

Jun 1982

OCEAN DUMPING

HEARINGS

BEFORE THE

SUBCOMMITTEE ON OCEANOGRAPHY

AND THE

SUBCOMMITTEE ON FISHERIES AND WILDLIFE
CONSERVATION AND THE ENVIRONMENT

OF THE

COMMITTEE ON
MERCHANT MARINE AND FISHERIES
HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

SECOND SESSION

ON

REAUTHORIZATION OF THE MARINE PROTECTION, RE-
SEARCH, AND SANCTUARIES ACT, TITLES I AND II—
H.R. 6112 AND H.R. 6113

MARCH 18, 23, 26, 1982

PROPOSED OCEAN DUMPING USER FEES—H.R. 6113 AND
H.R. 6324

(Joint committee hearing with Subcommittee on Natural Resources, Agriculture
Research and Environment of the Committee on Science and Technology)

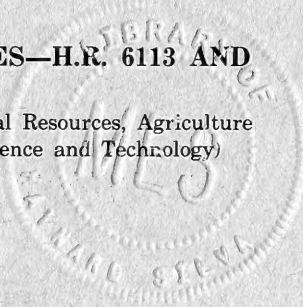
JUNE 23, 1982

Serial No. 97-40

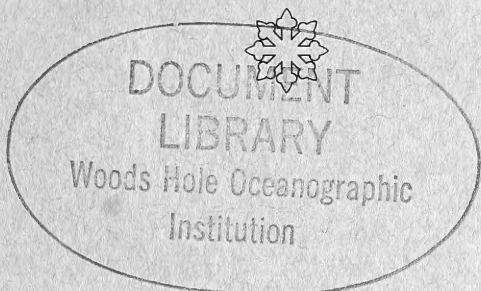
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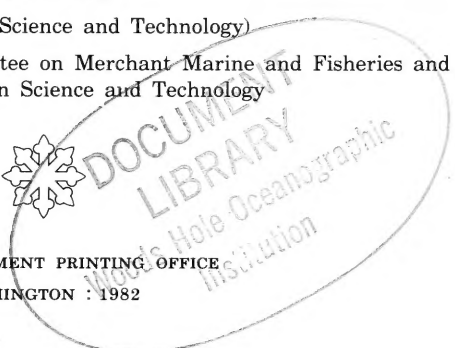
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CONTENTS

REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT, TITLES I AND II

| | Page |
|---|------|
| Hearings held: | |
| March 18, 1982..... | 1 |
| March 23, 1982..... | 177 |
| March 26, 1982..... | 383 |
| Text of: | |
| H.R. 6112..... | 33 |
| H.R. 6113..... | 22 |
| Report from: | |
| H.R. 6113: | |
| Commerce Department..... | 37 |
| Defense Department (Army)..... | 38 |
| Justice Department..... | 44 |
| Discussion draft for H.R. 6113..... | 3 |
| Statement of: | |
| American Association of Port Authorities (prepared statement)..... | 391 |
| Bennett, D. W., executive director, American Littoral Society..... | 531 |
| Brinson, J. Ron, president, the American Association of Port Authorities.. | 386 |
| Brown, Edmund G., Jr., Governor, State of California..... | 548 |
| Byrne, Dr. John V., Administrator, NOAA, Department of Commerce..... | 120 |
| Calhoun, Charles, Project Manager for Dredging Operational and Technical Support of the Corps' Environmental Laboratory, U.S. Army Corps of Engineers, Department of the Army..... | 125 |
| Cohalan, Peter F., county executive, Suffolk County, N.Y..... | 384 |
| Cousteau, Capt. Jacques-Yves, chairman, the Cousteau Society and the Foundation Cousteau..... | 178 |
| Prepared statement..... | 186 |
| Davies, Tudor, Director, Environmental Research Lab, Environmental Protection Agency..... | 45 |
| Engler, Dr. Robert M., Corps' Scientific Adviser to the U.S. Delegation of the London Dumping Convention and Chairman of the Ocean Dumping Technical Committee, U.S. Army Corps of Engineers, Department of the Army..... | 125 |
| Garabedian, Michael, assistant national conservation representative, Sierra Club..... | 345 |
| Goldberg, Dr. Edward, Scripps Institution of Oceanography..... | 511 |
| Prepared statement..... | 515 |
| Gay, Brig. Gen. Forrest T., III, Deputy Director of Civil Works, U.S. Army Corps of Engineers, Department of the Army..... | 125 |
| Haar, Herbert R., Jr., associate port director, Port of New Orleans; chairman, Special Dredging Committee, Environmental Planning and Engineering Task Force, the American Association of Port Authorities..... | 388 |
| Harper, Fred, chairman, Conference of Coastal Agencies..... | 491 |
| Howard, Hon. James J., chairman, Public Works and Transportation Committee..... | 545 |
| Hurd, Merna, Associate Assistant Administrator for Water, Environmental Protection Agency..... | 45 |
| Prepared statement..... | 50 |
| Imhoff, Col. Max, Commander, Water Resources Support Center, U.S. Army Corps of Engineers, Department of the Army..... | 125 |
| Janes, David, Office of Radiation Programs, Environmental Protection Agency..... | 45 |

VI

| | |
|---|-------------|
| Statement of—Continued | |
| Kamlet, Kenneth S., director, Pollution and Toxic Substances Division, National Wildlife Federation | Page 301 |
| Prepared statement | 307 |
| Knauss, Dr. John A., Chairman, National Advisory Committee on Oceans and Atmosphere | 288 |
| Koch, Hon. Edward I., mayor, New York City | 198 |
| Prepared statement | 201 |
| LeBlanc, Joseph E., Jr., of Milling, Benson, Woodward, Hillyer, Pierson & Miller | 386 |
| Lent, Hon. Norman F., a Representative in Congress from the State of New York | 103 |
| Mathis, David, Principal Biologist, U.S. Army Corps of Engineers, Depart- ment of the Army | 125 |
| McGough, Joseph T., commissioner, Department of Environmental Pro- tection, New York City | 198 |
| Pindzola, Dr. Daniel, principal engineer, Franklin Research Center | 533 |
| Prepared statement | 535 |
| Ricci, Rocco, chief engineer, Passaic Valley Sewage Commission | 518 |
| Prepared statement | 522 |
| Schatzow, Steven, Office of Water Regulations and Standards, Environ- mental Protection Agency | 45 |
| Seale, Linda, commissioner, Department of Ports and Terminals, New York City | 198 |
| Segar, Dr. Douglas, Conference of Coastal Agencies | 488 |
| Smith, Col. Walter M., District Engineer from New York District, U.S. Army Corps of Engineers, Department of the Army | 125 |
| Swanson, Capt. Larry, NOAA Office of Marine Pollution Assessment, Department of Commerce | 120 |
| White, Lee, Conference of Coastal Agencies | 488 |
| Additional material supplied: | |
| American Association of Port Authorities: | |
| Special Care Measures for Safe Disposal of Polluted Dredged Materi- al in the Marine Environment | 409 |
| Synthesis of Research Results—Dredged Material Research Program, December 1978 | 399 |
| Conference of Coastal Agencies: | |
| Position on amendment | 509 |
| Questions submitted by Mr. Anderson and answers | 509 |
| Questions submitted by Mr. Forsythe and answers | 510 |
| Corps of Engineers: | |
| Denial of ocean dumping permit requests and the impact of imple- mentation of the 1977 EPA ocean dumping regulations and criteria on permit processing in the New York district | 138 |
| Questions submitted by Mr. D'Amours and the answers | 146 |
| Questions submitted by Mr. Forsythe and the answers | 148 |
| Curtis, Clifton E.: | |
| Monitoring of past radioactive waste ocean dumpsites and "test" sites is needed to provide effective assurances that there are no undue hazards to human health and the environment, and to assist in the development of future policies | 553 |
| EPA: | |
| Cost of monitoring activities | 104 |
| New and old Philadelphia dumpsites | 107 |
| Questions submitted by Mr. Biaggi and the answers | 156 |
| Questions submitted by Mr. D'Amours and the answers | 155 |
| Questions submitted by Mr. Forsythe and the answers | 174 |
| Question submitted by Mrs. Schneider and the answer | 176 |
| Garabedian, Michael: | |
| AMSA case study analysis (a portion of) | 377 |
| Pretreatment resource reader (a portion of) by the Association of Metropolitan Sewerage Agencies | 362 |
| Report (a portion of): Assessment of the impacts of industrial dis- charges on publicly owned treatment works | 352 |
| Kamlet, Kenneth S.: | |
| Article: "EPA Must Stand Firm on Ocean-Dumping Deadline," the Philadelphia Inquirer, September 5, 1981 | 337 |
| Article: "Slants and Trends," Sludge Newsletter, January 22, 1982 | 336 |

Additional material supplied—Continued

| | |
|---|----------|
| Kamlet, Kenneth S.—Continued | |
| Letter to the editor: "Sludge on Land," by William J. Jewell, Lewis M. Naylor, Raymond C. Loehr, and Richard I. Dick, Water Pollution Control Federation Newsletter | Page 335 |
| Knauss, Dr. John A.: NACOA 1981 recommendations | 290 |
| Kock, Hon. Edward I.: | |
| Sewage sludge dumping at the 12-mile site..... | 220 |
| Technical analysis of the February 28, 1982 draft "Ocean Dumping Amendments of Act of 1982" | 235 |
| Summary of studies concerning ocean disposal of dredged material | 253 |
| NACOA: Questions submitted by Congressman D'Amours and the answers | 294 |
| NOAA: | |
| Questions submitted by Mr. Biaggi and the answers | 151 |
| Questions submitted by Mr. D'Amours and the answers | 150 |
| Questions submitted by Mr. Forsythe and the answers..... | 152 |
| Question submitted by Mrs. Schneider and the answer | 155 |
| Communications submitted: | |
| Barber, Walter C.: Memorandum of April 7, 1981, to Richard T. Dewling and Steven Schatzow | 119 |
| Garabedian, Michael: Letter of April 29, 1982, to Hon. Norman E. D'Amours with enclosures..... | 351 |
| PROPOSED OCEAN DUMPING USER FEES | |
| Hearing held June 23, 1982..... | 595 |
| Text of: | |
| H.R. 6113..... | 597 |
| H.R. 6324..... | 608 |
| Report from: | |
| H.R. 6113: | |
| Commerce Department..... | 651 |
| Army Department..... | 652 |
| Justice Department..... | 657 |
| Statement of: | |
| Borberg, James R., general manager, Hampton Roads, Virginia Sanitation District, representing the Conference on Coastal Agencies..... | 722 |
| Prepared statement..... | 724 |
| Eidsness, Frederic A., Jr., Assistant Administrator for Water, Environmental Protection Agency | 659 |
| Forsythe, Hon. Edwin B., a Representative in Congress from the State of New Jersey | 658 |
| Mattson, James S., attorney at law | 722 |
| Osann, Edward, director, Water Resources Program, Resources Conservation District, National Wildlife Federation | 737 |
| Prepared statement..... | 739 |
| Scheuer, Hon. James H., a Representative in Congress from the State of New York..... | 670 |
| Segar, Douglas A., Seaocean, Inc. | 722 |
| Swanson, R. Lawrence, Director, Office of Marine Pollution Assessment, National Oceanic and Atmospheric Administration | 663 |
| Prepared statement..... | 664 |
| Additional material supplied: | |
| Borberg, James R.: Enhancement of the Marine environment with wastewater solids..... | 729 |
| Conference of Coastal Agencies: Questions of Mr. Forsythe and answers ... | 749 |
| D'Amours, Hon. Norman: | |
| Proposed amendment to H.R. 6113 | 637 |
| Proposed amendment to H.R. 6324 | 640 |
| EPA: | |
| Questions of Mr. Carney and answers..... | 715 |
| Questions submitted by Mr. Forsythe and answers..... | 743 |
| Questions of Mr. Scheuer and answers | 672 |
| NOAA: | |
| Questions submitted by Mr. Forsythe and answers..... | 74 |
| Sewage sludge dumping in the New York Bight Apex: A comparison with other proposed ocean dumpsites..... | 676 |
| Support of certain recovery of research costs | 721 |
| Osann, Edward: Gaps in Federal performance of ocean dumping research | 741 |



REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT, TITLES I AND II

THURSDAY, MARCH 18, 1982

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY AND SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, D.C.

The subcommittees met, pursuant to recess, at 10 a.m., in room 1334, Longworth House Office Building, Hon. Norman E. D'Amours (chairman of the Subcommittee on Oceanography) presiding.

Present: Representatives D'Amours, Breaux, Studts, Hughes, Patman, Forsythe, Pritchard, Evans, and Carney.

Mr. D'AMOURS. The subcommittees will come to order. We are meeting today to hear from three administration agencies, EPA, NOAA, and the Army Corps of Engineers, on the reauthorization of the Marine Protection, Research, and Sanctuaries Act.

This past year has been an eventful one in the life of this act. Last January, an influential report from the National Advisory Committee on Oceans and Atmosphere [NACOA] said that existing law was too restrictive and that we must make more use of the oceans' assimilative capacity. Then a Federal district court judge in New York told EPA that it had been incorrectly implementing the act all along, that it could not impose a legislatively mandated December 31, 1981, deadline, and that it would have to rewrite its regulations accordingly. EPA, to nobody's surprise, decided that it was satisfied with this highly questionable ruling and would not appeal.

Because of these actions, we face the prospect of a large-scale return to ocean dumping. Some 20 to 25 municipalities are lining up to apply for new dumping permits. Many of them are the same municipalities which had only recently successfully halted their ocean dumping. Perversely, the administration has chosen this particular time to recommend severe cuts in programs needed to research and monitor the impacts of all dumping.

It has become painfully obvious that the MPRSA—the Ocean Dumping Act—as presently drafted means very different things to different people. It will be our job in this committee over the next several weeks to decide what it should mean to everybody by making the changes necessary to clear ambiguities, whether they are clear or they are imagined.

I had hoped that we would hear testimony today on the discussion draft of the amendments prepared and circulated by the staff,

but I am told that the witnesses are not prepared to formally comment on that draft, but they will answer questions informally on that subject matter. I look forward to hearing that important testimony.

I would like to point out that the discussion draft prepared by the staff bears no members' endorsements at this time. It is merely a discussion document. However, it is a constructive point of departure for the task that faces us; therefore, I do hope that at least in the question-and-answer period, we will spend considerable time discussing it.

[The discussion draft, bills, and departmental reports follow:]

RY372

[DISCUSSION DRAFT FOR H.R. 6113]
[12/25/82]

97th CONGRESS
2d Session

IN THE HOUSE OF REPRESENTATIVES

Mr. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To improve the ocean dumping program.

- 1 Be it enacted by the Senate and House of Representatives
- 2 of the United States of America in Congress assembled,

RY372

2

1 That this Act may be cited as the ``Ocean Dumping Amendments
2 Act of 1982``.

3 **SEC. 2. FINDINGS AND POLICIES.**

4 Subsections (a) and (b) of section 2 of the Marine
5 Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C.
6 1401) are amended to read as follows:

7 ``Sec. 2. (a) The Congress finds that--

8 ``(1) the unregulated dumping of material into ocean
9 waters endangers human health, welfare, and amenities,
10 and the marine environment, ecological systems, and
11 economic potentialities;

12 ``(2) certain ocean waters under the jurisdiction of
13 the United States are already unreasonably degraded as a
14 result of dumping and that degradation interferes with,
15 or prevents, other reasonable and accustomed uses of
16 marine resources from being made;

17 ``(3) certain materials that have heretofore been
18 dumped into ocean waters have potential commercial value
19 if appropriately recycled;

20 ``(4) ocean sites that have heretofore been used for
21 the dumping of materials have not been adequately
22 studied to determine the full environmental effects of
23 such dumping; and

24 ``(5) the reasonable use of the ocean as a
25 receptacle for society's waste requires that a

RY372

3

1 comprehensive plan for the research on, and monitoring
2 of, the effects of dumped material be developed and
3 implemented.

4 `` (b) The Congress declares that it is the policy of the
5 United States--

6 `` (1) to regulate the dumping of all types of
7 materials into ocean waters and to prevent the dumping
8 into ocean waters of any material that will result in
9 degradation of the marine environment;

10 `` (2) to restore areas degraded by dumping in order
11 that all reasonable and accustomed uses of marine
12 resources may again be made;

13 `` (3) to encourage the removal of degrading
14 contaminants from materials before dumping occurs; and

15 `` (4) to prohibit the dumping of materials into any
16 area of ocean waters unless that area has been
17 adequately studied to determine the effects of the
18 dumping.''.

