1977

OCEAN DUMPING IN THE UNITED STATES-1977

Fifth Annual Report of the Environmental Protection Agency

on Administration of Title I

Marine Protection, Research, and Sanctuaries

Act of 1972, as amended

U.S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

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January – December, 1976

MARCH 1977

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Water and Hazardous Materials
Washington, D. C. 20460

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 19 1977

THE ADMINISTRATOR

Honorable Walter F. Mondale
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

Section 112 of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, requires the Administrator of the Environmental Protection Agency (EPA) to submit an annual report on the administration of the ocean dumping permit program authorized under Title I of the Act. The fifth annual report for this program is transmitted with this letter.

The ocean dumping permit program became effective April 23, 1973, and final regulations and criteria were published October 15, 1973. Revisions to those regulations and criteria were published on January 11, 1977. This report covers activities during calendar year 1976.

The dumping into ocean waters of all materials is regulated by EPA permits except dredged materials, for which the U.S. Army Corps of Engineers issues permits. We believe that the permit program has brought the previously unregulated practice of ocean dumping under strict control.

Sincerely yours,

Douglas M. Costle

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 19 1977

THE ADMINISTRATOR

Honorable Thomas P. O'Neill
Speaker of the House
of Representatives
Washington, D.C. 20515

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CHAPTER I

INTRODUCTION AND SUMMARY

This is the fifth annual report of the Environmental Protection Agency (EPA) to the Congress on the implementation of Title I of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended (referred to in this report as "the Act"). See Appendix A. The Act became effective April 23, 1973, and since that time all ocean dumping of waste materials transported for the purpose of dumping has been regulated under permits issued by EPA except for dredged material, which is regulated by the U.S. Army Corps of Engineers (COE).

This report covers EPA Headquarters and Regional permit operations, research projects by EPA's Office of Research and Development (ORD), and other program activities during the calendar year 1976. A calendar of Headquarters and Regional activities during 1976 is provided as Table 1.

Previous annual reports by EPA included information on COE activities related to the issuance of permits for the ocean dumping of dredged material and on surveillance and monitoring activities of the U.S. Coast Guard (USCG) on ocean dumping operations. Under amendments to the Act passed in 1976, both the U.S. Army Corps of Engineers and the U.S. Coast Guard will submit separate reports of their activities in implementing Title I of the Act. This EPA report, therefore, does not contain a discussion of the activities of these two agencies under the Act, except as these activities impact the responsibilities of EPA.

Program responsibilities under the Act are divided among EPA Headquarters and the seven EPA coastal Regions and supported by related ORD research activities. The Regions are responsible for all activities relating to the issuance of special and interim permits for dumping in the respective Regions. The Regions are also delegated some responsibility for the management of ocean dumping sites. EPA Headquarters is responsible for all other program activities, including the designation of ocean dumping sites, issuance of emergency, research, and general permits, and coordination of Regional activities.

TABLE 1

Ocean Dumping Calendar for 1976

January 21	Public Hearing, Region III, City of Philadelphia (Pa.) Ocean Dumping Permit Application for Municipal Sewage Sludge, Philadelphia, Pa.
23 & 29	House Merchant Marine and Fisheries Committee, Ocean Dumping Oversight Hearings, Washington, D.C.
February 17	Public Hearing, Region VI, Shell Chemical Company (Deer Park, Texas) Ocean Dumping Permit Application for Biological Sludge, Houston, Texas
27	House Merchant Marine and Fisheries Committee, Ocean Dumping Oversight Hearings, Washington, D.C.
27	Draft Environmental Impact Statement (EIS) Issued, Region II, Ocean Dumping Sewage Sludge in the New York Bight
March 5	House Merchant Marine and Fisheries Committee, Ocean Dumping Oversight Hearings, New York, N.Y.
15	Emergency Permit Issued, Antilles Shipping Corp., San Juan, Puerto Rico, Disposal of Water Damaged Food Cargo
17	Public Hearing, Region II, Columbia Corrugated Container Corp. (Syosset, New York) Ocean Dumping Permit Application on Decision to Deny Permit, New York, New York
24-25	Public Hearing, Region II, Regarding Draft EIS on Sludge Dumping in New York Bight, New York, N.Y.
25	Meeting of Interagency Advisory Committee on the International Ocean Dumping Convention, Washington, D.C.
25	Public Hearing, Region VI, Ethyl Corporation (Baton Rouge, La.) Ocean Dumping Permit Application for Metallic Sludges, New Orleans, La.
29	Public Hearing, Region III, Regarding Draft EIS on Sludge Dumping in New York Bight, Toms River, N.J.

TABLE 1 - Continued

April 1	Public Hearing, Region II, Regarding Draft EIS on Sludge Dumping in New York Bight, Mineola, N.Y.
2	Public Hearing, Region III, City of Philadelphia (Pa.) Ocean Dumping Permit Application for Municipal Sewage Sludge, Philadelphia, Pa.
12	Senate Commerce Committee, Ocean Dumping Oversight Hearings, Washington, D.C.
21	Emergency Permit Issued, Puerto Rico Aqueduct and Sewer Authority, (San Juan, P.R.), Disposal of Deteriorated Chlorine Cylinders
23	Draft EIS Issued, Designation of an Ocean Incineration Site in the Gulf of Mexico
28	Emergency Dumping to Safeguard Life at Sea, Acid Wastes, Dumped After Collision at Sea, New York Bight (no permit required)
May 1	Public Hearing, Region II, 14 Municipal Ocean Dumping Permit Applications in New York-New Jersey Metropolitan Area, New York, New York
10	Court Decision in State of Maryland vs Train that EPA Need not Prepare EIS Before Designating a Dump Site or Issuing a Permit, Baltimore, Md.
June 15	Long Island Beaches First Closed from Washup of Floating Material
28	Ocean Dumping Proposed Revision of Regulations and Criteria Published in Federal Register
29	Public Hearing, Region VI, Shell Chemical Company (Deer Park, Texas) Ocean Dumping Permit Application for Ocean Incineration of Organic Chloride Wastes, Houston, Texas
30	P.L. 94-326 Passed, Extension of the Authorization for the Marine Protection, Research, and Sanctuaries Act
July 1	Emergency Permit Issued, Panama Canal Company, Canal Zone, Panama, Disposal of Sunken Vessel M/V TAIRONA (permit not used)

Table 1 - Continued

July	1	Emergency Dumping to Safeguard Life at Sea, Frozen Chicken Dumped by Sinking M V Taurus, off Puerto Rico (no permit required)
	4	Fish Kill in Atlantic Ocean off Coast of New Jersey First Reported
	13	Public Hearing, Region I, Safety Projects and Engineering, Inc. (West Quincy, Mass.), Ocean Dumping Permit Application for Laboratory Wastes, Boston, Mass.
	14	Final EIS Issued, Designation of an Ocean Incineration Site in Gulf of Mexico
	21	Public Hearing, Region III, City of Camden (N.J.) Ocean Dumping Permit Application for Municipal Sewage Sludge, Georgetown, Delaware.
	23	Draft EIS Issued, Proposed Revisions to Ocean Dumping Criteria
	24	House Merchant Marine and Fisheries Committee, Ocean Dumping Oversight Hearing, Hempstead, N.Y.
August	17	Meeting of Interagency Advisory Committee on the International Ocean Dumping Convention, Washington, D.C.
September	15	Designation in Federal Register of Ocean Incineration Site in the Gulf of Mexico
	15	Public Hearing, Region II, 8 Puerto Rico Industrial Ocean Dumping Permit Applications, Arecibo, Puerto Rico
	20	Public Hearing, Region II, 13 Industrial Ocean Dumping Permit Applications in New York-New Jersey Metropolitan Area, New York, New York
	20-24	First Consultative Meeting of Contracting Parties to International Ocean Dumping Convention, London, England
	30	House Merchant Marine and Fisheries Committee, Ocean Dumping Oversight Hearings, Washington, D.C.

Table 1 - Continued

October 13	Public Hearing, Region III, Dupont Company (Edge Moor, Del.) Ocean Dumping Permit Application for Acid Wastes, Georgetown, Delaware.
15	Ocean Incineration Special Permit Issued to Shell Chemical Company (Deer Park, Tex.) by Region VI for Incineration in the Gulf of Mexico
19&20	Technical Workshop on Ocean Dumping Criteria, Washington, D.C.
November 11	City of Camden Ocean Dumping Permit for Municipal Sewage Sludge Expired
22	Public Hearing, Region II, Dupont Company (Edge Moor, Del.) Ocean Dumping Permit Application for Acid wastes, New York, New York
29	"Ocean Dumping in the United States" 4th Annual Report Transmitted to the Congress
December 7	Issuance of Court Order Granting City of Camden (N.J.) Request for Ocean Dumping Permit for Sewage Sludge, Camden, N.J. (Court ordered EPA to issue emergency permit)
10	Emergency Permit Issued, City of Camden, N.J., for Municipal Sewage Sludge (court-ordered permit)
10	Food and Drug Administration (FDA) recommends closure of Region III sludge (Philadelphia site) and acid wastes (DuPont site) dump sites to shellfishing.
17	Emergency Permit Issued, U.S. Coast Guard (Washington, D.C.) for Disposal of vessel, ARGO MERCHANT (permit not used)
30	Ocean Dumping Final Revision to Regulations and Criteria signed by EPA Administrator (published in Federal Register on January 11, 1977).

During 1976, the amount of ocean dumping declined slightly from the level in 1975. The most active area was Region II (New York) which issued permits for the dumping of municipal sewage sludge, construction debris, and industrial wastes in the New York Bight and off the north coast of Puerto Rico. All permittees now dumping under interim permits have been directed to find alternatives to ocean dumping and to implement those alternatives by 1981 at the latest. A comparison of dumping activity since the permit program began in 1973 is shown in Table 2.

Several emergency permits were issued for the ocean disposal of materials which were an imminent hazard to public health and for which there was no feasible alternative for disposal, including leaking chlorine cylinders and wrecked vessels which were endangering shorelines. No research permits were issued, but a new general permit was issued for the disposal of wrecked vessels after appropriate cleaning.

The first Consultative Meeting of the Contracting Parties to the Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter (Ocean Dumping Convention) was held in London during September of 1976. At this meeting requirements for reporting ocean dumping activities to the Secretariat were developed, and steps were taken to clarify provisions of the Convention.

Major revisions to the Ocean Dumping Regulations and Criteria were developed during 1976. These regulations now bring dredged material under the same criteria that are applied to other dumped material and establish procedures for the designation and continuing management of ocean dumping sites. The revisions also require a thorough evaluation of the alternatives to ocean dumping as part of the permit application evaluation procedure. An Environmental Impact Statement (EIS) on the revisions to the Criteria also was published.

A major program effort during 1976 was the development of the EIS's for ocean dumping sites. A Draft EIS on sludge dumping in the New York Bight was published, and both Draft and Final EIS's were published on the Gulf Ocean Incineration Site. The Gulf Ocean Incineration Site became the first site to be formally designated as an approved ocean dumping site. Baseline surveys continued on two other sites, and additional studies were conducted on former radioactive waste disposal sites.

TABLE 2

Ocean Dumping 1973 - 1976
(in approx. tons)

WASTE TYPE	TOTAL			
	1973	1974	1975	1976
Industrial Waste	5,050,800	4,592,000	3,446,000	2,733,500
Sewage Sludge	4,898,900	5,010,000	5,039,600	5,270,900
Construction and Demolition Debris	973,700	770,400	395,900	314,600
Solid Waste	240	200	0	0
Explosives	0	0	0	0
TOTAL	10,923,640	10,372,600	8,881,500	8,319,000

Looking toward the future, EPA is developing new technology for monitoring the impact of ocean dumping and techniques for determining the efficiency of at-sea incinerators. EPA is participating in efforts to develop criteria for ocean incineration under the Ocean Dumping Convention. There are also continuing research efforts to improve existing bioassay procedures and to develop new ones.

Two pieces of legislation were enacted in October 1976 which have implications for the EPA ocean dumping permit program. These are the Resource Conservation and Recovery Act of 1976, which includes a permit system for hazardous waste management and provides for developing criteria and guidelines for acceptable land utilization and disposal practices for municipal sewage sludge, and the Toxic Substances Control Act of 1976, which provides for controlling the manufacture and disposal of toxic substances. Considerable effort will be taken by EPA to integrate these Acts with the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, and the Federal Water Pollution Control Act, as amended, so that the various regulatory authorities complement each other in providing environmental protection.

CHAPTER II

PERMIT OPERATIONS

It is the policy of the Act to regulate all ocean dumping and to prevent or strictly limit the ocean dumping of any material which would adversely affect the marine environment. To implement this policy, Title I of the Act establishes a system of permits to be administered by EPA and the COE to control dumping in ocean waters. The transportation from the United States of any radiological, chemical, or biological warfare agent or high-level radioactive wastes for dumping in ocean waters, the territorial seas, or the contiguous zone is prohibited. Transportation for the purpose of dumping of other materials, except dredged material, is prohibited unless the Administrator of EPA has issued a permit. The Administrator is empowered to issue a permit considering the criteria outlined in Section 102 of the Act and after determining that the dumping will not unreasonably degrade or endanger human health or the marine environment. The dumping of dredged material is regulated by COE in accordance with EPA and COE developed criteria. An analysis of ocean dumping of dredged material in 1976 is found in a COE separate report.

Title I also requires the Administrator to promulgate criteria for reviewing and evaluating permit applications, which must include an examination of the need for the proposed dumping and the alternatives available to the proposed dumping. In addition, the Administrator is authorized to designate areas where ocean dumping may be permitted and to designate critical areas where dumping may be prohibited. Before any permit is issued, EPA must also give notice and allow opportunity for public hearing. EPA has the authority to revoke or modify permits, to assess civil penalties for violation of permit conditions, and to initiate criminal action against persons who knowingly violate the Act.

Under Title I of the Act, the Coast Guard has been delegated the responsibility for conducting surveillance and other appropriate enforcement activity to prevent unlawful ocean dumping. More specifically, the USCG ensures that ocean dumping occurs under a valid permit and that the material is dumped at the location and in the manner specified within the permit. The USCG has prepared a separate report on its activities in 1976.

Title II of the Act requires the National Oceanic and Atmospheric Administration (NOAA) to conduct a comprehensive program of research and monitoring regarding the effects of the dumping of material into ocean waters. Title III gives to NOAA the authority to establish marine sanctuaries. A summary of these programs in 1976 will be found in separate reports prepared by NOAA.

The Permit System

The Ocean Dumping Permit Program first went into effect on April 23, 1973. Final regulations and criteria were published in October 1973. Significant revisions to the Ocean Dumping Regulations and Criteria were proposed in June 1976 and published in final form in January 1977.

The regulations provide for a permit system with six categories of permits: general, special, emergency, interim, research, and incineration at sea.

General permits may be issued for small quantities of material which will have a minimal adverse environmental impact, especially if dumped under prescribed conditions. Examples include burial at sea of human remains or ashes, transportation of target vessels by the Department of Defense with the intent of sinking the vessels, and transportation and disposal of sunken vessels, particularly when the vessels pose a threat to navigation.

Special permits may be issued for the dumping of materials which satisfy the criteria and then only for a maximum duration of three years for each permit. In 1976 special permits were issued for at-sea incineration of certain organochlorine wastes, for disposal of construction rubble and demolition debris, and for the dumping of certain aqueous dye production wastes and miscellaneous laboratory wastes.

Emergency permits may be issued for disposal of materials which pose an unacceptable risk relating to human health and for which there is no other feasible solution. Emergency permits in 1976 included the dumping of badly deteriorated chlorine gas cylinders and water damaged ship cargo unacceptable for land disposal due to the possibility of disease contamination.

Interim permits may be issued prior to April 23, 1978, to dump materials which are not in compliance with the environmental impact criteria or for dumping at a dump site designated only on an interim basis. However, no interim permit will be issued for the dumping of wastes from a facility which has not previously ocean dumped. Most of the current ocean dumping permits are interim permits, largely because most dump sites have only been approved on an interim basis and because some materials which do not satisfy the criteria are being ocean dumped while alternate disposal methods are under development.

Research permits may be issued for dumping materials into the ocean as part of a research project when it is determined that the scientific merit of the proposed project outweighs the potential environmental damage that may result from the dumping. No research permits were issued in 1976, but a research permit issued in 1974 provided the opportunity to investigate the feasibility of incineration at sea as a method of disposal.

The last type of permit is a permit for incineration at sea, as mentioned in the previous paragraph. Specific criteria are currently being developed for incineration permits. Permits for incineration at sea were issued in 1976 for the disposal by incineration of organic chloride wastes and for incineration of driftwood, pilings, derelict vessels, and other wooden materials collected in the New York Harbor and environs.

Analysis of Existing Dumping Activities

During the four years that the Act has been in effect all previously uncontrolled dumping of wastes into ocean waters has been strictly regulated by the Ocean Dumping Permit Program. The level of dumping activity that has occurred under EPA permits since the program became operational is indicated in Table 3. There has been a decline in dumping each year since the permit program went into effect.

The absence of complete and accurate dumping records prior to the implementation of the permit program makes any comparison with ocean dumping activity of past years difficult. It is evident from available data, however, that ocean dumping of wastes was increasing when the Act was passed. In addition, both the

Senate and House versions of this Act reflected the concern that those pollutants previously discharged into the Nation's territorial waters or air and now restricted by the Federal Water Pollution Control Act Amendments of 1972 and the Clean Air Act, not end up indiscriminately being dumped in the ocean.

The data in Table 3 and Figure I show a decrease from 1973 to 1976 in the dumping of industrial wastes, construction debris, and solid waste, a slight increase in the dumping of sewage sludge, and no appreciable dumping of explosives. Since the permit program went into effect in April 1973, the data from that year reflect eight months of dumping activity extrapolated for 12 months to arrive at an estimated annual rate.

In 1976, ocean dumping permits were issued by five of the seven EPA coastal Regions and by EPA Headquarters. Table 4 lists by Region those permits in effect during 1976, the type of permit, the material authorized for dumping, the effective dates of the permit, and the amounts actually dumped.

In implementing the ocean dumping permit program, EPA requires a thorough evaluation in all applications of the need for ocean dumping and the availability of alternate methods of disposal. This approach has required all municipal and industrial dumpers to seek other alternatives. Since the permit system went into effect, 248 former or potential ocean dumpers have ceased ocean dumping or been denied permits (Table 5). On the Atlantic Coast alone, 104 former dumpers phased out ocean dumping either by the time the Act went into effect or after having initially received permits. Another 138 industries or municipalities have either withdrawn their applications or been denied permits. A total of 155 dumpers ceased ocean dumping or were denied permits during 1976, and 16 more are scheduled to cease in 1977. Other permittees on implementation plans to phase-out ocean dumping are shown in Table 6.

As shown in Table 3 and Figure II, the amount of industrial wastes dumped in the Gulf of Mexico under ocean dumping permits declined in 1976 to 7 percent of the amount dumped in 1973 under the first year of the permit program. This decrease is due largely to the fact that five of the seven original permittees had implemented alternatives to ocean dumping by the end of 1975. Although a number of industrial dumpers have ceased ocean dumping off the Atlantic Coast, the amount of dumping has only decreased

TABLE 3

OCEAN DISPOSAL TYPES AND AMOUNTS, 1973*, 1974**, 1975**, and 1976**

(IN TONS, ANNUAL)

WASTE TYPE	ATLANTIC				GULF				PACIFIC				TOTAL			
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976
Industrial Waste	3,842,800	3,842,000	3,322,300	3,633,200	1,408,000	950,000	123,700	100,300	0	0	0	0	5,050,800	4,592,000	3,446,000	3,733,500
Sewage Sludge	4,888,000	5,010,000	5,030,600	5,270,000	0	0	0	0	0	0	0	0	4,888,000	5,010,000	5,030,600	5,270,000
Construction and Demolition Debris	873,700	770,400	385,900	314,800	0	0	0	0	0	0	0	0	873,700	770,400	385,900	314,800
Solid Waste	0	0	0	0	0	0	0	0	240	200	0	0	240	200	0	0
Explosives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9,515,400	9,442,400	8,757,800	9,218,700	1,408,000	950,000	123,700	100,300	240	200	0	0	10,823,540	10,372,600	8,881,500	9,318,000

* EPA Regional Offices. Unpublished reports, 1973; updated information, 1976 (8 months of dumping activities, May to December 1973 under permits issued by Ocean Disposal Program extrapolated for 12 months to provide an annual rate).

** EPA Regional Offices. Unpublished reports, 1974, 1975, 1976; updated information, 1976 (12 months of dumping activity).

