the least serious environmental and public health risks, has been widely advocated. Such

316. Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 93.

317. See supra text accompanying notes 250-51.

318. The District of Columbia has applied for a permit to dump its sewage sludge in the Atlantic Ocean. [12 Current Developments] Envtl Rep. (BNA) 1147 (Jan. 15, 1982). William J. Marrazzo, Water Commissioner for Philadelphia, a city which terminated ocean dumping in 1980, commented: "We don't believe we're out of the ocean forever." Id. at 254 (June 19, 1981). In addition, Baltimore, Boston, Jacksonville, and several other cities have expressed interest in applying for dumping permits. Swanson & Devine, supra note 189, at 17.


320. See generally Nat'l Research Council, Multimedia Management of Municipal Sludge: A Report to the U.S. Environmental Protection Agency from the Committee on a Multimedia Approach to Municipal Sludge Management (1978); Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19; see also Interagency Comm. on Ocean Pollution, Research, Dev. & Monitoring, Nat'l Oceanic & Atmospheric Admin., supra note 17, at 38.
an approach would be an improvement over the existing medium-by-medium approach to waste disposal. However, waste management strategies that involve a multimedia comparison of environmental risks should still incorporate a presumption against ocean disposal.

A number of general technical reasons exist for a presumption against ocean disposal of potentially harmful wastes. Containment of such wastes in a land disposal site allows greater monitoring and the opportunity for remedial action, reducing the potential for adverse impacts. In addition, knowledge of the effects of toxic materials on the marine environment is limited and justifies a presumption against ocean dumping.

The difference between ocean and land disposal represents a choice between media that disperse or contain wastes. Dispersion can render nontoxic and readily biodegradable wastes, such as organic matter, relatively innocuous when dumped in the ocean. On the other hand, persistent toxic materials, such as heavy metals and organohalogens, should not be dispersed in the marine environment. Although land-based alternatives do present potential environmental risks, proper land disposal of contaminated material isolates toxic substances from productive biological communities. Land disposal also allows monitoring of any potential adverse impacts and provides the opportunity for corrective action. In contrast, the effects of toxic substances dispersed in the oceans are difficult to predict and even more difficult to control.

321. NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 94.
322. See Kamlet, supra note 11, at 13-15.
323. Economic considerations also justify a presumption against ocean dumping. Two major economic services provided by the oceans and threatened by marine pollution will increase in value over time. Most importantly, world population pressures and growing demands on traditional food supplies will increase the importance of the oceans as a source of food. The value of ocean-related recreational services will also increase. The expected increase in the value of beneficial services provided by the oceans justifies at least maintaining the current quality of the marine environment. C. PEARSON, supra note 229, at 82.
324. Kamlet, supra note 11, at 13. Organic enrichment may alter the benthic community in the dumpsite vicinity, NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 58, but does not present the same danger to marine life or human health as toxic substances.
326. See Lahey, supra note 81, at 411.
327. For example, when applied to agricultural land, sludge generally remains on the soil surface where its effects can be monitored and corrective techniques can ameliorate problems. Hearings on Environmental Effects, supra note 169, at 43 (statement of Dr. Allan Hirsch, EPA Deputy Assistant Administrator, Environmental Processes and Effects Research). Landfilling can contaminate groundwater if metals and soluble compounds leach from the sludge; however, a properly sited and sealed sanitary landfill can reduce leachate problems to insignificant levels. Remedial action, such as collection and treatment of leachate, can be taken if problems occur. Id. at 84 (EPA responses submitted for the record).
328. See D. BROOKS, supra note 22, at 134-37. Some commentators have suggested that EPA use predictive models to assess the assimilative capacity of coastal areas with respect to specified contaminants. Goldberg, The Oceans as Waste Space: The Argument, OCEANUS,
EPA should reject the argument that the oceans are as appropriate as all other waste disposal media. Because it is difficult to measure effects on the marine environment, a requirement that dumping should be allowed unless it can be shown to cause harmful effects in excess of reasonable disposal alternatives will result in the oceans becoming a preferred disposal alternative. A greater understanding exists today about the effects of ocean dumping, and marine pollution in general, than existed in the early 1970's, however, there is still considerable uncertainty as to the long-term effects of dumping. This uncertainty justifies the presumption against ocean dumping of wastes contaminated with toxic materials. The difficulty of accurately predicting the impact of toxic substances on the marine environment indicates that waste disposal decisions cannot be based on a comparison of known adverse effects.