19 SEC. 3. DEGRADATION OF THE MARINE ENVIRONMENT.

20 Section 3 of the Marine Protection, Research, and
21 Sanctuaries Act of 1972 (33 U.S.C. 1402) is amended by
22 adding at the end thereof the following new subsection:

23 `` (m) 'degrade', when used in the context of the marine
24 environment, means--

25 `` (1) to have an adverse effect on human health,

RY372

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1 welfare, or amenities;

2 “(2) to have an adverse effect on the marine
3 environment, ecological systems, or economic
4 potentialities;

5 “(3) to prevent any reasonable or customary use of
6 the marine environment from being made; or

7 “(4) to adversely affect an area of ocean waters to
8 the extent that it cannot naturally restore itself,
9 after dumping is terminated, to the environmental,
10 ecological, esthetic, and economic posture existing
11 before dumping in the area was authorized under this
12 Act.”.

13 **SEC. 4. DUMPING PERMIT PROGRAM.**

14 Section 102 of the Marine Protection, Research, and
15 Sanctuaries Act of 1972 (33 U.S.C. 1412) is amended as
16 follows:

17 (1) That part of subsection (a) down through
18 subparagraph (I) is amended to read as follows:

19 “Sec. 102. (a)(1) No permit may be issued under this
20 section with respect to--

21 “(A) dredged material, to which section 103 applies;

22 “(B) radiological, chemical, or biological warfare
23 agents;

24 “(C) high level radioactive wastes;

25 “(D) known carcinogens, mutagens, and teratogens

RY372

5

1 and any material suspected, by responsible scientific
2 opinion, to be a carcinogen, mutagen, or teratogen;

3 "(E) any material which, on the basis of chemical
4 and toxicological testing, is found to contain more than
5 trace amounts of--

6 "(i) one or more persistent inert synthetic or
7 natural materials that may float or remain in
8 suspension in ocean waters in such a manner as to
9 interfere materially with fishing, navigation, or
10 other legitimate uses of the ocean,

11 "(ii) cadmium or any cadmium compound, mercury
12 or any mercury compound, or any organochlorine
13 compound, or

14 "(iii) oil of any kind or in any form,
15 including but not limited to, oil sludge, oil
16 refuse, crude oil, fuel oil, heavy diesel oil,
17 lubricating oils, hydraulic fluids, and any mixture
18 of the foregoing; and

19 "(F) any material of any kind whatsoever for
20 dumping in the area of ocean waters lying westward of 73
21 degrees 30 minutes west longitude and northward of 40
22 degrees 10 minutes north latitude, except that--

23 "(i) any permit for the dumping of material,
24 other than dredge spoil, in such area that was
25 issued before, and is in effect on, the date of the

RY372

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1 enactment of the Ocean Dumping Amendments Act of
2 1982 shall terminate at the close of December 31,
3 1982 or such earlier date as may be specified in the
4 permit; and

5 "(ii) any permit for the dumping of dredge
6 spoil in such area that was issued before, and is in
7 effect on, the date of the enactment of such Act of
8 1982 may be renewed after such date for a term
9 ending on or before the close of December 31, 1985.

10 "(2) Subject to section 105 and after consultation with
11 the Administrator of the National Oceanic and Atmospheric
12 Administration, the Administrator may issue permits, after
13 notice and opportunity for public hearings, for the
14 transportation from the United States or, in the case of an
15 agency or instrumentality of the United States, or in the
16 case of a vessel or aircraft registered in the United States
17 or flying the United States flag, for the transportation
18 from a location outside the United States, of material for
19 the purpose of dumping it into ocean waters, or for the
20 dumping of material into the waters described in section
21 101(b), if the Administrator determines that--

22 "(A) the proposed dumping will not degrade the
23 marine environment; or

24 "(B) the proposed dumping will degrade, or can
25 reasonably be expected to degrade, the marine

RY372

7

1 environment, but that there does not exist any prudent
2 ~~and~~ ^{and} feasible alternative to the disposal of the material
3 by ocean dumping.

4 "(3) The Administrator shall establish and apply
5 criteria for reviewing and evaluating applications for
6 permits under this section, and, in establishing or revising
7 such criteria, shall consider, but not be limited in his
8 consideration to, the following:

9 "(A) The effect of such dumping on human health and
10 welfare, including economic, esthetic, and recreational
11 values.

12 "(B) The effect of such dumping on fisheries
13 resources, plankton, fish, shellfish, wildlife, shore
14 lines and beaches.

15 "(C) The effect of such dumping on marine
16 ecosystems, particularly with respect to--

17 "(i) the transfer, concentration, and
18 dispersion of such material and its byproducts
19 through biological, physical, and chemical
20 processes;

21 "(ii) potential changes in marine ecosystem
22 diversity, productivity, and stability; and

23 "(iii) species and community population
24 dynamics.

25 "(D) The bioaccumulation, persistence and

RY372

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1 permanence of the effects of the dumping.

2 “(E) The effect of dumping particular volumes,
3 compositions and concentrations of such materials.

4 “(F) The effect of such dumping on alternate uses
5 of the ocean, such as scientific study, fishing, and
6 other living resource exploitation, and non-living
7 resource exploitation.

8 “(G) The composition and vulnerability of the
9 biological communities which may be exposed to dumped
10 materials, including the presence of unique species or
11 communities of species, the presence of species
12 identified as endangered or threatened pursuant to the
13 Endangered Species Act of 1969, or the presence of those
14 species critical to the structure or function of the
15 ecosystem, such as those important for the food chain.

16 “(H) The effect of such dumping in conjunction with
17 all existing and projected pollutant sources on human
18 health and the marine environment.

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

22 (2) Subsection (a) is further amended by adding at
23 the end thereof the following new paragraph:

24 “(4) For purposes of paragraph (2)(e) and section
25 103(a)(2), the following criteria apply for determining

1 whether a feasible ~~or~~ ^{and} prudent alternative exists to the
2 ocean dumping of material:

3 "(A) A prudent and feasible alternative exists if
4 the probable adverse impact of utilizing alternative
5 ocean locations or land-based locations and methods of
6 disposal and recycling is less than or equal to the
7 impact of the dumping.

8 "(B) A prudent and feasible alternative exists if
9 an alternative location or method of disposal or
10 recycling is available, or if improvements can be made
11 in process technology or in overall waste treatment, at
12 reasonable cost and energy expenditures. The cost and
13 energy expenditures for any such alternative location or
14 disposal, recycling, or improvement need not be
15 competitive with the costs of ocean dumping in order to
16 be deemed reasonable.

17 "(C) The fact that the ocean dumping of the
18 material may cost less, or be less difficult to
19 implement, than an alternative means of disposal is not
20 reason, in itself, for determining that the alternative
21 means is neither prudent nor feasible.

22 (3) Subsection (c) is amended to read as follows:

23 "(c)(1) The Administrator shall designate sites at
24 which materials may be dumped under permits issued under
25 this section and section 103; except that no site may be
designated by the Administrator under this subsection until
the Administrator undertakes and completes an analysis of
the environmental effects which will likely result from
dumping. In undertaking such an analysis of each site, the
Administrator shall take into consideration the criteria set

RY372

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1 forth in subsection (a) and shall specifically investigate--

2 “(A) the types and quantities of wastes projected
3 for dumping at the site over the next five years;

4 “(B) the ability of the waters at the site to
5 disperse, detoxify or neutralize the materials and
6 sustain a normal ecosystem;

7 “(C) the importance of the site to the surrounding
8 biological community, including the presence of
9 breeding, spawning, nursery or forage areas, migratory
10 pathways, or areas necessary for other functions or
11 critical stages in the life cycle of marine organisms;
12 and

13 “(D) the effects which the dumping at the site will
14 have with respect to human health and the ecosystem
15 within the site boundaries and adjacent areas outside
16 the boundaries.

17 “(2) The designation of a site under this subsection
18 shall be effective for a period of six consecutive years.
19 The designation may be renewed for additional 5-year periods
20 but only if for each such period the Secretary undertakes
21 and completes with respect to the site the analysis of
22 environmental effects required under paragraph (1).

23 “(3) The Administrator shall continuously monitor the
24 effects of the dumping of materials at each site designated
25 by him under paragraph (1), and shall, at the close of the

RY372

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1 third year of the site designation period, estimate the
2 extent of the dumping that will occur at the site during the
3 balance of the period. If the Administrator, on the basis of
4 the monitoring or such estimate, or both, determines that
5 the continued dumping of materials at the site will degrade,
6 or aggravate the degradation of, the marine environment at
7 the site, the Administrator may--

8 “(A) limit dumping at the site to certain materials
9 or at certain times or both; or

10 “(B) suspend or terminate the designation of the
11 site under paragraph (1).”.

12 **SEC. 5. DREDGED MATERIAL PERMITS.**

13 Section 103 of the Marine Protection, Research, and
14 Sanctuaries Act of 1972 (33 U.S.C. 1413) is amended as
15 follows:

16 (1) Subsection (a) is amended to read as follows:

17 “Sec. 133. (a) Subject to the provisions of subsections
18 (b), (c), and (d), the Secretary may issue permits, after
19 notice and opportunity for public hearings, for the
20 transportation of dredged material for the purpose of
21 dumping it into ocean waters, if the Secretary determines
22 that--

23 “(1) the proposed dumping will not degrade the
24 marine environment; or

25 “(2) the proposed dumping will degrade, or can

RY372

12

1 reasonably be expected to degrade, the marine
2 environment, but that there does not exist any prudent
3 ~~and~~^{and} feasible alternative to the disposal of the material
4 by ocean dumping.".

5 (2) Subsection (b) is amended to read as follows:

6 "(b)(1) In making the determination required by
7 subsection (a), the Secretary shall apply those criteria,
8 established under section 102(a)(3), relating to the effects
9 of dumping.

10 "(2) Based upon an evaluation of the potential effect
11 of a permit denial on navigation, economic and industrial
12 development, and the foreign and domestic commerce of the
13 United States, the Secretary shall make an independent
14 determination as to the need for the dumping.

15 "(3) The Secretary shall permit dumping pursuant to a
16 permit under this section only at a site designated by the
17 Administrator under section 102(c)(1) and subject to such
18 restrictions on dumping at the site as the Administrator may
19 have imposed under section 102(c)(3)(A).".

20 (3) Subsection (c) is amended by striking out

21 "section 102(c) of this title relating to critical
22 areas" and inserting in lieu thereof "section
23 102(c)(3)(A)".

24 (4) The first sentence of subsection (d) is amended
25 to read as follows: "If in any case the Secretary

RY372

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1 finds, as a result of his independent determination
 2 under subsection (b)(2), that the dumping should be
 3 permitted event tncugh such dumping, without regard to
 4 such determination, would not be authorized under this
 5 title, he shall certify the determination to, and
 6 request a waiver of the applicable requirements from,
 7 the Administrator."

8 **SEC. 6. PERMIT CONDITIONS.**

9 Section 174 of the Marine Protection, Research, and
 10 Sanctuaries Act of 1972 (33 U.S.C. 1414) is amended as
 11 follows:

12 (1) Subsection (a) is amended--

13 (A) by amending clause (3) to read as follows:

14 "(3) the site designated by the Administrator under
 15 section 172(c) where such transport for dumping will
 16 be terminated or where such dumping will occur;"
 17 and

18 (B) by amending clause (4) by inserting "(which
 19 may not exceed 3 years, except as provided in
 20 subsection (c)(2)(A))" immediately after "valid";
 21 and

22 (C) by striking out "and (5)" and inserting in
 23 lieu thereof ": (6) if an interim permit described
 24 in subsection (c), such terms and conditions as are
 25 required by that subsection; and (7)".

RY372

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1 (2) Subsection (d) is amended to read as follows--

2 "(b)(1) The Administrator or Secretary, as the case may
3 be, may prescribe such reporting requirements with respect
4 to actions taken by permittees pursuant to permits issued
5 under this title as he deems appropriate; and the
6 Administrator, in the case of interim permits described in
7 paragraph (2) of subsection (c), shall prescribe such
8 additional reporting requirements as may be necessary to
9 ensure that the requirements imposed under such paragraph
10 are being appropriately observed by the permittee.

11 "(2) The Administrator or the Secretary, as the case
12 may be, shall prescribe and collect a processing fee in an
13 amount commensurate with the administrative costs incurred
14 by the Administrator or Secretary in processing a permit.

15 "(3) The Administrator or the Secretary, as the case
16 may be, shall prescribe and collect a special fee with
17 respect to each interim permit provided for under subsection
18 (c)(2). The special fee shall be in an amount equal to the
19 costs incurred by the Administrator in developing the permit
20 requirements imposed under subsection (c)(2), plus an
21 appropriate amount to be applied in carrying out the
22 activities required under section 102(c)(3) regarding the
23 site concerned and under title II."

24 (3) Subsection (c) is amended by inserting "(1)"
25 immediately after "(c)"; and by adding at the end

RY372

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1 thereof the following new paragraph:

2 “(2) A permit issued with respect to dumping described
3 in section 102(a)(2)(B) or section 103(a)(2) shall be known
4 as an interim permit. The following requirements apply in
5 the case of an interim permit and any terms and conditions
6 necessary to implement these requirements shall be in
7 addition to any other conditions imposed with respect to
8 that permit under subsection (a):

9 “(A) An interim permit may not be valid for a
10 period exceeding 12 consecutive months; but may be
11 renewed, upon application therefor, for additional such
12 periods.

13 “(B) The Administrator shall, after taking into
14 account the results of the environmental analysis and
15 the continuing review required under section 102(c) with
16 respect to the site at which the material concerned will
17 be dumped or to which transported, establish procedures
18 and measures, which must be observed by the permittee,
19 that the Administration deems necessary or appropriate
20 to ensure that the dumping at the site, and the
21 transportation incident thereto, will be carried out in
22 a manner that, to the maximum extent practicable--

23 “(i) minimizes the adverse effect on the human
24 health, welfare and amenities;

25 “(ii) minimizes the adverse effect on the

RY372

16

1 marine environment, ecological systems, or economic
2 potentialities;

3 "(iii) ensures that all reasonable and
4 accustomed uses of the marine environment will
5 continue; and

6 "(iv) ensures that the site will be able to
7 restore itself to its environmental, ecological,
8 esthetic and economic posture in effect before the
9 dumping commenced.

10 "(C) The Administrator shall specify those measures
11 which the permittee must take during the permit period to
12 plan, develop, acquire, or implement, as appropriate--

13 "(i) prudent ^{and} ~~or~~ feasible alternatives for the
14 disposal of the material;

15 "(ii) processes for reducing or eliminating the
16 contaminants in the material;

17 "(iii) processes for recycling the material."

18 **SEC. 7. MISCELLANEOUS AMENDMENTS.**

19 For the purpose of sewage sludge and industrial waste as
20 described in section (4)(d) of PL 96-572 (33 USC 1411), "unrea-
21 sonably degrade" means to degrade as defined in section (3)(m)
22 when a prudent and feasible alternative exists.

23 **SEC. 8. TRANSITIONAL PROVISIONS.**

24 (a) The terms and conditions of a permit issued under
25 section 102 or 103 of the Marine Protection, Research, and

RY372

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1 Sanctuaries Act of 1972 before the date of the enactment of
2 this Act, and in effect on such date, shall be administered
3 and enforced without regard to the amendments made by this
4 Act; except that such permit, if other than a permit referred
5 to in section 102(a)(1)(F)(i) or (ii)--

6 (1) shall have force and effect until the day of
7 termination specified in the permit, or until the third
8 anniversary of the date of the enactment of this Act,
9 whichever date sooner occurs; and

10 (2) may not be renewed after the date of the
11 enactment of this Act.

12 (b) An application for permit under such section 102 or
13 103 that is pending on the date of the enactment of this Act
14 shall be processed under such Act of 1972 as amended by this
15 Act.

16 (c) Any area of ocean waters that, on the date of the
17 enactment of this Act, carried a final designation, pursuant
18 to section 102(c) of the Act of 1972 (as in effect before
19 such date of enactment), as an ocean dumping site shall be
20 treated for all purposes as a site designated by the
21 Administrator under section 102(c), as amended by this Act.
22 Any area of ocean waters that, on such date of enactment,
23 carried an interim designation as an ocean dumping site may
24 not be used as an ocean dumping site until the site
25 designation procedures set forth in section 102(c), as

RY372

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1 amendmend by this Act, are complied with regarding such
2 area.