Figure I

OCEAN DUMPING BY TYPE OF WASTE

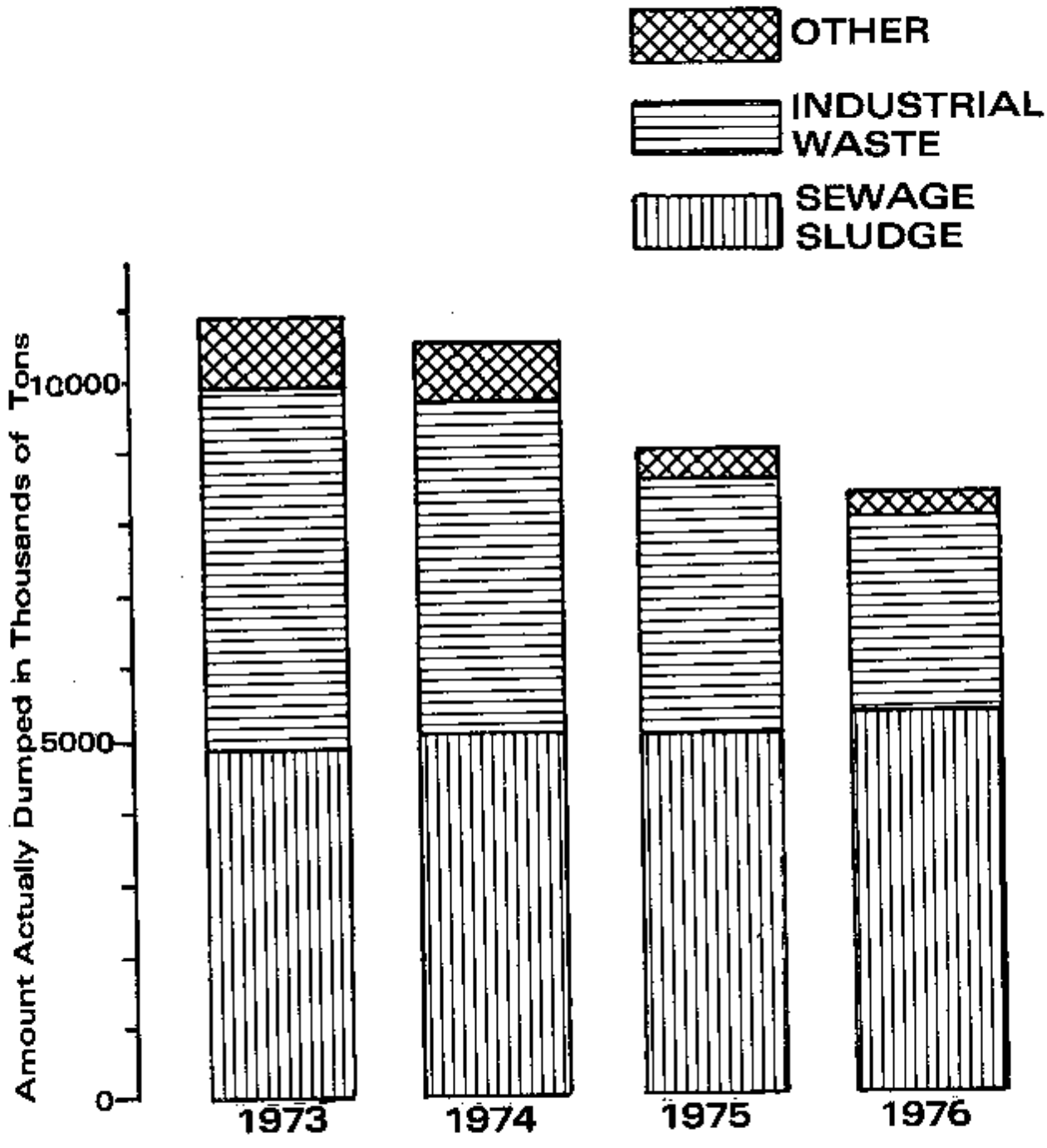


TABLE 4
PERMIT ACTIVITY - CALENDAR YEAR 1976

Permittee; Location Type Permit	Material Dumped	Effective Dates of 1976 Permits	Actual Quant. Dumped (1976)
Region I			
Safety Projects & Eng. W. Quincy, Mass. Special	misc. lab reagents, alkali metal cmpds, and explosives	6/24/75-6/30/76 9/26/76-11/1/77	9.378 wet T.
Region II			
Bergen Co. Sew. Auth. Little Ferry, N.J.; Interim	sewage sludge	7/1/75-7/31/76 8/1/76-7/31/77	246,000 wet T.
Joint Meeting of Essex & Union Counties Irvington, N.J.; interim	"	"	88,000 wet T.
Linden Roselle-Rahway Valley Sewage Auth., Linden, N.J., Rahway, N.J., Interim	"	"	228,000 wet T.
Middlesex Co. Sew. Auth, Sayreville, N. J.; interim	"	"	300,000 wet T.
Middletown Twp., Sew. Auth. Belford, N.J.; interim	"	"	18,000 wet T.
Passaic Valley Sew. Comm. Newark, N.J.; interim	"	"	579,000 wet T.
City of Glen Cove Glen Cove, N.Y.; interim	"	"	7,200 wet T.
City of Long Beach Long Beach, N.Y.; interim	"	"	5,600 wet T.
Nassau County D.P.W. East Rockaway, N.Y.; interim	"	"	401,000 wet T.
Westchester County D.E.F. Yonkers, N.Y.; interim	"	"	138,000 wet T.
West Long Beach Sew. Dist. Atlantic City, N.J.; interim	"	"	1,200 wet T.
New York City D.W.R. New York, N.Y.; interim	"	"	2,152,000 wet T.
Modern-PCI			164,000 wet T.
Modern - PCI, S. Kearny, N.J. W. Caldwell, N.J. interim	sewage sludge & septic tank wastes	7/1/75-7/31/76 8/1/76-7/31/77	
American Cyanamid, N.J. Princeton, N.J. interim	waste activated sludge	11/10/75-6/30/76	
Whippany Paper Board; Whippany, N.J.; interim	sludge from paper mill waste	11/20/75-1/9/76	
General Marine Transport Corp.			48,000 wet T.
General Marine Transport Corp., N.J.; Bayonne, N.J.; interim	sewage sludge and septic tank sludge wastes	7/1/75-7/31/76 8/1/76-7/31/77	
S. B. Thomas, Inc.; Totowa, NJ; Interim	sludge from treatment of bakery wastes	11/20/75-8/31/76	
Caldwell Trucking Co.; Fairfield, N.J.; interim	sewage sludge	11/20/75-7/31/76	

TABLE 4 (CONT'D)
PERMIT ACTIVITY - CALENDAR YEAR 1976

Permittee; Location Type Permit	Material Dumped	Effective Dates of 1976 Permits	Actual Quant. Dumped (1976)
Allied Chemical Elizabeth, N.J.; interim	by-product hydrochloric acid	11/20/75-1/9/77	52,000 wet T.
NL Industries Sayreville, N.J.; interim	spent sulfate sol; inert ore slurry	"	1,360,000 wet T.
DuPont-Grasselli Linden, N.J.; interim	chemical wastes	"	180,000 wet T.
Moran Towing Corp. New York, N.Y.; special	construction rubble	11/20/75-11/19/76	147,000 yd^3
American Cyanamid Linden, N.J.; interim	chemical wastes	8/25/75-9/14/76 9/15/76-9/14/77	131,000 wet T.
Modern Transp. Co. S. Kearny, N.J.; interim			69,000 wet T.
Merck Chemical; Rahway, N.J.; interim	chemical wastes	11/20/75-1/9/77	
International Wire Products; Wyckoff, N.J.; interim	residual sludge from wire drawing process	11/20/75-11/19/76	
Arrow Group Industries; Haskell, N.J.; interim	residual sludge from galvanizing and plating operations	11/20/75-4/30/76	
Rehels Chemical Co.; Berkeley Heights, N.J.; interim	residual sludge from pharm. manf.	11/20/75-1/9/77	
M & M/Mars; Hackettstown, N.J.; interim	liquid organic wastes from candy manufacturing	11/20/75-11/19/76	
The Coca-Cola Co; Hightstown, N.J.; interim	residual liquid waste from prod. of beverages	11/20/75-6/1/76	
Curtiss-Wright Corp; Fairfield, N.J.; interim	residual aqueous waste from rinsing of metal parts	"	
Norda Inc.; East Hanover, N.J.; interim	aqueous waste from manufacture of flavors and fragrances	11/20/75-11/19/76	
S.B. Penick & Co.; Montville, N.J.; interim	aqueous waste from prod. of plant extracts	11/20/75-1/9/77	
Pfizer Inc.; Parsippany, N.J.; interim	aqueous waste from manuf. of cosmetics	"	
J.T. Baker Chemical Co.; Phillipsburg, N.J.; interim	liquid waste from prod. of magnesium carbonate	"	
Fritzsche Dodge & Olcott; East Hanover, N.J.; interim	aqueous wastes from manuf. of flavoring chemicals	11/20/75-11/18/77	
Keuffel & Esser Co.; Rockaway, N.J.; interim	aqueous mixture of residual coating sol.	11/20/75-1/9/77	
Crompton & Knowles Corp.; Birdsboro, Pa.; special	chemical wastes	2/17/76-2/16/79	
Rollins Environ Services, Bridgeport, N.J.; interim	chemical wastes	3/1/75-4/30/78	

TABLE 4 (CONT'D)
PERMIT ACTIVITY – CALENDAR YEAR 1976

Permittee; Location; Type of Permit	Material Dumped	Effective Dates of 1976 Permits	Actual Quant. Dumped (1976)
PCI International Arecibo, Puerto Rico			360,000 wet T.
Upjohn Manuf. Co.; Barceloneta, P.R.; interim	neutralized pharm. wastes	11/11/75-12/31/76	
Abbott Chemicals, Inc.; Barceloneta, P.R.; interim	"	11/11/75-10/31/76	
Pfizer Pharmaceuticals; Barceloneta, P.R.; interim	"	11/11/75-12/31/76	
Merck Sharp & Dohme Quimica de Puerto Rico; Barceloneta, P.R.; interim	"	"	
Oxochem Enterprise; Penuelas, P.R.; interim	waste waters from prod. of oxo-alcohols	"	
Puerto Rico Olefins Co.; Penuelas, P.R.; interim	waste waters from gas caustic scrubbers	"	
Bristol Alpha Corp.; Barceloneta, P.R.; interim	neutralized pharm. wastes	"	
Shering Corporation; Manati, P.R.; interim	"	"	
U.S. Army COE New York, N.Y.; interim	incineration of driftwood, timber, pilings	6/1/76-5/31/77	1,370 yd^3
Antillas Shipping Corp; San Juan, Puerto Rico; Emergency	crushed bones, casine, etc.	3/15/76-3/30/76	700 T.
Puerto Rico Aqueducts & Sewers Auth.; San Juan, Puerto Rico; Emergency	cylinders containing pressurized Cl_2 gas	4/22/76-4/30/76	26 cylinders (3504 lbs. Cl_2 gas)
General Marine Trans. Corp.			5,000 wet T.
IMC Chemical Group (Sobin); Newark, N.J.; interim	chemical wastes	11/20/75-12/31/76	
Nassau Co. Dept. Public Works; Nassau Co., N.Y.; interim	industrial wastes	2/9/76-11/19/76	

TABLE 4 (CONT'd)

PERMIT ACTIVITY - CALENDER YEAR 1976

Permittee; Location; Type of Permit	Material Dumped	Effective Dates of 1976 Permits	Actual Quant. Dumped (1976)
Region III			
E.I. DuPont de Nemours & Co.; Edge Moor, Del.; interim	titanium dioxide wastes	11/13/75-11/13/76 11/23/76-2/28/77	476,200 wet T.
City of Camden; Camden, N.J.; interim	sewage sludge	11/11/75-11/11/76	52,500 wet T.
City of Philadelphia, Philadelphia, Pa., interim	sewage sludge	2/14/75-2/13/76 2/14/76-3/13/76 3/14/76-5/4/76 6/5/76-6/4/77	831,400 wet T.
Region IV			
APM Manufacturing Co., Augusta, Ga.; special	Chemical wastes	6/1/75-6/1/78	0 T.
Region VI			
Ethyl Corporation; Baton Rouge, La.; interim	sodium calcium sludge	3/12/75-3/11/76 7/1/76-6/30/77	1,100 wet T.
Shell Chemical Co.; Deer Park, Texas; special	aerobic treatment system biosolids	2/20/75-2/19/76 2/24/76-6/15/77	99,200 T.
Shell Chemical Co.; Deer Park Texas; special	incineration of chlorinated organics	10/15/76-4/15/79	0 T.
Region IX			
Shell Oil Company; Houston, Texas; special	form. cuttings, drilling mud, non-perishable solid waste from exploratory oil drilling	11/18/76-12/1/77	0 T.
Headquarters			
U.S. Coast Guard; Washington, D.C.; emergency	ARGO MERCHANT	12/17/76-12/31/76	0 T.
Panama Canal Company, Panama Canal Zone, Panama; emergency	M/V TAIRONA	7/1/76-10/1/77	0 T.
City of Camden; Camden N.J.; emergency	sewage sludge	12/10/76-3/6/77	8,000 wet T.

TABLE 5

OCEAN DUMPING PERMITS NOT GRANTED OR PHASED OUT

	Region	Company	Location	Date Phased Out or Denied
1.	II	Benjamin Moore & Co.	Newark, N.J.	before April 1973
2.	II	Chester Packing Co., Inc.	Chester, N.Y.	before April 1973
3.	II	Childers Products Co.	Bristol, Penn.	before April 1973
4.	II	Clairol, Inc.	Stamford, Conn.	before April 1973
5.	II	Debell & Richardson	Enfield, Conn.	before April 1973
6.	II	Dow Chemical Service	Stoneham, Mass.	before April 1973
7.	II	Drake Bakeries	Wayne, N.J.	before April 1973
8.	II	Drew Chemical	Boonton, N.J.	before April 1973
9.	II	Electro-Nucleonics, Inc.	Fairfield, N.J.	before April 1973
10.	II	Engelhard Industries	Newark, N.J.	before April 1973
11.	II	Fedders Corp.	Edison, N.J.	before April 1973
12.	II	Ford Motor Co.	Mahwah, N.J.	before April 1973
13.	II	Gamlen Chemical Co.	Elmwood Park, N.J.	before April 1973
14.	II	Heinzelmen & Sons	Carlstadt, N.J.	before April 1973
15.	II	B. Horstmann Co.	East Hanover, N.J.	before April 1973
16.	II	I.C.I. America, Inc.	Bayonne, N.J.	before April 1973
17.	II	International Paper	Whippany, N.J.	before April 1973
18.	II	Ivers-Lee Co.	W. Caldwell, N.J.	before April 1973
19.	II	Koppers Co., Inc.	Kearny, N.J.	before April 1973
20.	II	Lehn & Fink, Co.	Belle Mead, N.J.	before April 1973
21.	II	L & M Trucking Corp.	Kenilworth, N.J.	before April 1973
22.	II	Makar Trucking Co.	Mendham, N.J.	before April 1973
23.	II	National Can Corp.	Piscataway, N.J.	before April 1973
24.	II	NL Industries, Inc.	Pedricktown, N.J.	before April 1973
25.	II	Norton & Sons, Inc.	Bayonne, N.J.	before April 1973
26.	II	New York Twist Drill Mfg. Corp.	Ramsey, N.J.	before April 1973
27.	II	The Parker Co.	Wayne, N.J.	before April 1973
28.	II	G. Redner, Inc.	Wanaque, N.J.	before April 1973
29.	II	Sandoz-Wander, Inc.	East Hanover, N.J.	before April 1973
30.	II	Three Star Anodizing Corp.	Beacon, N.Y.	before April 1973
31.	II	Universal Oil Products	East Rutherford, N.J.	before April 1973
32.	VI	E.I. duPont de Nemours	La Place, La.	Nov. 1973
33.	II	**Pratt & Whitney	East Hartford, Conn.	Feb. 1975
34.	II	**Biocraft Corp.	Waldwick, N.J.	Sept. 1973
35.	II	**Alcholac, Inc.	Ossing, N.Y.	Sept. 1973
36.	II	**Everlon Fabrics Corp.	Closter, N.J.	Dec. 1973
37.	II	**The Ansul Co.	Marinette, Wisc.	Aug. 1973
38.	II	*Consolidated Edison Co.	New York, N.Y.	April 1974
39.	II	**BASF Wyandotte Corp.	So. Kearny, N.J.	April 1974
40.	II	**The Clorox Co.	Jersey City, N.J.	April 1974
41.	II	Gaess Environmental Services Corp.	Passaic, N.J.	Nov. 1974
42.	II	Bell Telephone Laboratories	Whippany, N.J.	Aug. 1974
43.	II	Amerada Hess Corp.	Woodbridge, N.J.	Oct. 1973
44.	II	Riegel Products Corp.	Milford, N.J.	Aug. 1974
45.	II	General Color Co.	Newark, N.J.	April 1974
46.	II	J. M. Huber Corp.	Edison, N.J.	April 1974
47.	II	Lily-Tulip	Holmdel, N.J.	April 1974
48.	II	The National Lockwasher Co.	North Branch, N.J.	April 1974
49.	II	Howmedica, Inc.	Rutherford, N.J.	April 1974
50.	II	Celanese Coatings Co.	Belvidere, N.J.	April 1974
51.	II	American Cyanamid Co.	Pearl River, N.Y.	April 1974
52.	II	Green Village Packing Co.	Green Village, N.J.	April 1974
53.	II	The Mennen Co.	Morristown, N.J.	April 1974
54.	II	Weyerhaeuser Co.	Closter, N.J.	April 1974
55.	II	Wilson Products Co.	Neshanic, N.J.	April 1974
56.	II	American Cyanamid Co.	Bound Brook, N.J.	April 1974
57.	II	Kimberly-Clark Corp.	Spotswood, N.J.	April 1974
58.	II	St. Regis Paper Co.	West Nyack, N.Y.	April 1974
59.	II	Hercules, Inc.	Kenvil, N.J.	April 1974
60.	II	Dow Chemical	Mt. Holly, N.J.	April 1974

* denied
** withdrawn application

TABLE 5 (CONT.)

OCEAN DUMPING PERMITS NOT GRANTED OR PHASED OUT

	Region	Company	Location	Date Phased Out or Denied
61.	IX	H-10 Water Taxi	San Pedro, Calif.	Sept. 1974
62.	VI	E.I. duPont de Nemours	Belle, W. Va.	Oct. 1974
63.	II	City of Stamford	Stamford, Conn.	Dec. 1974
64.	VI	GAF Corporation	Texas City, Texas	Dec. 1974
65.	I	Pine State By-Products, Inc.	S. Portland, Maine	Jan. 1975
66.	VI	E.I. duPont de Nemours	LaPorte, Texas	Jan. 1975
67.	VI	E.I. duPont de Nemours	Beaumont, Texas	Feb. 1975
68.	II	Blue Ridge-Winkler Textiles	Bangor, Penn.	July 1975
69.	II	The Nestle Co., Inc.	Freehold, N.J.	July 1975
70.	II	U.S. Radium Corp.	Hackettstown, N.J.	May 1975
71.	II	Tenco Division of the Coca-Cola Co.	Morris Plains, N.J.	July 1975
72.	II	Warner-Lambert Co.	Morris Plains, N.J.	May 1975
73.	II	Mycalex Corp.	Clifton, N.J.	July 1975
74.	II	Worthington Biochemical Corporation	Freehold, N.J.	May 1975
75.	II	Howmet Corp.	Dover, N.J.	July 1975
76.	II	Sherwin Williams Co.	Newark, N.J.	July 1974
77.	III	*New Jersey Zinc	Gloucester City, N.J.	June 1974
78.	III	Sun Oil Company	Marcus Hook, Penn.	July 1975
79.	II	*Solvents Recovery Services	Linden, N.J.	Mar. 1976
80.	II	*Eagle Extrusion Corp.	Dover, N.J.	Mar. 1976
81.	II	Chevron Oil Co.	Perth Amboy, N.J.	Oct. 1975
82.	VI	**City of Houston	Houston, Texas	May 1976
83.	II	Water Tunnel Control	New York, N.Y.	Nov. 1976
84.	II	Arrow Group Inc.	Haskell, N.J.	April 1976
85.	II	Coca-Cola Foods Division	Hightstown, N.J.	May 1976
86.	II	Curtiss-Wright Corp.	Fairfield, N.J.	May 1976
87.	II	*Chemical Recovery Corp.	North Brunswick, N.J.	Mar. 1976
88.	II	Evor Phillips Leasing Co.	Old Bridge, N.J.	July 1975
89.	II	Fritzche Dodge & Olcott	Clifton, N.J	Oct. 1976
90.	II	**FMC Corp.	Baltimore, Md.	Jan. 1976
91.	II	*International Wire Products Co.	Wyckoff, N.J.	Nov. 1976
92.	II	*M&M/Mars	Hackettstown, N.J.	Nov. 1976
93.	II	*Norda, Inc.	E. Hanover, N.J.	Nov. 1976
94.	II	**Rohm & Haas Co.	Paulsboro, N.J.	Feb. 1975
95.	II	*Scientific Chemical Processing Inc.	Carlstadt, N.J.	Mar. 1976
96.	II	Abbott Chemicals, Inc.	Barcelonela, P.R.	Oct. 1976
97.	II	American Cyanamid Co.	Princeton, N.J.	June 1976
98.	II	*Columbia Corrugated Contanier Corp.	Syosset, N.Y.	May 1976
99.	II	*Chem-Trol Pollution Services Inc.	Model City, N.Y.	Mar. 1976
100.	II	**Disposal at Sea, Inc.	Bayonne, N.J.	July 1975
101.	II	**Town of Yorktown	Yorktown Heights, N.Y.	Dec. 1975
102.	II	**NYC Police Dept.	New York, N.Y.	Dec. 1975
103.	II	**US Customs Service	New York, N.Y.	Jan. 1976
104.	II	Rollins Environmental Servicee Inc.	Bridgeport, N.J.	April 1976
105.	II	**LI Tungsten Corp.	Glen Cove, N.Y.	Oct. 1975
106.	II	S. B. Thomas, Inc.	Totowa, N.J.	Aug. 1976
107.	II	Airmarine Electroplating Corp.	Freeport, N.Y.	Nov. 1976
108.	II	Amperex Electronic Corp.	Hicksville, N.Y.	Nov. 1976
109.	II	B & B Electroplaters, Inc.	Freeport, N.Y.	Nov. 1976
110.	II	General Instrument Corp.	Hicksville, N.Y.	Nov. 1976
111.	II	John Hassell, Inc.	Westbury, N.Y.	Nov. 1976
112.	II	Lith-Kem Corp.	Lynbrook, N.Y.	Nov. 1976
113.	II	Semimetals Inc.	Westbury, N.Y.	Nov. 1976
114.	II	Weksler Instruments Corp.	Freeport, N.Y.	Nov. 1976

* denied
** withdrawn application

TABLE 5 (CONT.)

OCEAN DUMPING PERMITS NOT GRANTED OR PHASED OUT

	Region	Company	Location	Date Phased Out or Denied
115.	II	USEC, Inc.	Woodbury, N.Y.	Nov. 1976
116.	II	*Collingswood STP	Collingswood, N.J.	Aug. 1976
117.	II	*Maxim Sewerage Corp.	Union, N.J.	Aug. 1976
118.	II	Western Monmouth UA	Marlboro, N.J.	Oct. 1976
119.	II	*Norwood STP	Norwood, N.J.	Aug. 1976
120.	II	*Old Tappan STP	Old Tappan, N.J.	Aug. 1976
121.	II	*Ringwood STP	Ringwood, N.J.	Aug. 1976
122.	II	*Riverdale STP	Riverdale, N.J.	Aug. 1976
123.	II	*Saddle River STP	Saddle River, N.J.	Aug. 1976
124.	II	*Skyline Lakes STP	Skyline, N.J.	Aug. 1976
125.	II	*Upper Saddle River STP	Upper Saddle River, N.J.	Aug. 1976
126.	II	*West Milford STP	West Milford, N.J.	Aug. 1976
127.	II	*Wycloff STP	Wyckoff, N.J.	Aug. 1976
128.	II	*Diamond Hill STP	Hackettstown, N.J.	Aug. 1976
129.	II	*Far Hills STP	Far Hills, N.J.	Aug. 1976
130.	II	*Mt. Olive STP	Mt. Olive Township, N.J.	Aug. 1976
131.	II	Baldwin's Run STP	Camden, N.J.	Aug. 1976
132.	II	*Peapack Gladstone STP	Peapack, N.J.	Aug. 1976
133.	II	*Alpine STP	Alpine, N.J.	Aug. 1976
134.	II	*Cupsaw Lakes STP	Cupsaw Lakes, N.J.	Aug. 1976
135.	II	*Erskine Lakes STP	Erskine Lakes, N.J.	Aug. 1976
136.	II	*Fayson Lakes STP	Fayson Lakes, N.J.	Aug. 1976
137.	II	*Greenwood Lake STP	Greenwood Lake, N.J.	Aug. 1976
138.	II	*Harrington Park STP	Harrington Park, N.J.	Aug. 1976
139.	II	*Haskell STP	Haskell, N.J.	Aug. 1976
140.	II	*Kimmelon STP	Kimmelon, N.J.	Aug. 1976
141.	II	*Lake Edenmald, STP	Lake Edenmald, N.J.	Aug. 1976
142.	II	*Northvals STP	Northvals, N.J.	Aug. 1976
143.	II	Wynnewood Sewage Co.	Freehold, N.J.	Dec. 1976
144.	II	*Fair Lawn STP	Fair Lawn, N.J.	Aug. 1976
145.	II	*Dover STP	Toms River, N.J.	Aug. 1976
146.	II	Long Branch Sewerage Auth.	Long Branch, N.J.	Sept. 1976
147.	II	*Pennsauken Sewerage Auth.	Pennsauken, N.J.	Aug. 1976
148.	II	*Bordentown STP	Bordentown, N.J.	Aug. 1976
149.	II	*Deal STP	Deal, N.J.	Aug. 1976
150.	II	*Bradley Beach STP	Bradley Beach, N.J.	Aug. 1976
151.	II	*Long Beach Sewerage Auth.	Brant Beach, N.J.	Aug. 1976
152.	II	Point Pleasant Beach STP	Point Pleasant Beach, N.J.	July 1976
153.	II	*Bay Head STP	Bay Head, N.J.	Aug. 1976
154.	II	*Manasquan STP	Manasquan, N.J.	Aug. 1976
155.	II	*Neptune City STP	Neptune City, N.J.	Aug. 1976
156.	II	*Sea Girt STP	Sea Girt, N.J.	Aug. 1976
157.	II	*Spring Lake STP	Spring Lake, N.J.	Aug. 1976
158.	II	*Brick Township MUA	Brick Township, N.J.	Aug. 1976
159.	II	*North Wildwood STP	North Wildwood, N.J.	Aug. 1976
160.	II	*Haddon Heights STP	Haddon Heights, N.J.	Aug. 1976
161.	II	*Audubon STP	Audubon, N.J.	Aug. 1976
162.	II	*North Bergen STP	North Bergen, N.J.	Aug. 1976
163.	II	*Lavallette STP	Lavellette, N.J.	Aug. 1976
164.	II	*Sea Bright STP	Sea Bright, N.J.	Aug. 1976
165.	II	*Seaside Heights STP	Seaside Heights, N.J.	Aug. 1976
166.	II	*Hillsborough STP	Hillsborough, N.J.	Aug. 1976
167.	II	*Maple Shade STP	Maple Shade, N.J.	Aug. 1976
168.	II	*Clementon Sewerage Auth.	Clementon, N.J.	Aug. 1976
169.	II	*Mt. Ephriam STP	Mt. Ephriam, N.J.	Aug. 1976
170.	II	*Burlington STP	Burlington, N.J.	Aug. 1976

* denied

** withdrawn application

TABLE 5 (CONT.)