Uncertainty about the potential impact of ocean dumping is particularly relevant to EPA's recent designation of the 106-mile site. The National Oceanic and Atmospheric Administration (NOAA) has conducted research at this deep-water site since 1974, and scientists estimate...

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30. Assimilative capacity models have theoretical appeal and may eventually be used to regulate ocean dumping. These models, however, have not yet solved the difficulty of measuring the impact of particular substances on the marine environment. See Lahey, supra note 81, at 430. Without better information, assimilative capacity models cannot reliably predict the hazard potential for persistent toxic substances. Kamlet, supra note 11, at 14-17.
329. CEQ GLOBAL 2000 REPORT, supra note 1, at 300.
330. The Office of Management and Budget rejected EPA's attempt to formulate a policy which would have allowed dumping only where ocean disposal was considered environmentally preferable to disposal elsewhere. OMB insisted on language requiring that all disposal media be considered equally appropriate. See supra text accompanying notes 252-55. See also NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 100.
331. NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 93; but cf. McManus, supra note 68, at 121 (dearth of scientific information persists).
332. The scientific inability to determine accurately the adverse effects of ocean dumping stems from a number of factors. Some impacts on the marine environment may not appear for several years. Latent effects from pollutants can cause a serious underestimation of environmental impact. Delayed responses also result when waste inputs occur for a long time with no obvious effect, but when contaminant levels reach some threshold, a small increase in input can produce a disproportionate large effect. See Lahey, supra note 81, at 430.Insensitive measuring techniques and natural variability in the marine environment may lead to the conclusion that no demonstrable adverse ecological effects exist, even though harmful impacts actually occur. Kamlet, supra note 11, at 15-17. In addition, measurements of dumping impact usually consider a single pollutant at a time and may underestimate damage to the environment by ignoring the possibility of synergistic effects. Lahey, supra note 81, at 430.
333. Scientists know less about the ecological effects of waste disposal than about the human health effects. In part, this stems from the inherent problems in measuring sublethal effects in natural ecosystems. NAT'L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra note 19, at 2; see also D. BROOKS, supra note 22, at 136-37.
334. "Because of our limited knowledge about the fate and effects of many pollutants, particularly effects of chronic, low-level exposure, demonstrating the absence of deleterious effects is a tough order indeed." Walsh, U.S. Policy on Marine Pollution: Changes Ahead, OCEANUS, Spring 1981, at 18, 20. The same difficulties preclude a demonstration that adverse effects are certain.
335. 49 Fed. Reg. 19,005 (1984); see supra text accompanying note 247.
that the site can safely accommodate sewage sludge from the metropolitan New York region.\textsuperscript{336} Knowledge of the potential long-term impacts of sewage sludge disposal at this site, however, still may be inadequate.\textsuperscript{337} Although dispersion at the 106-mile site has been studied intensively, evidence suggests that sludge would be substantially dispersed only in the upper water layers, rather than through the full depth of the water column.\textsuperscript{338} Also, pollutants may be more disruptive to the ecology of the deep ocean than to the ecology of coastal areas.\textsuperscript{339} Although the 106-mile site is not as biologically productive as the current twelve-mile site,\textsuperscript{340} dumping at the deep water site may adversely affect several threatened and endangered species that migrate through the area.\textsuperscript{341} EPA's designation of the 106-mile site without an adequate understanding of the potential long-term consequences of contaminated sewage sludge disposal may be imprudent.\textsuperscript{342}