3 (d) Notwithstanding any provision of title I of the
4 Marine Protection, Research, and Sanctuaries Act of 1972,
5 during the 2-year period beginning on the date of the
6 enactment of this Act, no permit may be issued under such
7 title I that authorizes the dumping of any radioactive waste
8 unless the Administrator of the Environmental Protection
9 Agency determines--

10 (1) that the proposed dumping is necessary to
11 conduct research--

12 (A) on new technology related to ocean dumping,
13 or

14 (B) to determine whether the dumping of such
15 substance will degrade the marine environment;

16 (2) that the scale of the proposed dumping is such
17 that the dumping will have minimal adverse impact upon
18 the human health, welfare, and amenities, and the marine
19 environment, ecological systems, and economic
20 potentialities; and

21 (3) after consultation with the Secretary of
22 Commerce, that the potential benefits of such research
23 will outweigh any such adverse impact.

24 Each permit issued pursuant to this subsection shall be
25 subject to such conditions and restrictions as the

RY372

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1 Administrator determines to be necessary to minimize
2 possible adverse impacts of such dumping. No permit issued
3 by the Administrator pursuant to this subsection may have an
4 effective period of more than six consecutive months.

97TH CONGRESS
2D SESSION

H. R. 6113

To amend title I of the Marine Protection, Research, and Sanctuaries Act of 1972.

IN THE HOUSE OF REPRESENTATIVES

APRIL 20, 1982

Mr. D'AMOURS introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

A BILL

To amend title I of the Marine Protection, Research, and Sanctuaries Act of 1972.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "Ocean Dumping Amend-
4 ments Act of 1982".

5 **SEC. 2. DUMPING PERMIT PROGRAM.**

6 Section 102 of the Marine Protection, Research, and
7 Sanctuaries Act of 1972 (33 U.S.C. 1412) is amended as
8 follows:

1 (1) Subsection (a) is amended by striking out “,
2 but not be limited in his consideration to,” in the
3 second sentence; and by striking out paragraphs (A)
4 through (I), inclusive, and inserting in lieu thereof the
5 following:

6 “(1) The suitability of the material for ocean
7 dumping based upon, but not limited to, the following
8 environmental factors:

9 “(A) The effect of such dumping on human
10 health and welfare, including economic, esthetic,
11 and recreational values.

12 “(B) The effect of such dumping on fisheries
13 resources, plankton, fish, shellfish, wildlife, threat-
14 ened or endangered species, shorelines and
15 beaches.

16 “(C) The effect of such dumping on marine
17 ecosystems, particularly with respect to—

18 “(i) the transfer, concentration, and dis-
19 persion of such material and its byproducts
20 through biological, physical, and chemical
21 processes,

22 “(ii) potential changes in marine ecosys-
23 tem diversity, productivity, and stability, and

24 “(iii) species and community population
25 dynamics.

1 In considering the effects of dumping under this
2 subparagraph and subparagraphs (A) and (B), the
3 Administrator shall take into account the cumula-
4 tive effects of such dumping in combination with
5 such other materials as may be found or deposited
6 at the site.

7 “(D) The persistence and permanence of the
8 effects of the dumping.

9 “(E) The effect of dumping particular vol-
10 umes and concentrations of such materials.

11 “(F) The effect on alternate uses of oceans,
12 such as scientific study, fishing, and other living
13 resource exploitation, and nonliving resource ex-
14 ploitation.

15 “(2) For materials determined to be unsuitable
16 under paragraph (1), the availability of prudent and
17 feasible alternatives, including other ocean or land-
18 based locations or processes for disposal or recycling,
19 or some combination of alternatives.

20 “(3) For materials determined to be suitable under
21 paragraph (1), the availability of alternatives which are
22 clearly environmentally, economically, and technologi-
23 cally acceptable, including land-based locations or proc-
24 esses for disposal or recycling, or some combination of
25 alternatives.”.

1 (2) Subsection (c) is amended to read as follows:

2 “(c)(1) The Administrator shall designate sites at which
3 materials may be dumped under permits issued under this
4 section and section 103; except that no site may be designat-
5 ed by the Administrator under this subsection until the Ad-
6 ministrator undertakes and completes an analysis of the char-
7 acteristics of the site and its suitability for dumping and of
8 the environmental effects which will likely result from dump-
9 ing. In undertaking such an analysis of each site, the Admin-
10 istrator shall take into consideration the criteria set forth in
11 subsection (a) and shall specifically take into account the fol-
12 lowing factors:

13 “(A) The types and quantities of wastes and pol-
14 lutants projected to be deposited in, and adjacent to,
15 the site from dumping and other sources.

16 “(B) The ability of the waters at the site to dis-
17 perse, detoxify, or neutralize the materials.

18 “(C) The importance of the site to the surround-
19 ing biological community, including the presence of
20 breeding, spawning, nursery or foraging areas, migra-
21 tory pathways, or areas necessary for other functions
22 or critical stages in the life cycle of marine organisms.

23 “(D) The immediate and cumulative effects on
24 human health and on the ecosystem adjacent to the

1 site and the persistent effects on the ecosystem within
2 the site.

3 “(2) The Administrator shall periodically monitor the ef-
4 fects of the dumping of materials at and adjacent to each site,
5 and shall, at the close of the third year after the site designa-
6 tion and at every three-year interval thereafter until such
7 time as the designation is terminated, estimate the extent of
8 the dumping and other waste inputs that will occur in and
9 adjacent to the site during the next three-year period.

10 “(3) If at any time the Administrator, on the basis of the
11 factors taken into account under subparagraphs (A) through
12 (D) of paragraph (1), or on the basis of the monitoring or
13 estimates, or both, required under paragraph (2), determines
14 that the site is no longer suitable for such dumping, the Ad-
15 ministrator shall—

16 “(A) limit dumping at the site to certain materials
17 or at certain times or both; or

18 “(B) suspend or terminate the designation of the
19 site under paragraph (1).”.

20 **SEC. 3. PERMIT CONDITIONS.**

21 Section 104 of the Marine Protection, Research, and
22 Sanctuaries Act of 1972 (33 U.S.C. 1414) is amended as
23 follows:

24 (1) Clause (5) of subsection (a) is amended to read
25 as follows: “(5) any special provisions deemed neces-

1 sary by the Administrator or the Secretary, as the case
2 may be, to minimize the harm from dumping, or, after
3 consultation with the Secretary of the Department in
4 which the Coast Guard is operating, for the monitoring
5 and surveillance of the transportation or dumping;
6 and”.

7 (2) Subsection (b) is amended to read as follows:

8 “(b) The Administrator or the Secretary, as the case
9 may be, shall prescribe and collect from the applicant, unless
10 the applicant is a Federal agency, an application fee in an
11 amount commensurate with the costs incurred or expected to
12 be incurred by the Administrator or Secretary in processing
13 the permit. The application fee shall be deposited to the prin-
14 cipal appropriation account or accounts used to carry out the
15 processing of permits under this title.”.

16 (3) Subsections (d) through (g) are redesignated as
17 subsections (e) through (h), respectively, and the fol-
18 lowing new subsection is inserted immediately after
19 subsection (c):

20 “(d) The Administrator or Secretary, as the case may
21 be, may issue an interim permit under section 102 or 103 in
22 cases where the expected toxicity or the potential for envi-
23 ronmental degradation from dumping is of particular concern
24 but where no prudent and feasible alternative exists. The fol-
25 lowing requirements apply in the case of an interim permit

1 and any term or condition necessary to implement these re-
2 quirements shall be in addition to any other conditions im-
3 posed with respect to that permit under subsection (a):

4 “(1) An interim permit may not be valid for a
5 period exceeding twenty-four consecutive months; but
6 may be renewed, upon application therefor, for addi-
7 tional such periods.

8 “(2) The Administrator or Secretary, as the case
9 may be, may specify those measures which the permit-
10 tee must take during the interim permit period to plan,
11 develop, acquire, or implement, as appropriate—

12 “(A) prudent and feasible alternatives for the
13 disposal of the material;

14 “(B) processes for reducing or eliminating
15 the contaminants in the material; or

16 “(C) processes for recycling the material.”.

17 (4) The following new subsection is added at the
18 end thereof:

19 “(i) The Administrator or Secretary, as the case may
20 be, may prescribe such reporting requirements as he or she
21 deems appropriate with regard to actions taken by permittees
22 pursuant to permits issued under this title.”.

1 **SEC. 4. CONVENTION ADHERENCE.**

2 Section 106 of the Marine Protection, Research, and
3 Sanctuaries Act of 1972 (33 U.S.C. 1416) is amended by
4 adding at the end thereof a new subsection as follows:

5 “(g) The Administrator and the Secretary shall adhere
6 to and apply all requirements of the London Dumping Con-
7 vention, including its annexes, to the extent these require-
8 ments do not relax the requirements of this title.”.

9 **SEC. 5. TRANSITIONAL PROVISIONS.**

10 (a) The terms and conditions of a permit issued under
11 section 102 or 103 of the Marine Protection, Research, and
12 Sanctuaries Act of 1972 before the date of the enactment of
13 this Act, and in effect on such date, shall be administered and
14 enforced without regard to the amendments made by this
15 Act; except that such permit—

16 (1) shall have force and effect until the day of ter-
17 mination specified in the permit, or until the third anni-
18 versary of the date of the enactment of this Act,
19 whichever date sooner occurs; and

20 (2) may not be renewed after the date of the en-
21 actment of this Act.

22 (b) An application for a permit under section 102 or 103
23 of such Act of 1972 that is pending on the date of the enact-
24 ment of this Act shall be processed under such Act of 1972
25 as amended by this Act.

1 (c)(1) The requirements of paragraph (1) of section
2 102(c) of such Act of 1972 (as amended by this Act) shall not
3 apply with respect to any area of ocean waters that was ap-
4 proved for dumping on a final basis before the date of the
5 enactment of this Act, but each such area shall be subject to
6 paragraphs (2) and (3) of such section 102(c) and for purposes
7 of such paragraphs each such area shall be treated as having
8 been designated under such paragraph (1) on such date of
9 enactment.

10 (2) Section 102(c) of such Act of 1972 (as in effect
11 before the date of the enactment of this Act) shall continue to
12 apply with respect to any area of ocean waters (if that area
13 was approved, before such date of enactment, for dumping on
14 an interim basis pending completion of baseline or trend as-
15 sessment surveys) until whichever of the following first
16 occurs:

17 (A) The third anniversary of the date of the en-
18 actment of this Act.

19 (B) The date on which the Administrator desig-
20 nates the site in accordance with section 102(c)(1) (as
21 amended by this Act) and any site not so designated by
22 such third anniversary shall not thereafter be used as
23 an ocean dumping site under this Act until such a des-
24 ignation is made.

1 (d) Notwithstanding any provision of title I of the
2 Marine Protection, Research, and Sanctuaries Act of 1972 to
3 the contrary, during the two-year period beginning on the
4 date of the enactment of this Act, no permit may be issued
5 under such title I that authorizes the dumping of any low-
6 level radioactive waste unless the Administrator of the Envi-
7 ronmental Protection Agency determines—

8 (1) that the proposed dumping is necessary to con-
9 duct research—

10 (A) on new technology related to ocean
11 dumping, or

12 (B) to determine the degree to which the
13 dumping of such substance will degrade the
14 marine environment;

15 (2) that the scale of the proposed dumping is lim-
16 ited to the smallest amount of such material and the
17 shortest duration of time that is necessary to fulfill the
18 purposes of the research, such that the dumping will
19 have minimal adverse impact upon human health, wel-
20 fare, and amenities, and the marine environment, eco-
21 logical systems, economic potentialities, and other le-
22 gitimate uses;

23 (3) after consultation with the Secretary of Com-
24 merce, that the potential benefits of such research will
25 outweigh any such adverse impact; and

1 (4) that the proposed dumping will be preceded by
2 appropriate baseline monitoring studies of the proposed
3 dump site and its surrounding environment.

4 Each permit issued pursuant to this subsection shall be sub-
5 ject to such conditions and restrictions as the Administrator
6 determines to be necessary to minimize possible adverse im-
7 pacts of such dumping.

8 **SEC. 6. AUTHORIZATION OF APPROPRIATIONS.**

9 Section 111 of the Marine Protection, Research, and
10 Sanctuaries Act of 1972 (33 U.S.C. 1420) is amended by
11 striking "and" immediately following "fiscal year 1981," and
12 inserting "and not to exceed \$4,213,000 for each of fiscal
13 years 1983 and 1984," immediately after "fiscal year
14 1982,".

97TH CONGRESS
2D SESSION

H. R. 6112

To amend title II of the Marine Protection, Research, and Sanctuaries Act of 1972.

IN THE HOUSE OF REPRESENTATIVES

APRIL 20, 1982

Mr. D'AMOURS introduced the following bill; which was referred jointly to the Committees on Science and Technology and Merchant Marine and Fisheries

A BILL

To amend title II of the Marine Protection, Research, and Sanctuaries Act of 1972.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That section 201 of the Marine Protection, Research, and
4 Sanctuaries Act of 1972 (16 U.S.C. 1441) is amended by
5 striking out "from time to time, not less frequently than an-
6 nually," and inserting in lieu thereof "not later than March 1
7 of each year".

8 SEC. 2. Section 202 of such Act of 1972 (16 U.S.C.
9 1442) is amended—

1 (1) by adding at the end of subsection (a) the fol-
2 lowing new sentence: "Such program shall include, but
3 not be limited to—

4 "(1) the assessment of techniques to quantify
5 and define, using scientific bases, the degradation
6 of the marine environment;

7 "(2) the assessment of the ability of various
8 types and areas of ocean waters to assimilate ma-
9 terials without degrading the marine environment;
10 and

11 "(3) the development of methodology, tech-
12 niques, and equipment to minimize degradation of
13 the marine environment from dumping."; and

14 (2) by amending subsection (c)—

15 (A) by striking out "In March of each year,"
16 and inserting in lieu thereof "Not later than
17 March 1 of each year,"; and

18 (B) by inserting "the report required under
19 section 201 of this title and" immediately after
20 "in this report".

21 SEC. 3. Section 203(a) of such Act of 1972 (16 U.S.C.
22 1411(a)) is amended—

23 (1) by striking out "and" at the end of paragraph

24 (1);

1 management functions affecting a region into a comprehen-
2 sive disposal strategy that addresses, but is not limited to, the
3 following factors:

4 “(1) The availability and potential within the
5 region for developing alternative means of material dis-
6 posal and recycling facilities, and for improving proc-
7 essing and source control capabilities.

8 “(2) The sources and quantities of existing and
9 projected material sources in the region.

10 “(3) The weighing of environmental, economic,
11 and social factors associated with the various material
12 disposal and control alternatives actually or potentially
13 available within the region.

14 “(4) Application of the criteria set forth in section
15 102(a) on a regionwide basis.

16 “(5) Unified processing of material disposal appli-
17 cations within the region.

18 “(6) Unified monitoring and evaluation of the
19 short and long-term impacts of material disposal within
20 the region.”.

21 SEC. 5. Section 204 of such Act of 1972 (16 U.S.C.
22 1444) is amended by striking “and” immediately following
23 “fiscal year 1981,” and inserting “, and not to exceed
24 \$12,000,000 for each of fiscal years 1983 and 1984” imme-
25 diately after “fiscal year 1982”.



**GENERAL COUNSEL OF THE
UNITED STATES DEPARTMENT OF COMMERCE**
Washington, D.C. 20230

MAY 20 1982

Honorable Walter B. Jones
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

This is in response to your request for the views of the Department of Commerce concerning H.R. 6113, the "Ocean Dumping Amendments Act of 1982".

This bill would make a number of technical amendments to the Ocean Dumping Act. Because responsibility for title I of the Marine Protection, Research, and Sanctuaries Act of 1972 resides with the Environmental Protection Agency and does not affect any programs of the Department of Commerce, we have no comments on this proposed legislation.

We have been advised by the Office of Management and Budget that there is no objection to the submission of this letter to the Congress from the standpoint of the Administration's program.