OCEAN DUMPING PERMITS NOT GRANTED OR PHASED OUT

	Region	Company	Location	Date Phased Out or Denied
171.	II	*East Hanover STP	Burlington, N.J.	Aug. 1976
172.	II	*Hammonton STP	Hammonton, N.J.	Aug. 1976
173.	II	*South Amboy STP	South Amboy, N.J.	Aug. 1976
174.	II	*Wall Township STP	Wall, N.J.	Aug. 1976
175.	II	*Atlantic City STP	Atlantic City, N.J.	Aug. 1976
176.	II	*Allentown STP	Allentown, N.J.	Aug. 1976
177.	II	*Bridgeton STP	Bridgeton, N.J.	Aug. 1976
178.	II	*Mt. Holly STP	Mt. Holly, N.J.	Aug. 1976
179.	II	*Sayreville STP	Sayreville, N.J.	Aug. 1976
180.	II	*Rutherford-East Rutherford Lyndhurst Joint Meeting	East Rutherford, N.J.	Aug. 1976
181.	II	*East Windsor STP	East Windsor, N.J.	Aug. 1976
182.	II	*Hightstown STP	Hightstown, N.J.	Aug. 1976
183.	II	*Jersey City Sewage Auth.	Jersey City, N.J.	Aug. 1976
184.	II	*Rockaway Valley Sewerage Auth.	Boonton, N.J.	Aug. 1976
185.	II	*Morristown STP	Morristown, N.J.	Aug. 1976
186.	II	*Moorestown STP	Moorestown, N.J.	Aug. 1976
187.	II	*Livingston STP	Livingston, N.J.	Aug. 1976
188.	II	*Bernards STP	Bernards Township, N.J.	Aug. 1976
189.	II	*Somerset-Raritan Valley Sewerage Auth.	Bound Brook, N.J.	Aug. 1976
190.	II	*Berkeley Township Sewerage Auth.	Berkeley Township, N.J.	Aug. 1976
191.	II	*North West Bergen County Sewerage Auth.	Walwick, N.J.	Aug. 1976
192.	II	*Raritan Township STP	Raritan Township, N.J.	Aug. 1976
193.	II	*Princeton STP	Princeton, N.J.	Aug. 1976
194.	II	*Clinton STP	Clinton, N.J.	Aug. 1976
195.	II	*Edgewater STP	Edgewater, N.J.	Aug. 1976
196.	II	*Hoboken STP	Hoboken, N.J.	Aug. 1976
197.	II	*Bayonne STP	Bayonne, N.J.	Aug. 1976
198.	II	*Secaucus STP	Secaucus, N.J.	Aug. 1976
199.	II	*Woodbridge STP	Woodbridge, N.J.	Aug. 1976
200.	II	*Perth Amboy STP	Perth Amboy, N.J	Aug. 1976
201.	II	*Freehold STP	Freehold, N.J.	Aug. 1976
202.	II	*West Long Branch Sewer Dist.	West Long Branch, N.J.	Aug. 1976
203.	II	*Barnegat STP	Barnegat, N.J.	Aug. 1976
204.	II	*Wildwood STP	Wildwood, N.J.	Aug. 1976
205.	II	*Cape May Court House STP	Cape May Court House, N.J.	Aug. 1976
206.	II	*Cape May STP	Cape May, N.J.	Aug. 1976
207.	II	*Bayshore Regional Sewerage Auth.	Union Beach, N.J.	Aug. 1976
208.	II	*Ewing-Lawrence Sewerage Auth.	Trenton, N.J.	Aug. 1976
209.	II	*Bridgewater STP	Bridgewater, N.J	Aug. 1976
210.	II	*Lindenwold Borough MUA	Lindenwold, N.J.	Aug. 1976
211.	II	*Highlands STP	Highlands, N.J.	Aug. 1976
212.	II	*Seaside Park STP	Seaside Park, N.J.	Aug. 1976
213.	II	Berkeley Chemical Corp.	Berkeley, N.J.	Prior to April 1973
214.	II	Exxon Corp.	Linden, N.J.	Prior to April 1973
215.	II	Stone Hedge Corp.	N.J.	Prior to April 1973
216.	II	Autocar Trucks	Exton, Pa.	Prior to April 1973
217.	II	Hoffman-LaRoche	Belvidere, N.J.	Prior to April 1973
218.	II	Monroe Chemical	Eddystone, Pa.	Prior to April 1973
219.	II	Mrs. Smith's Pies	N.J.	Prior to April 1973
220.	II	Scott Paper Co.	Essington, Pa.	Prior to April 1973

*denied
**withdrawn application

TABLE 5 (CONT.)

OCEAN DUMPING PERMITS NOT GRANTED OR PHASED OUT

Region	Company	Location	Date Phased Out or Denied
221 II	Thomas Closeure (VAC)	Northvale, N.J	Prior to April 1973
222 II	Welles Mfg. Co.	N.J.	Prior to April 1973
223 II	Cross County Landfill	Mt. Vernon, N.Y.	Prior to April 1973
224 II	Sun Oil Co. - Yabucoa	Yabucoa, PR	Prior to April 1973
225 II	RCA de Caribe, Inc.	Barceloneta, PR	Prior to April 1973
226 II	Nassau Chrome Corp.	Mineola, N.Y.	February 1976
227 II	Lee Ronel, Inc.	Hicksville, N.Y.	February 1976
228 II	Ducon Co., Inc.	Mineola, N.Y.	February 1976
229 II	South Shore Plating	Long Island, N.Y.	February 1976
230 II	*Mathey Bishop	Malvern, Pa.	March 1976
231 II	*SCP, Inc.	Carlstadt, N.J.	March 1976
232 II	*Kawecki-Berylco Industries, Inc.	Bristol, Pa.	March 1976
233 II	*Superior Tube	Collegeville, Pa.	March 1976
234 II	*Nice Chemical Co.	N.J.	March 1976
235 II	*Liquid Removal Services - Wyeth Labs	Philadelphia, Pa.	March 1976
236 II	*Vamp Chemical Corp.	Middlesex, N.J.	March 1976
237 II	*Harshaw Chemical Corp.	Gloucester City, N.J.	March 1976
238 II	*Carpenter Technology	Philadelphia, Pa.	March 1976
239 II	*Curtiss-Wright Corp.	N.J	March 1976
240 II	*Union Carbide	N.J.	March 1976
241 II	*Stauffer Chemical	N.J.	March 1976
242 II	*Toms River Chemical	Toms River, N.J.	March 1976
243 II	*Air Products & Chemicals	Middlesex, N.J.	March 1976
244 II	*N.L. Industries	Pedricktown, N.J.	March 1976
245 II	*Chemical Leahman	Croydon, Pa.	March 1976
246 II	*Glenbrook Labs - div. of Sterling Labs	Trenton, N.J.	March 1976
247 II	*Bethlehem Steel	Bethlehem, Pa.	March 1976
248 II	*Armstrong Cork	Pa.	March 1976

*denied
**withdrawn application

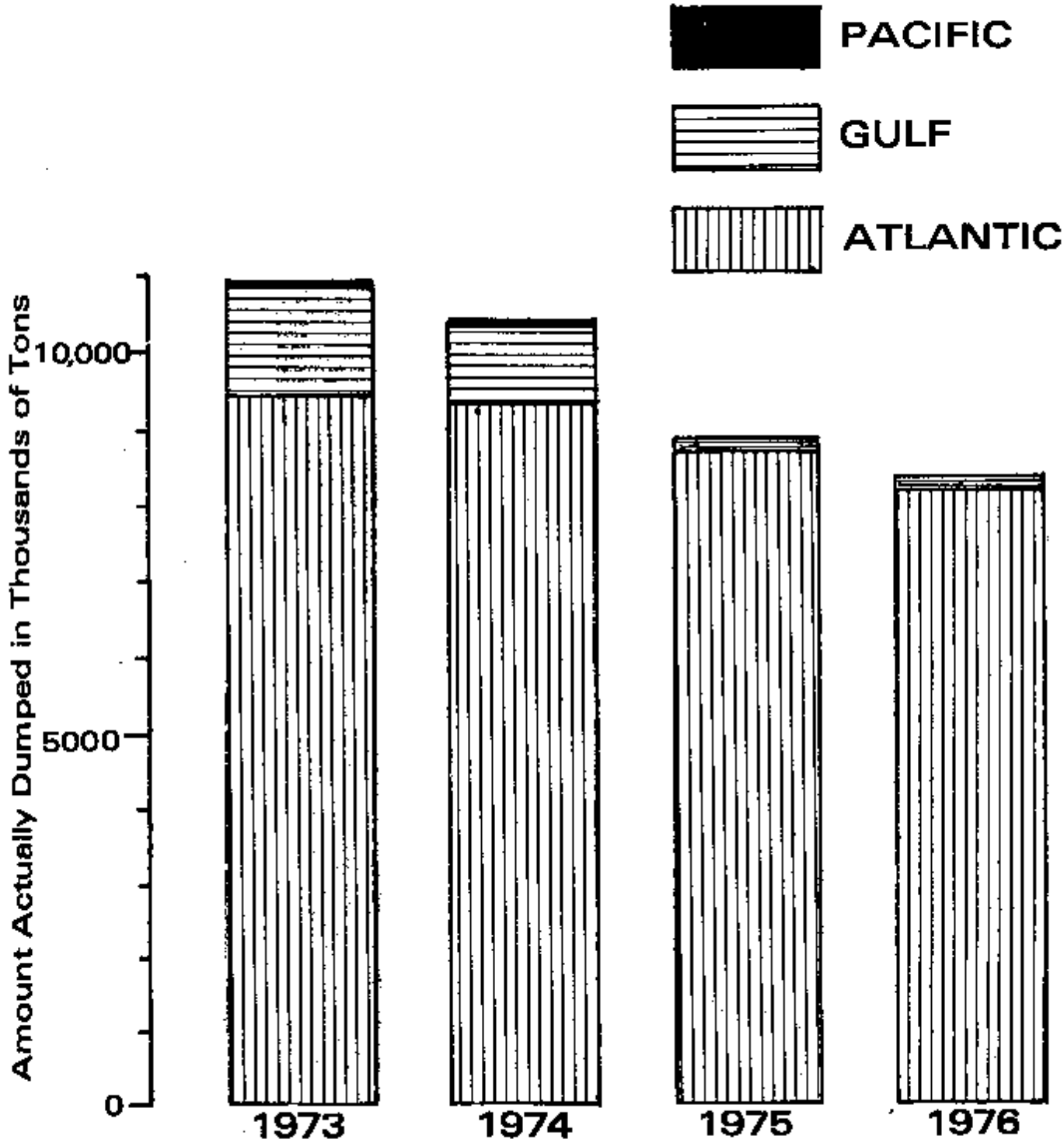
TABLE 6

PERMITTEES ON IMPLEMENTATION PLANS TO PHASE OUT OCEAN DUMPING

Region	Company	Location	Phase Out Date
II	American Cyanamid Co.	Linden, NJ	1980
	Middletown Sewer Authority	Belford, NJ	1981
	Passaic Valley Sew. Comm.	Newark, NJ	1981
	Allied Chemical Corp.	Morristown, NJ	1981
	The Upjohn Manuf. Co.	Barceloneta, PR	1979
	E.I. duPont de Nemours	Linden, NJ	1981
	City of Long Beach	Long Beach NY	1981
	Middlesex Co. Sew. Auth.	Sayreville, NJ	1981
	New York City	New York, NY	1981
	Merck & Co., Inc.	Rahway, NJ	1981
	NL Industries, Inc.	So. Amboy, NJ	1981
	Modern Transportation Co.	So. Kearny, NJ	1978
	Bergen Co. Sew. Authority	Little Ferry, NJ	1981
	Linden Roselle-Rahway Valley Sew. Auth.	Linden, NJ	1981
	Joint Meeting	Elizabeth, NJ	1981
	Pfizer Pharmaceuticals, Inc.	Barceloneta, PR	1979
	Merck Sharp & Dohme	Barceloneta, PR	1979
	County of Nassau	Mineola, NY	1981
	County of Westchester	White Plains, NY	1981
	West Long Beach Sew. Dist.	Atlantic Beach, NY	1981
	Oxochem Enterprises	Ponce, PR	1977
	Puerto Rico Olefins Co.	Ponce, PR	1978
	Whippany Paper Board Co.	Whippany, NJ	1977
	IMC Chemicals Co.	Newark, NJ	1977
	City of Glen Cove	Glen Cove, NY	1981
	Rehels Chemical Company	Berkeley Hts., NJ	1978
	Bristol Alpha Corporation	Barceloneta, PR	1979
	S.B. Penick & Co.	Montville, NJ	1977
	Pfizer, Inc.	Parsippany, NJ	1977
	J.T. Baker Chemical Co.	Phillipsburg, NJ	1977
	Keuffel & Esser	Morristown, NJ	1977
	Schering Corp.	Manati, PR	1979
	General Marine	Bayonne, NJ	1978
	Crompton and Knowles	Reading, PA	1979
	City of Camden	Camden, NJ	1977
	E.I. duPont de Nemours	Edge Moor, DE	1980
	Caldwell STP	Caldwell, NJ	1978
	Kearny STP	Kearny, NJ	1981
	Matawan Township MUA	Matawan Township, NJ	1977
	Neptune Township STP	Neptune Township, NJ	1978
	Ocean Grove STP	Ocean Grove, NJ	1978
	West New York STP	West New York, NJ	1981
	Wood-Ridge STP	Wood-Ridge, NJ	1981
	Oakland STP	Oakland, NJ	1978
	Pompton Lakes STP	Pompton Lakes, NJ	1978
	Wanaque STP	Wanaque, NJ	1980
	Wayne STP	Wayne, NJ	1978
	Cedar Grove STP	Cedar Grove, NJ	1981
	Chatham STP	Chatham Township, NJ	1981
	Fairfield STP	Fairfield, NJ	1977
	Morris STP	Morris Township, NJ	1981
	Pequannock, STP	Pequannock, NJ	1980
	Roxbury STP	Roxbury Township, NJ	1981
	Totowa STP	Totowa, NJ	1981
	Lincoln Park STP	Lincoln Park, NJ	1979
	Warren STP	Warren Township, NJ	1977
	Washington MUA	Washington Township, NJ	1981
	West Milford MUA	West Milford, NJ	1977
	Spring Lake Heights STP	Spring Lake Heights, NJ	1977
	Montville Township MUA	Montville, NJ	1977
	Wynnewood S.U. Co.	Freehold, NJ	1977
	Asbury Park STP	Asbury Park, NJ	1981
	Avon-by-the-Sea STP	Avon-by-the-Sea, NJ	1977
	Belmar STP	Belmar, NJ	1977
	Atlantic Highlands STP	Atlantic Highlands, NJ	1981
	West Paterson STP	West Paterson, NJ	1980
	Passaic Township STP	Passaic Township, NJ	1981
	Washington Township MUA	Washington Township, NJ	1981
	Northeast Monmouth County Region Sewerage Auth.	Monmouth Beach, NJ	1981
III	City of Philadelphia	Philadelphia, PA	1981

Figure II

OCEAN DUMPING BY COAST



slightly since those phased out have been primarily small volume dumpers. The remaining industrial permittees include a number of large volume dumpers who are developing alternatives to ocean dumping.

The slight increase in the amount of sewage sludge being ocean dumped off the Atlantic Coast is due primarily to additional levels of treatment for municipal waste, not to an increased number of municipal dumpers. About 5 million tons of municipal sludge were dumped in the New York Bight in 1976. Upgrading present treatment facilities to secondary treatment to obtain a 90% reduction of biochemical oxygen demand (BOD) and suspended solids, plus treatment of the present raw sewage discharges, will significantly increase the volume of sludge to be handled. Until environmentally acceptable alternative sludge disposal methods are developed, ocean dumping is the only practical means of disposing of the present and projected increased volumes generated by existing dumpers.

The decrease in construction rubble ocean dumped in 1975 and 1976 was due primarily to the cessation of the work on the Harlem River Water Supply Tunnel. The construction debris from this project had been transported to the ocean and dumped.

As indicated in Table 3 and Figure II, ocean dumping of barged wastes is currently utilized as a disposal technique predominantly on the East and Gulf Coasts for industrial wastes and on the East Coast alone for sewage sludge. This is not because these areas have failed to fully pursue alternatives to ocean dumping, but rather a combined result of historical usage of ocean dumping and the immediate unavailability of alternate methods of disposal.

Both the use of ocean outfall pipes and the availability of land for disposal on the West Coast have made the barging of wastes to the ocean unnecessary. Inland disposal of municipal effluents and sludges in the Gulf Coast states has precluded the development of ocean dumping of municipal wastes into the Gulf of Mexico. On the other hand, it has been those areas open to the sea with a high density of population and industrial development such as metropolitan New York-New Jersey and Philadelphia that have turned to ocean dumping. Now these industries and municipalities are being required to evaluate alternatives to ocean dumping to determine what is the most environmentally acceptable method of disposal.

In 1976, 11 ocean disposal sites were in active use (Figure III) for municipal and industrial wastes. The primary type of wastes being dumped at each site, as well as the projected phase-out dates for the current permittees at each site, are indicated in Table 7.

Enforcement

The USCG's present enforcement program objectives are 75 percent surveillance of the transportation and dumping of materials at EPA's mixed industrial waste sites and 10 percent surveillance of other disposal operations involving sewage sludge construction rubble, acid wastes, and dredged materials. Some surveillance methods currently being used include escort or interception of dumping vessels by USCG vessels or aircraft, comparison of dumpers' logs with permits and with USCG notification and sighting logs, and use of shipriders to ascertain position and dumping rate. Other operationally available methods include the use of shore-based vessel traffic services (VTS) radar, in-port boardings and inspections and a sample verification program. An on-board electronic surveillance device is under development to supplement the other methods.

In 1976 the Coast Guard received reports from permittees of 250 dumping operations involving mixed industrial wastes and 4,606 dumps of other permitted materials. A total of 806 surveillance missions were conducted by the Coast Guard of these disposal operations, 140 for industrial wastes and 666 for other materials, in some cases observing more than one dumping vessel on each mission.

Of the 806 missions conducted, 149 were performed by vessels, 507 by aircraft, 90 by shipriders, and 60 by radar tracking of vessel traffic (VTS). In addition to boardings conducted in conjunction with the shiprider program, there were 123 in-port boardings conducted to check for valid permits, examine logs and records, and to verify compliance with other permit provisions such as vessel marking and equipment requirements.

During 1976, 33 cases were reported to EPA by the Coast Guard consisting of 422 separate alleged violations of the Act, permit conditions, and EPA regulations. The majority of these alleged violations, 411 of the 422, involved a failure to properly provide the Coast Guard with advance departure notification. Of the remaining eleven violations, six involved off-site dumping, two dumping without a permit, two failure to have an effective permit on board the vessel, and one failure to maintain radio contact with the Coast Guard.

