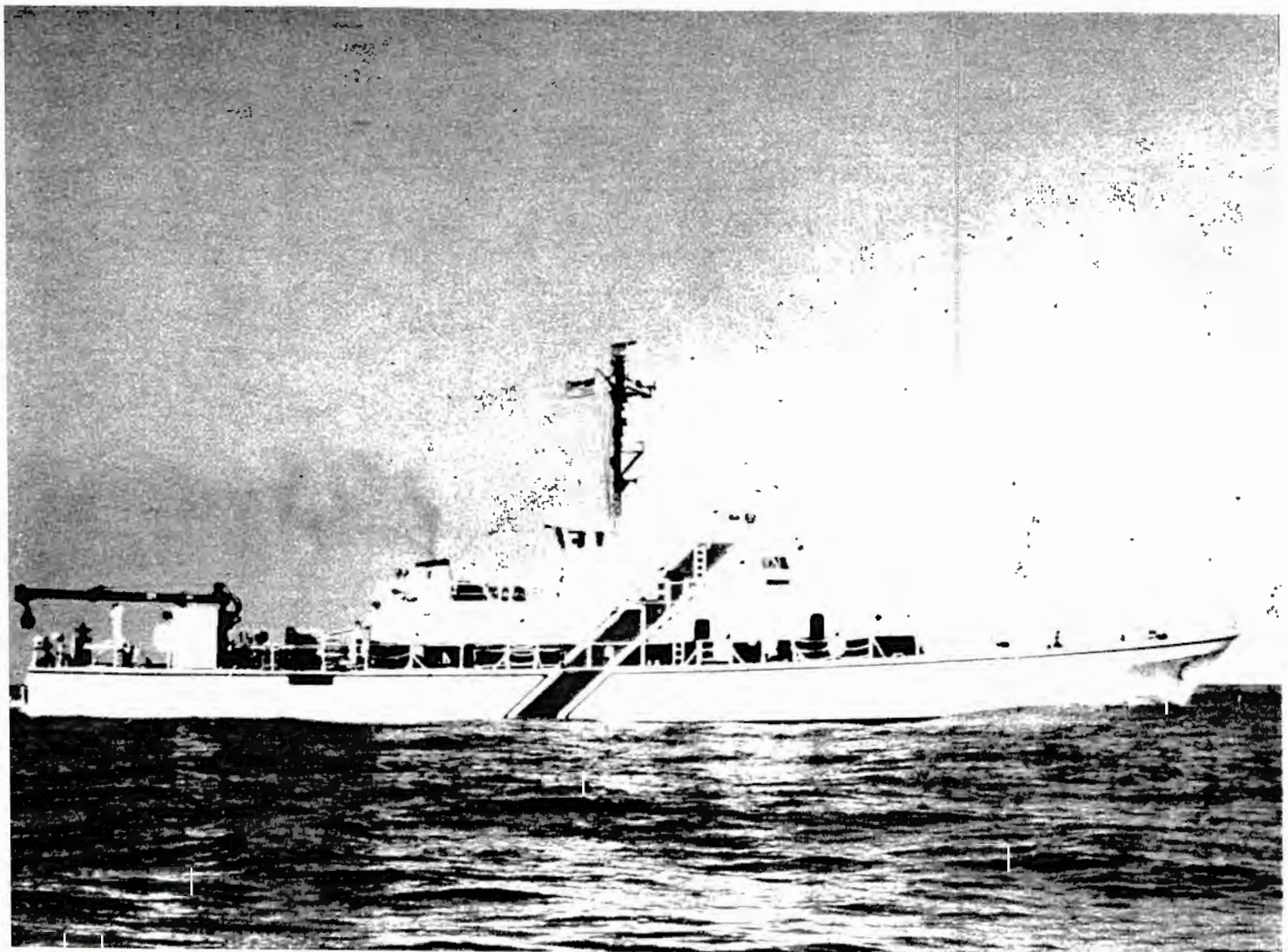




Annual Report to Congress Jan. - Dec. 1979

**On Administration of the Marine
Protection, Research, and Sanctuaries
Act of 1972, as Amended (P.L. 92-532)
and Implementing the International
London Dumping Convention**





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

OCT 15 1979

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 seventh annual report for this program is transmitted with this letter.

The ocean dumping permit program became effective on April 23, 1973, and final regulations and criteria were published on October 15, 1973. Revisions to those regulations and criteria were published on January 11, 1977. This report covers the activities carried out under the Act and those necessary to implement the London Dumping Convention during calendar year 1979.

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

Sincerely yours,

Douglas M. Costle



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OCT 15 1973

THE ADMINISTRATOR

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

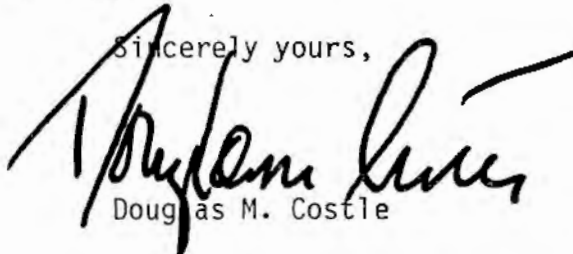
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INTRODUCTION

This is the Environmental Protection Agency's (EPA) eighth annual report to the Congress on the implementation of Title I of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), as amended. The report covers the Agency's authorities and responsibilities under the Act in carrying out the ocean dumping program and reviews those program activities conducted within EPA Headquarters and Regions during calendar year 1979.

Three other agencies having responsibilities under the MPRSA, the U.S. Army Corps of Engineers (COE), the U.S. Coast Guard (USCG), and the National Oceanic and Atmospheric Administration (NOAA) will each submit separate reports on their activities in implementing the Act. Therefore, this report does not contain a discussion of their activities under the Act, except as they impact the responsibilities of EPA.

MARINE PROTECTION, RESEARCH, AND SANCTUARIES
ACT, AS AMENDED (P.L. 92-532)

Program Authorized Under Title I

The purpose of Title I of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) is to regulate transportation for ocean dumping, and to prevent or strictly limit the ocean dumping of any material which would unreasonably affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. To implement this purpose and to control dumping in ocean waters, Title I of the Act establishes a permit system and assigns its administration to the EPA and COE.

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 of other materials (except dredged materials) for the purpose of dumping is prohibited except when authorized under a permit issued by the Administrator of EPA. Based upon criteria outlined in Section 102 of the Act, the Administrator is required to establish and apply criteria for reviewing and evaluating permit applications. Such permit may be issued after determining that the dumping involved will not unreasonably degrade or endanger human health or the marine environment and the need for ocean dumping has been demonstrated. Before a permit is issued, EPA must also give notice and opportunity for a public hearing. Dumping of dredged material is regulated under permits issued by the COE in accordance with the EPA criteria. In addition, the Administrator is authorized to designate areas where ocean dumping may be permitted and any critical areas where dumping may be prohibited. EPA has the authority to revoke or modify permits or to assess civil penalties for violation of permit conditions. In addition, the Attorney General may initiate criminal action against persons who knowingly violate the Act.