Sincerely,

Sherman E. Unger
for Sherman E. Unger
General Counsel



DEPARTMENT OF THE ARMY

WASHINGTON, D.C. 20310

12 JUL 1982

Honorable Walter B. Jones
Chairman, Committee on Merchant Marine
and Fisheries
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

This is in response to your letter requesting views on H.R. 6113, 97th Congress, a bill "To amend Title I of the Marine Protection, Research, and Sanctuaries Act of 1972", as reported by your Committee. The Secretary of Defense has assigned responsibility for reporting on this bill to the Department of the Army.

As reported, the bill would authorize appropriations for Fiscal Year 1983 and would make a number of changes to Title I of the Ocean Dumping Act related to EPA site designation, monitoring of dumping sites, issuance of interim permits, recovery of permit processing costs, disposal of radioactive wastes, adherence with the London Dumping Convention, continued use of existing interim sites and the authority of Federal district courts to hear mandamus actions to compel site designations.

The Department of the Army, on behalf of the Department of Defense, supports the efforts of your Committee to fashion a workable reauthorization of the Ocean Dumping Act for the next fiscal year. We are, as you know, very much interested in insuring that ocean dumping be allowed to continue unimpeded, subject to necessary and reasonable environmental safeguards. We understand that the reported bill was crafted with this same objective in mind and we welcome and support that effort. However, we feel that the actual bill contains a number of provisions that could be misinterpreted or would lead to unnecessary obstacles to reasonable ocean dumping. Accordingly, we are opposed to enactment of the bill as reported by the Committee on Merchant Marine and Fisheries and favor, instead, enactment of a simple two year reauthorization of the Ocean Dumping Act.

One of our primary concerns with the bill as reported is section 2(a)(2) which amends section 102(c) of the Act to require mandatory designation of dumping sites by the EPA for both section 102 and 103 permits. We are concerned that by making this change, the authority of the Army Corps of Engineers to dump dredged materials, or to permit such dumping pursuant to Section 103 at sites which have not received formal designation, would be precluded. Currently, dumping of dredged material may take place at a site which has received final or interim designation, or, where use of a designated site is not feasible, at a site determined pursuant to the 103 permit process. We are concerned that the change, making designations mandatory, especially when made in conjunction with section 5(a) of the bill dealing with interim designations, could be read as precluding future interim designation or dumping at a non-designated site even when use of a designated site was not feasible. We understand that this is not what is intended by the Committee on Merchant Marine and Fisheries. Nonetheless, we are concerned that this may be the practical effect of the change.

The Department of the Army also objects to the stringent monitoring requirements for all sites which would be imposed under proposed section 102(c)(2) and the definition of "monitoring" under section 6 of the bill. Monitoring should be required only where the nature and quantity of material dumped justify the additional costs of such monitoring.

The Department of the Army also believes any decision to limit dumping at a designated site used for dumping of dredged material or any suspension of the sites designation under proposed subsection 102(c)(3) should require prior consultation of the Secretary. Accordingly, we object to the proposed new section 102(c)(3) of the bill.

We are also concerned that section 5(a) of the bill could be read as precluding use of a site after completion of baseline or trend assessment surveys but before a decision on final designation is reached. This could result in halting use of the site for several months during the "gap" between completion of studies and final designation.

The Department of the Army, on behalf of the Department of Defense, also opposes section 3(4) of the bill which singles out low-level radioactive waste for unique and highly restrictive treatment. Specifically, the bill arbitrarily establishes a two-year moratorium on disposal of low-level radioactive waste in the ocean. The Department of the Army is concerned that the two year moratorium on dumping of low-level radioactive waste in section 3(4) would prohibit or interfere with the dumping of dredged material which may be contaminated by incidental quantities of radioactive material. Such dredged material poses no radiation threat to the environment. Unnecessarily strict regulatory treatment of this material could result in a total shutdown of important projects. We understand from the Committee Report of the Committee on Merchant Marine and Fisheries that this is not intended. However, because the language contained in the bill could be so interpreted we are opposed to its inclusion in the bill.

Also, the proposed moratorium may ultimately interfere with the plans of the Department of the Navy to dispose of defueled, decommissioned nuclear submarines. Although the specific provision in H.R. 6113 would have no immediate effect on efforts to evaluate and select an acceptable method for submarine disposal, it would set an undesirable precedent and may lead to pressure at the end of the two year period to continue the ban into the future. If, as a result of the evaluations currently being performed by the Navy in compliance with the National Environmental Policy Act (NEPA), the Navy should determine that it is environmentally acceptable and preferable to dispose of submarines in the ocean, then the possible continuance of a ban against such disposal could restrict the options available with no technical basis for such restriction. Sea disposal of low-level radioactive material is clearly permissible under international law. The London Ocean Dumping Convention of 1972, to which the United States is a signatory, allows disposal of low-level radioactive material in the ocean. Other foreign nations are currently disposing of low-level radioactive material in the North Atlantic under the provisions of the London Convention.

The bill also allows a one-house veto by Congress of any permit issued by the EPA for ocean disposal of low-level radioactive material. This proposal merely increases the uncertainty surrounding any effort to dispose of low-level radioactive material in the ocean, and is unnecessary, considering the requirements already mandated by the Ocean Dumping Act and NEPA and their implementing regulations governing such disposal. A one-house veto provision adds one more obstacle which could be used to thwart even the most conscientious compliance with existing regulations. Moreover, we understand that the Department of Justice believes that the legislative veto provision is unconstitutional.

In addition, the bill establishes a number of new administrative requirements which appear to be already covered by existing EPA regulations or which duplicate actions that would be covered under NEPA. In some cases, these requirements are inappropriate, specifically:

(1) Paragraph (E) of subsection (j)(1) requires a "plan for the removal or containment of the disposed nuclear material if the container leaks or decomposes." This provision follows paragraph (D) which requires "an analysis of the resulting environmental and economic conditions if the containers fail to contain the radioactive waste materials when initially deposited at the specific site." The current law and its implementing regulations already cover this subject adequately. It should also be noted that some of the most environmentally preferable sites for ocean disposal which comply with international site criteria are in very deep water where removal or containment of the disposed material would be extremely expensive or not even technically feasible in some cases. Thus, the proposed provisions could rule these sites out, despite their technical merits.

(2) Paragraph (F) of subsection (j)(1) requires "a determination by each affected state whether the proposed action is consistent with its approved

Coastal Zone Management Plan." This requirement is inappropriate for several reasons. First, it is not consistent with the Coastal Zone Management Act, since any ocean dumping site meeting international site selection criteria may be far beyond the three mile breadth of state coastal zones. A determination of consistency with state Coastal Zone Management Plans would only be required for disposal activities "directly affecting" the coastal zone. Second, under current regulations implementing the CZMA, it is the federal agency involved that determines whether a federal activity directly affects a state Coastal Zone (15 CFR 930.33). If a state disagrees, it can request that the federal agency make a determination as to whether the proposed action is consistent with the state plan (15 CFR 930.35) and if both the state and the federal agency disagree, 15 CFR 930.36 provides a mediation process. On the other hand, the proposed paragraph (F) would alter the current process by requiring "each affected state" to agree that a disposal action is consistent with its plan. The term "affected state" is not defined, and could be broadly interpreted to mean any state on a coastline, even though the state would not be directly affected by the disposal action. Thus, in effect, this would give any coastal state veto power over any ocean disposal of radioactive material off that coast.

The bill also contains a provision which would allow a writ of mandamus action in Federal district court to compel the Administrator to implement the site designation provisions of the bill "in a timely manner". We share the concerns of the EPA that this provision could create undesirable results and is unnecessary in light of the adequacy of existing civil remedies.

This report has been coordinated within the Department of Defense in accordance with procedures prescribed by the Secretary of Defense.

The Office of Management and Budget advises that there is no objection to submission of this report for the consideration of the Congress.

Sincerely,

A handwritten signature in cursive script, appearing to read "W. Gianelli".

William R. Gianelli
Assistant Secretary of the Army
(Civil Works)



U.S. Department of Justice
Office of Legislative Affairs

Office of the Assistant Attorney General

Washington, D.C. 20530

JUL 30 1982

Honorable Walter B. Jones
Chairman
Committee on Merchant Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

The purpose of this letter is to inform you of the objection of the Department of Justice to Section 3 of H.R. 6113, the "Ocean Dumping Amendments of 1982."

Section 3, proposed 33 U.S.C. § 1414 (j)(4)(A), contains a legislative veto provision that would purport to authorize one House of Congress to take action that would be binding on the Executive Branch.

Section 3 of the bill adds a new subsection (j) to Section 104 of the Marine Protection, Research and Sanctuaries Act of 1972, 33 U.S.C. § 1414, which includes a provision for one House of Congress to disapprove dumping permits issued under that Act. See proposed § 104(j)(4)(A). From a constitutional perspective, this one-House legislative veto provision is invalid for two reasons. First, any exercise of legislative power by the Congress that purports to bind the Executive Branch is governed by the procedures set forth in Art. I, § 7, Cls. 2 & 3 of the Constitution. These procedures require passage of a bill or resolution by majorities of both Houses of Congress, and presentation of the item to the President for his approval or veto. Since a one-House legislative veto is not presented to the President, the provision is unconstitutional. Second, the provision violates the basic principle of the separation of powers, under which Congress is to legislate, and the Executive Branch is to execute the laws. By purporting to retain power to control the Executive Branch in its exercise of the executive function, the legislative veto provision effectively seeks to authorize one House of Congress to execute the law in violation of the separation of powers principle. We should note that these general arguments were accepted by a unanimous panel of the United States Court of Appeals for the District of Columbia Circuit in Consumer Energy Council of America v. Federal Energy Regulatory Commission, Nos. 80-2184 & 80-2312 (D.C. Cir.,

Jan. 29, 1982) (suggestion for rehearing *en banc* unanimously denied Mar. 10, 1982), now pending in the Supreme Court on a jurisdictional statement filed by intervenor Process Gas Consumer Group No. 80-2008 (S. Ct., Apr. 29, 1982). See also *Chada v. Immigration and Naturalization Service*, 634 F.2d 408 (9th Cir. 1980), pending before the Supreme Court as Nos. 80-1832, 80-2170 and 80-2171 (argued Feb. 22, 1982).

We strongly object to Section 3 of H.R. 6113 because of the importance of the constitutional issues raised by this provision.

Concerning the other provisions of this bill, we defer to the other concerned agencies.

The Office of Management and Budget has advised that there is no objection to the submission of this report from the standpoint of the Administration's program.

Sincerely,

(Signed) Robert A. McConnell

Robert A. McConnell
Assistant Attorney General

Mr. D'AMOURS. Our first witness today is Ms. Merna Hurd who is the Associate Assistant Administrator for Water of the Environmental Protection Agency. She is accompanied by three persons whom I will let her introduce.

Welcome, Ms. Hurd, and we look forward to your testimony.

STATEMENT OF MERNA HURD, ASSOCIATE ASSISTANT ADMINISTRATOR FOR WATER, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY TUDOR DAVIES, DIRECTOR, ENVIRONMENTAL RESEARCH LAB; DAVID JANES, OFFICE OF RADIATION PROGRAMS; AND STEVEN SCHATZOW, OFFICE OF WATER REGULATIONS AND STANDARDS

Ms. HURD. Thank you, Mr. Chairman.

Currently, I do have responsibility in the Agency for coordinating sludge management. To my right is Steven Schatzow who is the Director of the Office of Water Regulations and Standards, who is responsible for the Agency's ocean dumping program.

Also with us are Tudor Davies who is the Director of the Environmental Research Laboratory in Narragansett, R.I.; and Dave Janes, Director of the Surveillance and Energy Preparedness Division, in the Office of Air, Noise, and Radiation.

I am pleased to be here today, and to discuss with you EPA's program for regulating ocean dumping, and to share with you the Agency's thoughts on the reauthorization of the Marine Protection Research and Sanctuaries Act.

I have submitted for the record a detailed statement on these subjects as well as answers to the questions submitted by the committee.

First, let me take a few minutes to summarize our testimony, and then to answer questions that the committee members might have.

Regarding the reauthorization of the Marine Protection, Research, and Sanctuaries Act, the Agency feels that the present statute provides a flexible and workable approach for considering

ocean disposable activities along with other waste disposal options, while at the same time protecting our marine resources from unreasonable degradation.

We support reauthorization of the act and see no need to substantially amend the current statute beyond providing the Administrator the discretion in adopting a financial management system to recover the program costs for ocean disposal which I will discuss in a few minutes.

However, I would like to share with you for a moment the evaluation of the Agency's ocean dumping program in terms of where we have been, our current status regarding what we know and do not know about the ocean in ocean disposal, and our future direction.

In the late 1960's and 1970's, the Nation and the Congress became increasingly aware and concerned that the quality of the environment was deteriorating. There was particular concern to adequately protect the marine ecosystems of which little was understood. The ocean was perceived to be fragile, and, because of its vast size and mysterious complexity, the ocean was given special attention by Congress.

In 1972, Congress passed the Clean Water Act and the Marine Protection, Research, and Sanctuaries Act. These acts, among other things, sought to regulate the indiscriminate dumping and discharge of materials into marine waters. Both acts encouraged the removal of waste from the water, the recycle and reuse, and ultimate of disposal of sludges on land.

In 1977, Congress amended the Marine Sanctuaries Act. The amendment placed a ban on dumping sewage sludge which would unreasonably degrade the marine environment. In 1980, that ban was extended to industrial waste, the dumping of which would unreasonably degrade the ocean environment.

EPA shares the concerns with Congress, and it has worked hard at getting municipal and industrial dumpers out of the ocean. From 1973 to 1980, over 300 applicants or permittees were either denied permits or had permits phased out of the ocean.

Concurrent with our efforts at reducing the ocean dumping of industrial and municipal wastes, there was a general agreement by scientists and policymakers that we could use the ocean as an appropriate site for disposal of most dredged material and incineration of wastes. These activities were carried out with substantial studies and analyses by EPA, NOAA, the Coast Guard, the Maritime Administration, and the Army Corps of Engineers.

During this 10-year period, studies have also been conducted regarding the ocean disposal of municipal and industrial wastes. These studies have been conducted by many organizations, including EPA, NOAA, the Woods Hole Oceanographic Institute, and the Scripps Institute of Oceanography, as well as Canadian and European scientists.

There has been an increase in knowledge concerning the capacity of the ocean to assimilate certain types of waste materials without becoming unreasonably degraded. In particular, a great deal has been learned about the impacts of municipal sludge composed primarily of domestic wastes as distinguished from sludges of a high industrial contribution. These studies indicate that the ocean

does have a capacity to assimilate naturally occurring organic materials such as domestic wastes and sewage.

The ocean disposal of most dredged material has been a generally accepted practice. Over 400 million cubic yards must be disposed of annually and approximately 15 percent goes into the ocean.

EPA and the Corps of Engineers have conducted extensive studies on dredged-material disposal sites. We have compiled information and conducted surveys on 32 ocean dumping areas, and we are completing environmental impact statements.

Our studies of these sites have generally concluded that the disposal of uncontaminated dredged material and material that is similar to the natural sediments at the site have minimal impact on the ocean. Some of the observed effects have included periodic smothering of benthic fauna, temporary increases in concentrations of suspended solids, and short-term displacement of fish during disposal operations. Such impacts are unavoidable but, with proper siting, pose no threat of significant environmental degradation.

We believe these conclusions regarding domestic sewage sludge and dredged material are generally accepted in the environmental community. Groups such as the National Wildlife Federation, the Army Corps of Engineers, the National Advisory Committee on Oceans and Atmosphere are in agreement on these points.

The National Wildlife Federation so testified before this subcommittee last June. NACOA, in its January 1981 report on "The Role of the Ocean in a Waste Management Strategy," reviewed the scientific literature and reached a similar conclusion that the ocean should not be precluded as an option for disposal of domestic sewage sludge and dredged material.

Our research efforts over the last 10 years have also enabled us to better predict impacts in the field before they are allowed to occur. We have improved our laboratory bioassay techniques as well as seeing dramatic improvement in our chemical analyses to find low-levels of pollutants.

Concurrent with improved laboratory techniques, EPA has developed new techniques for in situ biological monitoring of marine pollution. We now have the capacity to place several kinds of test animals at dump sites for extended periods of time and detect subchronic impacts of certain pollutants such as heavy metals and synthetic organic compounds. We are now in a position to reduce some of the uncertainties of ocean disposal by utilizing these evolving techniques to study in closely controlled and monitored situations the impacts of waste disposal.

The written testimony extensively discusses our research programs and our efforts to coordinate these activities within EPA and with other agencies.