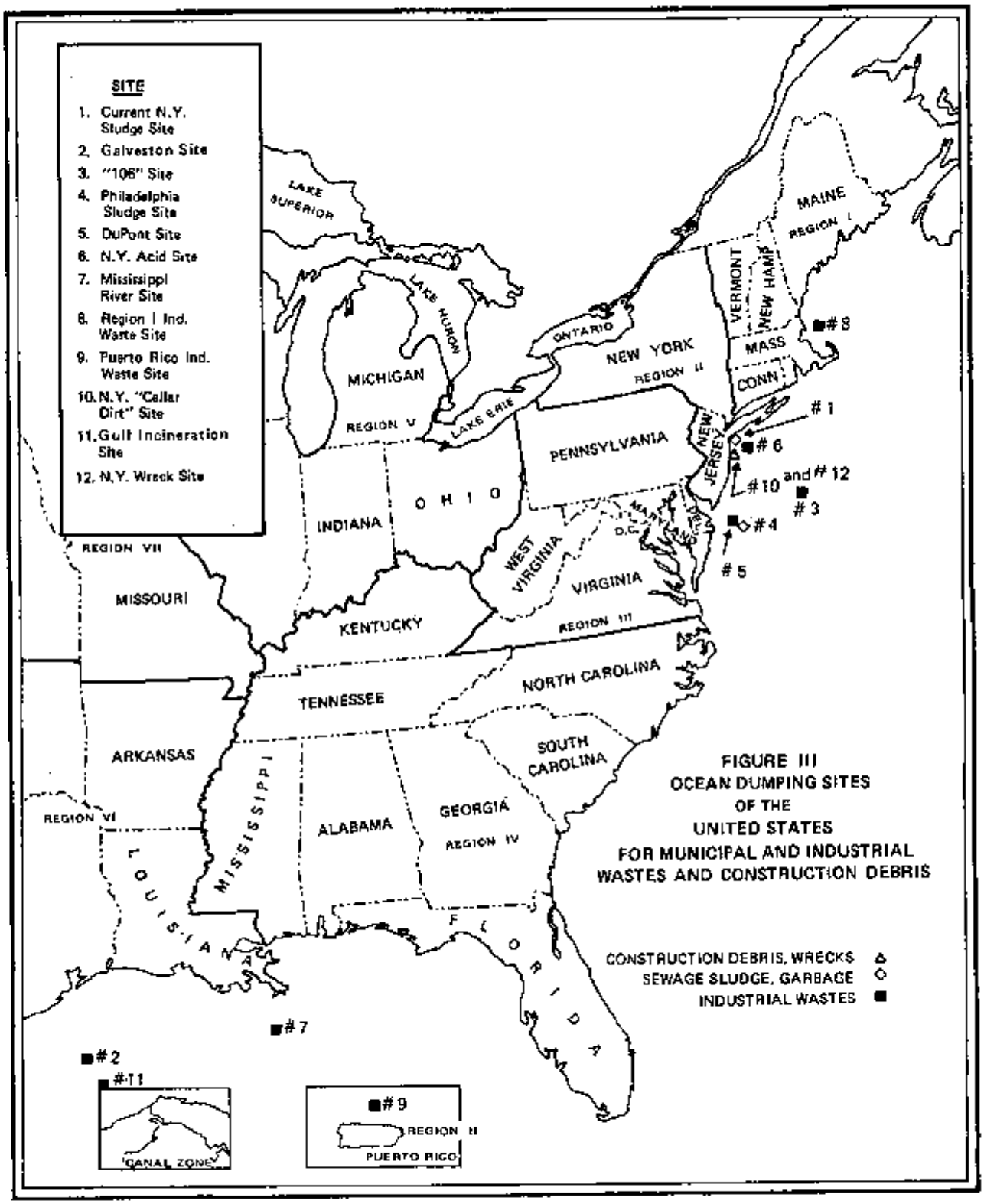


FIGURE III
OCEAN DUMPING SITES
OF THE
UNITED STATES
FOR MUNICIPAL AND INDUSTRIAL
WASTES AND CONSTRUCTION DEBRIS

TABLE 7

Ocean Dumping Sites For Municipal And Industrial Wastes

Site	Location	Primary Use	Phase Out Date for Current Dumpers at Site
1. Region II Sludge (N.Y. Sludge Site)	40° 22'30"N to 40° 25'00"N 73° 41'30"W to 73° 45'00"W	municipal sewage sludge	December 1981
2. Region II Industrial Wastes Site (Galveston Site)	27° 12'00"N to 27° 28'00"W 94° 28'00"N to 94° 44'00"W	industrial wastes	Dumpers under strict implementation plan to develop alternatives to ocean dumping
3. Region II Industrial Wastes Site ("106" Site)	38° 40'00"N to 39° 00'00"N 72° 00'00"W to 72° 30'00"W	industrial wastes	December 1981 or bring waste within limitations of criteria (all but 2 dumpers out by May 1980)
4. Region III Sludge Site (Philadelphia Sludge Site)	38° 20'00"N to 38° 25'00"N 74° 10'00"W to 74° 20'00"W	municipal sewage sludge	January 1981
5. Region III Acid Site (DuPont Site)	38° 30'00"N to 38° 35'00"N 74° 15'00"W to 74° 25'00"W	acid wastes	May 1980
6. Region II Acid Site (N.Y. Acid Site)	40° 16'00"N to 40° 20'00"N 73° 36'00"W to 73° 40'00"W	acid wastes	December 1981 or bring waste within limitations of criteria
7. Region VI Industrial Wastes Site (Mississippi River Site)	28° 00'00"N to 28° 10'00"N 89° 15'00"W to 89° 30'00"W	industrial wastes	Dumper under strict implementation plan to develop alternatives to ocean dumping
8. Region I Industrial Wastes Site	43° 22'30"N to 40° 25'00"N 73° 41'30"W to 73° 45'00"W	industrial wastes	Dumper under strict implementation plan to develop alternatives to ocean dumping
9. Region II Industrial Wastes Site (Puerto Rico Site)	18° 10'00"N to 19° 20'00"N 65° 35'00"N to 66° 50'00"W	industrial wastes	November 1979
10. Region II Construction Debris Sites (NY "Cellar Dirt" Site)	40° 23'00"N , 73° 49'00"W 0.6 nautical mile radius	construction or demolition debris	None
11. Region VI Gulf of Mexico Ocean Incineration Site	27° 06'12"N, 93° 24'15"W 26° 32'24"N, 93° 15'30"W 26° 19'00"N, 93° 56'00"W 26° 52'40"N, 94° 04'40"W	at-sea incineration	Site designation approval expires September 1981
12. Region II Wrecked Vessel Dump Site (NY "Wreck" Site)	40° 10'00"N, 73° 42'00"W 0.5 nautical mile radius	wrecks	None; use authorized under general permits

When alleged violations are reported by the Coast Guard, the appropriate EPA Regional Office follows up on the case. Warning letters were sent in 22 of the cases involving failure to notify the Coast Guard in advance of departure. The Regional offices investigated all other cases and, where a violation was substantiated, issued notices of violation under EPA enforcement regulations.

In addition to surveillance provided by the Coast Guard, alleged violations sometimes are detected by EPA and occasionally reported to EPA by other organizations or citizens. From these reports, EPA issued notices of violations in 1976 in 8 other cases in which penalties have been assessed or final determinations are pending.

Enforcement actions taken by EPA during 1976, as well as the disposition of each case, are shown in Table 8.

TABLE 8

ENFORCEMENT ACTIONS - 1976

ORDER NO.	RESPONDENT'S NAME	REFERRAL FROM	TYPE OF VIOLATION	NOTICE OF VIOLATION	DISPOSITION	DISPOSAL SITE
Region II						
76-1	Schering Corp.	EPA	Permit reporting requirement	6/29/76	Pending	Chemical wastes P.R.
76-2	Fritzche D&O	EPA	Permit reporting requirement	6/29/76	Final Order- 9/1/76 $500 penalty payment	Chemical wastes
76-3	Whippany Paper-board Co., Inc.	EPA	Permit reporting requirement	6/22/76	Pending	Sewage sludge
76-4	S.B. Thomas, Inc.	EPA	Permit reporting requirement	7/22/76	Final Order- 9/9/76 $500 penalty payment	Sewage sludge
76-5	International Wire Products, Inc.	EPA	Permit reporting requirement	7/22/76	Final Order- 9/20/76 $1,000 penalty payment	Chemical wastes
76-6	Spentonbush Transport Services, Inc.	USCG	No permit aboard towing vessel	7/22/76	Final Order- 9/30/76 $200 penalty payment	Chemical wastes
76-7	General Marine Trans. Corp.	USCG	Failure to properly notify Coast Guard of sailing	7/22/76	Awaiting Hearing Officer's determination	Chemical wastes
76-8	Whippany Paper-board Co., Inc.	EPA	Failure to file timely application	Waived	Final Order- 10-18-76 $3,500 penalty payment	Sewage sludge
76-9	Gates Construction Corp. & C.H. Towing Co.	COE	Dumped outside authorized site, dumping floatables, transporting floatables for purpose of dumping	10/21/76	Pending	Dredged Material
76-10	Allied Chemical Corp.	USCG	Dumped outside authorized dump site	11/12/76	Pending	Acid wastes
76-11	The City of New York	USCG	Dumped outside authorized site	11/12/76	Pending	Sewage sludge

(TABLE 8 CONT'D)

ENFORCEMENT ACTIONS - 1976

ORDER NO.	RESPONDENT'S NAME	REFERRAL FROM	TYPE OF VIOLATION	NOTICE OF VIOLATION	DISPOSITION	DISPOSAL SITE
Region III						
-	City of Philadelphia	EPA	Failure to adhere to compliance schedule and reporting requirements	11/17/76	Pending-Adm. Law Judge recommended $225,000 penalty	Philadelphia
Region IV						
-	Elco James, Port Richey, Fla.	USCG	Illegal dumping without permit of F/V HI-MAK in Gulf of Mexico, 25 miles west of Hudson, Fla.	8/24/76	No penalty assessed since vessel remains were removed	Gulf of Mexico
-	Ralph Rawson City of Manager Madiera Beach, Fla.	USCG	Illegal dumping without approval of houseboat in Gulf of Mexico, 12 miles offshore on Pinellas Co. artificial fishing reef	8/24/76	No penalty assessed since effort was made to contact appropriate agency	Gulf of Mexico
-	Oceanic Operations Corporation	USCG	Illegal dumping without permit of planks and other material in Atlantic Ocean off St. Lucie Inlet	5/5/76	Final Order-6/7/76 $1,000 penalty paid	Atlantic Ocean
-	Walter Byrd, Byrd Commercial Diving Company Key West, Fla.	USCG	Illegal Dumping without permit of derelict barge in Atlantic Ocean 3 miles off Fowey Rock Light	12/28/76	Pending	Atlantic Ocean
Region VI						
-	Ethyl Corp.	USCG	Dumped outside authorized dump site	-	Violation occurred Jan. 1976 while permittee was installing equipment required under 1975 enforcement action; no penalty assessed	Central Gulf
-	Ethyl Corp.	USCG	Failure to maintain radio contact with Coast Guard	-	No penalty assessed; Coast Guard given authority under permit to send barge back to port	Central Gulf

CHAPTER III

IMPORTANT EVENTS OF 1976

International Ocean Dumping Convention

The Convention on the Prevention of Marine Pollution By Dumping of Wastes and Other Matter became effective on August 30, 1975. See Appendix B. By the end of 1976, approximately thirty nations had ratified or acceded to the Convention (Table 9). In accordance with the provisions of Article XIV(1) of the Convention, the first meeting of the contracting parties was held in London, England on December 17 and 18, 1975, and included delegations representing 22 contracting parties, 50 observer states, and 13 observer organizations. The contracting parties adopted resolution LDC(7) Rev I which designated the Intergovernmental Maritime Consultative Organization (IMCO) to be responsible for Secretariat duties in relation to the Convention.

In view of the importance attached to the Ocean Dumping Convention, the U.S. Department of State established a subcommittee within the Shipping Coordinating Committee to ensure coordination among government agencies and to provide for public comment on U.S. positions regarding the implementation of the Convention. In addition, the first meeting of the Advisory Committee on Ocean Dumping, consisting of Federal Agencies and private organizations also appointed by the State Department, was held on March 25, 1976, and was chaired by EPA. The purpose of the meeting was to obtain comments on the draft U.S. submission to IMCO on the proposed agenda for the first consultative meeting in September 1976 at IMCO Headquarters.

The First Consultative Meeting was held in London, England, on September 20-24, 1976. Delegations representing 14 of the 29 contracting parties, 23 observer states, and 9 observer organizations attended the meeting. Agenda items included reporting requirements (Appendix C), interim procedures for emergency situations, and the position of the Convention regarding incineration at sea. Other areas of high priority for consideration at subsequent meetings include a definition of "trace contaminants," the position of the Convention on radioactive wastes disposal, and revisions to the reporting requirements.

TABLE 9

Governments Which Have Ratified or Acceded to the Convention

Afghanistan

Byelorussian SSR

Canada

Cuba

Dominican Republic

Denmark

Guatemala

Haiti

Uruguay

Iceland

Jordan

Kenya

Mexico

New Zealand

Nigeria

Norway

Panama

Philippines

Spain

Sweden

Tunisia

Ukrainian SSR

USSR

United Arab Emirates

United Kingdom

United States

Yugoslavia

Zaire

Hungary

German Democratic Republic

France

Morocco

Cape Verde

Publication of Revised Regulations and Criteria

The Ocean Dumping Permit Program went into effect April 1973 under interim regulations and criteria. Final regulations and criteria were published on October 15, 1973. Operating experience, recent advances in scientific knowledge, and comments and petitions for changes all indicated that the regulations and criteria needed revision and a proposed revision to the Regulations and Criteria was published on June 28, 1976. In compliance with the EPA's policy of voluntarily preparing EIS's on certain regulatory actions, a Draft EIS was prepared on the proposed revisions to the criteria and released in July 1976.

Over eighty sets of comments were received on the proposed revisions and on the Draft EIS. In order to resolve some of the scientific questions on the criteria, EPA convened a 2-day technical workshop in Washington D. C. in October 1976. The subsequent Final Revision of the Regulations and Criteria was signed by the Administrator of EPA on December 30, 1976, and published in the Federal Register on January 11, 1977. A Final EIS was prepared to support the finalized revisions.

The final revisions to the ocean dumping regulations and criteria affect both the procedures to be followed in reviewing applications for ocean dumping permits and the substantive criteria to be applied in evaluating those applications.

The Agency believes that changes in the regulations were appropriate for several reasons:

Operating experience of EPA pointed to several ways in which the regulations required modification. There was a need to specify in more detail the factors which will be considered by EPA in determining whether to issue a permit. The former regulations did not adequately address the regulation of ocean dumping sites. Also, the former regulations required clarification with respect to the disposal of dredged material.

A petition for additional rulemaking by the National Wildlife Federation was received in April of 1974 which pointed out several areas in which the regulations then in force required changes if they were to completely satisfy the Act, the Ocean Dumping Convention, and the Amendments to the Act in light of the Convention which were brought about by P. L. 93-254 (March 22, 1974). The final regulations reflect agreements on procedures reached at the first Consultative Meeting of the Convention.

In addition to the petition from the National Wildlife Federation, one individual had requested that the emergency permit provisions contained in the regulations be modified to require more adequate public notice and opportunity for hearing prior to issuance of those permits. EPA has thoroughly revised and expanded the ocean dumping regulations and criteria to allow for greater public participation in the entire program.

The Agency held several major hearings on applications to dispose of materials. The experience of these hearings and that of the Regional Administrators in reviewing applications prompted several suggestions as to ways in which the former regulations and criteria could be improved to more adequately address the implementation of the Act and Convention, and to address problems encountered by the Regional Administrators.

The criteria have been modified to reflect recent advances in scientific knowledge, but there is no change in EPA's intent to end the ocean dumping of unacceptable materials as rapidly as possible.

Ocean Incineration Investigations

Since September 1974 EPA has construed the Act as regulating ocean incineration. Therefore, ocean incineration requires an ocean dumping permit from EPA and involves the designation of an ocean disposal site where incineration is authorized. EPA believes that ocean incineration is an acceptable alternative, under carefully controlled conditions, to the direct dumping of the material into the marine environment. Ocean incineration is a waste burning process whereby chemical wastes are taken aboard specially designed and equipped vessels and transported to specified locations in the ocean for disposal by incineration under carefully controlled conditions.

On October 4, 1974, a public hearing was held in response to Shell Chemical Company's application for a permit to incinerate organochlorine wastes in the Gulf of Mexico. As a result of the hearing, Shell Chemical Company was granted a research permit authorizing at-sea incineration of 4,200 metric tons (one ship load) of organochlorine wastes subject to specific conditions and monitoring activities. A second research permit was issued on November 27, 1974, and an interim permit was issued on December 11, 1974, for incineration of an additional 8,400 metric tons of waste. The incineration of Shell wastes was completed on January 7, 1975, and EPA published a final report on the results of the research burns in July 1975. In October 1976, a 3-year special permit was issued to the Shell Chemical Company for incineration at sea of its organochlorine wastes in the Gulf of Mexico.

During the organochlorine waste incineration tests in the Gulf of Mexico, EPA undertook a sampling and analysis program to acquire the data necessary for evaluating the efficiency of the incineration for those particular wastes. Although these efforts provide an assessment of the acute effects of incinerating organochlorine wastes, a better understanding of the potential long-term effects of ocean incineration is needed. Evaluation of long-term effects is, in turn, dependent upon the advancement of at-sea monitoring technology which is currently in its early stages of development.

To enable refined analysis of the potential for long-term impacts of ocean incineration, EPA is developing a test program which will:

1. Evaluate a test protocol for ocean incineration based on a similar protocol developed for land incineration. If successful, the test protocol may then be used to standardize equipment and techniques for monitoring ocean incineration.

2. Conduct tests to determine if additional criteria for stack gas emissions are needed which could serve as guidelines for limiting emissions.

3. Acquire additional information to determine if further assessments and evaluations of potential long-term impacts to the environment are required.

The test program being developed for the incineration process at sea is based on recent studies of land-based incineration sponsored by EPA. These studies have resulted in the development of a methodology to characterize the emissions from organochlorine incineration and the adequacy of new waste incineration technology. This new methodology, if successfully applied to ocean incineration, would extend the current state-of-the-art to the monitoring of incineration at sea. Each new incinerator design and each category of waste with different thermochemical properties could then be evaluated by a single standard or protocol, thus providing a uniform basis of comparison of the projected impacts to the environment.

On January 9, 1975, the U.S. Air Force applied for an ocean dumping permit for the ocean incineration of its stocks of Herbicide Orange. The Air Force also requested EPA to assist them in exploring the feasibility of reformulation or reprocessing.

Public hearings were held on the permit application in Honolulu on April 25, 1975, and in San Francisco on April 28, 1975. At these hearings the Air Force presented extensive testimony indicating that the proposed ocean incineration would do no harm to the marine environment or cause any effects in the air. They also indicated an intent to investigate reprocessing proposals by conducting pilot plant studies on a small amount of Herbicide Orange to see whether the claims made by the reprocessing firms were valid. They requested a reconvening of the hearing in Washington, D.C., at a later date, after the pilot plant studies were completed. The pilot plant studies were initiated by the end of 1975. Several attempts at reprocessing the Herbicide Orange were conducted in 1976. By the end of the year, however, it became apparent that there were problems with reprocessing and that ocean incineration might once again become the best alternative for disposal of Herbicide Orange.

New York and New Jersey Coastal Pollution Problems During 1976

Two incidents occurred in 1976 that drew considerable attention to EPA ocean dumping permits for municipal sewage sludge. These permits regulate the ocean dumping of sewage sludge at two ocean dumping sites in the Atlantic Ocean - one 12 miles out from the entrance to the New York Harbor off the coasts of New York and New Jersey and the other 40 miles off the Delaware-Maryland coast. Barged disposal of sewage sludge occurs only in the Atlantic Ocean and then only from municipalities in the New York-New Jersey metropolitan area and Philadelphia-Camden area.

One incident was the washup of "floatables" on New York's Long Island beaches in late spring and early summer of last year. The other was the extensive fish kill that occurred off the coast of New Jersey last summer. Some people charged that sewage sludge dumping was responsible for these incidents. However, the results of several scientific investigations by Federal and State agencies and by academic and private groups found that sludge dumping would have been no more than a minor contributing factor.

Long Island Beach Pollution

Most of New York's Long Island beaches were closed during part of June 1976 due to trash and other materials which floated onto the beaches with the winds and the currents. The beach pollution began in early May when large quantities of grease and tar balls washed upon the shore shortly after an oil spill from a fuel barge in Upper New York Bay.

Although this pollution was cleaned up, other events occurred in May and early June which caused further problems. An oil storage tank in Jersey City, New Jersey, spilled large quantities of oil into the Hackensack River. Two sewage sludge storage tanks exploded at the west end of Long Island and spilled over a million gallons of sewage sludge into the water. Pier fires in Weehawkin, New Jersey, and Manhattan, New York, dumped tons of debris in the nearby waters. Meanwhile, the flow of the Hudson River remained above normal for most of May providing greater flushing action in the estuary. Finally, the month of June was characterized by predominately southerly winds.

On June 14, the U.S. Coast Guard station at Fire Island received reports of unusual amounts of floatable washing upon the beaches. These materials included grease and tar balls, plastics, rubber, charred wood, and general trash--such as cigarette and cigar tips, paper, bread wrappers, soda cans, and vegetable wastes.

The major sources of the floatable material were raw sewage discharge, inadequately treated wastewater discharges, combined sewer overflows, urban runoff, and solid wastes barging operations in New York Harbor. Minor contributions were made by discharges from vessels in the area, ocean dumping of sewage sludge and dredged materials, sanitary landfill operations, and beach litter. These floatables were propelled onto Long Island beaches by the relatively strong and persistent southerly winds.

A Federal task force composed of EPA, NOAA, the Coast Guard and the National Park Service was created after the first reports to determine the cause of the pollution, and Federal, State and local agencies met to discuss the problem. Although total coliform levels were extremely high in the grease balls which were examined, water samples during the incidence showed total coliform levels well within the New York State standard for swimming. By July 1, beach conditions had returned to normal.

New Jersey Fish Kill

Reports during the July 4th weekend of 1976 from sport divers indicated observations of dead fish and invertebrates on or around shipwrecks off the north Jersey Coast. Initial investigations show depressed levels of dissolved oxygen. This anoxic condition expanded and moved southward in August. At the same time, unusual concentrations of fish were found near the beach and in the bay and estuaries, most likely avoiding the anoxic area. Extensive mortalities occurred in surf clams, quahogs, lobsters, and other demersal fish and invertebrates.

The fish kill resulted from the extended period of low oxygen concentrations in the bottom water below the approximate depth of the thermocline (the interface between the warmer surface water and the cool bottom water). The low dissolved oxygen condition was caused by the degradation of dead organisms resulting from a massive phytoplanktonn (microscopic algal) bloom. The major component was identified by NOAA as ceratium.

A combination of climatic conditions and the addition of plant nutrients to the ocean waters off New Jersey from a variety of sources led to the algal bloom. Sewage sludge is not among the major sources of plant nutrients, and no study on the fish kill found a direct association of sludge dumping and the offshore algal bloom.

CHAPTER IV

BASELINE AND MONITORING SURVEYS OF DUMP SITES

Section 102(c) of the Act authorizes the Administrator to designate recommended sites and times for dumping, considering the criteria of Section 102(a). When the interim regulations were published, a list of interim dump sites was included. These sites were selected from existing information on ocean dumping and were selected based on historical usage, not on environmental criteria governing the selection of sites to minimize damage to the marine environment. This was recognized as a temporary expediency, and EPA has since made the commitment that it will comply with EPA's regulatory EIS procedures in the designation of ocean dumping sites for continuing use.

The revised regulations establish the procedures by which ocean dumping sites will be designated for continuing use. These procedures include the preparation of an EIS for virtually all ocean dump sites designated on a permanent basis.

The requirements of the Act and the EPA policy on EIS's on ocean dumping sites make necessary the collection of a large amount of environmental data, at the site itself and in nearby areas, to form the basis for an environmental assessment of the site and to predict the impact of dumping on the site. The data collection requirements needed for an environmental assessment of a dump site have been formalized into a standard baseline survey guideline.

This baseline survey guideline was developed in consultation with NOAA and will serve as the basic plan for all baseline surveys, with appropriate modifications being made to meet special situations. The basic plan in any baseline survey is to take samples of both water and sediments to determine the levels of specific chemical parameters in and near the dump site. Of particular interest are trace metals and persistent organic compounds that might be present in wastes dumped at the site. Samples are also taken of living organisms at and near the site in the water column, at the bottom, and in the sediments. This broad scale sampling is needed to provide data on the widest possible range of ecological features at the dump site so that an accurate assessment can be made of the possible impact of pollutants at the dump site. Before any acceptable appraisal of conditions at a dump site is possible, the full range of seasonal or other periodic variations in conditions must be observed. The baseline survey program began during FY 1974, and additional studies have been conducted on a continuing basis since that time (Table 10). A brief synopsis of each baseline survey presently being conducted follows.

TABLE 10

Dump Site Designation and Monitoring

Site	Accomplished to Date	Remains To Be Done
N.Y. Sludge Site	Monthly surveys since April 1974	monitoring surveys
Proposed Alternate N.Y. Sludge Site	3 surveys completed	quality control studies
N.Y. Acid Site	None	4 surveys
N.Y. "Cellar Dirt" Site	None	2 surveys
"106" Site	3 surveys completed (NOAA)	monitoring surveys
Philadelphia Sludge Site	8 surveys completed + 5 special surveys completed	2 surveys + monitoring studies
DuPont Site	8 surveys completed + 5 special surveys completed, combined with Phil. Site Surveys	monitoring studies
Puerto Rico Site	None	3 surveys
Galveston Site	None	3 surveys (NOAA)
Mississippi River Site	None	3 surveys
Gulf Incineration Site	4 surveys completed; 2 EPA, 1 contract, 1 by Shell Chemical	---
Region I Industrial Site	None	3 surveys
SPECIAL STUDIES	**Accomplished to date**	**Remains To Be Done**
Biotal Ocean Monitor System Development	Two sizes of prototypes designed and tested at sea	Design and test benthic model; develop biological test procedures.