Also under Title I, the USCG is given the responsibility to conduct surveillance and other appropriate enforcement activities to prevent unlawful ocean dumping. More specifically, the USCG ensures that the dumping occurs under a valid permit and at the location and in the manner specified within the permit.

Title II requires NOAA to conduct a comprehensive program of research and monitoring regarding the effects of the dumping of material into ocean waters. Title III gives NOAA the authority to establish marine sanctuaries.

A 1977 amendment to the MPRSA requires that ocean dumping of sewage sludge cease as soon as possible and in any event no later than December 31, 1981. For the purposes of this amendment, the term "sewage sludge" is defined to mean "any solid or liquid waste generated by a municipal wastewater treatment plant the ocean dumping of which may unreasonably degrade or endanger human health, welfare, amenities, or the marine environment, ecological systems, or economic potentialities." Thus, the 1981 phase out date required under the EPA ocean dumping regulations is now a statutory date to terminate dumping of sewage sludge as defined. Ocean dumping of wastes from a municipal wastewater treatment plant is not precluded by the amendment if the wastes meet EPA's environmental impact criteria.

THE PERMIT PROGRAM

Permitted Dumping During 1979

As established by the Ocean Dumping Regulations and Criteria (40 CFR, Parts 220-229) published January 11, 1977, general permits may be issued for dumping of small quantities of material which will have a minimal adverse environmental impact when dumped under prescribed conditions. Examples include burial at sea of human remains or ashes, transportation of target vessels with the intent of sinking the vessels during ordnance testing, and transportation and disposal of derelict vessels, particularly when they pose a threat to navigation.

Special permits may be issued for the dumping of materials which satisfy the criteria, but only for a maximum duration of three years for each permit. In 1979, special permits were issued for dumping of construction debris, acid iron-wastes, miscellaneous pharmaceutical wastes, and for the incineration of wood.

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. Two emergency permits were issued during 1979.

Interim permits may be issued for a period not to exceed one year. Until the December 31, 1981 termination date, interim permits cover those materials that do not comply with the ocean dumping impact criteria and for which there are no feasible land based disposal alternatives at the present time.

Since April 23, 1978, no interim permits have been issued for dumping of wastes from a facility which had not previously ocean dumped. In addition, those permittees dumping under interim permits are required to have an implementation schedule providing for the phase out of ocean dumping or compliance with the criteria on or before December 31, 1981.

Table I lists the permittees operating under interim permits at the end of 1979 and the dates by which they are scheduled to stop ocean dumping.

Research permits may be issued for dumping material into the ocean as part of a research project when a determination is made that the scientific merit of the proposed project outweighs the potential environmental damage that may result from the dumping. One permit was effective for 1979 for oil dispersant research.

Incineration at sea permits are generally issued only as research permits; however, a special permit may be issued in those cases where studies on the waste, the incineration method, the vessel, and the disposal site have already been conducted and a site has been designated. Five special permits were effective during 1979 for the

incineration of wood generated in the New York Harbor environs. No research or interim permits for this disposal method were issued during 1979.

Table II lists the permits issued, the materials and amounts dumped during 1979 by EPA permitting authority (Region or Headquarters). Table III summarizes the total amount of dumping during 1979 by coastal area and also presented a comparison of the amounts dumped during 1979 with the amounts dumped under EPA permit during preceding years.

The further reduction in overall ocean dumping during 1979 is the result of the continuing EPA effort to require those permittees whose wastes are unacceptable for ocean dumping to implement alternative means of disposal as rapidly as possible. During 1979, nine permittees were phased out of ocean dumping, increasing the number of permits denied, phased out or withdrawn since the inception of the program to a total of 316 (Table IV). All of the phase outs during 1979 were in Region II (Table V).

TABLE I

PERMITTEES ON IMPLEMENTATION
PLANS TO PHASE OUT OCEAN DUMPING

<u>Region</u>	<u>Company/Municipality</u>	<u>Location</u>	<u>Dump Site</u>	<u>Phase Out Date</u>
II	Linden-Roselle S.A., NJ	Linden, NJ	SS	1981
	Middletown TWP Sewerage Authority	Belford, NJ	SS	1981
	Passaic Valley Sew. Comm.	Newark, NJ	SS	1981
	* Upjohn Mfg. Co.	Barceloneta, PR	PR	1981
	City of Long Beach	Long Beach, NY	SS	1981
	Middlesex Co. Util. Auth.	Sayreville, NJ	SS	1981
	New York City (12 plants)	New York, NY	SS	1981
	Merck & Co., Inc.	Rahway, NJ	106	1980
	Bergen Co. Util. Auth.	Little Ferry, NJ	SS	1981
	Rahway Valley S.A.	Rahway, NJ	SS	1981
	Joint Mtg.-Essex & Union Co.	Elizabeth, NJ	SS	1981
	Pfizer Pharmaceuticals, Inc.	Barceloneta, PR	PR	1981
	* Merck Sharp & Dohme	Barceloneta, PR	PR	1981
	County of Nassau (9 plants)	Mineola, NY	SS	1981
	County of Westchester	Yonkers, NY	SS	1981
	City of Glen Cove	Glen Cove, NY	SS	1981
	* Bristol Alpha Corporation	Barceloneta, PR	PR	1981
	* Schering Corp.	Manatie, PR	PR	1981
	American Cyanamid Co.	Linden, N.J. 106	106	1980
	* E.I. DuPont de Nemours	Edge Moor, DE	106	1980
	West New York STP	West New York, NJ	SS	1980
	Wanaque STP	Wanaque, NJ	SS	1980
	Cedar Grove STP	Cedar Grove, NJ	SS	1980
	Morris STP	Morris Township, NJ	SS	1980
	Totowa STP	Totowa, NJ	SS	1980
	West Paterson STP	West Paterson, NJ	SS	1980
	Northeast Monmouth Regional S.A.	Monmouth Beach,	SS	1981
	Cyanamid Agric. de P.R.	Barceloneta, PR	PR	1981
	* Suibb Mfg. Inc.	Humacao, PR	PR	1980
III	City of Philadelphia	Philadelphia, PA	SS	1980

* Special permits; all others are interim
 ** Permit required phase out within 18 months of promulgation of National Effluent Limitations guidelines for titanium dioxide industry.