I would like to take a few minutes to discuss an area of concern within the agency and the environmental community: contaminated sludges and where the agency is headed to find safe disposal alternatives.

The Agency is confident that municipal sludge composed of domestic waste can be ocean disposed with minimal impact with proper site selection and maintenance. We are less certain of the impacts; and, therefore, we are more concerned regarding the dis-

posal of sludges containing large loadings from industrial facilities, whether from industrial or municipal systems.

Such sludges are more likely to contain toxic organics or high concentrations of heavy metals. One of the hardest problems we face in determining how high the levels of toxic organics and heavy metals in municipal sludges are before they affect the successful use of different disposal alternatives.

Another question is to what extent these pollutants are bound up in this sludge and to what extent and at what rate they will be released to the environment. Unfortunately, we cannot determine scientifically the ocean's full ability to absorb and biologically process toxic wastes, nor can we fully track the fate and effects of the potentially contaminated sludges.

It is clear that we still do not have all of the answers as to the best disposable alternative for some wastes. The question which is being debated in the scientific community, as well as by policy-makers, is given the risks and uncertainties of both land-based and ocean disposal options, which would be the preferred disposal medium for our more polluted wastes?

EPA does not pretend to know the complete answer. While the Agency is encouraging a reduction in the amounts of waste produced, clearly disposal of those wastes produced should be in a location and manner so to minimize impacts.

To accomplish this objective, knowledge about the composition of the sludge and a thorough understanding of viable disposal sites are needed.

The Agency has established a work group to develop sludge-management guidelines under section 405 of the Clean Water Act. The guidance will cut across all media and program lines to address the best methods for disposable sludges.

Specifically, within the dumping program itself, the Agency is undertaking an effort to characterize different industrial and municipal sludges in order to determine the components of the sludges, and their potential for adversely affecting different marine settings.

Concurrent with the waste characterization activities, the Agency is studying the characteristics of disposal sites to determine an area's capacity to absorb various types of waste. In matching wastes with sites, the Agency will assess the risks and uncertainties of different disposal alternatives for particular wastes.

In regards to potentially toxic sludges whose fate and effects are uncertain, EPA will devote much effort to improve the data base for decisionmaking. These activities by the Agency should assist waste disposers who are considering applying for an ocean-dumping permit.

Even with additional data, the burden of proof will continue to be on the applicants to make their case for ocean disposal. Furthermore, based on observed impacts and technological advances, the Agency will continually reevaluate the permits to assure there is no unreasonable degradation and that the most sound disposal alternative is being used.

I mentioned earlier, municipal sludges vary as to the level of toxic organics and heavy metals. Problems result when the levels of toxic organics and metals limit the choice of disposal alterna-

tives. The Agency is currently identifying technologies to separate out potentially toxic components from sludges and to encourage process changes that reduce the use or encourage the recycling of potentially harmful materials so that they do not enter municipal treatment works and contaminate domestic sludges.

It should be clear from today's discussion that any expanded use of the ocean for waste disposal will be done prudently by this Agency. Whereas past ocean disposal occurred at historical sites, future efforts will be made to find new sites that are best suited for a particular waste. The use of field monitoring will also play a significant role to assure that disposal practices are not causing environmental problems.

While it is difficult to estimate the potential growth of ocean dumping in the near future, the Agency has evaluated financial management system alternatives to help finance any expanded program of site designation, research, and monitoring that may be needed for municipal and industrial disposal.

The best alternative appears to be a two-part fee system with the fees payable directly to EPA's account for the administration of the program. One fee would recover permit application processing costs. The second fee would recover the cost of research, site designation, maintenance, and monitoring. Adoption of such a system would require amendment of the statute. We will work with the committee staff on the language to that amendment.

Recent studies about the effects of past dumping and increasing concern about the effects of land disposal have convinced us that the ocean must be included as a legitimate disposal option in any integrated and well thought out waste management program. However, we cannot afford to open up the ocean indiscriminately to return to an out-of-sight/out-of-mind philosophy.

The challenge now is to define the parameters of safe disposal, of unreasonable degradation, and of acceptable risks in such a way that intelligent judgments and rational tradeoffs of environmental effects and costs can be made on a case-by-case basis.

The Agency believes intelligent judgments and rational tradeoffs, along with continued emphasis on techniques to recycle and reduce the generation of wastes, are the primary characteristics of the solution to our waste management problems. The ocean has a role to play in that solution, and we will be seeking widespread Agency and public involvement in determining what changes to our regulations, guidelines, and testing methods will best assure that the proper safeguards are applied.

Thank you.

[Statement of Ms. Hurd follows:]

PREPARED STATEMENT OF MERNA HURD, ASSOCIATE ASSISTANT ADMINISTRATOR FOR
WATER, ENVIRONMENTAL PROTECTION AGENCY

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

MY NAME IS MERNA HURD. I AM ASSOCIATE ASSISTANT ADMINISTRATOR FOR THE OFFICE OF WATER. I HAVE RESPONSIBILITY IN THE AGENCY FOR COORDINATING SLUDGE MANAGEMENT. WITH ME THIS MORNING IS STEVEN SCHATZOW, THE DIRECTOR OF THE OFFICE OF WATER REGULATIONS AND STANDARDS WHO IS RESPONSIBLE FOR THE AGENCY'S OCEAN DUMPING PROGRAM. ALSO WITH US ARE TUDOR DAVIES, DIRECTOR, ENVIRONMENTAL RESEARCH LABORATORY, NARRAGANSETT, RHODE ISLAND, AND DAVID JANES, DIRECTOR, SURVEILLANCE AND EMERGENCY PREPAREDNESS DIVISION IN THE OFFICE OF AIR, NOISE, AND RADIATION. I AM PLEASED TO BE HERE TODAY TO DISCUSS WITH YOU EPA'S PROGRAM FOR REGULATING OCEAN DUMPING AND TO SHARE WITH YOU THE AGENCY'S THOUGHTS ON THE REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT (MPRSA). I HAVE SUBMITTED FOR THE RECORD A DETAILED STATEMENT ON THESE SUBJECTS AS WELL AS ANSWERS TO THE QUESTIONS SUBMITTED BY THE COMMITTEE. X

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, I AM PLEASED TO BE HERE TODAY TO DISCUSS WITH YOU EPA'S PROGRAM FOR REGULATING OCEAN DUMPING. I WILL BRIEFLY DESCRIBE WHERE EPA HAS BEEN IN THIS PROGRAM, WHERE WE ARE NOW, AND WHERE WE ARE HEADED IN THIS IMPORTANT AREA OF PUBLIC POLICY.

WHERE WE HAVE BEEN

IN THE LATE 60's AND EARLY 70's, THE NATION AND THE CONGRESS BECAME INCREASINGLY AWARE AND CONCERNED THAT THE QUALITY OF THE ENVIRONMENT WAS DETERIORATING. THERE WAS PARTICULAR CONCERN TO ADEQUATELY PROTECT THE MARINE ECOSYSTEMS, OF WHICH LITTLE WAS UNDERSTOOD. THE OCEAN WAS PERCEIVED TO BE FRAGILE AND BECAUSE OF ITS VAST SIZE AND MYSTERIOUS COMPLEXITY, THE OCEAN WAS GIVEN SPECIAL ATTENTION BY CONGRESS. IN 1972, CONGRESS PASSED THE CLEAN WATER ACT (CWA) AND THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT (MPRSA). THESE ACTS, AMONG OTHER THINGS, SOUGHT TO REGULATE THE INDISCRIMINANT DUMPING AND DISCHARGE OF MATERIALS INTO MARINE WATERS. BOTH ACTS ENCOURAGED THE REMOVAL OF WASTES FROM THE WATER, THEIR RECYCLE AND REUSE, AND ULTIMATE DISPOSAL OF SLUDGES ON LAND. IN 1977, CONGRESS AMENDED THE MPRSA. THE AMENDMENT PLACED A BAN ON DUMPING SEWAGE SLUDGE WHICH WOULD "UNREASONABLY DEGRADE" THE MARINE ENVIRONMENT. IN 1980, THAT BAN WAS EXTENDED TO INDUSTRIAL WASTES, THE DUMPING OF WHICH WOULD "UNREASONABLY DEGRADE" THE OCEAN ENVIRONMENT. EPA, SHARING THIS CONCERN WITH CONGRESS, HAS WORKED HARD AT GETTING MUNICIPAL AND INDUSTRIAL DUMPERS WHOSE WASTES ARE INCOMPATIBLE WITH THE OCEAN ENVIRONMENT OUT OF THE OCEAN. FROM 1973 TO 1980, OVER 300 APPLICANTS OR PERMITTEES WERE EITHER DENIED PERMITS OR HAD PERMITS PHASED OUT OF THE OCEAN.

CONCURRENT WITH OUR EFFORTS AT REDUCING THE OCEAN DUMPING OF INDUSTRIAL AND MUNICIPAL WASTES, THERE WAS GENERAL AGREEMENT BY SCIENTISTS AND POLICYMAKERS THAT WE COULD USE THE OCEAN AS AN APPROPRIATE SITE FOR DISPOSAL OF MOST DREDGED MATERIAL AND INCINERATION OF WASTES. THESE ACTIVITIES WERE CARRIED OUT WITH SUBSTANTIAL STUDIES AND ANALYSES BY EPA, NOAA, THE COAST GUARD, THE MARITIME ADMINISTRATION AND THE ARMY CORPS OF ENGINEERS.

DURING THIS TEN YEAR PERIOD, STUDIES HAVE ALSO BEEN CONDUCTED REGARDING THE OCEAN DISPOSAL OF MUNICIPAL AND INDUSTRIAL WASTES. THESE STUDIES HAVE BEEN CONDUCTED BY MANY ORGANIZATIONS, INCLUDING EPA, NOAA, THE WOODS HOLE OCEANOGRAPHIC INSTITUTE, AND THE SCRIPPS INSTITUTE OF OCEANOGRAPHY, AS WELL AS CANADIAN AND EUROPEAN SCIENTISTS. SOME OF THE AREAS STUDIED HAVE INCLUDED THE PHILADELPHIA SLUDGE DUMPING SITE, THE 106 MILE OCEAN WASTE DISPOSAL SITE, THE 12 MILE SITE IN THE NEW YORK BIGHT, THE GULF OF LA NAPOULE FRANCE, VANCOUVER, CANADA, AND THE ENGLISH CHANNEL. EFFLUENTS FROM OCEAN OUTFALLS HAVE ALSO BEEN STUDIED. EPA AND THE SOUTHERN CALIFORNIA COASTAL WATERS RESEARCH PROJECT (SCCWRP) HAVE EXTENSIVELY INVESTIGATED THE DISCHARGE OF MUNICIPAL EFFLUENTS FROM OCEAN OUTFALLS IN SOUTHERN CALIFORNIA.

WHERE WE ARE TODAY

BASED ON THE RESULTS OF THESE STUDIES WHERE ARE WE TODAY, TEN YEARS AFTER THE PASSAGE OF THE MPRSA?

DOMESTIC MUNICIPAL SLUDGE

THERE HAS BEEN AN INCREASE IN KNOWLEDGE CONCERNING THE CAPACITY OF THE OCEAN TO ASSIMILATE CERTAIN TYPES OF WASTE MATERIALS WITHOUT BECOMING UNREASONABLY DEGRADED. IN PARTICULAR, A GREAT DEAL HAS BEEN LEARNED ABOUT THE IMPACTS OF MUNICIPAL SLUDGE COMPOSED PRIMARILY OF DOMESTIC WASTES AS DISTINGUISHED FROM SLUDGES WITH A HIGH INDUSTRIAL CONTRIBUTION. THESE STUDIES INDICATE THAT THE OCEAN DOES HAVE A CAPACITY TO ASSIMILATE NATURALLY OCCURRING ORGANIC MATERIAL SUCH AS DOMESTIC SEWAGE.

DOMESTIC SLUDGES FROM MUNICIPAL WASTE TREATMENT PLANTS ARE PREDOMINANTLY COMPOSED OF FINE GRAINED ORGANIC MATERIAL THAT AT APPROPRIATE SITES TEND TO REMAIN IN SUSPENSION AND CAN BE RAPIDLY DISPERSED BY OCEAN CURRENTS WITHOUT BUILDING UP ON THE FLOOR. THE AEROBIC CONDITIONS IN THE OCEAN AIDS IN THE BIODEGRADATION OF THIS MATERIAL. WHILE SOME CHANGES WITHIN THE MARINE ECOSYSTEMS HAVE OCCURRED, SUCH AS PHYTOPLANKTON BLOOMS OR CHANGES IN SPECIES DIVERSITY, THESE ECOLOGICAL CHANGES APPEAR TO BE LOCALIZED AROUND THE DUMP SITE, AND TEMPORARY. AT THE ORIGINAL PHILADELPHIA DUMPSITE, TEN MILES OFF CAPE MAY, THERE WAS BACTERIAL CONTAMINATION FROM SEWAGE SLUDGE DUMPING AS WELL AS SLIGHTLY ELEVATED LEVELS OF TRACE METAL CONTAMINATION IN THE SEDIMENTS FROM RUNOFF FROM THE DELAWARE BAY. TWO YEARS AFTER THE SITE WAS CLOSED, THE LEVELS OF BACTERIA HAD DECLINED SUFFICIENTLY TO PERMIT REOPENING OF THE SITE TO SHELLFISHING BY THE FOOD AND DRUG ADMINISTRATION. DUMPING AT THE NEW PHILADELPHIA DUMPSITE 40 MILES FARTHER OUT TO SEA WAS STOPPED IN 1980, AND THIS SITE HAS ALSO PURIFIED ITSELF TO THE EXTENT THAT RECENT STUDIES BY FDA SHOW THAT IT CAN BE REOPENED TO SHELLFISHING IN THE NEAR FUTURE.

THE SOUTHERN CALIFORNIA STUDIES OF MUNICIPAL EFFLUENTS FROM OCEAN
OUTFALLS HAVE BEEN CONDUCTED TO SATISFY THE REQUIREMENTS OF EPA'S
301(H) WAIVER PROGRAM. THE AGENCY HAS TENTATIVELY DETERMINED THAT
IMPACTS OF LESS THAN SECONDARY TREATED DISCHARGES IN THAT AREA WILL NOT
ADVERSELY AFFECT THE MARINE ECOSYSTEM. MUCH OF THE OCEANOGRAPHIC AND
GEOLOGICAL DATA WE ARE OBTAINING IN THE 301(H) PROCESS WILL ALSO BE
USEFUL IN ASSESSING THE IMPACTS OF THE OCEAN DISPOSAL OF SEWAGE SLUDGE.

DREDGED MATERIAL

THE OCEAN DISPOSAL OF MOST DREDGED MATERIAL HAS BEEN A GENERALLY
ACCEPTED PRACTICE. OVER 400 MILLION CUBIC YARDS MUST BE DISPOSED OF
ANNUALLY AND APPROXIMATELY 15 PERCENT GOES INTO THE OCEAN.

EPA AND THE CORPS OF ENGINEERS HAVE CONDUCTED EXTENSIVE STUDIES ON
DREDGED MATERIAL DISPOSAL SITES. OUR STUDIES OF THESE SITES HAVE
CONCLUDED THAT THE DISPOSAL OF UNCONTAMINATED DREDGED MATERIAL AND
MATERIAL THAT IS SIMILAR TO THE NATURAL SEDIMENTS AT A SITE HAVE
MINIMAL IMPACT ON THE OCEAN. SOME OF THE OBSERVED EFFECTS HAVE
INCLUDED PERIODIC SMOTHERING OF BENTHIC FAUNA, TEMPORARY INCREASES IN
CONCENTRATIONS OF SUSPENDED SOLIDS, AND SHORT-TERM DISPLACEMENT OF FISH
DURING DISPOSAL OPERATIONS. SUCH IMPACTS ARE UNAVOIDABLE BUT, WITH
PROPER SITING, POSE NO THREAT OF SIGNIFICANT ENVIRONMENTAL
DEGRADATION.