1. Sewage Sludge Dump Site in the New York Bight

Sewage sludge from the New York-New Jersey metropolitan area is currently being dumped at a site approximately twelve miles from shore. While no impact on the shores has yet been indicated in EPA studies from sludge dumped at this site, increased sewage treatment in the New York-New Jersey metropolitan area will result in greater volumes of sludge to be disposed of during the next few years. Much of this sludge may have to be ocean dumped at this site as an interim measure until an alternative form of ultimate disposal is selected and implemented.

In early 1974, EPA requested NOAA to recommend other areas in the New York Bight for study as alternate sludge dumping sites. NOAA recommended two areas, one north and one south of the Hudson Canyon. EPA has completed studies, by contract, of the north area recommended by NOAA about 60 miles from shore. The first survey was conducted during September and October 1974; the second during January and February 1975; and the third survey during July and August 1975.

EPA also supported studies by NOAA in other parts of the New York Bight and used the results of these studies, as well as its own studies, to prepare an EIS on ocean dumping of sewage sludge in the New York Bight. This EIS was made available, in draft form, for public comment in February 1976. The conclusions reached in the EIS were that dumping should continue at the existing site, that a comprehensive monitoring program should be maintained for the existing site, and that the alternate site should be designated so that it can be used when and if the monitoring program indicates that the existing site cannot safely accommodate any more sewage sludge. Steps are now being taken to implement the conclusions reached in the EIS.

2. Philadelphia/Camden and DuPont Dump Sites off Delaware Bay.

There were two active disposal sites in Region III during 1976, both located approximately 40 miles off the Maryland/Delaware coast (Sea Figure III). The site designated as the DuPont site was recommended by the U. S. Interior Department's Bureau of Commercial Fisheries in 1968. Ocean disposal of DuPont's wastes began in September 1968, in an area centered about 10 nautical miles southwest of the designated site on a temporary basis. This alternate area (later designated as the Philadelphia/Camden site) was used until July 1969, pending completion of predisposal surveys in the designated site. The surveys were completed in June 1969, and barging began in the DuPont site in July 1969. Monitoring and dispersion studies were conducted

under EPA grants at the DuPont site between 1970 and 1976.

The Philadelphia/Camden site was designated in May 1973 with the beginning of the Ocean Dumping Permit Program. Prior to May 1973, the Cities of Camden and Philadelphia utilized a site approximately 11 miles seaward of the mouth of the Delaware Bay.

EPA Region III, in May 1973, initiated a field monitoring program on the two active dumpsites. The program was designed with emphasis on the longer term, more persistent effects, especially on the benthic environment, as contrasted to the more transient effects in the water column. To supplement the field monitoring, special studies were conducted to determine such things as waste dispersion and transport, in situ waste toxicity and bacterial decay.

Since the last annual report, cruises were conducted in December 1975, June 1976 and August 1976. About 20-25 historical stations were sampled on each survey. An intensive bottom sampling grid, with stations one mile apart, was also part of the surveys in the sewage sludge site.

Special studies conducted in 1976 included the following: a description of inferred bedload transport in the dump areas; the development of a mathematical model of dispersion and settling of sewage sludge in the Philadelphia site; a description of surface and mid-level circulation in the disposal area; and the initiation of an extensive and exhaustive compilation of data and literature pertinent to the area. It is EPA's intent to begin preparation of a detailed environmental assessment of ocean dumping at the Philadelphia dump site.

3. Mixed Industrial Wastes Dump Site, East of Cape Henlopen, Delaware. ("106" site)

This dumpsite is located 106 nautical miles southeast of Ambrose Light (at the entrance to New York Harbor) and approximately 90 nautical miles due east of Toms River, New Jersey. The area is bounded by 38°40'N to 39°00'N and 72°00'W to 72°30'W. The site is off the continental shelf at depths ranging from 1,550 meters(m.) in the northwest corner of the site to 2,750 m. in the relatively flat southeast corner.

The bottom, for the most part, is characterized by a rugged topography. A major topographic feature of the region, the Hudson Canyon, is to the north, northeast, and east of the dump site.

This site is used by over 17 different permittees primarily in the New Jersey area for the disposal of industrial chemicals.

Typical waste materials include water solutions of inorganic salts with trace amounts of organic materials, liquid wastes from manufacture of non-persistent organophosphate pesticides, liquid wastes from textile manufacturing, residual sludges from galvanizing and plating operations, and similar materials resulting from diverse manufacturing processes. Containerized radioactive wastes were dumped in a location just south of the present site several years ago and prior to enactment of the Act.

In May 1974 NOAA began a series of baseline surveys of this dumpsite in cooperation with EPA, the Virginia Institute of Marine Sciences, the Woods Hole Oceanographic Institution, the Lamont-Doherty Geological Observatory of Columbia University, and the Smithsonian Institution. The cruise report has now been completed.

Additional cruises were conducted in July 1975. The July cruise made use of the manned submersible ALVIN, and data were also collected at the radioactive waste dumping area south of the dump site.

The hydrography of the dump site area is complex and the currents are seasonally variable. Any one of three water masses may be present at different times or at different levels in the water column; shelf, slope, and Gulf Stream water have all been identified. Circulation patterns are affected by mixing across frontal zones. Currents run predominantly southward along the coast, while the Gulf Stream runs generally northeastward.

The slope water may circulate in a cyclonic gyre. Surface circulation is primarily a function of season. In addition to hydrography, studies have also been made in the water column of the occurrence and, in some cases, relative abundance of nutrients, zooplankton, ichthyoplankton, and nekton. The ocean bottom at the dumpsite has also been investigated by means of echo-sounding, photography, trawling, and quantitative sampling in order to describe aspects of geology, geochemistry, and benthic fauna. Investigations have been made of heavy metal and other contaminants in water, sediments, and in the tissues of larger benthic fishes and invertebrates.

In February 1976, NOAA and EPA sponsored a third baseline study cruise of the 106-mile dump site, using the NOAA R/V OREGON II. A variety of environmental data was collected under winter conditions to define statistically spatial and temporal marine environmental variations. Selected research was also conducted on the reactions of specific pollutants being dumped. Primary support was provided by scientists at Woods Hole Oceanographic Institution, by the University of Rhode Island, and by NOAA's National Marine Fisheries Service laboratories. These efforts will be combined with other seasonal surveys to develop as environmental baseline of the 106-mile dump site.

Two large-scale experimental studies were also carried out at this site later in 1976; one in June using the USCG cutter DALLAS and the submersible ALVIN; and one in August using the Woods Hole ship R/V KNORR. These studies included the tracking of waste materials using acoustic methods and investigations of biological effects.

Scientists have been able to follow plumes of pollutants dumped at the site for up to 24 hours. Some low-density wastes mixed rapidly with surface waters, while other wastes sank more rapidly and formed layers in various regions of discontinuity (pycrocline). The presence of waste layers poses concern of possible effects in two major components of the food web: planktonic animals and small vertically migrating species of fish. None of the wastes dumped at the 106-mile site apparently reaches the bottom in that vicinity.

Findings to date are indicative of the difficulties inherent in measuring and predicting waste disposal effects in areas off the Continental Shelf. Conditions such as depth, distance from shore, swift and complex ocean currents, and different water mass boundaries make for both effective waste dispersal and difficult monitoring of effects. NOAA and EPA are now entering a monitoring phase in this area leading to assessment and prediction of ocean dispersal effects.

4. Gulf Incineration Site

As a result of two burns under research permits and two burns under an interim permit of the organochlorine wastes from the Shell Chemical Company, environmental data on the site and on the impacts of burning at the site were collected. A report on the entire program of this incineration has been published, and about 2,000 copies have been distributed.

Draft and Final Environmental Impact Statements have been published regarding the site, and the designation of the site for ocean incineration of organochlorine wastes was published in September 1976. With that final designation, this site became the first ocean dump site that has been approved on other than an interim basis. The designation provides for a period of use through September 1981.

5. Radioactive Waste Dump Site Surveys

Since 1974 the EPA Office of Radiation Programs has conducted a program of environmental assessment surveys at three of the four primary radioactive waste disposal sites used between 1946 and 1970. Although ocean dumping of radioactive wastes by the United States was discontinued in 1970, recent problems with existing land burial sites and a national policy decision to look at all radioactive waste management alternatives has resulted in renewed consideration of the ocean disposal option, for which EPA has the regulatory authority.

As a result of surveys of the Pacific dump sites at depths of 900 m. and 1700 m. off the California coast, and the Atlantic 2800 m. dump site off the Maryland-Delaware coast, two basic conclusions have emerged:

(1) Techniques formerly used to package the radioactive wastes for ocean disposal were, in general, not adequate to insure that the wastes would remain isolated from the surrounding environment.

(2) If ocean disposal of low-level radioactive wastes were to commence in the future, the technology currently exists to precisely survey or monitor a deep ocean site to detect the possible release and movement of selected radionuclides and to recover waste packages disposed at depths up to 2800 m.

A. Farallon Islands 1700 m. Dump Site

The EPA Fourth Annual Report on Ocean Dumping discussed the preliminary findings of plutonium contamination in the sediments at the 1700 m. site at levels comparable to those found at the 900 m. site in a 1974 survey. Since that time the radioanalysis of sediments from the 1700 m. dump site has been completed and all of the samples analyzed showed plutonium-239, -240 concentrations in surface sediments at levels 3 to 30 times higher than the maximum expected concentration that could have resulted from weapons testing fallout alone. Plutonium-238 was also detected in the surface sediments but at concentrations lower than the plutonium-239, -240 concentrations. However,

one sediment sample taken close to a visibly imploded container showed plutonium-238 contamination at a level four times higher than the highest plutonium-239, -240 concentration, further confirming that the radioactive waste containers have been the source of the plutonium release at this site.

Although the concentrations of plutonium detected in the Pacific dump sites so far do not represent a risk to man or the marine environment, the dump site does represent a unique study area to develop a radionuclide transport model based on measured processes rather than postulated conditions.

B. Atlantic 2800 m. Dump Site

The EPA Fourth Annual Ocean Dumping Report also discussed preliminary evidence of a measurable directional bottom current in this site. Since that time the first quantitative bottom current measurements in the dump site were made for a three month period from August through October 1976. Initial results indicate the presence of a measurable current with an average velocity of approximately 10 cm/sec and a maximum velocity of 50 cm/sec in the northeast corner of the site--a velocity of sufficient magnitude to transport radioactive materials in solution and adsorbed to sediments. Longer-term measurements must be taken to corroborate what appears to be an anticyclonic gyre-like movement of the bottom water around the dump site and to determine whether significant seasonal variations in the velocity exist.

A comprehensive survey of the dump site was conducted during July-August 1976, using the deep submersible ALVIN. A program of sediment coring at precisely located positions both throughout the 100 square mile dump site area and relative to specific radioactive waste containers was successfully completed. The cores are being analysed to determine: (a) the extent and direction of radionuclide contamination of the sediments, particularly cesium-137, (b) the biological infauna populations within the site, and (c) the sediment retention characteristics at the site.

Of particular significance during the 1976 survey was the recovery of an 80-gallon radioactive waste container from a depth of 2800 m. (9300 feet). The container was dumped approximately fifteen years ago. This recovery is unique and required a specially-designed container attachment device, a computerized precision navigation system, and a special synthetic lift line. The recovered package consisted of a mild-steel container filled with concrete in which the radioactive waste material was

imbedded. The package is being analyzed for metal corrosion rate, and matrix degradation and leach rates. Preliminary evidence suggests that the recovered container has withstood the rigors of its immersion surprisingly well. There appears to be limited surface corrosion and the concrete matrix seems to have cured, becoming more durable although still permeable.

The other major dump site requiring a site-specific study is the Atlantic 3800 m. site located approximately 200 miles east of the Maryland-Delaware coast. Between 1957 and 1959 this site received approximately 15,000 drums of radioactive waste with an estimated activity of 2100 curies at the time of packaging. This site has become more important recently since it would closely approximate conditions at and below 4000 m., which is the minimum acceptable disposal depth currently being considered internationally for radioactive waste disposal pursuant to the International Ocean Dumping Convention.

Significant progress has been made in the environmental assessment surveys of the Pacific Farallon Islands 900 m. and 1700 m. dumpsites and the Atlantic 2800 m. site. A comprehensive report on the results of the 1974-1975 surveys will be issued next year with a report on the above 1976 Atlantic 2800 m. dump site survey scheduled for 1978.

The results of U.S. east and west coast assessment surveys will provide a major part of the technical basis for determining the feasibility of ocean disposal of low-level radioactive wastes in an environmentally acceptable manner. This survey information will also be used in the preparation of a generic Environmental Impact Statement relative to any proposed revisions of the ocean dumping regulations and criteria regarding disposal of such low-level radioactive wastes.

CHAPTER V

ECOLOGICAL EFFECTS RESEARCH IN 1976

EPA's Office of Research and Development has continued to support the mandates of the Act, with an aggressive research program. In Fiscal Year (FY) 1976 the level of effort was directly increased through the allocation of additional money by the Congress for research in the area of ocean disposal. This has allowed a variety of new studies to be started and has increased the level of in-house support.

The most noteworthy progress made in FY 76 was the revision of the Ocean Dumping Regulations and Criteria. These revisions have clarified the criteria by which environmental acceptability is evaluated and allowable waste concentrations are determined. EPA and the COE were jointly responsible for the development of the procedures and methodologies by which these determinations are made. One major change effected by the new regulations is in terms of criteria which require liquid, suspended particulate, and benthic bioassays for many of the waste classes.

The Office of Research and Development also supports the permit and enforcement aspects of the program through its ability to supply technical experts to review permit applications and testify in legal proceedings.

The following descriptions of research projects represent only those specifically responsive to The Act.

Development of Benthic Bioassay Techniques

A bioassay procedure for evaluating the effects of dumping using representative benthic organisms has been established. The survival of the component species will be investigated and related to sediment changes resulting from various depths of introduced materials. Experiments will be performed with natural sediments, polluted sediments and sediments of different particle sizes. Organisms will include polychaetes, amphipods and molluscan species.

. Assessment of the Near-field Dilution and Dispersion of Sewage Sludge in the Wake of Discharging Barges.

Two studies were undertaken, one to examine the physical processes within the water column, the other to examine chemical partitioning and trophic level accumulation of trace metals.

The physical study sought to determine the dispersion of sewage sludge from dumping operations in the New York Bight area. Sludge vessels from metropolitan New York were monitored under controlled discharge conditions while underway and while stopped. Salinity, temperature and depth (STD) and percent light transmission were measured continuously to define the vertical and horizontal limits of the sewage field in space and time. Correlations between extinction coefficients and total suspended matter (TSM) were also made providing a continuous trace of TSM. Laboratory measurements of the physical characteristics of the sludge were determined from samples collected from the sewage vessels. Four data reports are in the final stages of publication and an analysis of the study has been published.

The chemical studies resulted from cruises that examined sludge disposal practices outside the immediate New York Bight area. Serial water samples were taken in the middle and lateral portions of the sludge plume. Conservative constituents of the waste were determined to reveal particulate/dissolved phase partitioning, dilution rates, and physical behavior. The results of these investigations will be used to investigate metals accumulation in several trophic levels of biota and to compare sediment geochemical data. The interactions between sediments and bottom fauna will also be studied.

. Influence of Sewage Sludge and Dredged Material Disposal on Trace Metal Assimilation by Organisms.

This research effort assessed the sediment water exchange rates of metals and nutrients in clean and polluted sediments and studied the influence of bioturbation on the exchange rates. Methods to measure these rates at disposal sites were investigated. Initial results, from measurements of sediments, interstitial, and overlying water reveal that organic leaching rates may control the rate at which metal species become available. In highly polluted areas metals tend to be retained as sulfides, whereas sulfates would exist in less polluted areas where higher oxygen levels prevail. Future work will be initiated to measure the actual flux from dredged material and from clean sediments where organic loadings are essentially absent.

. The Problems of Ocean Dumping Stability and Resiliency in Experimental Ecosystems Exposed to Constant and Time-varying Stresses.

Research was intiated to elucidate the long-term consequences resulting from the discharge of complex wastes, such as sewage sludge, on marine ecosystems. Experimental microcosms are used to study the tolerance, structural changes and metabolic dynamics of an imposed sewage sludge stress. Resiliency and recovery thresholds are also being examined.

. Dredged Material and Sewage Sludge in the Trace Metal Budget of Estuarine and Coastal Waters.

The primary objective of this project is to determine the rate and chemical nature of heavy metal releases from polluted sediments to estuarine and coastal waters. The approach is to analyze sediments, interstitial and overlying waters in selected sample locations (from the head to the mouth of the Hudson River estuary) for several heavy metals and a number of stable radioactive tracers. Nutrient budgets and metal cycles will be determined to aid development of meaningful dredging policies for the Hudson estuary and to advance knowledge of the behavior of toxic metals at the critical fresh water/salt water interface in an urbanized estuarine system.

. Environmental Monitoring Using Molluscan Shell-Growth and Life History Data.

The project focuses on the development of a manual of techniques describing methods for extracting molluscan life history data from shell structures or death assemblages. Illustrations of the shell growth technique as an indicator of environmental stress will be made at the Brenton Reef, R.I., dredged material site using the bivalve, Arctica islandica, while population statistics of several short-lived species will be examined at the New Haven Conn., dredged material site. The techniques and illustrations will substantially aid our ability to assess long-term impact on marine benthic populations by dredging operations.

- Indigenous Shellfish Species as Indicators of the Bioavailability of Sewage and Industrial Waste Contaminants Disposed at Sea.

Clean, healthy sea scallops from unpolluted waters have been placed in non-metallic cages on the sea floor for periods of 3 months in areas down current and upcurrent from two disposal sites. Subsequent to recovery, tissue analyses for metals associated with disposed wastes are performed in order to assess both bioavailability and uptake rates. Parallel analyses of sediments are made to determine if accumulation patterns are revealed in the substrate and thereby indicate longer term potential availability to benthic populations.

Collections of two commercially-valued shellfish, the sea scallop (Placopecten magellanicus) and the mahogany clam (Arctica islandica), are being made in and around two ocean dumpsites on the continental shelf. Tissue analyses revealed significant accumulations of metals closely associated with the dumping activity both directly beneath the actual sites and in down-current regions many tens of kilometers away. Patterns have been shown to persist in collections made on several research cruises. Results have been used extensively in public hearing testimony pertaining to renewal of ocean dumping permits.

- Assessment of Ecosystem Impact Along Gradients from Stressed to Unstressed Environments Using Introduced Species as Biological Monitors.

Both short and long-term trends within estuarine and marine ecosystems will be examined in a series of coordinated projects that will use various sensitive but common species introduced into stressed areas as biological monitors. In the Narragansett Bay gradient, particular emphasis will be placed on trends resulting from episodic events such as storm runoff, passing ship turbulence, and seasonal temperature fluctuations as well as outfall impacts. Caged mussels and scallops will be examined for a broad series of physiologic and biochemical parameters subsequent to controlled exposure. Longer term events and trends will be assessed under a grant where mussels from a variety of coastal zones nationwide will be examined in depth for indicators of prolonged impact.

- Spatial-temporal Variations in the Structure of Macrobenthic Communities in the New York Bight South of Fire Island.

To define annual, seasonal, and spatial variations in the species composition, dominance, density, and diversity of benthic communities in the New York Bight, five replicate Smith-McIntyre benthic grab samples are collected quarterly at 15 stations in the study area. Specimens retained on a 1.0 mm screen are identified to the species level and enumerated. Data analysis involves a variety of structural parameters. Surveys have been conducted since December 1972. A report on spatial temporal heterogeneity is in preparation.

- Methodology for Ecological Investigations of Environmental Perturbations.

Studies have been initiated (1) to assess the applicability, efficacy, and problems of interpretation of multivariate analysis in aquatic ecological assessments of environmental perturbations and (2) to assess spatial and temporal parameters in several ways to determine the impact of single sources of pollution on otherwise unaffected offshore areas. These studies should provide for the development of guidelines and for the selection of appropriate methods based on practicality, theoretical considerations, and ecological relevancy.

- Biological Analysis of Primary Productivity and Related Processes in New York Harbor as Reflective of Changing Water Quality.

This four-year study of New York Harbor and adjacent waters by the Louis Calder Conservation and Ecology Center of Fordham University was initiated in 1974 in conjunction with the New York Ocean Science Laboratory. Project objectives are: (1) to provide information relevant to the kinds of treatment necessary for municipal waste discharge into coastal waters and how the various treatments might influence water quality, including how changes in water quality may lead to massive algal blooms (noxious and/or toxic) in these waters; (2) to determine whether the quality of the waters in New York Harbor is being affected or would be affected by materials flowing into the area from the current offshore sludge dumping sites or from proposed alternate sites and how the toxigenicity of these materials to the primary producers is reflective of changing water quality; and (3) to construct a dynamic and predictive model system to be used in the economic, sociological, and scientific planning for the future development of water resources in this area.

. Revision of the Koh-Chang Barge Model for Dispersion of Dredged Materials

The Koh-Chang Barge Model is being evaluated and modified based on field and laboratory studies to improve its predictive capabilities for open water dredged material disposal. The model is also being simplified to facilitiate its use by EPA regional personnel, the COE, and other prospective users. The output of the model should provide data in a format usable by biologists in making assessments of potential ecological effects.

. Chemical Effects of Waste Disposal.

Two studies have been initiated to address chemical aspects associated with ocean disposal of wastes. One study will develop predictive models for impact assessment relating to the chemical behavior of metals and for regulating disposal activities. The technical approach involves improvement of an existing model developed for ocean outfalls. This study will attempt to predict partitioning of the dissolved and particulate phases upon disposal and the long-term mobilization potential of sedimented metal species and will seek to identify valid tracers to measure fates of various waste constituents. The second study will assess the accumulation characteristics and biological consequences of trace organic compounds (chlorinated hydrocarbons and high molecular weight aromatic and aliphatic hydrocarbons) in estuarine ecosystems as a function of the input mechanisms, the circulation characteristics, and the primary productivity of the area.

CHAPTER VI

ALTERNATIVES TO OCEAN DUMPING

In its first four years of regulatory authority over ocean dumping, EPA has taken a highly restrictive approach toward applying the criteria embodied in the Act by requiring all dumpers to actively seek alternatives to ocean dumping even when their wastes have met the published EPA criteria for issuing permits. During these four years EPA has brought all ocean dumping in the United States under full regulatory control and has required many dumpers either to stop dumping immediately or to phase out their dumping activities within the next few years.

EPA has taken this approach because of the general lack of specific knowledge about the impacts of waste materials on marine ecosystems. As the results of research now underway become available, it may be possible to become more selective in permitting the disposal of some wastes by ocean dumping, if it can be demonstrated that the disposal will not cause unreasonable degradation of the marine environment.

EPA has published revisions to the ocean dumping criteria in January 1977. These revisions do not change the regulatory approach used in the program, but they provide an additional measure of environmental safety, as well as additional flexibility in the long term management of ocean dumping sites. The criteria establish levels of impact which define "unreasonable degradation" on a quantitative basis based on monitoring of each dump site. The criteria allow EPA to modify the use of any site to avoid unreasonable degradation.