SS - New York Bight Sewage Sludge Site
 PR - Puerto Rico Industrial Site
 106 - 106-Mile Ocean Waste Site

TABLE II
PERMIT ACTIVITY - CY 1979

<u>Permittee, Location</u>	<u>Type Permit, Material Dumped</u>	<u>Actual Quant. Dumped (in thousand wet tons)</u>
<u>Region II</u>	<u>Interim Permit</u>	
Digester Cleanout (covered under permits issued to mun./sewage auth. generally dumping at the sewage sludge site)	sewage sludge	90
Bergen County Util. Auth. Little Ferry, NJ	sewage sludge	250
General Marine Transp. Corp., Bayonne, NJ	sewage sludge	20
City of Glen Cove, Glen Cove, NJ	sewage sludge	7
Joint Meeting-Essex & Union Counties, Irvington, NJ	sewage sludge	307
Linden Roselle/Rahway Valley S.A. Linden, N.J.	sewage sludge	253
City of Long Beach, Long Beach, NY	sewage sludge	5
Middlesex Co. Utilities Sayerville, NY	sewage sludge	900
Middletown Twp S.A. Belford, NJ	sewage sludge	19
Modern Transp. Co. S. Kearny, NJ	sewage sludge	87
Nassau Co. DPW (9 plants) Mineola, NY	sewage sludge	395
New York City DEP (12 plants) New York, NY	sewage sludge	2809
Passaic Valley Sew. Comm. Newark, NJ	sewage sludge	534
Westchester Co. DEF Yonkers, NY	sewage sludge	346
W. Long Beach Sew. Dist. Atlantic City, NJ; (combined w/Nassau Co. in 1978)	sewage sludge	
American Cyanamid Co. Linden, NJ		101
Merck & Co. Rahway, NJ	wastes from manufacture of insecticides and chemicals, thiabendazole	46
Maria Costa General Marine Transp. Corp., Bayonne, NJ	chemical waste	4
PCI International Arecibo, PR	waste from manufacture of pharmaceuticals, chemicals	333

TABLE III (CONT'D)

WASTE TYPE	(C) PACIFIC						
	1973	1974	1975	1976	1977	1978	1979
Industrial Waste	0	0	0	0	0	0	0
Sewage Sludge	0	0	0	0	0	0	0
Construction and Demolition Debris	0	0	0	0	0	0	0
Solid Waste	240	200	0	0	0	0	998
Explosives	0	0	0	0	0	0	0
Incinerated (Wood)	0	0	0	0	0	0	0
Incinerated (Chemicals)	0	0	0	0	12,100	0	0
TOTALS	240	200	0	0	12,100	0	998
WASTE TYPE	TOTALS OF A, B, AND C (IN APPROX. TONS)						
	1973	1974	1975	1976	1977	1978	1979
Industrial Waste	5,050,800	4,579,700	3,441,900	2,733,500	1,843,800	2,548,173	2,577,000
Sewage Sludge	4,808,900	5,010,000	5,039,600	5,270,900	5,134,000	5,535,000	5,932,000
Construction and Demolition Debris	973,700	770,400	395,900	314,600	379,000	241,000	107,000
Solid Waste	240	200	0	0	100	0	998
Explosives	0	0	0	0	0	0	0
Incinerated (Wood)	10,800	15,800	6,200	8,700	15,100	18,000	36,000
Incinerated (Chemicals)	0	12,300	4,100	0	29,700	0	0
TOTALS	10,934,440	10,388,400	8,887,700	8,327,700	7,401,600	8,101,173	8,652,998

TABLE IV

SUMMARY OF OCEAN DUMPING PERMITTEES/APPLICANTS
DENIED OR PHASED OUT FROM 1973 to 1979

		REGION								
		I	II	III	IV	VI	IX	X	Totals	
Action prior to April 1973 phased out		--	44	--	--	--	--	-	44	
During the remainder of 1973										
	withdrew	--	4	--	--	--	--	-	4	
	phased out	--	1	--	--	1	--	-	2	
	denied	--	--	--	--	1	--	-	1	
During 1974										
	withdrew	--	2	--	--	--	1	-	3	
	phased out	--	21	--	--	1	--	-	22	
	denied	--	1	1	--	1	1	-	4	
During 1975										
	withdrew	--	6	--	--	--	--	-	6	
	phased out	1	10	1	--	2	--	-	14	
	denied	--	--	--	--	--	--	-	--	
During 1976										
	withdrew	--	2	--	--	--	--	-	2	
	phased out	--	17	--	--	--	--	-	17	
	denied	--	130	--	--	1	--	-	131	
During 1977										
	withdrew	--	2	--	--	--	--	-	2	
	phased out	1	16	--	-	1	--	-	18	
	denied	--	--	--	-	--	--	-	--	
During 1978										
	withdrew	--	1	--	--	--	--	-	1	
	phased out	--	31	--	--	1	--	-	32	
	denied	--	1	--	--	--	--	-	1	
During 1979										
	withdrew	--	4	--	--	--	--	-	4	
	phased out	--	8	--	--	--	--	-	8	
	denied	--	1	--	--	--	1	-	2	
Totals		2	292	2	--	9	3		318	

Table V

OCEAN DUMPING PERMITS PHASED OUT
BY REGION II DURING 1979

<u>Permittee</u>	<u>Location</u>	<u>Date</u>
Asbury Park	New Jersey	December 1979
Atlantic Highlands	New Jersey	July 1979
Kearny	New Jersey	April 1979
Lincoln Park	New Jersey	October 1979
Pequannock	New Jersey	October 1979
Roxbury	New Jersey	July 1979
Crompton and Knowles Co.	Pennsylvania	February 1979
Puerto Rico Olefins Co.	Puerto Rico	February 1979

LONDON DUMPING CONVENTION

The Convention on Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Dumping Convention) was negotiated in London in November 1972 and came into force on August 30, 1975 following receipt of the required 15 ratifications or accessions. The Inter-governmental Maritime Consultative Organization (IMCO), as the designated Secretariat, handles the administrative functions of the Convention.

In summary, the Convention is an international treaty requiring the Contracting Parties (member nations) to establish national systems to control substances leaving their shores for the purpose of being dumped at sea. Annex I of the Convention contains a "black list" of substances whose dumping would be prohibited under normal circumstances: mercury and cadmium and their compounds, organohalogen compounds such as DDT and PCB's, persistent plastics, oil, high level radioactive wastes, and chemical and biological warfare agents. Annex II lists substances requiring special permits as well as special care in each dumping including: heavy metals, lead, copper, zinc, also cyanides and fluorides, waste containers which could present a serious obstacle to fishing or navigation, and medium and low level radioactive wastes. Substances not listed in Annex I or II require a general permit and all dumping must be carried out with full consideration given to a list of technical considerations contained in Annex III. These Annexes are shown at the Appendix to this report.

The Convention provides that each party will take appropriate steps to ensure that the terms of the Convention apply to its flagships and aircraft and to any vessel or aircraft loading at its ports for the purpose of dumping. Full continuous use is to be made of the best available technical knowledge in implementation which, together with periodic meetings and planned participation by appropriate international technical bodies, is designed to keep the contents of the Annexes up-to-date and realistic in meeting the ocean pollution control needs stemming from ocean dumping.

As the U.S. authority for implementing the international requirements for control of ocean dumping, the MPRSA was amended in 1974 to bring the Act into conformance with the Convention.

Consultative Meetings of the Contracting Parties have been held annually since 1976. Ad hoc working groups are established as needed to work intersessionally (the interim between Consultative Meetings) on particular subjects. The ad hoc Scientific Group on Dumping is an ongoing working group, currently chaired by the U.S., which meets annually to develop recommendations on technical scientific issues under consideration.