THE AGENCY HAS IDENTIFIED ENVIRONMENTALLY ACCEPTABLE OCEAN DISPOSAL SITES FOR DREDGED MATERIAL WHERE WATER DEPTHS AND TURBULENCE GENERALLY PROVIDE ADEQUATE DILUTION AND DISPERSION OF SEDIMENTS. ALSO THE INFREQUENCY OF DISPOSAL OPERATIONS MINIMIZES THE DIRECT EXPOSURE OF IMPORTANT SPECIES TO DREDGED MATERIAL. STUDIES HAVE SHOWN THAT THE OCEAN DISPOSAL SITES ARE RAPIDLY RECOLONIZED BY NEW POPULATIONS OF SPECIES WHICH HAVE MIGRATED FROM NEARBY UNAFFECTED AREAS, AND BY SURVIVING ORGANISMS AT THE SITE.

WE BELIEVE THESE CONCLUSIONS REGARDING DOMESTIC SEWAGE SLUDGE AND DREDGED MATERIAL ARE GENERALLY ACCEPTED IN THE ENVIRONMENTAL COMMUNITY. GROUPS SUCH AS THE NATIONAL WILDLIFE FEDERATION, THE ARMY CORPS OF ENGINEERS, AND THE NATIONAL ADVISORY COMMITTEE ON OCEANS AND ATMOSPHERE (NACOA), ARE IN AGREEMENT ON THESE POINTS. THE NATIONAL WILDLIFE FEDERATION SO TESTIFIED BEFORE THIS COMMITTEE LAST JUNE. NACOA, IN ITS JANUARY 1981 REPORT ON "THE ROLE OF THE OCEAN IN A WASTE MANAGEMENT STRATEGY", REVIEWED THE SCIENTIFIC LITERATURE AND REACHED A SIMILAR CONCLUSION THAT THE OCEAN SHOULD NOT BE PRECLUDED AS AN OPTION FOR DISPOSAL OF DOMESTIC SEWAGE SLUDGE AND DREDGED MATERIAL.

IMPROVED SCIENTIFIC TECHNIQUES

OVER THE LAST TEN YEARS, LABORATORY BIOASSAY TECHNIQUES AND PLUME MODELING HAVE IMPROVED SO THAT WE CAN BETTER PREDICT IMPACTS IN THE FIELD BEFORE THEY ARE ALLOWED TO OCCUR. SOME OF THESE TECHNIQUES CAN BE OF USE IN OUR OCEAN DUMPING ACTIVITIES. WE NOW HAVE FIELD DATA FROM LOS ANGELES AND PUGET SOUND TO ASSESS THE ACCURACY OF SOME OF OUR

LABORATORY BIOASSAYS. CHEMICAL ANALYSES TO FIND LOW LEVEL POLLUTANTS HAVE IMPROVED DRAMATICALLY. FOR EXAMPLE, IN 1976, WE MEASURED LEVELS OF THE TOXIC ORGANIC POLLUTANTS AND PESTICIDES USING GAS CHROMATOGRAPHY AND THIN LAYER CHROMATOGRAPHY. OUR DETECTION LIMITS WERE BETWEEN 100 AND 500 PARTS PER BILLION. TODAY, WITH IMPROVED GAS CHROMATOGRAPH COLUMNS AND WITH MASS SPECTROSCOPY WITH MICROPROCESSORS, OUR DETECTION LIMITS HAVE IMPROVED TO LESS THAN 1 PART PER BILLION FOR SOME PURGEABLE ORGANICS, TO BETWEEN 6 AND 7 PARTS PER BILLION FOR OTHER ORGANICS. WE HAVE ALSO CUT OUR PROCESSING TIME FROM DAYS TO HOURS, AS WE CAN NOW ANALYZE FOR SEVERAL COMPOUNDS AT THE SAME TIME. SIMILARLY, THE USE OF OPTICAL EMISSIONS SPECTROSCOPY VIA INDUCTIVELY COUPLED PLASMA HAS IMPROVED THE PRECISION AND REDUCED THE COSTS OF METALS ANALYSIS.

CONCURRENT WITH IMPROVED LABORATORY TECHNIQUES, EPA HAS DEVELOPED NEW TECHNIQUES FOR IN SITU BIOLOGICAL MONITORING OF MARINE POLLUTION. WE NOW HAVE THE CAPABILITY TO PLACE SEVERAL KINDS OF TEST ANIMALS AT DUMPSITES FOR EXTENDED PERIODS OF TIME AND DETECT SUB-CHRONIC IMPACTS OF CERTAIN POLLUTANTS SUCH AS HEAVY METALS AND SYNTHETIC ORGANIC COMPOUNDS. WE ARE NOW IN A POSITION TO REDUCE SOME OF THE UNCERTAINTIES OF OCEAN DISPOSAL BY UTILIZING THESE EVOLVING TECHNIQUES TO STUDY IN CLOSELY CONTROLLED AND MONITORED SITUATIONS THE IMPACTS OF WASTE DISPOSAL.

OCEAN INCINERATION

ONE ENCOURAGING DEVELOPMENT IN THE DISPOSAL OF SOME OF OUR MORE TOXIC WASTES HAS BEEN THE SUCCESSFUL USE OF OCEAN INCINERATION. AN

OCEAN VESSEL WITH SOPHISTICATED INCINERATION SYSTEMS HAS DEMONSTRATED THE CAPABILITY OF MAINTAINING OPERATING COMBUSTION EFFICIENCIES WITH RESULTANT DESTRUCTION EFFICIENCIES OF GREATER THAN 99.9 PERCENT OF ORGANIC MATTER. OCEAN INCINERATION HAS BEEN USED SUCCESSFULLY TO DESTROY AGENT ORANGE AND OTHER LIQUID CHLORINATED ORGANICS. THE AGENCY HAS CONCLUDED ON THE BASIS OF EXTENSIVE MONITORING THAT THIS DISPOSAL TECHNIQUE IS A DESIRABLE ALTERNATIVE FOR THE DISPOSAL OF A WIDE RANGE OF POTENTIALLY TOXIC ORGANIC WASTES, RESINS, AND PESTICIDES. WHILE THERE IS CURRENTLY ONLY ONE CERTIFIED OCEAN INCINERATION VESSEL, THE AGENCY IS ENCOURAGING THE GROWTH OF THAT DISPOSAL ALTERNATIVE.

SLUDGES WITH HIGH INDUSTRIAL CONTRIBUTION

THE AGENCY IS CONFIDENT THAT MUNICIPAL SLUDGE COMPOSED OF DOMESTIC WASTES CAN BE OCEAN DISPOSED WITH MINIMAL IMPACTS WITH PROPER SITE SELECTION AND MAINTENANCE. WE ARE LESS CERTAIN OF THE IMPACTS, AND THEREFORE MORE CONCERNED REGARDING THE DISPOSAL OF SLUDGES CONTAINING LARGE LOADINGS FROM INDUSTRIAL FACILITIES WHETHER FROM INDUSTRIAL OR MUNICIPAL SYSTEMS. SUCH SLUDGES ARE MORE LIKELY TO CONTAIN TOXIC ORGANICS OR HIGH CONCENTRATIONS OF HEAVY METALS. ONE OF THE HARDEST PROBLEMS WE FACE IS DETERMINING HOW HIGH THE LEVELS OF TOXIC ORGANICS AND HEAVY METALS IN MUNICIPAL SLUDGES ARE BEFORE THEY AFFECT THE SUCCESSFUL USE OF DIFFERENT DISPOSAL ALTERNATIVES. ANOTHER QUESTION IS TO WHAT EXTENT THESE POLLUTANTS ARE BOUND UP IN THE SLUDGE AND TO WHAT EXTENT AND AT WHAT RATE THEY WILL BE RELEASED TO THE ENVIRONMENT. UNFORTUNATELY, WE CANNOT DETERMINE SCIENTIFICALLY THE OCEAN'S FULL ABILITY TO ABSORB AND BIOLOGICALLY PROCESS TOXIC WASTES, NOR CAN WE FULLY TRACK THE FATE AND EFFECTS OF POTENTIALLY CONTAMINATED SLUDGES.

AS NOTED IN THE NACOA REPORT, EXCEPT FOR PCB'S AND CHLORINATED INSECTICIDES SUCH AS DDT, THERE IS LITTLE DATA ON CONCENTRATIONS OF PERSISTENT ORGANOHALOGENS IN SEAFOOD. THERE IS ALSO A LACK OF SCIENTIFIC CONSENSUS ON THE POTENTIAL RISKS TO HUMAN HEALTH FROM INGESTION OF ORGANISMS IN THE NEW YORK BIGHT CONTAMINATED WITH PCB'S, ON THE SOURCES OF PCB'S, AND THE RELATIVE AMOUNTS ENTERING THE BIGHT FROM OCEAN DUMPING OR FROM SOURCES ALONG THE HUDSON RIVER.

SOME MEMBERS OF THE SCIENTIFIC COMMUNITY HAVE RECOMMENDED THE USE OF DEEP OCEAN SITES BECAUSE THEY ARE HIGHLY DISPERSIVE AND UNLIKELY TO CAUSE ADVERSE IMPACTS TO BENTHIC COMMUNITIES. THE ACT ITSELF ENCOURAGES THE DESIGNATION OF DISPOSAL SITES OFF THE CONTINENTAL SHELF. THE DISPOSAL OF INDUSTRIAL WASTES HAS BEEN OCCURRING AT THE 106 MILE OCEAN WASTE DISPOSAL SITE. THIS DEEP OCEAN DUMPSITE IS APPROXIMATELY 90 NAUTICAL MILES EAST OF CAPE HENLOPEN, DELAWARE, WITH DEPTHS OF BETWEEN 1400 METERS AND 2800 METERS. OVER THE LAST TEN YEARS, STUDIES HAVE BEEN CONDUCTED AT THE SITE ON THE DISPOSAL THAT HAS OCCURRED THERE. SOME ACUTE EFFECTS HAVE BEEN NOTED WHERE ACID-IRON WASTES HAVE BEEN DUMPED. HOWEVER, THESE EFFECTS HAVE OCCURRED WITHIN THE DUMP SITE IMMEDIATELY AFTER DISCHARGE AND HAVE BEEN SHOWN TO BE MITIGATED BY THE RAPID DILUTION OF WASTES. IT HAS BEEN DIFFICULT TO IDENTIFY LONG-TERM IMPACTS OF DEEP OCEAN DUMPING OF WASTES LARGELY BECAUSE OF OUR LIMITED TECHNICAL ABILITY TO MONITOR THE FATE AND EFFECTS OF POLLUTANTS IN DEEP OCEAN SITES, IN PART BECAUSE OF RAPID DISPERSION.

OTHER FACTORS INFLUENCING REEVALUATION ON OCEAN DUMPING POLICIES

SOME OTHER FACTORS BEYOND OUR INCREASED SCIENTIFIC KNOWLEDGE ARE INFLUENCING OUR EVALUATION OF OCEAN DUMPING POLICIES. WHILE RECYCLE/ REUSE HAS BEEN ENCOURAGED, AND STILL REMAINS THE BEST LONG-TERM APPROACH, IN MANY INSTANCES IT HAS PROVEN TOO EXPENSIVE OR TOO UNCERTAIN TO IMPLEMENT ON A LARGE SCALE.

IN ADDITION, THE ALTERNATIVES TO OCEAN DISPOSAL IN SOME INSTANCES MAY BE LESS ENVIRONMENTALLY SOUND. IN PARTICULAR, THERE HAS BEEN INCREASED PUBLIC AWARENESS AND CONCERN OVER THE POTENTIALLY ADVERSE EFFECTS OF LAND-BASED DISPOSAL OF WASTES. PUBLIC OPPOSITION TO PARTICULAR LAND DISPOSAL PROPOSALS FOCUSES ON THE PERCEIVED THREAT TO HUMAN HEALTH AND WELFARE OF THE CONTAMINATED DRINKING WATERS, THE POLLUTED AIR FROM INCINERATION AND SUCH DIRECT RESULTS OF PROBLEMS RESULTING FROM ABANDONED LAND DISPOSAL SITES SUCH AS LOVE CANAL IN NEW YORK. IN RECENT YEARS, CONGRESS HAS RESPONDED WITH THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) AND THE "SUPERFUND" BILL DESIGNED TO PROTECT THE LAND ENVIRONMENT, AND IN THE CASE OF SUPERFUND, TO CLEAN UP THE RESULTS OF PAST MISTAKES. IMPLEMENTATION OF THESE LAWS HAS THE EFFECT OF TIGHTENING REQUIREMENTS ON LAND DISPOSAL AND INCREASING THE DEMAND FOR AIR OR WATER DISPOSAL.

NEW YORK CITY DECISION

A CHALLENGE NOW IS TO ENSURE THAT A PROPER BALANCE BETWEEN THE VARIOUS AIR, LAND, SURFACE WATER, AND OCEAN DISPOSAL OPTIONS IS STRUCK. THIS ISSUE OF BALANCING OUR DISPOSAL ALTERNATIVES WAS CONSIDERED IN THE RECENT DECISION OF JUDGE SOFAER, IN CITY OF NEW YORK V. EPA, 80 CIV. 1677 (ADS) (S.D.N.Y. AUGUST 28, 1981). IN CITY OF NEW YORK JUDGE SOFAER FOUND EPA HAD REFUSED TO RENEW NEW YORK'S OCEAN DUMPING PERMIT ON IMPROPER GROUNDS. AT ISSUE IN THAT CASE WAS EPA'S REFUSAL TO ALLOW NEW YORK CITY TO ATTEMPT TO SHOW THAT THE OCEAN WAS THE BEST SLUDGE DISPOSAL ALTERNATIVE, BECAUSE THE CITY COULD NOT DEMONSTRATE THAT IT WOULD MEET EPA'S ENVIRONMENTAL CRITERIA FOR OCEAN DISPOSAL.

JUDGE SOFAER DETERMINED THAT EPA COULD NOT PRECLUDE OCEAN DUMPING. SIMPLY BECAUSE OF A FAILURE BY AN APPLICANT TO MEET THE ENVIRONMENTAL CRITERIA. RATHER, THE AGENCY WAS REQUIRED TO TAKE INTO ACCOUNT ALL THE RELEVANT STATUTORY FACTORS, INCLUDING THE NEED FOR THE PROPOSED DUMPING. THE COURT DECISION REQUIRES THE AGENCY, IN EVALUATING EACH OCEAN DUMPING APPLICATION, TO BALANCE THE ENVIRONMENTAL CONSEQUENCES AND NEED FOR OCEAN DISPOSAL WITH THE POTENTIAL ENVIRONMENTAL IMPACTS OF

FEASIBLE LAND-BASED ALTERNATIVES. IN THE INTERIM, THE COURT HAS ENJOINED EPA FROM TAKING ANY ENFORCEMENT ACTION AGAINST NEW YORK CITY WITH RESPECT TO THE CITY'S OCEAN DUMPING OF SEWAGE SLUDGE SO LONG AS SUCH DUMPING IS ACCOMPLISHED IN ACCORDANCE WITH THE CONDITIONS OF THE CITY'S LAST OCEAN DUMPING PERMIT. EPA IS RECONSIDERING NEW YORK'S REQUEST FOR RENEWAL OF ITS OCEAN DUMPING PERMIT IN ACCORDANCE WITH THE COURT DECISION. WE WILL EVALUATE THE REQUEST IN LIGHT OF THE ENVIRONMENTAL RISKS AND COSTS OF OCEAN DUMPING AND OF ALL FEASIBLE ALTERNATIVES, INCLUDING ALTERNATIVE OCEAN DUMPING SITES.

AFTER CONSIDERATION OF ALL THE ARGUMENTS FOR AND AGAINST APPEAL OF JUDGE SOFAER'S DECISION, THE AGENCY DECIDED NOT TO APPEAL, FOR THE FOLLOWING REASONS:

FIRST, AND MOST IMPORTANT, WE CONCLUDED THAT JUDGE SOFAER'S DECISION IS CONSISTENT WITH THE INTENT OF CONGRESS TO PROHIBIT THE DUMPING OF MATERIALS WHICH WOULD UNREASONABLY DEGRADE THE MARINE ENVIRONMENT. THE DECISION ONLY REQUIRES EPA TO CONSIDER ALL OF THE STATUTORY FACTORS SET FORTH IN SECTION 102(A) OF THE ACT IN DETERMINING WHETHER OCEAN DUMPING OF SEWAGE SLUDGE UNREASONABLY DEGRADES THE OCEAN ENVIRONMENT.