By using this approach it will be possible to permit some ocean dumping of certain materials which meet the criteria without causing significant damage to the marine environment.

However, at the present time some of the wastes being dumped do not meet the criteria, and, as a consequence, the dumpers of these wastes are being required to seek other alternatives for ultimate disposal of wastes which might cause unreasonable degradation to the marine environment. In particular, it is the intent of EPA Regions II and III to phase out the current dumping of sewage sludge in the ocean by 1981, since the sludge does not meet the criteria.

Alternatives for Municipal Sludge Disposal

The City of Philadelphia is required to end ocean dumping of sewage sludge by or before 1981. To meet the 1981 deadline, Philadelphia has developed a 10-point master plan to select and implement alternatives. EPA Region III is cooperating with the City of Philadelphia, the U.S. Department of Agriculture's Agricultural Research Service in Beltsville, Md., and others to determine metals uptake from the application of sludge to cropland, involving both composting and liquid application projects. The City has begun small scale liquid sludge application on city lands. EPA has funded feasibility projects to use sludge in strip mine reclamation, including research by the University of Pennsylvania that is monitored by the State of Pennsylvania. Franklin Institute in conjunction with EPA is studying the environmental acceptability of ECO Rock, a highway aggregate made from sludge, to determine whether this material in its final form has any appreciable leaching of heavy metals and to test it for specific uses; i.e., as baserock for road foundations.

In addition, the City has begun a sludge give-away program (Philorganic) using aged lagooned sludge as a source. Following installation of dewatering equipment they hope to use stabilized daily-generated sludge as the source. This is sludge that is now being ocean dumped. Philadelphia has promulgated pre-treatment regulations effective July 1977 in order to reduce concentrations of heavy metals entering the sludge.

In December 1976 EPA Region II approved a $1.3 million grant to the City of Camden under Construction Grant funding to construct sludge composting facilities as an immediate alternative for sludges presently ocean dumped. This will allow Camden to phase out ocean dumping during 1977 and will demonstrate that technology exists for the composting of large volumes of municipal sludges. Cook College (Rutgers University) is heavily involved in the evaluation of producing and utilizing the compost product. Meanwhile, incineration, pyrolysis, and land application are being examined in more detail.

All other barged ocean dumping of sewage sludge is by municipalities located in EPA Region II. To meet the goal of ending the dumping by these municipalities by 1981, EPA Region II in conjunction with the States of New York and New Jersey has initiated a comprehensive program for development of land-based alternatives to ocean dumping for these municipalities. The first phase of the study, a technical examination of applicable alternative

methods, was completed in June 1975. The contractor's report recommended that the most desirable alternative to ocean dumping for the urban metropolitan area was dewatering of the sludge with filter presses followed by pyrolysis. Current estimates indicate that the implementation of this process would cost one-half billion dollars. The report also recommended that a small-scale pilot study be started immediately to develop engineering design parameters needed prior to full-scale demonstration, since pyrolysis of sewage sludge is still under development. In their Phase II report which was completed in June 1976, the contractor developed in specific terms a recommended technical plan for sludge management on a regional basis for the New York-New Jersey Metropolitan Area. This plan included recommended site locations, capital and operating costs, energy recovery, and an environmental impact assessment for the processes recommended in Phase I. The third phase, completed in October 1976, addressed the legal and institutional arrangements for authorization and administration of the operating program identified in Phases I and II. The completion of this three-phase comprehensive study provides the framework for implementation of a potential program of land-based alternatives to ocean dumping of sludge in the New York-New Jersey Metropolitan Area.

ORD has awarded a contract to Nichols Engineering to evaluate an existing GSA multiple hearth incinerator located in Belle Meade, N.J., as a pyrolysis unit for pyrolizing secondary sludge, to set design parameters, and to investigate any previously unforeseen environmental consequences.

Similar work was done at Concord, California, with a Step I Construction Planning Grant. ORD is also evaluating a new pyrolysis process developed by Union Carbide. Finally, most of the ORD technological activities focus on developing management schemes which will permit land application practices commensurate with the goals of EPA; i.e., economically feasible and environmentally sound.

The marine environment is, however, only a part of the total environment which must be used for the ultimate disposal of wastes, and problems which affect the marine environment and solutions to these problems must be viewed in terms of their interrelation with the total environment. For example, EPA under the mandate of the Act is in the process of phasing out ocean dumping of materials which do not meet the criteria, but this creates other environmental problems. Some alternative form of disposal must be developed for each waste that is

phased out of ocean dumping. Considerable research is going into the development of alternative methods of disposal which will reduce the environmental effects of the ultimate disposal of the unavoidable residue - be it solid, liquid, or gas - either on the land, in the water, or in the air. EPA is concerned particularly about the problem of the ultimate disposal of sewage sludge, which will be produced in ever increasing quantities as municipalities install more advanced forms of sewage treatment.

EPA, continuing the work of its predecessor agencies, has been developing environmentally acceptable methods for the disposal and management of municipal sludge since the enactment of the first Federal water pollution control laws. The study of alternatives to ocean dumping of municipal sludge normally has been funded not through the ocean dumping program, but under the Federal Water Pollution Control Act (FWPCA), since municipal sludge is a by-product of the sewage treatment process.

The initial phases of the research program were concerned with the characteristics and dewatering properties of primary and secondary sludge because of the need to dewater sludge before its ultimate disposal. The current research and demonstration program emphasis has shifted toward development of improved technology for returning sludge to the environment in an ecologically acceptable manner. In FY 76 nearly $3 million was allocated on such programs, including secondary health and ecological effects of the alternatives to ocean disposal (Table 11). The emphasis of these projects was on beneficial utilization, i.e., land application for soil enhancement, crop production and reclamation of disturbed lands, the production of energy, and resource recovery.

EPA plans to continue its comprehensive program for municipal wastewater sludge management, including the development of a strategy to coordinate the various Agency activities regarding sludge management. This program will concentrate on demonstration of new technologies which will recycle or reuse sludges, or recover residuals contained in the sludges. For example, new technologies are being examined to determine if there are cost-effective methods for producing or recovering marketable products in the processing of sludge. These products include metals recovery, organic acids, fertilizer bases, soil conditioner, methane, and the recovery of process heat. The program will also provide guidance for controlling unacceptable land disposal practices under the Resource Conservation and Recovery Act of 1976.

TABLE 11

Major Projects Funded in EPA R&D Programs
for Municipal Sludge Technology & Health Effects

Task Description	Funding Level FY 75	FY 76	FY 77
Technology R&D (Contracts & Grants)			
Processing & Treatment			
a. Disinfection/Stablization (Includes irradiation and composting)	$665K	$300K	$291K
b. Dewatering	265	120	-
c. Metals Extraction Processes	-	155	100
d. Heat Treatment	138	190	50
e. Engineering, economic, sociological evaluations, and guidance documents (EESE, GD)	-	-	285
Conversion Processing			
a. Fuel substitution	380	-	-
b. Pyrolysis	205	350	-
c. Non-thermal Processes	450	100	61
d. EESE, GD	8	-	-
e. Environmental Effects		-	200
Utilization on Land			
a. Agricultural Land	231	526	416
b. Renovation of Improverished Land	100	100	100
c. Non-Food Crops	78	78	-
d. Disposal	50	82	50
e. EESE, GD	-	50	75
Other Projects	-	89	132
Technology R&D (In-House)	510	630	565
Sub Total of Technology R&D	$3,080K	$2,770K	$2,325K
Health Effects R&D	68K	558K	620K
Total	$3,148K	$3,328K	$2,945K

Health effects research will include investigations into land application, disinfection, and composting. The health effects of airborne contaminants from incinerators and the improved technology for reducing or eliminating pollution emissions will be evaluated. It is also EPA's intent to continue cooperative agreements with other Federal, State and local agencies.

In addition to research and demonstration programs, EPA is undertaking pilot studies for the design of new and innovative technologies for sludge as well as studies of regional solutions to sludge issues. Presently over $17 million has either been obligated or is in the process of being committed for such studies (Table 12). This work is being done under the FWPCA.

One alternative showing particular promise is the composting of sludge with various bulking agents such as wood chips, bark or solid waste. EPA has a joint project with the Agricultural Research Service at Beltsville, Maryland and is conducting a composting demonstration program in Bangor, Maine. Composting processes stabilize the sludge and, when properly operated, can kill pathogenic organisms in the process. The land area required for composting as a means of stabilizing sludges is small, and in some cases an energy saving can be realized by using this method. The product resulting from composting has been shown to be an excellent soil conditioner.

Another alternative being used by many cities is the direct application of liquid or dewatered sludge to farm land or forests. EPA estimates that about 25% of the municipal sludges are currently being disposed of in this manner. This method has been frequently used to provide all or part of the fertilizer requirements for growing forage crops and grain. Such direct applications of sludge have also been used to reclaim strip mined or otherwise disturbed lands (shifting sand dunes, mine spoils, etc.). EPA has initiated studies to survey the results of such programs in an effort to more adequately document the current nationwide practices in land application of sludges.

TABLE 12

Status of Step I Construction Grants
Funding Sludge Managment Studies*

Region I	- Greater Boston (MDC), Mass. (facility plan, EIS) . . .	$ 136,000
	- Putnam, Conn.	7,500
	- Paris, Maine	97,000**
Region II	- New York/New Jersey Metro Area (ISC)	approx. 4,500,000***
Region III	- Beltsville, Md. (Composting Facility)	1,067,250
	- Washington, D. C. (Finished. Dec. '75)	100,000
Region IV	- Daytona Beach, Fla. . . . . (facility plan)	**
	- Lee County, Fla. . . . . (facility plan)	79,800**
	- Jacksonville, Fla. . . . . (facility plan)	50,000
	- Winston/Salem, N. C., possible in future	
Region V	- Minneapolis/St. Paul, Minn.	319,714
	- Detroit, Mich. . . . . (W/EIS)	750,000**
	- Greeneville, Ohio . . . . . (into Step II & III) .	
	- Sandusky, Ohio . . . . . (into Step II & III) .	
	- Chicago, (MSD), Ill.	1,734,000**
	- Madison, Wisc. . . . . (w/EIS)	160,000**
	- Hammond, Ind.	30,000**
Region VI	- Houston, Texas . . . . . (mostly sludge) . .	1,000,000
	- San Antonio, Texas, possible in future	
Region VII	- Kansas City, Mo. . . . . (partially sludge) .	
Region VIII	- Metro Denver, Co.	124,950
Region IX	- Los Angeles/OMA, Calif.	2,000,000
	- Bay Area, Calif. . . . . (incl. Contra Costa).	2,000,000
	- Orange Co. JPL, Calif.	2,000,000
Region X	- Seattle, Wash. . . . . (park devel.) . . .	565,318
	(forest appl.) . . .	234,000

* Step I Construction Grants funds or related Federal/State matching funds
** Grant Award Pending
*** Nearly $1,500,000 is pending award

Utilization of compost and direct land application of sludges are examples of alternative methods of sludge management where the nutrient and soil conditioning values of the sludge are being used. Several firms are attempting to fortify sludge with nitrogen to make it a high grade fertilizer. Another practice that has been accepted in several areas of the country for many years involves the commercial operator who simply bags dried sludge and sells it as a soil conditioner. However, any disposal/management alternative which results in sludge being applied to the land creates the potential for pollutants, particularly trace metals and persistent organics, to leach into ground water or enter the food chain; and land application may not be the best alternative for some sludges formerly ocean dumped.

In urban areas where the scarcity of open land inhibits the employment of any alternatives using land application, pyrolysis may be the answer. Pyrolysis is the thermal decomposition of materials into gases, liquids, and char under low oxygen conditions. The gases and liquids can be used as a fuel, while the char is generally amenable to landfill disposal. A pilot facility at Orange County, California, is being tested in an effort to convert the sludge pyrolysis char into activated carbon. The carbon will then be recycled to treat the sewage. In this way it may be possible to upgrade the conventional activated sludge system to achieve a substantial reduction in the quantity of sludge. Another pilot study was undertaken at Contra Costa County, California, where sludge and refuse-derived fuel (RDF), were co-pyrolyzed to produce the energy needed to operate the facility. Such a system may also produce some excess power. In another program, a pilot pyrolysis plant converting solid waste has been built by EPA in conjunction with the City of Baltimore, Maryland. At present, the operation of the plant is awaiting the correction of technological problems encountered during the plant's trial run. Another pyrolysis system using solid waste, sludge, and coal is being developed in South Charleston, West Virginia with the aid of an EPA grant. Finally, EPA Region II has provided a grant of $69,000 to the Interstate Sanitation Commission for the conversion of an existing sludge incinerator into a pilot pyrolysis plant for sewage sludge. Once constructed, it is expected that the plant should significantly reduce air pollution problems, and the residue should be of better quality for landfill disposal. However, until pyrolysis is perfected, traditional sludge incineration may be the best sludge disposal alternative for those urban areas without air pollution problems.

At present, the elimination of unacceptable ocean dumping is a laudable goal. The pursuit of alternative methods of waste disposal must be continued. However, there are many remaining unanswered questions regarding the overall problem of the pollution of the marine environment, what is known about it, and what are the impacts of alternative methods of disposal. There may be circumstances where ocean dumping of certain wastes may cause no harm to the ocean or may be the most overall environmentally acceptable solution. Thus, while EPA is continuing to scrutinize carefully all applications for ocean disposal permits to insure that harmful dumping is eliminated as rapidy as possible, it is investigating the broader issue of sludge utilization or disposal to develop the most environmentally accepted waste management program.

The general problem of pollution of the marine environment has numerous components, of which pollution by ocean dumping is only one. Other significant sources of pollution are ocean outfalls, discharges from offshore platforms, and land runoff from rivers and estuaries. Most forms of pollution from these sources are regulated under the FWPCA Amendments of 1972 through the National Pollutant Discharge Elimination System, and specifically Section 403(c) which requires the setting of ocean discharge criteria for ocean outfalls.

In looking to the future, it can be expected that increases in population and industral growth in coastal areas, which historically tend to grow more rapidy than inland areas, will result in greater pressures for ocean disposal either by outfall or by dumping, in addition to much larger quantities of effluents being discharged in rivers and estuaries. All these sources of pollution of the marine environment must be regulated and strictly controlled to limit adverse impacts and to insure that the best environmental alternatives are chosen.

APPENDIX A

Marine Protection, Research, and Sanctuaries Act of 1972 and Amendments

Public Law 92-532
92nd Congress, H. R. 9727
October 23, 1972

An Act

86 STAT. 1052

To regulate the transportation for dumping, and the dumping, of material into ocean waters, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Marine Protection, Research, and Sanctuaries Act of 1972". Marine Protection, Research, and Sanctuaries Act of 1972.

FINDING, POLICY, AND PURPOSE

SEC. 2. (a) Unregulated dumping of material into ocean waters endangers human health, welfare, and amenities, and the marine environment, ecological systems, and economic potentialities.

(b) The Congress declares that it is the policy of the United States to regulate the dumping of all types of materials into ocean waters and to prevent or strictly limit the dumping into ocean waters of any material which would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.

To this end, it is the purpose of this Act to regulate the transportation of material from the United States for dumping into ocean waters, and the dumping of material, transported from outside the United States, if the dumping occurs in ocean waters over which the United States has jurisdiction or over which it may exercise control, under accepted principles of international law, in order to protect its territory or territorial sea.

DEFINITIONS

SEC. 3. For the purposes of this Act the term—

(a) "Administrator" means the Administrator of the Environmental Protection Agency.

(b) "Ocean waters" means those waters of the open seas lying seaward of the base line from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5639).

(c) "Material" means matter of any kind or description, including, but not limited to, dredged material, solid waste, incinerator residue, garbage, sewage, sewage sludge, munitions, radiological, chemical, and biological warfare agents, radioactive materials, chemicals, biological and laboratory waste, wreck or discarded equipment, rock, sand, excavation debris, and industrial, municipal, agricultural, and other waste; but such term does not mean oil within the meaning of section 11 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1161) and does not mean sewage from vessels within the meaning of section 13 of such Act (33 U.S.C. 1163). Ante, p. 816.

(d) "United States" includes the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Canal Zone, the territories and possessions of the United States, and the Trust Territory of the Pacific Islands.

(e) "Person" means any private person or entity, or any officer, employee, agent, department, agency, or instrumentality of the Federal Government, of any State or local unit of government, or of any foreign government.

(f) "Dumping" means a disposition of material: *Provided*, That it does not mean a disposition of any effluent from any outfall structure to the extent that such disposition is regulated under the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1151-1175), under the provisions of section 13 of the Rivers and Harbors Act

30 Stat. 1152.
68 Stat. 921.

of 1899, as amended (33 U.S.C. 407), or under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011, et seq.), nor does it mean a routine discharge of effluent incidental to the propulsion of, or operation of motor-driven equipment on, vessels: *Provided further*, That it does not mean the construction of any fixed structure or artificial island nor the intentional placement of any device in ocean waters or on or in the submerged land beneath such waters, for a purpose other than disposal, when such construction or such placement is otherwise regulated by Federal or State law or occurs pursuant to an authorized Federal or State program: *And provided further*, That it does not include the deposit of oyster shells, or other materials when such deposit is made for the purpose of developing, maintaining, or harvesting fisheries resources and is otherwise regulated by Federal or State law or occurs pursuant to an authorized Federal or State program.

(g) "District court of the United States" includes the District Court of Guam, the District Court of the Virgin Islands, the District Court of Puerto Rico, the District Court of the Canal Zone, and in the case of American Samoa and the Trust Territory of the Pacific Islands, the District Court of the United States for the District of Hawaii, which court shall have jurisdiction over actions arising therein.

(h) "Secretary" means the Secretary of the Army.

(i) "Dredged material" means any material excavated or dredged from the navigable waters of the United States.

(j) "High-level radioactive waste" means the aqueous waste resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated waste from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels, or irradiated fuel from nuclear power reactors.

(k) "Transport" or "transportation" refers to the carriage and related handling of any material by a vessel, or by any other vehicle, including aircraft.

TITLE I—OCEAN DUMPING

PROHIBITED ACTS

SEC. 101. (a) No person shall transport from the United States any radiological, chemical, or biological warfare agent or any high-level radioactive waste, or except as may be authorized in a permit issued under this title, and subject to regulations issued under section 108 hereof by the Secretary of the Department in which the Coast Guard is operating, any other material for the purpose of dumping it into ocean waters.

(b) No person shall dump any radiological, chemical, or biological warfare agent or any high-level radioactive waste, or, except as may be authorized in a permit issued under this title, any other material, transported from any location outside the United States, (1) into the territorial sea of the United States, or (2) into a zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the base line from which the breadth of the territorial sea is measured, to the extent that it may affect the territorial sea or the territory of the United States.

(c) No officer, employee, agent, department, agency, or instrumentality of the United States shall transport from any location outside the United States any radiological, chemical, or biological warfare agent or any high-level radioactive waste, or, except as may be authorized in a permit issued under this title, any other material for the purpose of dumping it into ocean waters.

ENVIRONMENTAL PROTECTION AGENCY PERMITS

SEC. 102. (a) Except in relation to dredged material, as provided for in section 103 of this title, and in relation to radiological, chemical, and biological warfare agents and high-level radioactive waste, as provided for in section 101 of this title, the Administrator may issue permits, after notice and opportunity for public hearings, for the transportation from the United States or, in the case of an agency or instrumentality of the United States, for the transportation from a location outside the United States, of material for the purpose of dumping it into ocean waters, or for the dumping of material into the waters described in section 101(b), where the Administrator determines that such dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. The Administrator shall establish and apply criteria for reviewing and evaluating such permit applications, and, in establishing or revising such criteria, shall consider, but not be limited in his consideration to, the following:

(A) The need for the proposed dumping.

(B) The effect of such dumping on human health and welfare, including economic, esthetic, 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 impact of requiring use of such alternate 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.

(I) In designating recommended sites, the Administrator shall utilize wherever feasible locations beyond the edge of the Continental Shelf.

In establishing or revising such criteria, the Administrator shall consult with Federal, State, and local officials, and interested members of the general public, as may appear appropriate to the Administrator. With respect to such criteria as may affect the civil works program of the Department of the Army, the Administrator shall also consult with the Secretary. In reviewing applications for permits, the Administrator shall make such provision for consultation with interested Federal and State agencies as he deems useful or necessary. No permit shall be issued for a dumping of material which will violate applicable water quality standards.

(b) The Administrator may establish and issue various categories of permits, including the general permits described in section 104(c).

(c) The Administrator may, considering the criteria established pursuant to subsection (a) of this section, designate recommended sites or times for dumping and, when he finds it necessary to protect critical areas, shall, after consultation with the Secretary, also designate sites or times within which certain materials may not be dumped.

(d) No permit is required under this title for the transportation for dumping or the dumping of fish wastes, except when deposited in harbors or other protected or enclosed coastal waters, or where the Administrator finds that such deposits could endanger health, the environment, or ecological systems in a specific location. Where the Administrator makes such a finding, such material may be deposited only as authorized by a permit issued by the Administrator under this section.

CORPS OF ENGINEERS PERMITS

SEC. 103. (a) Subject to the provisions of subsections (b), (c), and (d) of this section, the Secretary may issue permits, after notice and opportunity for public hearings, for the transportation of dredged material for the purpose of dumping it into ocean waters, where the Secretary determines that the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.

(b) In making the determination required by subsection (a), the Secretary shall apply those criteria, established pursuant to section 102(a), relating to the effects of the dumping. Based upon an evaluation of the potential effect of a permit denial on navigation, economic and industrial development, and foreign and domestic commerce of the United States, the Secretary shall make an independent determination as to the need for the dumping. The Secretary shall also make an independent determination as to other possible methods of disposal and as to appropriate locations for the dumping. In considering appropriate locations, he shall, to the extent feasible, utilize the recommended sites designated by the Administrator pursuant to section 102(c).

(c) Prior to issuing any permit under this section, the Secretary shall first notify the Administrator of his intention to do so. In any case in which the Administrator disagrees with the determination of the Secretary as to compliance with the criteria established pursuant to section 102(a) relating to the effects of the dumping or with the restrictions established pursuant to section 102(c) relating to critical areas, the determination of the Administrator shall prevail. Unless the Administrator grants a waiver pursuant to subsection (d), the Secretary shall not issue a permit which does not comply with such criteria and with such restrictions.

Waiver.

(d) If, in any case, the Secretary finds that, in the disposition of dredged material, there is no economically feasible method or site available other than a dumping site the utilization of which would result in non-compliance with the criteria established pursuant to section 102(a) relating to the effects of dumping or with the restrictions established pursuant to section 102(c) relating to critical areas, he shall so certify and request a waiver from the Administrator of the specific requirements involved. Within thirty days of the receipt of the waiver request, unless the Administrator finds that the dumping of the material will result in an unacceptably adverse impact on municipal water supplies, shell-fish beds, wildlife, fisheries (including spawning and breeding areas), or recreational areas, he shall grant the waiver.

(e) In connection with Federal projects involving dredged material, the Secretary may, in lieu of the permit procedure, issue regulations which will require the application to such projects of the same criteria, other factors to be evaluated, the same procedures, and the same requirements which apply to the issuance of permits under subsections (a), (b), (c), and (d) of this section.