Two ad hoc groups convened early in 1979. The work of the Group on Incineration at Sea included revising the Interim Technical

TABLE VII (CONT'D)

United Kingdom	Industrial liquids	22	342,200
	Industrial sludges	29	257,020
	<u>Industrial Solids</u>		
	- Fly ash	2	850,000
	- Drums w/arsenic residues	1	20
	- Ammunition	1	20
	- Pipes		150
	Diluted acids	4	71,500
	Caustic material	15	141,000
	Sewage sludge	30	9,024,000
	Seal carcasses	1	3,000
	Mutilated weapons	2	3.5
	Concrete pipes	1	300
	Excavation material	6	720,000m ³
	Dredged material	11	5,580,000m ³
United States	<u>Industrial</u>		
	- Aqueous/liquid wastes	12	920,000
	- Sludges	2	760,000
	- Diluted acids	3	2,680,000
	<u>Solids</u>		
	- (Excavation material)	1	600,000
	<u>Scientific Exp.</u>		
	- Crude oil/dispersants	1	80,097 l
	Sewage Sludge	15	6,395,000
	Dredged material	83	34,620,000cu.m
	Technical equipment and ammunition	1	1078 (Kwajalein, Marshall I.)
United Kingdom (Hong Kong Gov't)	<u>Industrial Wastes</u>		
	Sludges	5	2,847
	Liquids	1	800
	Drums containing sludges	2	170
	Drums containing solids	5	2,235

* dry weight

** not yet a Contracting Parties

TABLE VII (CONT'D)
INCINERATION AT SEA PERMITS ISSUED IN 1978

COUNTRY	TYPE OF MATERIAL	NO. OF PERMITS	TOTAL AMT. AUTHORIZED (in tonnes if not expressed otherwise)
Denmark		NIL	
Iceland		NIL	
Netherlands	(Type of waste not given)	2	200m ³
	Alcohols together mainly w/keytones, chlorinated hydrocarbons (not specified)	1	500m ³
	Ethanes, Cresols and Phenols (mainly)	1	9,500
	Trichloropropanes, dichlorohydrins, and Ethers	1	15,000
Norway		NIL	
Portugal		NIL	
Sweden		NIL	
United States	Driftwood	2	56,700

DUMPING OF RADIOACTIVE WASTES, 1978

COUNTRY		TOTAL AMOUNT AUTHORIZED (in tonnes gross weight**)
Belgium***	19-30 June 1978	2,588
Belgium	Joint operation*	-1,083
Netherlands		
Switzerland		
Belgium	3 permits	14,251.7
Netherlands	1 permit	1,562.2
United Kingdom	5-17 July 1978	2,080

* Loading in a harbour of the Netherlands

** i.e. including the weight of containers

*** not yet a Contracting Party

OSV ANTELOPE

Under the MPRSA, EPA received responsibility for regulating ocean dumping, designating and managing dumping sites, and assessing the consequences of ocean dumping.

When EPA contracted for preparation of environmental impact statements (EIS) on ocean dumping sites, field surveys of some of these sites were found to be necessary; site-specific data were lacking, making environmental assessment difficult. At ocean sites used for many years and at sites receiving large quantities of material, the effects of this dumping on the marine ecosystem was considered important enough to launch an extensive field sampling program. The field survey program would provide data not only as specific information on the sites for EIS development, but also would enable EPA to make future recommendations on the rates, quantities, and types of material that a certain site may receive. In order to survey most efficiently these sites off the Atlantic, Gulf and Pacific coasts in a two-year period, EPA acquired the PG ANTELOPE on surplus from the General Services Administration. ANTELOPE had served in Vietnam and the Mediterranean as a Navy patrol gunboat, armed with a three-inch gun, rockets, machine guns, and powered by a gas turbine engine for nearshore patrol and high speed pursuit.

The conversion of ANTELOPE to an ocean survey vessel took eight months, and was completed in February 1979. The armament and large gas turbine engine were removed, making room for a wet lab, chemical lab, and microbiological lab while retaining berthing space for a crew of 13 and a scientific party of 12.

A crane was added to handle heavy survey gear over the side, and stabilizers were installed for ease of vessel movement in rough seas. A computerized bow-thruster system keeps the ship on station during sampling. On-deck sampling equipment includes trawls, hydrographic winches, sediment box cores, plankton nets, an underwater camera and water sampling bottles. Scientific support equipment in the laboratories includes an autoclave, incubator, water distiller, and refrigerating units. The ANTELOPE carries a salinometer, fluorometer, turbidimeter, pH meter, microburet titration system for dissolved oxygen measurements, and conductivity-temperature-density (CTD) system capable of operating to 750 meters depth. To track samples from the water to the analytical lab and to log shipboard-generated data, a mini-computer and line printer with an uninterruptable power supply were added. A closed-circuit TV system linking the bridge with the after deck aids in proper ship positioning during sampling.

During 1979, the first year of operation for ANTELOPE, 16 surveys were completed at 39 waste disposal sites. In addition to her routine survey responsibilities, a quick response effort to support monitoring the Campeche oil spill was conducted in the Gulf of Mexico during August and September. Between February and December 1979, the ship occupied 260 stations and 7000 samples were collected. She traveled a total of 14,926 nautical miles along the Atlantic and Gulf coasts during 164 operational days. Figure 2 shows the site locations where the surveys were conducted.

The ANTELOPE's mission on the Atlantic, Gulf, and Pacific coasts is the most comprehensive ocean monitoring program administered by EPA. Surveys at these ocean dumpsites around the U.S. will yield scientific data pertinent to the designation of ocean dumping sites and proper management of these sites under the MPRSA.



Figure 1
OCEAN DISPOSAL SITES SAMPLED
1979

BASELINE AND MONITORING SURVEYS OF OCEAN SITES FOR SITE DESIGNATION

During 1979 EPA conducted baseline surveys at ocean disposal sites off the Atlantic and Gulf Coasts of the United States. These oceanographic surveys at selected locations provide new or additional site-specific data on proposed ocean dumpsites for the purpose of developing an Environmental Assessment (EA) of the site. An Environmental Impact Statement (EIS) on proposed designations of most of the sites will also be written, describing the environment of the site, the types and quantities of material which the site may receive, and recommending future monitoring activities at the site. Table VIII lists the Draft EISs under preparation and their availability dates. The EISs and information developed through the site designation program will aid EPA in proper management of these ocean areas so that unreasonable degradation or unacceptable adverse impacts will not occur.

Ocean disposal site surveys must be as practical, economic, and site-specific as possible while providing data appropriate to an EA of the site. It is not the purpose of the program to measure a large suite of parameters but to focus on those likely to identify where impacts may be occurring to the marine environment. The known characteristics of the site and the composition of the waste which the site will receive determine which parameters should be measured. Historical data, other pollutant sources, and the basic physical/chemical processes of the ocean are also considered in the survey plan.

In most cases EPA conducts both a winter and a summer season survey at each site. The summer season represents the high temperature period when the water column is not thoroughly mixed and a thermocline may develop. This survey provides the site data when impacts from pollutants may be most severe. The winter survey occurs during a period of mixing of the water column and when storms may resuspend the smaller sediment particles. The possibility of transport of wastes out of the site is best investigated during the winter survey.

Some materials disposed in ocean waters are likely to have an effect on the water column some on the benthic, or bottom, environment. Industrial wastes and municipal treatment plant wastes require site designation surveys which concentrate on water column effects. In contrast, dredged material, for the most part, settles quickly and directly to the bottom where it is most likely to affect the benthic community.