SECOND, WE HAVE CONCLUDED THAT EPA WOULD NOT HAVE BEEN LIKELY TO PREVAIL ON THE MERITS HAD IT APPEALED THE DECISION. JUDGE SOFAER'S INTERPRETATION OF THE STATUTE IS A REASONABLE ONE. A CONTRARY INTERPRETATION REQUIRES ACKNOWLEDGING AT LEAST THE THEORETICAL POSSIBILITY THAT OCEAN DUMPING CAN BE BANNED EVEN WHEN ALTERNATIVE SLUDGE DISPOSAL METHODS POSE AN EVEN GREATER RISK TO HEALTH AND THE ENVIRONMENT.

THIRD, JUDGE SOFAER'S DECISION GIVES EPA ADDED IMPETUS TO MODIFY ITS REGULATIONS WHEN NECESSARY TO TAKE INTO ACCOUNT ADDITIONAL SCIENTIFIC INFORMATION AND THE EXPERIENCE GAINED FROM ADMINISTERING THE OCEAN DUMPING PROGRAM. THE AGENCY AGREES WITH THE COURT THAT THE 1977 AMENDMENTS TO THE ACT WERE NOT INTENDED TO FREEZE EPA'S ENVIRONMENTAL CRITERIA. A CONTRARY INTERPRETATION OF THE STATUTE WOULD SEVERELY LIMIT THE AGENCY'S FLEXIBILITY. FOR EXAMPLE, IN REVIEWING THE REGULATIONS THE AGENCY IS CONSIDERING REORIENTING OUR LABORATORY TESTS, BIOASSAYS AND BIOACCUMULATION PROCEDURES TO BETTER REFLECT WHAT ACTUALLY HAPPENS IN THE OCEAN ENVIRONMENT. IN MANY CASES WE WILL BE MAKING OUR TESTS MORE SITE-SPECIFIC IN TERMS OF TARGET SPECIES USED AND METHODS USED TO PREDICT CHRONIC EFFECTS.

WE ARE CONSIDERING SOME SPECIFIC CHANGES IN THE PROPOSED REGULATION. FOR EXAMPLE, INSTEAD OF USING LABORATORY ANIMALS, WE MAY USE SPECIES FROM THE FIELD. WE MAY ALSO USE ALTERNATIVES TO A STANDARD APPLICATION FACTOR OF .01 TIMES THE ACUTE TOXICITY

CONCENTRATION FOR SETTING ACCEPTABLE POLLUTANT LEVELS TO PROTECT AGAINST CHRONIC IMPACTS. FOR EXAMPLE, WHERE MATERIALS CONTAIN CONSTITUENTS WHICH ARE NOT KNOWN TO BIOACCUMULATE IN MARINE ORGANISMS OR RESULT IN OTHER SERIOUS SUB-LETHAL EFFECTS, THE AGENCY IS CONSIDERING THE USE OF AN APPLICATION FACTOR OF 0.1. THE AGENCY ALSO MAY USE ACUTE/CHRONIC RATIOS WHERE CHRONIC DATA EXISTS TO MORE ACCURATELY ESTABLISH ACCEPTABLE LIMITS FOR SPECIFIC MATERIALS. SUCH LIMITS WOULD MORE CLOSELY REFLECT ACTUAL CHRONIC IMPACTS IN THE FIELD. THE AGENCY IS ALSO CONSIDERING GREATER RELIANCE ON FIELD STUDIES OVER LABORATORY TESTS IN APPLICATION REVIEWS.

MR. CHAIRMAN, I EMPHASIZE THAT JUDGE SOFAER'S DECISION DOES NOT REQUIRE EPA TO ALLOW SLUDGE DUMPING IN THE NEW YORK BIGHT APEX OR ANY OTHER OCEAN SITE. THE COURT DECISION MERELY REQUIRES THAT EPA CONSIDER RELEVANT STATUTORY FACTORS BEFORE GRANTING OR DENYING A PERMIT APPLICATION. EPA HAS NOT YET MADE A FINAL DETERMINATION ON WHETHER OR WHERE NEW YORK CITY WILL BE PERMITTED TO CONTINUE ITS OCEAN DUMPING OF SLUDGE. THE AGENCY WILL SHORTLY PROPOSE TO DESIGNATE THE 106-MILE DUMP SITE FOR THE DUMPING OF MUNICIPAL WASTES AND WILL SOLICIT COMMENTS ON NEW YORK CITY'S PETITION TO REDESIGNATE THE 12-MILE SLUDGE SITE, AND, IN ADDITION OR IN THE ALTERNATIVE, THE 60-MILE SLUDGE SITE. EPA WILL CAREFULLY ANALYZE THE COMMENTS SUBMITTED BEFORE DETERMINING WHETHER TO GRANT NEW YORK CITY'S PETITION. EPA WILL ALSO BE REVIEWING PERMIT APPLICATIONS SUBMITTED BY

SEVERAL NEW YORK AND NEW JERSEY MUNICIPALITIES. AGAIN, INTERESTED PERSONS WILL BE GIVEN AN OPPORTUNITY TO COMMENT ON THESE APPLICATIONS AND THE AGENCY WILL CONSIDER ALL COMMENTS RECEIVED BEFORE MAKING ANY FINAL DECISIONS.

THE NEW YORK CITY DECISION AND THE IMPLEMENTATION OF RCRA HAS REINFORCED THE NEED TO MOVE TOWARD A MORE INTEGRATED WASTE MANAGEMENT APPROACH. LAND DISPOSAL TODAY SHOULD NOT RESULT IN THE IRREVERSIBLE CONTAMINATION OF TOMORROW'S DRINKING WATER SUPPLIES. NOR SHOULD OCEAN DISPOSAL ADVERSELY AFFECT THE FISH AND OTHER CRITICALLY IMPORTANT WILDLIFE. EPA IS COMMITTED TO MINIMIZING ENVIRONMENTAL IMPACTS OF WASTE DISPOSAL AND TO DOING SO EFFICIENTLY.

WHERE WE ARE HEADED

WE STILL DON'T HAVE ALL THE ANSWERS AS TO THE BEST DISPOSAL ALTERNATIVES FOR SOME WASTES. THE QUESTION BEING DEBATED IN THE SCIENTIFIC COMMUNITY AS WELL AS BY POLICYMAKERS IS: GIVEN THE RISKS AND UNCERTAINTIES OF BOTH LAND BASED AND OCEAN DISPOSAL OPTIONS, WHAT SHOULD BE THE PREFERRED DISPOSAL MEDIUM FOR OUR MORE POLLUTED WASTES? EPA DOESN'T PRETEND TO KNOW THE COMPLETE ANSWER. WHILE THE AGENCY IS ENCOURAGING A REDUCTION IN THE AMOUNTS OF WASTES PRODUCED, CLEARLY, DISPOSAL OF THOSE WASTES PRODUCED SHOULD BE IN A LOCATION AND MANNER SO AS TO MINIMIZE IMPACTS AND TO MAXIMIZE COST EFFECTIVENESS. TO

ACCOMPLISH THIS OBJECTIVE, CONTINUED RESEARCH INTO THE COMPOSITION OF THE SLUDGE AND VIABLE DISPOSAL SITES IS NEEDED. THE AGENCY HAS ESTABLISHED A WORK GROUP TO DEVELOP SLUDGE MANAGEMENT GUIDELINES UNDER SECTION 405 OF THE CLEAN WATER ACT. THE GUIDANCE WILL CUT ACROSS ALL MEDIA AND PROGRAM LINES TO ADDRESS THE BEST METHODS FOR DISPOSAL OF SLUDGES.

SPECIFICALLY, WITHIN THE OCEAN DUMPING PROGRAM ITSELF, THE AGENCY IS UNDERTAKING AN EFFORT TO CHARACTERIZE DIFFERENT INDUSTRIAL AND MUNICIPAL SLUDGES IN ORDER TO DETERMINE THE COMPONENTS OF THE SLUDGES AND THEIR POTENTIAL FOR ADVERSELY AFFECTING DIFFERENT MARINE SETTINGS. CONCURRENT WITH WASTE CHARACTERIZATION ACTIVITIES, THE AGENCY IS STUDYING THE CHARACTERISTICS OF DISPOSAL SITES TO DETERMINE AN AREA'S CAPACITY TO ABSORB VARIOUS TYPES OF WASTE.

IN MATCHING WASTES WITH SITES, THE AGENCY WILL ASSESS THE RISKS AND UNCERTAINTIES OF DIFFERENT DISPOSAL ALTERNATIVES FOR PARTICULAR WASTES. IN REGARD TO POTENTIALLY TOXIC SLUDGES WHOSE FATE AND EFFECTS ARE UNCERTAIN, EPA WILL DEVOTE MUCH EFFORT TO IMPROVE THE DATA BASE FOR DECISION MAKING. THESE ACTIVITIES BY THE AGENCY SHOULD ASSIST WASTE DISPOSERS WHO ARE CONSIDERING APPLYING FOR AN OCEAN DUMPING PERMIT. EVEN WITH ADDITIONAL DATA THE BURDEN OF PROOF WILL CONTINUE TO BE ON THE APPLICANTS TO MAKE THEIR CASE FOR OCEAN DISPOSAL.

AS I MENTIONED EARLIER, MUNICIPAL SLUDGES VARY AS TO THE LEVELS OF TOXIC ORGANICS AND HEAVY METALS. PROBLEMS RESULT WHEN THE LEVELS OF TOXIC ORGANICS AND HEAVY METALS LIMIT THE CHOICE OF DISPOSAL

ALTERNATIVES. THE AGENCY IS CURRENTLY IDENTIFYING TECHNOLOGIES TO SEPARATE OUT POTENTIALLY TOXIC COMPONENTS FROM SLUDGES AND TO ENCOURAGE PROCESS CHANGES THAT REDUCE THE USE OR ENCOURAGE THE RECYCLING OF POTENTIALLY HARMFUL MATERIALS SO THAT THEY DO NOT ENTER MUNICIPAL TREATMENT WORKS AND CONTAMINATE DOMESTIC SLUDGES. MANY CITIES ARE INCORPORATING INDUSTRIAL PRETREATMENT PROGRAMS INTO THEIR WASTE MANAGEMENT SCHEMES.

SEVERAL NEW RECOVERY TECHNOLOGIES HAVE BEEN DEVELOPED FOR USE BY METAL FINISHERS. THESE INCLUDE HIGH SURFACE AREA REACTORS, REVERSE OSMOSIS, ION EXCHANGE AND EVAPORATIVE RECOVERY. ALL OF THESE TECHNIQUES RECOVER 98% OR BETTER OF THE MATERIALS (MOSTLY METALS) WHICH ARE NORMALLY DISCHARGED TO TRADITIONAL END-OF-PIPE TREATMENT SYSTEMS. THESE RECOVERY PROCESSES WILL OFTEN PAY FOR THEMSELVES WITH THE VALUE OF THE RECOVERED RAW MATERIALS, AND ALSO ELIMINATE OR MINIMIZE THE GENERATION OF HAZARDOUS SLUDGES WHICH ARE CHARACTERISTIC OF END-OF-PIPE TREATMENT SYSTEMS. A SIDE BENEFIT OF UTILIZING THESE PROCESSES IS THAT PLANTS ALSO TYPICALLY REDUCE THEIR WATER USE BY 50 TO 75 PERCENT.

EPA'S RESEARCH ACTIVITIES

IN RESPONSE TO THE SUBCOMMITTEE'S REQUEST, I WILL DISCUSS SOME OF EPA'S ONGOING AND PLANNED RESEARCH ACTIVITIES WHICH PERTAIN TO OCEAN

POLLUTION PROBLEMS. EPA'S MARINE RESEARCH ACTIVITIES ADDRESS PROBLEMS OF OCEAN DUMPING, OCEAN OUTFALLS, DREDGED MATERIAL DISPOSAL, DRILLING MUDS DISPOSAL, OIL SPILL CONTAINMENT, MARINE WATER QUALITY AND BIOMONITORING. THIS WORK IS DONE BOTH IN-HOUSE AT EPA LABORATORIES AND THROUGH CONTRACTS.

EPA HAS ALSO ENTERED INTO COLLABORATIVE RESEARCH AGREEMENTS ON OCEAN DUMPING AND MARINE RESEARCH WITH NOAA AND THE U.S. ARMY CORPS OF ENGINEERS. IN RECOGNITION OF THE DIFFERENT TYPES OF EXPERTISE, THE THREE AGENCIES ARE ATTEMPTING TO GAIN OPTIMAL USE OF RESOURCES. ONE PROJECT IS THE DEVELOPMENT OF IMPROVED BIOASSAY PROCEDURES FOR BENTHIC ORGANISMS. THIS PROJECT IS PART OF AN OVERALL PROGRAM TO IMPROVE MONITORING OF THE IMPACTS OF OCEAN DISPOSAL.

THIS COOPERATIVE PROGRAM ALSO FOCUSES ON THE DEVELOPMENT OF METHODS AND PROTOCOLS FOR MARINE HAZARD ASSESSMENT OF WASTE DISPOSAL. FIELD STUDIES WILL ANALYZE ACTIVE WASTE AND DREDGED MATERIAL DISPOSAL SITES IN NEW YORK BIGHT AND LONG ISLAND SOUND. THESE STUDIES WILL IMPROVE OUR SKILLS TO ASSESS MARINE POLLUTION, FROM THE INITIAL CHARACTERIZATION OF WASTES TO PREDICTIVE TESTING AND MODELING PROCEDURES, AND SHORT- AND LONG-TERM MONITORING APPROACHES, ESPECIALLY IN THE DEEP OCEAN. A MORE DETAILED DESCRIPTION OF OUR RESEARCH ACTIVITIES, INCLUDING FUNDING LEVELS AND A DESCRIPTION OF INTERAGENCY AND INTRAGENCY COORDINATION ACTIVITIES, IS INCLUDED IN THE PORTION OF THIS TESTIMONY THAT RESPONDS TO THE COMMITTEE'S FORMAL QUESTIONS.

OCEAN DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTES

I WOULD LIKE TO TAKE A FEW MINUTES TO DISCUSS THE DISPOSAL OF LOW LEVEL RADIOACTIVE WASTES IN THE OCEAN. THE AGENCY HAS BEEN BEFORE THIS SUBCOMMITTEE TWICE WITHIN THE LAST FIFTEEN MONTHS TO DISCUSS THIS SUBJECT, SO I WILL KEEP MY REMARKS BRIEF.

BETWEEN 1946 AND 1962, THE UNITED STATES ALLOWED THE DISPOSAL OF PACKAGED LOW-LEVEL RADIOACTIVE WASTES AT ABOUT 30 LOCATIONS OFF OUR COAST. THE ATOMIC ENERGY COMMISSION (AEC) REGULATED THE OCEAN DISPOSAL OF THESE WASTES, WHICH CONSISTED OF APPROXIMATELY 112,000 CONTAINERS (MOSTLY 55-GALLON STEEL DRUMS) WITH A TOTAL RADIOACTIVITY OF ABOUT 120,000 CURIES. BETWEEN 1960 AND 1962, THE AEC PHASED OUT THE OCEAN DISPOSAL OF MOST RADIOACTIVE WASTES AS COMMERCIAL LAND BURIAL SITES BECAME AVAILABLE. ONLY A FEW OCEAN DISPOSALS WERE ALLOWED AFTER 1962 AND IN 1970 THE AEC STOPPED ISSUING OCEAN DISPOSAL LICENSES. THIS 1970 DECISION WAS BASED LARGELY ON A REPORT BY THE COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) WHICH CONCLUDED THAT:

"THE POLICY RECOMMENDED WOULD CONTINUE THE PRACTICE OF PROHIBITING HIGH-LEVEL RADIOACTIVE WASTES IN THE OCEAN. DUMPING OTHER RADIOACTIVE MATERIALS WOULD BE PROHIBITED, EXCEPT IN A VERY FEW CASES FOR WHICH NO PRACTICAL ALTERNATIVE OFFERS LESS RISK TO MAN AND HIS ENVIRONMENT."

THE CEQ RECOMMENDATION TO PROHIBIT OCEAN DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE WAS INCORPORATED INTO THE MARINE PROTECTION,

RESEARCH, AND SANCTUARIES ACT OF 1972. THE ACT REQUIRES THE AGENCY TO EVALUATE PERMIT APPLICATIONS FOR OCEAN DISPOSAL OF MATERIALS NOT PROHIBITED BY THE ACT, INCLUDING LOW-LEVEL RADIOACTIVE WASTES.