\textbf{B. Requiring Pretreatment to Reduce Contaminant Levels}

A comprehensive waste disposal strategy would recognize that production of sludge containing toxic contaminants results from the normal process of sewage effluent treatment. Sewage treatment represents a national commitment to improve water quality and eliminate the discharge of pollutants into navigable waters.\textsuperscript{343} The process of producing sludge concentrates toxic and organic wastes present in the effluent stream.\textsuperscript{344} Separating the contaminants from raw sewage allows the waste treatment plant to release clean effluent. After investing energy and technology to remove the pollutants from sewage so that the effluent can be discharged without impairing water quality, it is illogical and unwise to dispose of the contaminated sludge in the ocean.\textsuperscript{345}

\begin{itemize}
\item \textsuperscript{336} Swanson & Devine, \textit{supra} note 189, at 17-18; see also 49 Fed. Reg. 19,005, 19,007 (1984).
\item \textsuperscript{337} \textit{Hearings on Environmental Effects, supra} note 169, at 11 (statement of Dr. Douglas Segar, Ocean Disposal Consultant to New York City).
\item \textsuperscript{338} \textit{Id.}
\item \textsuperscript{339} In the open ocean, pollutants persist for longer periods of time and are biologically degraded or immobilized in sediments at a much slower rate than in coastal waters. Exposure to even low concentrations of pollutants may cause damage to organisms in deep oceanic waters that have evolved in a very stable environment and cannot adapt to change. \textit{CEQ GLOBAL 2000 REPORT, supra} note 1, at 315.
\item \textsuperscript{340} \textit{Compare} 49 Fed. Reg. 19,005 (1984) (EPA designates 106-mile site) with \textit{Id.} at 19,042 (EPA tentatively denies designation of twelve-mile site).
\item \textsuperscript{341} 49 Fed. Reg. 19,005, 19,007 (1984).
\item \textsuperscript{342} Swanson & Devine, \textit{supra} note 189, at 20.
\item \textsuperscript{343} Federal Water Pollution Control Act, § 101(a) (codified at 33 U.S.C. § 1251 (1982)).
\item \textsuperscript{344} \textit{NAT’L ADVISORY COMM. ON OCEANS & ATMOSPHERE, supra} note 19, at 45.
\item \textsuperscript{345} \textit{See Ocean Dumping Oversight Hearings, supra} note 194, at 171 (statement of Mr. Jorling, EPA Assistant Administrator). Congress amended the Clean Water Act in 1977 to relax requirements applicable to municipal sewage treatment plants discharging directly into marine waters. Pub. L. No. 95-217, § 44, 91 Stat. 1584 (1977) (codified at 33 U.S.C. § 1311(b) (1982)). This amendment appears to recognize the ocean’s assimilative capacity and to give
\end{itemize}
Industrial pretreatment, which builds upon the concept implicit in sludge generation of isolating contaminants from effluent, is a necessary component of an integrated approach to sewage treatment. Pretreatment reduces the high concentration of heavy metals and synthetic organic compounds normally present in sludge by limiting industrial discharges into the municipal sewage system and thereby preventing toxic pollutants from entering the effluent stream. Pretreatment results in cleaner sludge and allows containment of the toxic contaminants on land.

Municipalities in the United States dumping sewage sludge in the ocean should implement pretreatment programs to satisfy this nation's international responsibilities under the London Convention. The London Convention requires each contracting party "to take all practicable steps" in accordance with its "scientific, technical and economic capabilities" to prevent marine pollution caused by dumping. Continued dumping of contaminated sewage sludge in this country effectively provides other nations with an excuse of impracticability for failing to reduce contaminants in wastes proposed for dumping. By establishing pretreatment controls, the United States, the most technologically advanced and economically stable party to the Convention, would provide an example of leadership in preventing harmful dumping. An effective pretreatment program would also allow ocean disposal of sewage sludge without violating the trace contaminants provision of the London Convention.

credibility to ocean dumping of sewage sludge as an attractive policy alternative for coastal municipalities. Bleicher, The Battle Over Ocean Dumping, 12 Env'l. L. Rep. (Envtl. L. Inst.) 15,032, 15,034-35 (1982). However, the amendment prohibits discharges that would interfere with applicable water quality standards that protect the public health and marine environment. This test is analogous to the MPRSA's requirement that dumping can only occur if it will not degrade the marine environment.