The baseline survey program in 1979 covered 11 ocean dumping sites, 10 of them dredged material sites. These sites ranged between 6 meters deep and 265 meters deep and between 0.15 nautical miles and 35 nautical miles offshore. The surveys were accomplished by the EPA OSV ANTELOPE.

Three examples of ocean disposal sites sampled in 1979 are: a municipal site, a shallow dredged material site, and a deepwater dredged material site.

Municipal Waste Site

The municipal waste dumpsite surveyed during 1979 receives up to 27,500 tons of waste a year and is located off the Delaware/Maryland peninsula. This site also is located in an area under the influence of the Delaware River. The survey plan illustrates how sampling locations have been placed to take into account the river flow (Figure 1).

Shallow Water Dredged Material Site

A dredged material dumpsite less than 15 meters deep is located on the continental shelf on the Atlantic Coast of the United States. The sampling plan of this site is given in Figure 2. The plan takes into account a prevailing northeasterly bottom current; stations are located parallel to this current as well as perpendicular to it. This site receives annually 1 million cu yd. of dredged material; the plan has been designed to identify bottom transport of dredged material and any pollutants which may be associated with it.

Deepwater Dredged Material Site

The deepest site surveyed in 1979 is a dredged material site located off the coast of Puerto Rico. The average depth of the site is 265 meters, but the site itself is small, less than 3.5 Km². The survey plan of the site is given in Figure 3. At this site, too, estimated transport of sediment is of concern. Water column impacts are also expected to be greater than at a shallow site because of the greater distance the materials fall through the water column, therefore, a larger number of water column parameters were taken.

TABLE VIII
SCHEDULE FOR AVAILABILITY OF DRAFT EISs

<u>Draft EIS</u>	<u>Availability Date</u>
106 Mile Site	6/29/79
Hawaii Dredged Material Site	11/16/79
Region II Acid Waste Site	12/14/79
San Francisco Channel Bar Dredged Material Site	8/15/80
Galveston Dredged Material Site	10/10/80
New York Mud Dump Site	11/14/80
Viegas Pass Dredged Material Site	12/19/80
Moss Landing Dredged Material Site	1/2/81
Columbia River Dredged Material Site	2/13/81
Portland, ME Dredged Material Site	3/20/81
Sabine-Neches Dredged Material Site	4/17/81
Jacksonville Dredged Material Site	5/22/81
Tampa Dredged Material Site	6/19/81
Region II Cellar Dirt Site	7/17/81
Charleston/Savannah Dredged Material Sites	8/21/81
Los Angeles Dredged Material Site	10/16/81
New Jersey/Long Island Dredged Material Sites	11/20/81
San Juan Harbor Dredged Material Site	12/18/81
Mobile/Gulfport/Pensacola Dredged Material Sites	1/8/82
San Diego Dredged Material Site	2/19/82
Wilmington Dredged Material Site	3/19/82
Farallon Islands Dredged Material Site	4/16/82
Humbolt Bay Dredged Material Site	5/14/82
Coos Bay Dredged Material Site	6/18/82