PERMIT CONDITIONS

SEC. 104. (a) Permits issued under this title shall designate and include (1) the type of material authorized to be transported for dumping or to be dumped; (2) the amount of material authorized to be transported for dumping or to be dumped; (3) the location where such transport for dumping will be terminated or where such dumping will occur; (4) the length of time for which the permits are valid and their expiration date; (5) any special provisions deemed necessary by the Administrator or the Secretary, as the case may be, after consultation with the Secretary of the Department in which the Coast Guard is operating, for the monitoring and surveillance of the transportation or dumping; and (6) such other matters as the Administrator or the Secretary, as the case may be, deems appropriate.

(b) The Administrator or the Secretary, as the case may be, may prescribe such processing fees for permits and such reporting requirements for actions taken pursuant to permits issued by him under this title as he deems appropriate.

(c) Consistent with the requirements of sections 102 and 103, but in lieu of a requirement for specific permits in such case, the Administrator or the Secretary, as the case may be, may issue general permits for the transportation for dumping, or dumping, or both, of specified materials or classes of materials for which he may issue permits, which he determines will have a minimal adverse environmental impact.

Review.

(d) Any permit issued under this title shall be reviewed periodically and, if appropriate, revised. The Administrator or the Secretary, as the case may be, may limit or deny the issuance of permits, or he may alter or revoke partially or entirely the terms of permits issued by him under this title, for the transportation for dumping, or for the dumping, or both, of specified materials or classes of materials, where he finds that such materials cannot be dumped consistently with the criteria and other factors required to be applied in evaluating the permit application. No action shall be taken under this subsection unless the affected person or permittee shall have been given notice and opportunity for a hearing on such action as proposed.

(e) The Administrator or the Secretary, as the case may be, shall require an applicant for a permit under this title to provide such information as he may consider necessary to review and evaluate such application.

Public information.

(f) Information received by the Administrator or the Secretary, as the case may be, as a part of any application or in connection with any permit granted under this title shall be available to the public as a matter of public record, at every stage of the proceeding. The final determination of the Administrator or the Secretary, as the case may be, shall be likewise available.

(g) A copy of any permit issued under this title shall be placed in a conspicuous place in the vessel which will be used for the transportation or dumping authorized by such permit, and an additional copy shall be furnished by the issuing official to the Secretary of the department in which the Coast Guard is operating, or its designee.

PENALTIES

SEC. 105. (a) Any person who violates any provision of this title, or of the regulations promulgated under this title, or a permit issued under this title shall be liable to a civil penalty of not more than $50,000 for each violation to be assessed by the Administrator. No penalty shall be assessed until the person charged shall have been given notice and an opportunity for a hearing of such violation. In determining the amount of the penalty, the gravity of the violation, prior violations, and the demonstrated good faith of the person charged in attempting to achieve rapid compliance after notification of a violation shall be considered by said Administrator. For good cause shown, the Administrator may remit or mitigate such penalty. Upon failure of the offending party to pay the penalty, the Administrator may request the Attorney General to commence an action in the appropriate district court of the United States for such relief as may be appropriate.

(b) In addition to any action which may be brought under subsection (a) of this section, a person who knowingly violates this title, regulations promulgated under this title, or a permit issued under this title shall be fined not more than $50,000, or imprisoned for not more than one year, or both.

(c) For the purpose of imposing civil penalties and criminal fines under this section, each day of a continuing violation shall constitute a separate offense as shall the dumping from each of several vessels, or other sources.

(d) The Attorney General or his delegate may bring actions for equitable relief to enjoin an imminent or continuing violation of this title, of regulations promulgated under this title, or of permits issued under this title, and the district courts of the United States shall have jurisdiction to grant such relief as the equities of the case may require.

Liability.

(e) A vessel, except a public vessel within the meaning of section 13 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1163), used in a violation, shall be liable in rem for any civil penalty assessed or criminal fine imposed and may be proceeded against in any district court of the United States having jurisdiction thereof; but no vessel shall be liable unless it shall appear that one or more of the owners or bareboat charterers, was at the time of the violation a consenting party or privy to such violation.

Ante, p. 816.

(f) If the provisions of any permit issued under section 102 or 103 are violated, the Administrator or the Secretary, as the case may be, may revoke the permit or may suspend the permit for a specified period of time. No permit shall be revoked or suspended unless the permittee shall have been given notice and opportunity for a hearing on such violation and proposed suspension or revocation.

Ante, pp. 1054, 1055.

(g)(1) Except as provided in paragraph (2) of this subsection any person may commence a civil suit on his own behalf to enjoin any person, including the United States and any other governmental instrumentality or agency (to the extent permitted by the eleventh amendment to the Constitution), who is alleged to be in violation of any prohibition, limitation, criterion, or permit established or issued by or under this title. The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce such prohibition, limitation, criterion, or permit, as the case may be.

(2) No action may be commenced—

(A) prior to sixty days after notice of the violation has been given to the Administrator or to the Secretary, and to any alleged violator of the prohibition, limitation, criterion, or permit; or

(B) if the Attorney General has commenced and is diligently prosecuting a civil action in a court of the United States to require compliance with the prohibition, limitation, criterion, or permit; or

(C) if the Administrator has commenced action to impose a penalty pursuant to subsection (a) of this section, or if the Administrator, or the Secretary, has initiated permit revocation or suspension proceedings under subsection (f) of this section; or

(D) if the United States has commenced and is diligently prosecuting a criminal action in a court of the United States or a State to redress a violation of this title.

(3) (A) Any suit under this subsection may be brought in the judicial district in which the violation occurs.

(B) In any such suit under this subsection in which the United States is not a party, the Attorney General, at the request of the Administrator or Secretary, may intervene on behalf of the United States as a matter of right.

(4) The court, in issuing any final order in any suit brought pursuant to paragraph (1) of this subsection may award costs of litigation (including reasonable attorney and expert witness fees) to any party, whenever the court determines such award is appropriate.

(5) The injunctive relief provided by this subsection shall not restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any standard or limitation or to seek any other relief (including relief against the Administrator, the Secretary, or a State agency).

(h) No person shall be subject to a civil penalty or to a criminal fine or imprisonment for dumping materials from a vessel if such materials are dumped in an emergency to safeguard life at sea. Any such emergency dumping shall be reported to the Administrator under such conditions as he may prescribe. Exception.

RELATIONSHIP TO OTHER LAWS

SEC. 106. (a) After the effective date of this title, all licenses, permits, and authorizations other than those issued pursuant to this title shall be void and of no legal effect, to the extent that they purport to authorize any activity regulated by this title, and whether issued before or after the effective date of this title.

(b) The provisions of subsection (a) shall not apply to actions taken before the effective date of this title under the authority of the Rivers and Harbors Act of 1899 (30 Stat. 1151), as amended (33 U.S.C. 401 et. seq.).

(c) Prior to issuing any permit under this title, if it appears to the Administrator that the disposition of material, other than dredged material, may adversely affect navigation in the territorial sea of the United States, or in the approaches to any harbor of the United States, or may create an artificial island on the Outer Continental Shelf, the Administrator shall consult with the Secretary and no permit shall

be issued if the Secretary determines that navigation will be unreasonably impaired.

(d) After the effective date of this title, no State shall adopt or enforce any rule or regulation relating to any activity regulated by this title. Any State may, however, propose to the Administrator criteria relating to the dumping of materials into ocean waters within its jurisdiction, or into other ocean waters to the extent that such dumping may affect waters within the jurisdiction of such State, and if the Administrator determines, after notice and opportunity for hearing, that the proposed criteria are not inconsistent with the purposes of this title, may adopt those criteria and may issue regulations to implement such criteria. Such determination shall be made by the Administrator within one hundred and twenty days of receipt of the proposed criteria. For the purposes of this subsection, the term "State" means any State, interstate or regional authority, Federal territory or Commonwealth or the District of Columbia.

"State."

(e) Nothing in this title shall be deemed to affect in any manner or to any extent any provision of the Fish and Wildlife Coordination Act as amended (16 U.S.C. 661–666c).

60 Stat. 1080; 72 Stat. 563.

ENFORCEMENT

SEC. 107. (a) The Administrator or the Secretary, as the case may be, may, whenever appropriate, utilize by agreement, the personnel, services and facilities of other Federal departments, agencies, and instrumentalities, or State agencies or instrumentalities, whether on a reimbursable or a nonreimbursable basis, in carrying out his responsibilities under this title.

(b) The Administrator or the Secretary may delegate responsibility and authority for reviewing and evaluating permit applications, including the decision as to whether a permit will be issued, to an officer of his agency, or he may delegate, by agreement, such responsibility and authority to the heads of other Federal departments or agencies, whether on a reimbursable or nonreimbursable basis.

(c) The Secretary of the department in which the Coast Guard is operating shall conduct surveillance and other appropriate enforcement activity to prevent unlawful transportation of material for dumping, or unlawful dumping. Such enforcement activity shall include, but not be limited to, enforcement of regulations issued by him pursuant to section 108, relating to safe transportation, handling, carriage, storage, and stowage. The Secretary of the Department in which the Coast Guard is operating shall supply to the Administrator and to the Attorney General, as appropriate, such information of enforcement activities and such evidentiary material assembled as they may require in carrying out their duties relative to penalty assessments, criminal prosecutions, or other actions involving litigation pursuant to the provisions of this title.

Infra.

REGULATIONS

SEC. 108. In carrying out the responsibilities and authority conferred by this title, the Administrator, the Secretary, and the Secretary of the department in which the Coast Guard is operating are authorized to issue such regulations as they may deem appropriate.

INTERNATIONAL COOPERATION

SEC. 109. The Secretary of State, in consultation with the Administrator, shall seek effective international action and cooperation to insure protection of the marine environment, and may, for this purpose, formulate, present, or support specific proposals in the United Nations and other competent international organizations for the development of appropriate international rules and regulations in support of the policy of this Act.

EFFECTIVE DATE AND SAVINGS PROVISIONS

SEC. 110. (a) This title shall take effect six months after the date of the enactment of this Act.

(b) No legal action begun, or right of action accrued, prior to the effective date of this title shall be affected by any provision of this title.

Appropriation.

SEC. 111. There are hereby authorized to be appropriated not to exceed $3,600,000 for fiscal year 1973, and not to exceed $5,500,000 for fiscal year 1974, for the purposes and administration of this title, and for succeeding fiscal years only such sums as the Congress may authorize by law.

Annual report to Congress.

SEC. 112. The Administrator shall report annually, on or before June 30 of each year, with the first report to be made on or before June 30, 1973 to the Congress, on his administration of this title, including recommendations for additional legislation if deemed necessary.

TITLE II—COMPREHENSIVE RESEARCH ON OCEAN DUMPING

Report to Congress.

SEC. 201. The Secretary of Commerce, in coordination with the Secretary of the Department in which the Coast Guard is operating and with the Administrator shall, within six months of the enactment of this Act, initiate a comprehensive and continuing program of monitoring and research regarding the effects of the dumping of material into ocean waters or other coastal waters where the tide ebbs and flows or into the Great Lakes or their connecting waters and shall report from time to time, not less frequently than annually, his findings (including an evaluation of the short-term ecological effects and the social and economic factors involved) to the Congress.

SEC. 202. (a) The Secretary of Commerce, in consultation with other appropriate Federal departments, agencies, and instrumentalities shall, within six months of the enactment of this Act, initiate a comprehensive and continuing program of research with respect to the possible long-range effects of pollution, overfishing, and man-induced changes of ocean ecosystems. In carrying out such research, the Secretary of Commerce shall take into account such factors as existing and proposed international policies affecting oceanic problems, economic considerations involved in both the protection and the use of the oceans, possible alternatives to existing programs, and ways in which the health of the oceans may best be preserved for the benefit of succeeding generations of mankind.

(b) In carrying out his responsibilities under this section, the Secretary of Commerce, under the foreign policy guidance of the President and pursuant to international agreements and treaties made by

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the President with the advice and consent of the Senate, may act alone or in conjunction with any other nation or group of nations, and shall make known the results of his activities by such channels of communication as may appear appropriate.

Annual report to Congress.

(c) In January of each year, the Secretary of Commerce shall report to the Congress on the results of activities undertaken by him pursuant to this section during the previous fiscal year.

(d) Each department, agency, and independent instrumentality of the Federal Government is authorized and directed to cooperate with the Secretary of Commerce in carrying out the purposes of this section and, to the extent permitted by law, to furnish such information as may be requested.

Inter-agency agreements.

(e) The Secretary of Commerce, in carrying out his responsibilities under this section, shall, to the extent feasible utilize the personnel, services, and facilities of other Federal departments, agencies, and instrumentalities (including those of the Coast Guard for monitoring purposes), and is authorized to enter into appropriate inter-agency agreements to accomplish this action.

Federal-State cooperation.

SEC. 203. The Secretary of Commerce shall conduct and encourage, cooperate with, and render financial and other assistance to appropriate public (whether Federal, State, interstate, or local) authorities, agencies, and institutions, private agencies and institutions, and individuals in the conduct of, and to promote the coordination of, research, investigations, experiments, training, demonstrations, surveys, and studies for the purpose of determining means of minimizing or ending all dumping of materials within five years of the effective date of this Act.

Appropriation.

SEC. 204. There are authorized to be appropriated for the first fiscal year after this Act is enacted and for the next two fiscal years thereafter such sums as may be necessary to carry out this title, but the sums appropriated for any such fiscal year may not exceed $6,000,000.

TITLE III—MARINE SANCTUARIES

"Secretary."

SEC. 301. Notwithstanding the provisions of subsection (h) of section 3 of this Act, the term "Secretary", when used in this title, means Secretary of Commerce.

SEC. 302. (a) The Secretary, after consultation with the Secretaries of State, Defense, the Interior, and Transportation, the Administrator, and the heads of other interested Federal agencies, and with the approval of the President, may designate as marine sanctuaries those areas of the ocean waters, as far seaward as the outer edge of the Continental Shelf, as defined in the Convention of the Continental Shelf (15 U.S.T. 74; TIAS 5578), of other coastal waters where the tide ebbs and flows, or of the Great Lakes and their connecting waters, which he determines necessary for the purpose of preserving or restoring such areas for their conservation, recreational, ecological, or esthetic values. The consultation shall include an opportunity to review and comment on a specific proposed designation.

15 UST 471.

(b) Prior to designating a marine sanctuary which includes waters lying within the territorial limits of any State or superjacent to the subsoil and seabed within the seaward boundary of a coastal State, as that boundary is defined in section 2 of title I of the Act of May 22, 1953 (67 Stat. 29), the Secretary shall consult with, and give due consideration to the views of, the responsible officials of the State involved. As to such waters, a designation under this section shall become effec-

43 USC 1301.

tive sixty days after it is published, unless the Governor of any State involved shall, before the expiration of the sixty-day period, certify to the Secretary that the designation, or a specified portion thereof, is unacceptable to his State, in which case the designated sanctuary shall not include the area certified as unacceptable until such time as the Governor withdraws his certification of unacceptability.

(c) When a marine sanctuary is designated, pursuant to this section, which includes an area of ocean waters outside the territorial jurisdiction of the United States, the Secretary of State shall take such actions as may be appropriate to enter into negotiations with other Governments for the purpose of arriving at necessary agreements with those Governments, in order to protect such sanctuary and to promote the purposes for which it was established.

(d) The Secretary shall submit an annual report to the Congress, on or before November 1 of each year, setting forth a comprehensive review of his actions during the previous fiscal year undertaken pursuant to the authority of this section, together with appropriate recommendation for legislation considered necessary for the designation and protection of marine sanctuaries. Annual report to Congress.

(e) Before a marine sanctuary is designated under this section, the Secretary shall hold public hearings in the coastal areas which would be most directly affected by such designation, for the purpose of receiving and giving proper consideration to the views of any interested party. Such hearings shall be held no earlier than thirty days after the publication of a public notice thereof. Hearings.

(f) After a marine sanctuary has been designated under this section, the Secretary, after consultation with other interested Federal agencies, shall issue necessary and reasonable regulations to control any activities permitted within the designated marine sanctuary, and no permit, license, or other authorization issued pursuant to any other authority shall be valid unless the Secretary shall certify that the permitted activity is consistent with the purposes of this title and can be carried out within the regulations promulgated under this section. Regulations.

(g) The regulations issued pursuant to subsection (f) shall be applied in accordance with recognized principles of international law, including treaties, conventions, and other agreements to which the United States is signatory. Unless the application of the regulations is in accordance with such principles or is otherwise authorized by an agreement between the United States and the foreign State of which the affected person is a citizen or, in the case of the crew of a foreign vessel, between the United States and flag State of the vessel, no regulation applicable to ocean waters outside the territorial jurisdiction of the United States shall be applied to a person not a citizen of the United States.

SEC. 303. (a) Any person subject to the jurisdiction of the United States who violates any regulation issued pursuant to this title shall be liable to a civil penalty of not more than $50,000 for each such violation, to be assessed by the Secretary. Each day of a continuing violation shall constitute a separate violation. Penalties.

(b) No penalty shall be assessed under this section until the person charged has been given notice and an opportunity to be heard. Upon failure of the offending party to pay an assessed penalty, the Attorney General, at the request of the Secretary, shall commence action in the appropriate district court of the United States to collect the penalty and to seek such other relief as may be appropriate.

(c) A vessel used in the violation of a regulation issued pursuant to this title shall be liable in rem for any civil penalty assessed for such violation and may be proceeded against in any district court of the United States having jurisdiction thereof.

Jurisdiction.

(d) The district courts of the United States shall have jurisdiction to restrain a violation of the regulations issued pursuant to this title, and to grant such other relief as may be appropriate. Actions shall be brought by the Attorney General in the name of the United States, either on his own initiative or at the request of the Secretary.

Appropriation.

SEC. 304. There are authorized to be appropriated for the fiscal year in which this Act is enacted and for the next two fiscal years thereafter such sums as may be necessary to carry out the provisions of this title, including sums for the costs of acquisition, development, and operation of marine sanctuaries designated under this title, but the sums appropriated for any such fiscal year shall not exceed $10,000,000.

Approved October 23, 1972.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 92-361 (Comm. on Merchant Marine and Fisheries) and No. 92-1546 (Comm. of Conference).
SENATE REPORT No. 92-451 (Comm. on Commerce).
CONGRESSIONAL RECORD:
Vol. 117 (1971): Sept. 8, 9, considered and passed House.
Nov. 24, considered and passed Senate, amended.
Vol. 118 (1972): Oct. 13, Senate and House agreed to conference report.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:
Vol. 8, No. 44 (1972): Oct. 28, Presidential statement.

Public Law 93-254
93rd Congress, H. R. 5450
March 22, 1974

An Act

To amend the Marine Protection, Research, and Sanctuaries Act of 1972, in order to implement the provisions of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Marine Protection, Research, and Sanctuaries Act of 1972 (86 Stat. 1052) is amended as follows:

Marine Protection, Research, and Sanctuaries Act of 1972, amendments.

(1) Section 2 is amended by deleting the last sentence thereof and by adding a new subsection to read as follows:

33 USC 1401.

"(c) It is the purpose of this Act to regulate (1) the transportation by any person of material from the United States and, in the case of United States vessels, aircraft, or agencies, the transportation of material from a location outside the United States, when in either case the transportation is for the purpose of dumping the material into ocean waters, and (2) the dumping of material transported by any person from a location outside the United States, if the dumping occurs in the territorial sea or the contiguous zone of the United States.".

33 USC 1402.

(2) Section 3 is amended—

(A) in subsection (c), by deleting "oil within the meaning of section 11 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1161), and does not mean sewage from vessels within the meaning of section 13 of such Act (33 U.S.C. 1163).", and inserting in lieu thereof "sewage from vessels within the meaning of section 312 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1322). Oil within the meaning of section 311 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1321), shall be included only to the extent that such oil is taken on board a vessel or aircraft for the purpose of dumping.";

88 STAT. 50
88 STAT. 51
86 Stat. 871.
86 Stat. 862; 87 Stat. 906.

(B) in subsection (f), by deleting "(33 U.S.C. 1151–1175)", and inserting in lieu thereof "(33 U.S.C. 1251–1376)"; and

(C) by adding a new subsection to read as follows:

"(l) 'Convention' means the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.".

"Convention."

(3) Section 101 is amended to read as follows:

33 USC 1411.

"(a) Except as may be authorized by a permit issued pursuant to section 102 or section 103 of this title, and subject to regulations issued pursuant to section 108 of this title,

33 USC 1412, 1413.

"(1) no person shall transport from the United States, and

33 USC 1418.

"(2) in the case of a vessel or aircraft registered in the United States or flying the United States flag or in the case of a United States department, agency, or instrumentality, no person shall transport from any location

any material for the purpose of dumping it into ocean waters.

"(b) Except as may be authorized by a permit issued pursuant to section 102 of this title, and subject to regulations issued pursuant to section 108 of this title, no person shall dump any material transported from a location outside the United States (1) into the territorial sea of the United States, or (2) into a zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the base line from which the breadth of the territorial sea is measured, to the extent that it may affect the territorial sea or the territory of the United States.".

88 STAT. 51

86 Stat. 1054.
33 USC 1412.

(4) Section 102 is amended—

(A) in subsection (a)—

(i) by deleting the words "as provided for in section 101 of this title," and inserting in lieu thereof the words "for which no permit may be issued,";

(ii) by adding, after the phrase "instrumentality of the United States,", the words "or in the case of a vessel or aircraft registered in the United States or flying the United States flag,"; and

(iii) by adding at the end of the subsection the following sentence: "To the extent that he may do so without relaxing the requirements of this title, the Administrator, in establishing or revising such criteria, shall apply the standards and criteria binding upon the United States under the Convention, including its Annexes."

(B) by adding a new subsection to read as follows:

"(e) In the case of transportation of material, by a vessel or aircraft registered in the United States or flying the United States flag, from a location in a foreign State Party to the Convention, a permit issued pursuant to the authority of that foreign State Party, in accordance with Convention requirements, and which otherwise could have been issued pursuant to subsection (a) hereof, shall be accepted, for the purposes of this title, as if it were issued by the Administrator under the authority of this section.".

Effective dates.

SEC. 2. The amendments made by subparagraph 1(4)(A)(iii) and paragraph 1(4)(B) of this Act shall become effective on the date that the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters enters into force for the United States. In all other respects, this Act shall become effective on the date of enactment.

Approved March 22, 1974.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-568 (Comm. on Merchant Marine and Fisheries).
SENATE REPORT No. 93-726 (Comm. on Commerce).
CONGRESSIONAL RECORD:
Vol. 119 (1973): Oct. 16, considered and passed House.
Vol. 120 (1974): Mar. 8, considered and passed Senate.

Public Law 93-472
93rd Congress, H. R. 15540
October 26, 1974

An Act

88 STAT. 1430

To extend for one year the authorization for appropriations to implement title I of the Marine Protection, Research, and Sanctuaries Act of 1972.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 111 of the Marine Protection, Research, and Sanctuaries Act of 1972 (Public Law 92-532; 86 Stat. 1052) is amended by striking "fiscal year 1974," and inserting in lieu thereof "fiscal years 1974 and 1975,". 33 USC 1420.

Approved October 26, 1974.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-1259 (Comm. on Merchant Marine and Fisheries).
SENATE REPORT No. 93-1279 (Comm on. Commerce).
CONGRESSIONAL RECORD, Vol. 120 (1974):
Aug. 19, considered and passed House.
Oct. 15, considered and passed Senate.