346. Pretreatment requirements would address the need to manage sewage waste comprehensively, rather than focusing narrowly on disposal media. See Nat'l Advisory Comm. on Oceans & Atmosphere, supra note 19, at 94 (recommends managing waste, not media).

347. Industrial pretreatment can achieve up to a four-fold reduction in the concentration of certain toxic metals in sewage sludge and is a prerequisite to implementing environmentally sound sludge disposal programs. Ocean Dumping Oversight Hearings, supra note 194, at 184-85 (statement of Mr. Sadat, New Jersey Dep't of Environmental Protection).

348. EPA evidence indicates that industries produce most of the toxic material in sludge. Lahey, supra note 309, at 314. Pretreatment reduces the amount of toxic substances in sludge more effectively than treatment after contaminants have been introduced into the sewage effluent. Hearings on Environmental Effects, supra note 169, at 83 (EPA responses submitted for the record); 46 Fed. Reg. 9404, 9404-11 (1981).

349. London Convention, supra note 6, at arts. I & II; see supra note 55.

350. The London Convention requirements that contracting parties "take all practicable steps" to prevent marine pollution in accordance with their "capabilities" were introduced and strongly supported by developing countries. These provisions were meant to distinguish between developed and developing countries and to impose a lesser burden on the latter. G. Timagenis, supra note 49, at 193. Commentators have noted that these terms may be used to justify dumping in violation of the Convention. See id. at 195.
Although the Clean Water Act requires industrial pretreatment, EPA has made little progress in developing standards to limit the industrial discharge of toxic pollutants. In developing a comprehensive approach to management of sewage sludge, EPA should give priority to the establishment and enforcement of pretreatment standards.

CONCLUSION

The City of New York decision has allowed the status quo to continue for those communities most dependent historically on ocean disposal of sewage sludge. EPA has indicated that dumping will be shifted to the 106-mile dumpsite in the New York Bight and that ocean disposal of sewage sludge will not be precluded solely on the basis of potential adverse environmental impacts.

Congress should clarify national goals with respect to ocean dumping policy. Although the outlook for substantive amendments to the MPRSA is uncertain, legislation approved by the House of Representatives since City of New York indicates that Congress wants EPA to curb harmful dumping.

A presumption against ocean disposal of highly contaminated wastes should continue to influence policy decisions, based on our limited ability to predict or remedy the adverse effects of toxic substances on the marine environment. At the same time, efforts to develop an integrated approach to waste management should be encouraged. A key component of any comprehensive sewage sludge management program should be industrial pretreatment to reduce the concentration of contaminants and render sludge acceptable for ocean dumping.

The United States should fulfill its international obligations under the London Convention by prohibiting continued ocean disposal of contaminated sewage sludge. A sound national ocean dumping policy would prevent ocean disposal of sewage sludge from becoming a serious environmental problem, and would encourage the prevention of marine pollution by the international community, the primary goal of the London Convention.

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351. The interim guidelines under the London Convention provide that prohibited substances may be considered present in trace amounts if technical processes cannot reduce further the concentration of contaminants. See supra text accompanying note 181. An effective pretreatment program would reduce the concentration of contaminants normally present in sludge and, therefore, dumping could occur without violating the trace contaminants provision of the Convention.


353. Lahey, supra note 309, at 314. Under the Clean Water Act, EPA must develop standards limiting industrial discharges of toxic pollutants for 34 categories of industries. As of 1982, EPA had developed standards for only two industries. Id.