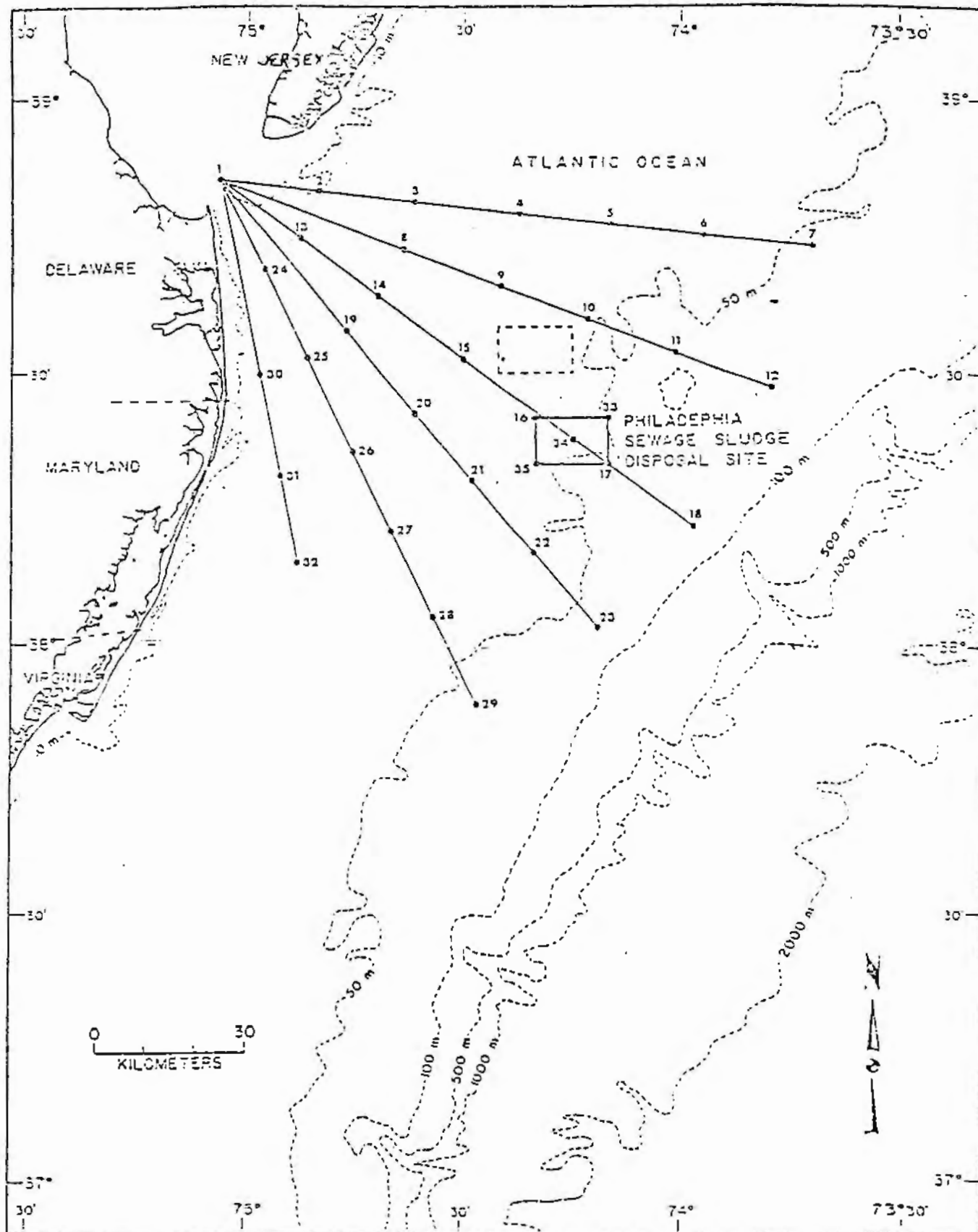


Figure 2. Municipal Waste Disposal Site

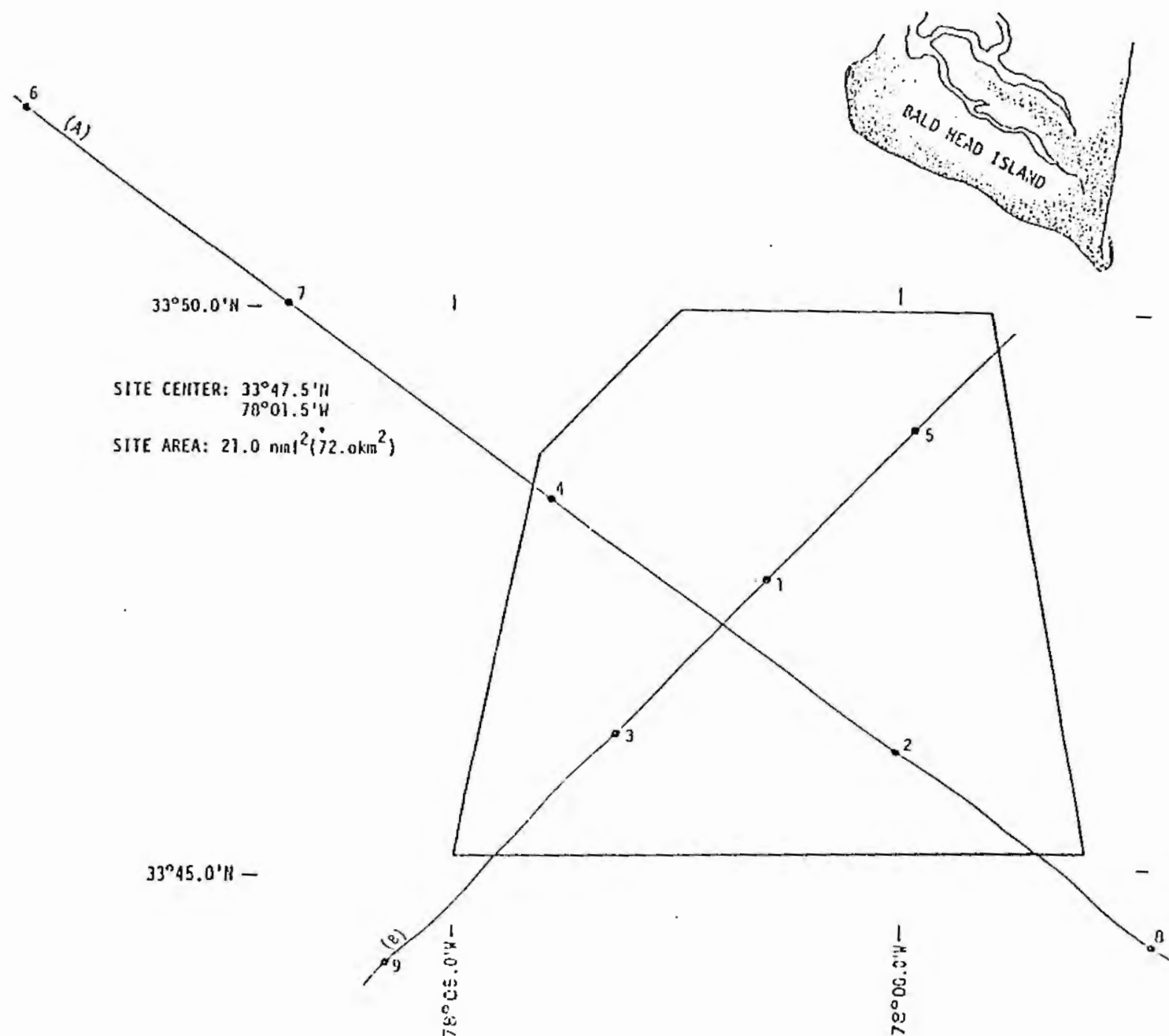


Figure 3. Sampling Locations, Shallow Water Dredge Material Disposal Site

Site Center: $18^{\circ}30.7'N$
 $66^{\circ}09'W$

Site Area: 3.35 sq. km (0.98 sq. n mi)

Bottom Current: March-July 270° True
4.3 cm/sec. (0.1 kt)