Public Law 94-62
94th Congress, H. R. 5710
July 25, 1975

An Act

To amend the Marine Protection, Research, and Sanctuaries Act of 1972 to authorize appropriations to carry out the provisions of such Act for fiscal year 1976 and for the transition period following such fiscal year, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 111 of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1420), is amended by striking out "and not to exceed $5,500,000 for fiscal years 1974 and 1975," and inserting in lieu thereof the following: "not to exceed $5,500,000 for each of the fiscal years 1974 and 1975, not to exceed $5,300,000 for fiscal year 1976, and not to exceed $1,325,000 for the transition period (July 1 through September 30, 1976),". Marine Protection, Research, and Sanctuaries Act of 1972, amendment. Appropriation authorization.

SEC. 2. Section 202(c) of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1442(c)) is amended by striking out "January" and inserting in lieu thereof "March". Report to Congress.

SEC. 3. Section 204 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1444) is amended by adding at the end thereof the following new sentence: "There are authorized to be appropriated not to exceed $1,500,000 for the transition period (July 1 through September 30, 1976).".

SEC. 4. Section 304 of the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1434) is amended to read as follows:

"SEC. 304. There are authorized to be appropriated not to exceed $10,000,000 for each of the fiscal years 1973, 1974, and 1975, not to exceed $6,200,000 for fiscal year 1976, and not to exceed $1,550,000 for the transition period (July 1 through September 30, 1976) to carry out the provisions of this title, including the acquisition, development, and operation of marine sanctuaries designated under this title.".

Approved July 25, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-217 (Comm. on Merchant Marine and Fisheries).
SENATE REPORT No. 94-271 (Comm. on Commerce).
CONGRESSIONAL RECORD, Vol. 121 (1975):
May 19, considered and passed House.
July 11, considered and passed Senate.

89 STAT. 303

Public Law 94-326
94th Congress, S. 3147
June 30, 1976

An Act

To extend the Marine Protection, Research, and Sanctuaries Act for two years.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 111 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1420) is amended—

Marine Protection, Research, and Sanctuaries Act of 1972, extension.

(1) by striking out "and" immediately after "fiscal year 1976,"; and

(2) by adding immediately after "September 30, 1976)," the following: "and not to exceed $4,800,000 for fiscal year 1977,".

SEC. 2. Section 112 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1421) is amended—

(1) by striking out "Administrator shall" and inserting in lieu thereof "Administrator, the Secretary, and the Secretary of the department in which the Coast Guard is operating shall each individually";

(2) by striking out "June 30 of each year" and inserting in lieu thereof "March 1 of each year".

SEC. 3. The last sentence of section 204 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1444) is amended by inserting immediately before the period the following: ", and not to exceed $3,600,000 for fiscal year 1977".

SEC. 4. Section 304 of the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1434) is amended—

(1) by striking out "and" immediately after "fiscal year 1976,"; and

(2) by adding immediately after "September 30, 1976)" the following ", and not to exceed $500,000 for fiscal year 1977".

Approved June 30, 1976.

LEGISLATIVE HISTORY:

SENATE REPORT No. 94-860 (Comm. on Commerce).
CONGRESSIONAL RECORD, Vol. 122 (1976):
May 21, 25, considered and passed Senate.
June 17, considered and passed House.

APPENDIX B

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter

The Contracting Parties to this Convention,

Recognizing that the marine environment and the living organisms which it supports are of vital importance to humanity, and all people have an interest in assuring that it is so managed that its quality and resources are not impaired;

Recognizing that the capacity of the sea to assimilate wastes and render them harmless, and its ability to regenerate natural resources, is not unlimited;

Recognizing that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control to not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction;

Recalling Resolution 2749 (XXV) of the General Assembly of the United Nations on the principles governing the sea-bed and the ocean floor and the subsoil thereof, beyond the limits of national jurisdiction;

Noting that marine pollution originates in many sources, such as dumping and discharges through the atmosphere, rivers, estuaries, outfalls and pipelines, and that it is important that States use the best practicable means to prevent such pollution and develop products and processes which will reduce the amount of harmful wastes to be disposed of;

Being convinced that international action to control the pollution of the sea by dumping can and must be taken without delay but that this action should not preclude discussion of measures to control other sources of marine pollution as soon as possible; and

Wishing to improve protection of the marine environment by encouraging States with a common interest in particular geographical areas to enter into appropriate agreements supplementary to this Convention;

Have agreed as follows:

ARTICLE I

Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment, and pledge themselves especially to take all practicable steps to prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

ARTICLE II

Contracting Parties shall, as provided for in the following Articles, take effective measures individually, according to their scientific, technical and economic capabilities, and collectively, to prevent marine pollution caused by dumping and shall harmonize their policies in this regard.

ARTICLE III

For the purposes of this Convention:

1. (a) "Dumping" means:

(i) any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea;

(ii) any deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures at sea.

(b) "Dumping" does not include:

(i) the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures;

(ii) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of this Convention.

(c) The disposal of wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources will not be covered by the provisions of this Convention.

2. "Vessels and aircraft" means waterborne or airborne craft of any type whatsoever. This expression includes air cushioned craft and floating craft, whether self-propelled or not.

3. 'Sea" means all marine waters other than the internal waters of States.

4. "Wastes or other matter" means material and substance of any kind, form or description.

5. "Special permit" means permission granted specifically on application in advance and in accordance with Annex II and Annex III.

6. "General permit" means permission granted in advance and in accordance with Annex III.

7. "The Organisation" means the Organisation designated by the Contracting Parties in accordance with Article XIV(2).

ARTICLE IV

1. In accordance with the provisions of this Convention Contracting Parties shall prohibit the dumping of any wastes or other matter in whatever form or condition except as otherwise specified below:

(*a*) the dumping of wastes or other matter listed in Annex I is prohibited;

(*b*) the dumping of wastes or other matter listed in Annex II requires a prior special permit;

(*c*) the dumping of all other wastes or matter requires a prior general permit.

2. Any permit shall be issued only after careful consideration of all the factors set forth in Annex III, including prior studies of the characteristics of the dumping site, as set forth in Sections B and C of that Annex.

3. No provision of this Convention is to be interpreted as preventing a Contracting Party from prohibiting, insofar as that Party is concerned, the dumping of wastes or other matter not mentioned in Annex I. That Party shall notify such measures to the Organisation.

ARTICLE V

1. The provisions of Article IV shall not apply when it is necessary to secure the safety of human life or of vessels, aircraft, platforms or other man-made structures at sea in cases of *force majeure* caused by stress of weather, or in any case which constitutes a danger to human life or a real threat to vessels, aircraft, platforms or other man-made structures at sea, if dumping appears to be the only way of averting the threat and if there is every probability that the damage consequent upon such dumping will be less than would otherwise occur. Such dumping shall be so conducted as to minimise the likelihood of damage to human or marine life and shall be reported forthwith to the Organisation.

2. A Contracting Party may issue a special permit as an exception to Article IV(1)(a), in emergencies, posing unacceptable risk relating to human health and admitting no other feasible solution. Before doing so the Party shall consult any other country or countries that are likely to be affected and the Organisation which, after consulting other Parties, and international organisations as appropriate, shall in accordance with Article XIV promptly recommend to the Party the most appropriate procedures to adopt. The Party shall follow these recommendations to the maximum extent feasible consistent with the time within which action must be taken and with the general obligation to avoid damage to the marine environment and shall inform the Organisation of the action it takes. The Parties pledge themselves to assist one another in such situations.

3. Any Contracting Party may waive its rights under paragraph (2) at the time of, or subsequent to ratification of, or accession to this Convention.

ARTICLE VI

1. Each Contracting Party shall designate an appropriate authority or authorities to:

(*a*) issue special permits which shall be required prior to, and for, the dumping of matter listed in Annex II and in the circumstances provided for in Article V(2);

(*b*) issue general permits which shall be required prior to, and for, the dumping of all other matter;

(*c*) keep records of the nature and quantities of all matter permitted to be dumped and the location, time and method of dumping;

(*d*) monitor individually, or in collaboration with other Parties and competent International Organisations, the condition of the seas for the purposes of this Convention.

2. The appropriate authority or authorities of a Contracting Party shall issue prior special or general permits in accordance with paragraph (1) in respect of matter intended for dumping:

(*a*) loaded in its territory;

(*b*) loaded by a vessel or aircraft registered in its territory or flying its flag, when the loading occurs in the territory of a State not party to this Convention.

3. In issuing permits under sub-paragraphs (1) (a) and (b) above, the appropriate authority or authorities shall comply with Annex III, together with such additional criteria, measures and requirements as they may consider relevant.

4. Each Contracting Party, directly or through a Secretariat established under a regional agreement, shall report to the Organisation, and where appropriate to other Parties, the information specified in sub-paragraphs (c) and (d) of paragraph (1) above, and the criteria, measures and requirements it adopts in accordance with paragraph (3) above. The procedure to be followed and the nature of such reports shall be agreed by the Parties in consultation.

ARTICLE VII

1. Each Contracting Party shall apply the measures required to implement the present Convention to all:

(*a*) vessels and aircraft registered in its territory or flying its flag;

(*b*) vessels and aircraft loading in its territory or territorial seas matter which is to be dumped;

(*c*) vessels and aircraft and fixed or floating platforms under its jurisdiction believed to be engaged in dumping.

2. Each Party shall take in its territory appropriate measures to prevent and punish conduct in contravention of the provisions of this Convention.

3. The Parties agree to co-operate in the development of procedures for the effective application of this Convention particularly on the high seas, including procedures for the reporting of vessels and aircraft observed dumping in contravention of the Convention.

4. This Convention shall not apply to those vessels and aircraft entitled to sovereign immunity under international law. However each Party shall ensure by the adoption of appropriate measures that such vessels and aircraft owned or operated by it act in a manner consistent with the object and purpose of this Convention, and shall inform the Organisation accordingly.

5. Nothing in this Convention shall affect the right of each Party to adopt other measures, in accordance with the principles of international law, to prevent dumping at sea.

ARTICLE VIII

In order to further the objectives of this Convention, the Contracting Parties with common interests to protect in the marine environment in a given geographical area shall endeavour, taking into account characteristic regional features, to enter into regional agreements consistent with this Convention for the prevention of pollution, espe-

cially by dumping. The Contracting Parties to the present Convention shall endeavour to act consistently with the objectives and provisions of such regional agreements which shall be notified to them by the Organisation. Contracting Parties shall seek to co-operate with the Parties to regional agreements in order to develop harmonized procedures to be followed by Contracting Parties to the different conventions concerned. Special attention shall be given to co-operation in the field of monitoring and scientific research.

ARTICLE IX

The Contracting Parties shall promote, through collaboration within the Organisation and other international bodies, support for those Parties which request it for:

(*a*) the training of scientific and technical personnel;

(*b*) the supply of necessary equipment and facilities for research and monitoring;

(*c*) the disposal and treatment of waste and other measures to prevent or mitigate pollution caused by dumping;

preferably within the countries concerned, so furthering the aims and purposes of this Convention.

ARTICLE X

In accordance with the principles of international law regarding State responsibility for damage to the environment of other States or to any other area of the environment, caused by dumping of wastes and other matter of all kinds, the Contracting Parties undertake to develop procedures for the assessment of liability and the settlement of disputes regarding dumping.

ARTICLE XI

The Contracting Parties shall at their first consultative meeting consider procedures for the settlement of disputes concerning the interpretation and application of this Convention.

ARTICLE XII

The Contracting Parties pledge themselves to promote, within the competent specialised agencies and other international bodies, measures to protect the marine environment against pollution caused by:

(*a*) hydrocarbons, including oil, and their wastes;

(*b*) other noxious or hazardous matter transported by vessels for purposes other than dumping;

(*c*) wastes generated in the course of operation of vessels, aircraft, platforms and other man-made structures at sea;

(*d*) radio-active pollutants from all sources, including vessels;

(*e*) agents of chemical and biological warfare;

(*f*) wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources.

The Parties will also promote, within the appropriate international organisation, the codification of signals to be used by vessels engaged in dumping.

ARTICLE XIII

Nothing in this Convention shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea convened pursuant to Resolution 2750 C (XXV) of the General Assembly of the United Nations nor the present or future claims and legal views of any State concerning the law of the sea and the nature and extent of coastal and flag State jurisdiction. The Contracting Parties agree to consult at a meeting to be convened by the Organisation after the Law of the Sea Conference, and in any case not later than 1976, with a view to defining the nature and extent of the right and the responsibility of a coastal State to apply the Convention in a zone adjacent to its coast.

ARTICLE XIV

1. The Government of the United Kingdom of Great Britain and Northern Ireland as a depositary shall call a meeting of the Contracting Parties not later than three months after the entry into force of this Convention to decide on organisational matters.

2. The Contracting Parties shall designate a competent Organisation existing at the time of that meeting to be responsible for Secretariat duties in relation to this Convention. Any Party to this Convention not being a member of this Organisation shall make an appropriate contribution to the expenses incurred by the Organisation in performing these duties.

3. The Secretariat duties of the Organisation shall include:

(*a*) the convening of consultative meetings of the Contracting Parties not less frequently than once every two years and of special meetings of the Parties at any time on the request of two-thirds of the Parties;

(*b*) preparing and assisting, in consultation with the Contracting Parties and appropriate International Organisations, in the development and implementation of procedures referred to in subparagraph (4) (e) of this Article;

(*c*) considering enquiries by, and information from the Contracting Parties, consulting with them and with the appropriate International Organisations, and providing recommendations to the Parties on questions related to, but not specifically covered by the Convention;

(*d*) conveying to the Parties concerned all notifications received by the Organisation in accordance with Articles IV(3), V (1) and (2), VI(4), XV, XX and XXI.

Prior to the designation of the Organisation these functions shall, as necessary, be performed by the depositary, who for this purpose shall be the Government of the United Kingdom of Great Britain and Northern Ireland

4. Consultative or special meetings of the Contracting Parties shall keep under continuing review the implementation of this Convention and may, *inter alia:*

(*a*) review and adopt amendments to this Convention and its Annexes in accordance with Article XV;

(*b*) invite the appropriate scientific body or bodies to collaborate with and to advise the Parties or the Organisation on any scientific or technical aspect relevant to this Convention, including particularly the content of the Annexes;

(*c*) receive and consider reports made pursuant to Article VI (4);

(*d*) promote co-operation with and between regional organisations concerned with the prevention of marine pollution;

(*e*) develop or adopt, in consultation with appropriate International Organisations, procedures referred to in Article V(2), including basic criteria for determining exceptional and emergency situations, and procedures for consultative advice and the safe disposal of matter in such circumstances, including the designation of appropriate dumping areas, and recommend accordingly;

(*f*) consider any additional action that may be required.

5. The Contracting Parties at their first consultative meeting shall establish rules of procedure as necessary.

ARTICLE XV

1. (a) At meetings of the Contracting Parties called in accordance with Article XIV amendments to this Convention may be adopted by a two-thirds majority of those present. An amendment shall enter into force for the Parties which have accepted it on the sixtieth day after two-thirds of the Parties shall have deposited an instrument of acceptance of the amendment with the Organisation. Thereafter the amendment shall enter into force for any other Party 30 days after that Party deposits its instrument of acceptance of the amendment.

(b) The Organisation shall inform all Contracting Parties of any request made for a special meeting under Article XIV and of any amendments adopted at meetings of the Parties and of the date on which each such amendment enters into force for each Party.

2. Amendments to the Annexes will be based on scientific or technical considerations. Amendments to the Annexes approved by a two-thirds majority of those present at a meeting called in accordance with Article XIV shall enter into force for each Contracting Party immediately on notification of its acceptance to the Organisation and 100 days after approval by the meeting for all other Parties except for those which before the end of the 100 days make a declaration that they are not able to accept the amendment at that time. Parties should endeavour to signify their acceptance of an amendment to the Organisation as soon as possible after approval at a meeting. A Party may at any time substitute an acceptance for a previous declaration of objection and the amendment previously objected to shall thereupon enter into force for that Party.

3. An acceptance or declaration of objection under this Article shall be made by the deposit of an instrument with the Organisation. The Organisation shall notify all Contracting Parties of the receipt of such instruments.

4. Prior to the designation of the Organisation, the Secretarial functions herein attributed to it, shall be performed temporarily by the Government of the United Kingdom of Great Britain and Northern Ireland, as one of the depositaries of this Convention.

ARTICLE XVI

This Convention shall be open for signature by any State at London, Mexico City, Moscow and Washington from 29 December 1972 until 31 December 1973.

ARTICLE XVII

This Convention shall be subject to ratification. The instruments of ratification shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

ARTICLE XVIII

After 31 December 1973, this Convention shall be open for accession by any State. The instruments of accession shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

ARTICLE XIX

1. This Convention shall enter into force on the thirtieth day following the date of deposit of the fifteenth instrument of ratification or accession.

2. For each Contracting Party ratifying or acceding to the Convention after the deposit of the fifteenth instrument of ratification or accession, the Convention shall enter into force on the thirtieth day after deposit by such Party of its instrument of ratification or accession.

ARTICLE XX

The depositaries shall inform Contracting Parties:

(a) of signatures to this Convention and of the deposit of instruments of ratification, accession or withdrawal, in accordance with Articles XVI, XVII, XVIII and XXI, and

(b) of the date on which this Convention will enter into force, in accordance with Article XIX.

ARTICLE XXI

Any Contracting Party may withdraw from this Convention by giving six months' notice in writing to a depositary, which shall promptly inform all Parties of such notice.

ARTICLE XXII

The original of this Convention of which the English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America who shall send certified copies thereof to all States.

IN WITNESS WHEREOF the undersigned Plenipotentiaries, being duly authorised thereto by their respective Governments have signed the present Convention.

DONE in quadruplicate at London, Mexico City, Moscow and Washington, this twenty-ninth day of December, 1972.

Annexes

Annex I

1. Organohalogen compounds.
2. Mercury and mercury compounds.
3. Cadmium and cadmium compounds.
4. Persistent plastics and other persistent synthetic materials, for example, netting and ropes, which may float or may remain in suspension in the sea in such a manner as to interfere materially with fishing, navigation or other legitimate uses of the sea.
5. Crude oil, fuel oil, heavy diesel oil, and lubricating oils, hydraulic fluids, and any mixtures containing any of these, taken on board for the purpose of dumping.
6. High-level radio-active wastes or other high-level radio-active matter, defined on public health, biological or other grounds, by the competent international body in this field, at present the International Atomic Energy Agency, as unsuitable for dumping at sea.
7. Materials in whatever form (e.g. solids, liquids, semi-liquids, gases or in a living state) produced for biological and chemical warfare.
8. The preceding paragraphs of this Annex do not apply to substances which are rapidly rendered harmless by physical, chemical or biological processes in the sea provided they do not:
   (i) make edible marine organisms unpalatable, or
   (ii) endanger human health or that of domestic animals.

The consultative procedure provided for under Article XIV should be followed by a Party if there is doubt about the harmlessness of the substance.

9. This Annex does not apply to wastes or other materials (e.g. sewage sludges and dredged spoils) containing the matters referred to in paragraphs 1-5 above as trace contaminants. Such wastes shall be subject to the provisions of Annexes II and III as appropriate.

Annex II

The following substances and materials requiring special care are listed for the purposes of Article VI(1)(a).

A. Wastes containing significant amounts of the matters listed below:

arsenic, lead, copper, zinc } and their compounds

organosilicon compounds
cyanides
fluorides
pesticides and their by-products not covered in Annex I.

B. In the issue of permits for the dumping of large quantities of acids and alkalis, consideration shall be given to the possible presence in such wastes of the substances listed in paragraph A and to the following additional substances:

beryllium, chromium, nickel, vanadium } and their compounds

C. Containers, scrap metal and other bulky wastes liable to sink to the sea bottom which may present a serious obstacle to fishing or navigation.

D. Radio-active wastes or other radio-active matter not included in Annex I. In the issue of permits for the dumping of this matter, the Contracting Parties should take full account of the recommendations of the competent international body in this field, at present the International Atomic Energy Agency.

ANNEX III

Provisions to be considered in establishing criteria governing the issue of permits for the dumping of matter at sea, taking into account Article IV(2), include:

A. Characteristics and composition of the matter

1. Total amount and average composition of matter dumped (e.g. per year).
2. Form, e.g. solid, sludge, liquid, or gaseous.
3. Properties: physical (e.g. solubility and density), chemical and biochemical (e.g. oxygen demand, nutrients) and biological (e.g. presence of viruses, bacteria, yeasts, parasites).
4. Toxicity.
5. Persistence: physical, chemical and biological.
6. Accumulation and biotransformation in biological materials or sediments.
7. Susceptibility to physical, chemical and biochemical changes and interaction in the aquatic environment with other dissolved organic and inorganic materials.
8. Probability of production of taints or other changes reducing marketability of resources (fish, shellfish, etc.).

B. Characteristics of dumping site and method of deposit

1. Location (e.g. co-ordinates of the dumping area, depth and distance from the coast), location in relation to other areas (e.g. amenity areas, spawning, nursery and fishing areas and exploitable resources).
2. Rate of disposal per specific period (e.g. quantity per day, per week, per month).

3. Methods of packaging and containment, if any.

4. Initial dilution achieved by proposed method of release.

5. Dispersal characteristics (e.g. effects of currents, tides and wind on horizontal transport and vertical mixing).

6. Water characteristics (e.g. temperature, pH, salinity, stratification, oxygen indices of pollution—dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD)—nitrogen present in organic and mineral form including ammonia, suspended matter, other nutrients and productivity).

7. Bottom characteristics (e.g. topography, geochemical and geological characteristics and biological productivity).

8. Existence and effects of other dumpings which have been made in the dumping area (e.g. heavy metal background reading and organic carbon content).

9. In issuing a permit for dumping, contracting Parties should consider whether an adequate scientific basis exists for assessing the consequences of such dumping, as outlined in this Annex, taking into account seasonal variations.

C. General considerations and conditions

1. Possible effects on amenities (e.g. presence of floating or stranded material, turbidity, objectionable odour, discolouration and foaming).

2. Possible effects on marine life, fish and shellfish culture, fish stocks and fisheries, seaweed harvesting and culture.

3. Possible effects on other uses of the sea (e.g. impairment of water quality for industrial use, underwater corrosion of structures, interference with ship operations from floating materials, interference with fishing or navigation through deposit of waste or solid objects on the sea floor and protection of areas of special importance for scientific or conservation purposes).

4. The practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the matter less harmful for dumping at sea.

APPENDIX C

Ocean Dumping Convention Reporting Form

IMCO Report on Ocean Dumping - CY _____

1. Issuing authority:

   United States Environmental Protection Agency

   Region _____

2. Date Issued: _____

3. Country of origin of material:

   _____

   Port of loading (activity location):

   _____

4. General description of material, and process from which derived (industrial or municipal process, municipal source):

5. Form in which material is presented for disposal (i.e., solid, liquid, sludge):

6. Total quantity (in metric units - volume and weight) authorized by the permit:

7. Period for which permit is valid:

   _____

8. Expected frequency of dumping:

9. Chemical composition of the material:

10. Biological properties of the material:

a) Toxicity

Organism	TLm (96 hr)

b) Other significant biological properties:

11. Physical properties of the material:

Percent solid material _____

Density (g/cc) _____

pH _____

Interaction with seawater to form precipitate: yes ____
no ____

Nature of precipitate:

12. Method of packaging (e.g., bulk, container):

13. Method and rate of release:

14. Procedure and site for subsequent barge/tank washing:

15. Approved dumping site:

a) Geographical position :

Latitude	Longitude

b) Depth of water (meters):

c) Distance (kilometers) from nearest coast:

16. Additional information:

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