➡ : 1/2 hr. trawl

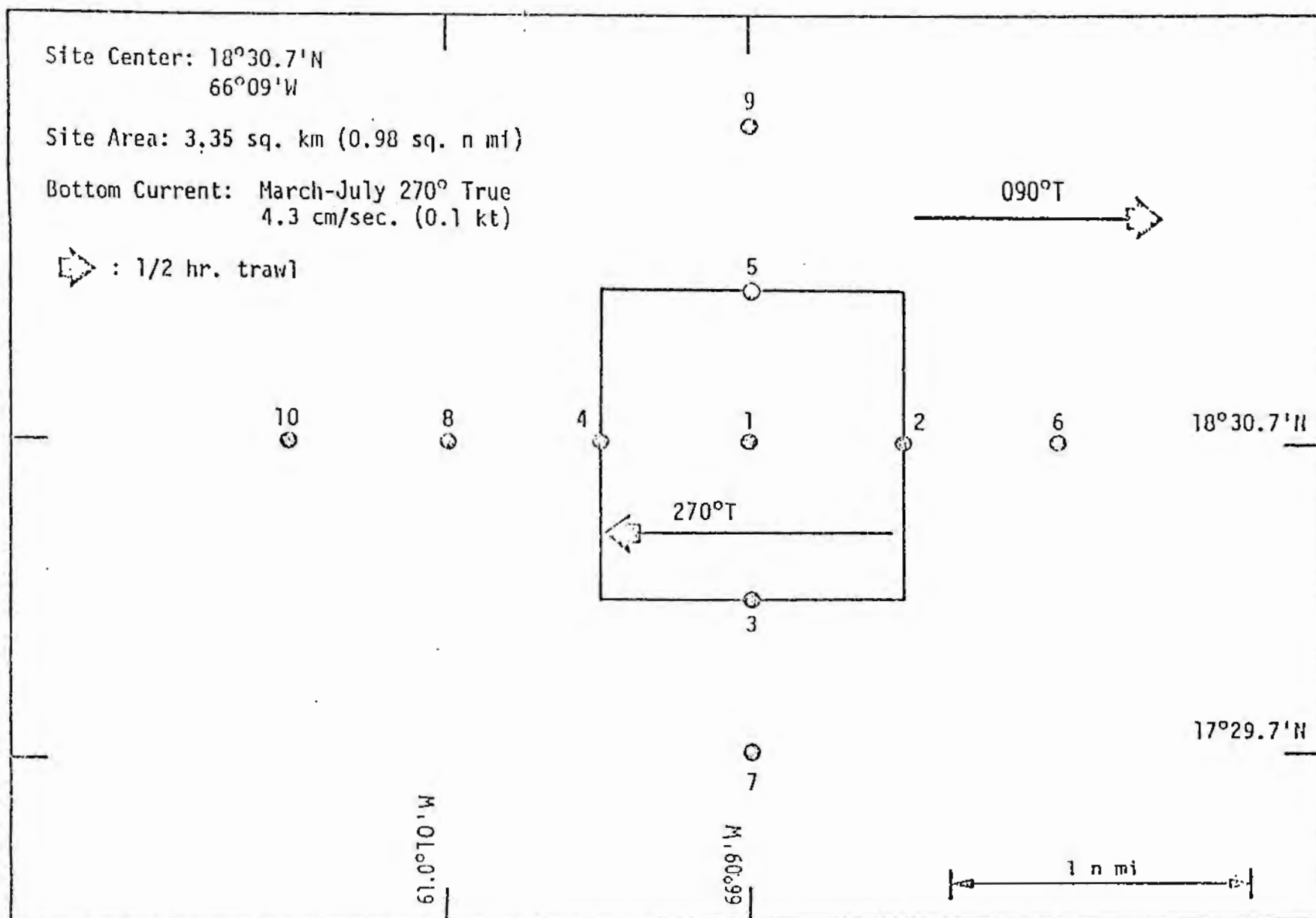


Figure 4. Deep Water Dredged Material Disposal Site

ENFORCEMENT

Surveillance and enforcement activities to prevent unlawful dumping or transportation of materials for dumping, and to assure compliance with ocean dumping permit conditions are the responsibility of the U.S. Coast Guard.

The Coast Guard conducts surveillance of ocean dumping operations by several methods, including vessel and aircraft patrols, shipriders on board dumping vessels, in-port boardings and inspections, and Vessel Traffic Services (VTS) radar. The scheduling of surveillance resources is aided by a permit condition which requires permittees to give authorities advance notification prior to commencing any dumping operations.

During 1979 a total of 679 surveillance missions were conducted -- 192 on dumps of industrial waste and 487 on dumps of other wastes, representing respectively a 64 percent and a 12 percent Coast Guard surveillance coverage for each of the two categories of wastes. The missions were accomplished by using 51 vessel patrols, 441 aircraft patrols, and 187 ship rider operations. The latter method required in excess of 10,000 manhours. In addition to all the surveillance resource hours, another 7,500 administrative manhours were needed at the field unit and district level.

The Coast Guard published a notice of proposed rulemaking in the December 13, 1979 Federal Register (44 FR 72188) which will require vessels engaged in ocean dumping activities to be equipped with an electronic surveillance device, the Ocean Dumping Surveillance System (ODSS). The device is designed to augment present surveillance methods so a higher level of surveillance can be achieved and the total number of resource hours can be reduced. The ODSS includes a Loran-C receiver for navigation information, a data input section which provides information such as permit number and vessel identification, dump status sensors to determine when dumping is occurring, and a digital cassette recorder. Tapes produced by the recorder will be retrieved from the vessels and analyzed at Coast Guard facilities to determine who dumped and where the dumping occurred. It is anticipated that the final rule will be published in early 1980 and be effective by the end of that year.

In calendar year 1979, the Coast Guard referred to EPA regional offices 3 cases involving 3 alleged violations. All of the violations were for failure to conduct wood incineration operations within the authorized ocean dumping site.

The number of cases forwarded to EPA during 1979 is significantly less than in previous years. Two factors contribute to this smaller number. In past years, there had been a high number of alleged violations for failure to properly notify the Coast Guard in advance of departure. Discussions between the applicable Coast Guard field units and the waste transporters involved have led to very good

compliance with this permit provision. Additionally, most of the past violations resulted in letters of warning from EPA with notification that stronger action would be taken in the future. There were 77 such alleged violations in 1977, two reported in 1978, and none in 1979.

The second factor concerns fewer violations of the permit provision establishing the dispersal rate to be used when discharging waste material. In 1977, there were 126 such reported violations. All were for permitted activity involving sewage sludge disposal in EPA Region II (Third Coast Guard District). Permits for sewage sludge disposal required dispersal of material in the dumpsite over a distance of five nautical miles at a speed not exceeding five knots. One waste transporter was not complying with the speed and time requirements until the notice of violation was received. In addition to compliance during 1978 (only four violations--all in 1977--were reported to EPA), a question was raised over the equity of this dispersal rate. Smaller vessels with less capacity previously had had to spend a minimum of one hour dumping even though their loads were less. A new dispersal rate of 15,500 gallons per minute at a vessel speed of not less than three knots is now incorporated in permit renewals. This new rate will treat all vessels fairly since it is dependent on cargo quantity.

In late 1977, EPA Region III initiated enforcement actions against the City of Philadelphia for failure to comply with their implementation schedule for phasing out ocean dumping. Following an adjudicatory hearing, litigation was carried out and in 1978 a fine of \$225,000 was levied against the City. In 1979, the City signed a consent decree to end ocean dumping by December 31, 1980, and to pay a fine totaling \$2,165,000 (of which \$225,000 were for ocean dumping).

On April 26, 1979, the Department of Justice brought suit in the Southern New York District on behalf of EPA Region II against the Westchester County Department of Environmental Facilities for failure to comply with their implementation schedule for phasing out ocean dumping. Table VIII identifies enforcement actions taken by EPA during 1979 and the disposition of each case. Also included are several cases for which action had been pending from a previous year and final disposition was made in 1979.

TABLE IX
ENFORCEMENT ACTIONS

<u>ORDER NO.</u>	<u>RESPONDENT'S NAME</u>	<u>REFERRAL FROM</u>	<u>TYPE OF VIOLATION</u>	<u>COMPLAINT ISSUED</u>	<u>DISPOSITION</u>	<u>DISPOSAL SITE</u>
<u>Region II</u>						
78-12	Northeast Monmouth Regional Sewerage Auth.	EPA	Permit condition, Compliance schedule	2/22/78	Final Order- 9/24/79 Revision of schedule	Sewage Sludge
79-1	City of Asbury Park	EPA	Permit condition, Compliance schedule	7/17/79	Final Order- 11/8/79 Dumping by end of 1979	Sewage Sludge
79-2	American Cyanamid	EPA	Compliance schedule	7/27/79	Final Order- 12/21/79 \$5,000 penalty payment and revision of schedule	Chemical Waste

APPENDIX

ANNEXES I, II AND III
TO THE CONVENTION ON THE PREVENTION
OF MARINE POLLUTION BY DUMPING WASTES
OTHER MATTER

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	} and their compounds
lead	
copper	
zinc	

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.

Attachment

AMENDMENTS TO ANNEXES TO THE CONVENTION
ON THE PREVENTION OF MARINE POLLUTION
BY DUMPING OF WASTES AND OTHER MATTER
CONCERNING INCINERATION AT SEA

The following paragraph shall be added to Annex I:

10. Paragraphs 1 and 5 of this Annex do not apply to the disposal of wastes or other matter referred to in these paragraphs by means of incineration at sea. Incineration of such wastes or other matter at sea requires a prior special permit. In the issue of special permits for incineration the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to this Annex (which shall constitute an integral part of this Annex) and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation.

The following paragraph shall be added to Annex II:

E. In the issue of special permits for the incineration of substances and materials listed in this Annex, the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to Annex I and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by Contracting Parties in consultation, to the extent specified in these Regulations and Guidelines.

ADDENDUM

REGULATIONS FOR THE CONTROL OF INCINERATION OF WASTES AND OTHER MATTER AT SEA

PART I REGULATION 1

Definitions

For the purposes of this Addendum:

- (1) "Marine incineration facility" means a vessel, platform, or other man-made structure operating for the purpose of incineration at sea.
- (2) "Incineration at Sea" means the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Activities incidental to the normal operation of vessels, platforms or other man-made structures are excluded from the scope of this definition.

REGULATION 2

Application

- (1) Part II of these Regulations shall apply to the following wastes or other matter:
 - (a) those referred to in paragraphs 1 of Annex I;
 - (b) pesticides and their by-products not covered in Annex I.
- (2) Contracting Parties shall first consider the practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the wastes or other matter less harmful, before issuing a permit for incineration at sea in accordance with these Regulations. Incineration at sea shall in no way be interpreted as discouraging progress towards environmentally better solutions including the development of new techniques.
- (3) Incineration at sea of wastes or other matter referred to in paragraph 10 of Annex I and paragraph E of Annex II, other than those referred to in paragraph (1) of this Regulation, shall be controlled to the satisfaction of the Contracting Party issuing the special permit.

(4) Incineration at sea of wastes or other matter not referred to in paragraphs (1) and (3) of this Regulation shall be subject to a general permit.

(5) In the issue of permits referred to in paragraphs (3) and (4) of this Regulation, the Contracting Parties shall take full account of all applicable provisions of these Regulations and the Technical Guidelines on the Control of Incineration of Waste and Other Matter at Sea for the waste in question.

PART II
REGULATION 3

Approval and Surveys of the Incineration System

(1) The incineration system for every proposed marine incineration facility shall be subject to the surveys specified below. In accordance with Article VII(1) of the Convention, the Contracting Party which proposes to issue an incineration permit shall ensure that the surveys of the marine incineration facility to be used have been completed and the incineration system complies with the provisions of these Regulations. If the initial survey is carried out under the direction of a Contracting Party, a special permit which specifies the testing requirements, shall be issued by the Party. The results of each survey shall be recorded in a survey report.

- (a) An initial survey shall be carried out in order to ensure that during the incineration of waste and other matter combustion and destruction efficiencies are in excess of 99.9 percent.
- (b) As a part of the initial survey, the State under whose direction the survey is being carried out shall:
 - (i) approve the siting, type and manner of use of temperature measuring devices;
 - (ii) approve the gas sampling system including probe locations, analytical devices, and the manner of recording;
 - (iii) ensure that approved devices have been installed to automatically shut off the feed of waste to the incinerator if the temperature drops below approved minimum temperatures;

- (iv) ensure that there are no means of disposing of wastes or other matter from the marine incineration facility except by means of the incinerator during normal operations;
 - (v) approve the devices by which feed rates of waste and fuel are controlled and recorded;
 - (vi) confirm the performance of the incineration system by testing under intensive stack monitoring, including the measurements O_2 , CO , CO_2 , halogenated organic content, and total hydrocarbon content using wastes typical of those expected to be incinerated
- (c) The incineration system shall be surveyed at least every two years to ensure that the incinerator continues to comply with these Regulations. The scope of the biennial survey shall be based upon an evaluation of operating data and maintenance records for the previous two years.

(2) Following the satisfactory completion of a survey, a form of approval shall be issued by a Contracting Party if the incineration system is found to be in compliance with these Regulations. A copy of the survey report shall be attached to the form of approval. A form of approval issued by a Contracting Party shall be recognized by other Contracting Parties unless there are clear grounds for believing that the incineration system is not in compliance with these Regulations. A copy of each form of approval and survey report shall be submitted to the Organization.

(3) After any survey has been completed, no significant changes which could affect the performance of the incineration system shall be made without approval of the Contracting Party which has issued the form of approval.

REGULATION 4

Wastes Requiring Special Studies

(1) Where a Contracting Party has doubts as to the thermal destructibility of the wastes and other matter proposed for incineration, pilot scale tests shall be undertaken.

(2) Where a Contracting Party proposes to permit incineration of wastes or other matter over which doubts as to the efficiency of combustion exist, the incineration system shall be subject to the same intensive stack monitoring as required for the initial incineration system survey. Consideration shall be given to the sampling of particulates, taking into account the solid content of the wastes.

(3) The minimum approved flame temperature shall be that specified in Regulation 5 unless the results of tests on the marine incineration facility demonstrate that the required combustion and destruction efficiency can be achieved at a lower temperature.

(4) The results of special studies referred to in paragraphs (1)(2) and (3) of this Regulation shall be recorded and attached to the survey report. A copy shall be sent to the Organization.

REGULATION 5

Operational Requirements

(1) The operation of the incineration system shall be controlled so as to ensure that the incineration of wastes or other matter does not take place at a flame temperature less than 1250 degrees centigrade, except as provided for in Regulation 4.

(2) The combustion efficiency shall be at least $99.95 \pm 0.05\%$ based on:

$$\text{Combustion efficiency} = \frac{\frac{C_{CO}}{2} + \frac{C_{CO}}{2}}{C_{CO}}$$

where C_{CO} = concentration of carbon dioxide in the combustion gases

C_{CO} = concentration of carbon monoxide in the combustion gases

(3) There shall be no black smoke nor flame extension above the plane of the stack.

(4) The marine incineration facility shall reply promptly to radio calls at all times during the incineration.

REGULATION 6

Recording Devices and Records

(1) Marine incineration facilities shall utilize recording devices or methods as approved under Regulation 3. As a minimum, the following data shall be recorded during each incineration operation and retained for inspection by the Contracting Party who has issued the permit:

- (a) continuous temperature measurements by approved temperature measuring devices;
- (b) date and time during incineration and record of waste being incinerated;
- (c) vessel position by appropriate navigational means;
- (d) feed rates of waste and fuel - for liquid wastes and fuel the flow rate shall be continuously recorded; the latter requirement does not apply to vessels operating on or before 1 January 1979;
- (e) CO and CO₂ concentration in combustion gases;
- (f) vessel's course and speed.

(2) Approval forms issued, copies of survey reports prepared in accordance with Regulation 3 and copies of incineration permits issued for the wastes or other matter to be incinerated on the facility by a Contracting Party shall be kept at the marine incineration facility.

REGULATION 7

Control over the Nature of Wastes Incinerated

A permit application for the incineration of wastes or other matter at sea shall include information on the characteristics of wastes or other matter sufficient to comply with the requirements of Regulation 9.

REGULATION 8

Incineration Sites

(1) Provisions to be considered in establishing criteria governing the selection of incineration sites shall include, in addition to those listed in Annex III to the Convention, the following:

- (a) the atmospheric dispersal characteristics of the area - including wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity - in order to determine the potential impact on the surrounding environment of pollutants released from the marine incineration facility, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;
- (b) oceanic dispersal characteristics of the area in order to evaluate the potential impact of plume interaction with the water surface;
- (c) availability of navigational aids.

(2) The coordinates of permanently designated incineration zones shall be widely disseminated and communicated to the Organization.

REGULATION 9

Notification

Contracting Parties shall comply with notification procedures adopted by the Parties in consultation.

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