TO DEVELOP CRITERIA FOR EVALUATING PERMIT REQUESTS AND FOR CONTROLLING ANY FUTURE OCEAN DISPOSAL OF RADIOACTIVE WASTE, EPA CONDUCTED A SERIES OF SURVEYS BEGINNING IN 1974 TO EVALUATE THE RESULTS OF PAST U.S. OCEAN DUMPING. WE FOCUSED OUR SURVEY EFFORTS ON THE THREE MAJOR OCEAN DUMPSITES WHICH CONTAINED MORE THAN 95 PERCENT OF ALL RADIOACTIVE MATERIALS DUMPED BY THE UNITED STATES. ONE OF THESE DUMPSITES IS LOCATED NEAR THE FARALLON ISLANDS ABOUT 50 MILES OFF THE COAST OF CALIFORNIA, THE OTHER TWO ARE AT ABOUT 120 MILES AND 200 MILES OFF THE MARYLAND-DELAWARE COAST. THE DETAILS OF THESE SURVEYS WERE PRESENTED IN EPA'S TESTIMONY BEFORE A HEARING OF THIS SUBCOMMITTEE ON NOVEMBER 20, 1980. FROM THE DATA GATHERED, WE HAVE CONCLUDED THAT THERE IS NO EVIDENCE OF HARM TO HUMANS OR THE MARINE ENVIRONMENT FROM PAST U.S. OCEAN DUMPING OF RADIOACTIVE WASTES.

THE U.S. GENERAL ACCOUNTING OFFICE (GAO) REACHED A SIMILAR CONCLUSION IN THEIR RECENT REPORT "HAZARDS OF PAST LOW-LEVEL RADIOACTIVE WASTE OCEAN DUMPING HAVE BEEN OVEREMPHASIZED." THE GAO CONTACTED OVER 30 SCIENTISTS, EXAMINED THE MAJOR SCIENTIFIC RESEARCH PAPERS ON THIS SUBJECT, AND TALKED WITH SEVERAL ENVIRONMENTAL AND PUBLIC INTEREST GROUPS. THE RESULTS OF THIS INVESTIGATION INDICATED THAT THE EVIDENCE OVERWHELMINGLY SHOWS THAT PAST OCEAN DUMPING BY THE U.S. POSES NEITHER AN ENVIRONMENTAL NOR PUBLIC HEALTH HAZARD.

PRESENT REGULATIONS

IN 1973, EPA ISSUED REGULATIONS GOVERNING OCEAN DISPOSAL OF RADIOACTIVE WASTES. THESE REGULATIONS DIRECTED THAT RADIOACTIVE MATERIALS BE CONTAINED TO PREVENT THEIR DIRECT DISPERSION OR DILUTION IN OCEAN WATERS. FURTHERMORE, THE MATERIALS TO BE DISPOSED OF SHOULD RADIODECAY TO ENVIRONMENTALLY INNOCUOUS MATERIAL WITHIN THE LIFE EXPECTANCY OF THE CONTAINERS AND THEIR INERT MATRIX. THESE REQUIREMENTS WERE ALSO INCLUDED IN EPA'S OCEAN DUMPING REGULATIONS PUBLISHED IN 1977 (40 CFR PART 227.11).

EVEN THOUGH EPA HAS HAD REGULATIONS AVAILABLE SINCE 1973 FOR EVALUATING PERMIT APPLICATIONS FOR OCEAN DISPOSAL OF RADIOACTIVE MATERIALS, WE HAVE NOT RECEIVED ANY SUCH REQUESTS. CONSEQUENTLY, WE HAVE NOT ISSUED ANY PERMITS AND WE HAVE TAKEN NO POSITION ON THE MERITS OF OCEAN DISPOSAL OF RADIOACTIVE WASTES.

INTERNATIONAL CRITERIA

THE INTERNATIONAL CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER, ALSO KNOWN AS THE LONDON DUMPING CONVENTION, PROVIDES FOR INTERNATIONAL CONTROL OVER OCEAN DISPOSAL OF RADIOACTIVE MATERIALS. THE UNITED STATES BECAME A CONTRACTING PARTY TO

THIS CONVENTION IN 1974. ANNEX I OF THE CONVENTION PROHIBITS OCEAN DUMPING OF HIGH-LEVEL RADIOACTIVE WASTES AND ANNEX II STATES THAT THE CONTRACTING PARTIES SHOULD TAKE FULL ACCOUNT OF THE RECOMMENDATIONS OF THE IAEA WHEN ISSUING PERMITS FOR OTHER RADIOACTIVE WASTES.

AT THE FOURTH CONSULTATIVE MEETING OF CONTRACTING PARTIES TO THE LONDON DUMPING CONVENTION IN 1978, THE IAEA PRESENTED A DEFINITION OF HIGH-LEVEL RADIOACTIVE WASTE UNSUITABLE FOR DUMPING AT SEA AND RECOMMENDATIONS FOR OCEAN DISPOSAL OF OTHER RADIOACTIVE MATERIALS.

THE DOCUMENT CONTAINING THE IAEA RECOMMENDATIONS IS ATTACHED TO THIS TESTIMONY (IAEA INFORMATION CIRCULAR, INFCIRC/205/ADD.1/REV.1, AUGUST 1978). ALSO, ATTACHED IS THE CONVENTION RESOLUTION WHICH ADOPTED THE IAEA RECOMMENDATIONS.

REVISION TO EPA REGULATIONS FOR LOW-LEVEL RADIOACTIVE WASTE

WE ARE CONSIDERING INCORPORATING THE IAEA DEFINITION AND RECOMMENDATIONS INTO OUR OCEAN DUMPING REGULATIONS. SPECIFIC CHANGES OR ADDITIONS TO THE REGULATIONS WILL DEAL WITH 1) THE IAEA DEFINITION OF HIGH-LEVEL RADIOACTIVE WASTE, 2) PROHIBITED MATERIALS, 3) LIMITS FOR SPECIFIC WASTES OR WASTE CONSTITUENTS AND TRACE AMOUNTS, 4) CONTAINERIZED WASTES, AND 5) GENERAL CRITERIA FOR SELECTION OF RADIOACTIVE WASTE DUMPSITES.

PUBLIC CONCERNS

THERE IS A POPULAR BELIEF THAT THE UNITED STATES HAS AN OFFICIAL BAN OR MORATORIUM ON OCEAN DISPOSAL OF RADIOACTIVE WASTES. WHEN PEOPLE HEAR THAT WE ARE THINKING OF INCORPORATING THE IAEA CRITERIA INTO EPA'S REGULATIONS, THEY CONCLUDE THAT EPA HAS DECIDED TO ONCE AGAIN ALLOW OCEAN DUMPING. ACTUALLY, NO BAN EXISTS, EXCEPT FOR THE PROHIBITION AGAINST OCEAN DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES. SINCE WE HAVE RECEIVED NO PERMIT APPLICATIONS, WE HAVE NOT HAD TO MAKE A DECISION FOR OR AGAINST SUCH DISPOSAL. IF WE RECEIVED A PERMIT APPLICATION, WE WOULD EVALUATE IT ACCORDING TO REQUIREMENTS OF THE OCEAN DUMPING ACT, THE LONDON DUMPING CONVENTION AND EPA'S OCEAN DUMPING REGULATIONS.

STATUS OF PERMIT REQUESTS

EPA HAS BEEN NOTIFIED BY BOTH THE DEPARTMENT OF THE NAVY AND THE DEPARTMENT OF ENERGY (DOE) THAT THEY ARE EVALUATING OCEAN DISPOSAL AS AN OPTION FOR SPECIFIC TYPES OF RADIOACTIVE WASTES. THE NAVY IS EVALUATING ALTERNATIVES FOR DISPOSAL OF DECOMMISSIONED, DEFUELED NAVAL SUBMARINE REACTOR PLANTS. DOE IS CONSIDERING THE OPTION OF OCEAN DISPOSAL OF SOILS VERY SLIGHTLY CONTAMINATED WITH NATURALLY OCCURRING RADIONUCLIDES AS A RESULT OF ORE PROCESSING OPERATIONS UNDER THE MANHATTAN PROJECT. EPA HAS ALSO RECEIVED SEVERAL INQUIRIES ABOUT OCEAN DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTES FROM PRIVATE INDUSTRY, AND FROM REPRESENTATIVES OF STATE COMPACTS WHICH ARE EVALUATING WASTE DISPOSAL OPTIONS ACCORDING TO THE LOW-LEVEL RADIOACTIVE WASTE POLICY ACT OF 1980. THIS CONCLUDES MY DISCUSSION ON OCEAN DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTES.

GENERAL REVISIONS TO OCEAN DUMPING REGULATIONS

FOR A NUMBER OF REASONS DISCUSSED EARLIER, INCLUDING OUR IMPROVED SCIENTIFIC KNOWLEDGE, THE NEW YORK CITY DECISION, AND THE LONDON DUMPING CONVENTION RESOLUTIONS ON LOW-LEVEL RADIOACTIVE WASTES, WE ARE REVISING THE OCEAN DUMPING REGULATIONS. I WOULD LIKE TO TAKE A FEW MOMENTS TO DISCUSS SOME OF THE ISSUES BEING RAISED AS WE WORK ON THE REGULATIONS. MANY DIFFICULT SCIENTIFIC, LEGAL, AND POLITICAL ISSUES MUST BE ADDRESSED. SOME OF THESE ISSUES INCLUDE: THE TRADEOFFS OF DISPOSAL ALTERNATIVES GIVEN RELATIVE RISKS AND UNCERTAINTIES OF EACH; ASSESSING THE VALUES OF DIFFERENT POTENTIALLY AFFECTED RESOURCES ON LAND AND IN THE OCEAN; TECHNIQUES FOR EVALUATING IMPACTS; AND SELECTING THE BEST ALTERNATIVES FOR THE DISPOSAL OF TOXIC SLUDGES AND LOW LEVEL RADIOACTIVE WASTES. THE PROPOSED REGULATIONS WILL NOT ONLY ADDRESS THESE ISSUES AND VARIOUS OPTIONS, BUT ALSO PROVIDE A FORUM FOR PUBLIC AND CONGRESSIONAL DISCUSSION.

REAUTHORIZATION OF THE ACT

REGARDING THE REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT, THE AGENCY FEELS THAT THE PRESENT STATUTE PROVIDES A FLEXIBLE AND WORKABLE APPROACH FOR CONSIDERING OCEAN DISPOSAL ACTIVITIES ALONG WITH OTHER WASTE DISPOSAL OPTIONS, WHILE AT THE SAME TIME PROTECTING OUR MARINE RESOURCES FROM UNREASONABLE DEGRADATION. WE SUPPORT REAUTHORIZATION OF THE ACT AND SEE NO NEED TO SUBSTANTIVELY AMEND THE CURRENT STATUTE BEYOND PROVIDING THE ADMINISTRATOR DISCRETION IN ADOPTING A FINANCIAL MANAGEMENT SYSTEM TO RECOVER THE PROGRAM COSTS FOR OCEAN DISPOSAL, WHICH I WILL BE DISCUSSING WITH YOU IN OUR RESPONSE TO THE COMMITTEE'S QUESTIONS.

CONCLUSION

RECENT STUDIES ABOUT THE EFFECTS OF PAST DUMPING AND INCREASING CONCERN ABOUT THE EFFECTS OF LAND DISPOSAL HAVE CONVINCED US THAT THE OCEAN MUST BE INCLUDED AS A LEGITIMATE DISPOSAL OPTION IN ANY INTEGRATED AND WELL THOUGHT OUT WASTE MANAGEMENT PROGRAM. HOWEVER, WE CANNOT AFFORD TO OPEN UP THE OCEAN INDISCRIMINATELY, TO RETURN TO AN "OUT OF SIGHT-OUT OF MIND" PHILOSOPHY. THE CHALLENGE NOW IS TO DEFINE THE PARAMETERS OF "SAFE DISPOSAL", OF "UNREASONABLE DEGRADATION" AND OF "ACCEPTABLE RISK" IN SUCH A WAY THAT INTELLIGENT JUDGMENTS AND RATIONAL TRADEOFFS OF ENVIRONMENTAL EFFECTS AND COSTS CAN BE MADE ON A CASE-BY-CASE BASIS. THE AGENCY BELIEVES INTELLIGENT JUDGMENTS AND RATIONAL TRADEOFFS, ALONG WITH CONTINUED EMPHASIS ON TECHNIQUES TO RECYCLE AND REDUCE THE GENERATION OF WASTES, ARE THE PRIMARY CHARACTERISTICS OF THE SOLUTION TO OUR WASTE MANAGEMENT PROBLEMS. THE OCEAN HAS A ROLE TO PLAY IN THAT SOLUTION AND WE WILL BE SEEKING WIDESPREAD AGENCY AND PUBLIC INVOLVEMENT IN DETERMINING WHAT CHANGES TO OUR REGULATIONS, GUIDELINES AND TESTING METHODS WILL BEST ASSURE THAT THE PROPER SAFEGUARDS ARE APPLIED.

RESPONSE TO COMMITTEE'S FORMAL QUESTIONS

CONGRESSMAN D'AMOURS RAISED FIVE QUESTIONS THAT HE WANTED THE AGENCY TO RESPOND TO. THE QUESTIONS FOCUSED ON RESEARCH ACTIVITIES, THE WILDLIFE FEDERATION SUIT, COORDINATION EFFORTS AND ALTERNATIVE FUNDING MECHANISMS.

IN THE COURSE OF MY TESTIMONY, I HAVE GENERALLY ADDRESSED OUR RESEARCH ACTIVITIES. THE FOLLOWING IS A MORE DETAILED ANSWER TO QUESTION 1 DESCRIBING OUR RESEARCH ACTIVITIES AND FUNDING LEVELS.

QUESTION 1 ON EPA'S FY 80-82 MANAGEMENT AND RESEARCH ACTIVITIES PERTAINING TO OCEAN DUMPING AND DISPOSAL, MARINE WATER QUALITY, BIOMONITORING AND OTHER OCEAN POLLUTION PROGRAMS AND EXPECTED ACTIVITIES IN FY 83.

OCEAN DUMPING RESEARCH

THE OBJECTIVE OF THIS RESEARCH IS TO DEVELOP HAZARD ASSESSMENT PROTOCOLS FOR THE OCEAN DUMPING OF WASTES. MAJOR COMPONENTS OF THIS EFFORT INCLUDE WASTE CHARACTERIZATION, EXPOSURE ASSESSMENT AND EFFECTS ASSESSMENT. THIS EFFORT IS JUST STARTING IN FY-82.

A. WASTE CHARACTERIZATION

THE FIRST STEP IN A HAZARD ASSESSMENT SCHEME FOR OCEAN DUMPING IS THE DEVELOPMENT OF PROTOCOLS FOR WASTE CHARACTERIZATION. THIS CHARACTERIZATION WILL UTILIZE PHYSICAL, BIOLOGICAL AND CHEMICAL SCREENING PROCEDURES. EMPHASIS WILL BE GIVEN TO THE DEVELOPMENT/ REVISION OF SHORT-TERM BIOLOGICAL SCREENING PROCEDURES. THIS RESEARCH WILL BUILD ON EXISTING PROTOCOLS CURRENTLY BEING USED IN THE OCEAN

DUMPING PERMIT PROGRAM. ADDITIONAL DATA COLLECTED UNDER THE RCRA PROGRAM, THE NPDES PERMIT APPLICATION PROCESS, AND THE POTW PRETREATMENT REMOVAL PROGRAM, AS WELL AS OTHER SOURCES, WILL ALSO BE USED. CHEMICAL SCREENING RESEARCH WILL EVALUATE HIGH PRESSURE LIQUID CHROMATOGRAPHY AS A RAPID SCREENING PROCEDURE FOR COMPLEX WASTES. IF THIS PROCEDURE PROVES TO BE USEFUL ON A ROUTINE BASIS, THE AMOUNT OF THE MORE EXPENSIVE BIOLOGICAL SCREENING NOW REQUIRED COULD BE GREATLY REDUCED.

B. EXPOSURE ASSESSMENT

THE EXPOSURE ASSESSMENT PORTION OF A HAZARD ASSESSMENT PROTOCOL PREDICTS THE ENVIRONMENTAL DISTRIBUTION AND FATE OF POLLUTANTS. IT IS NECESSARY TO DETERMINE NOT ONLY WHERE A POLLUTANT MAY GO IN THE ENVIRONMENT (I.E., SEDIMENT, WATER, OR ORGANISMS) BUT ALSO TO DETERMINE AT WHAT LEVELS IT CAN BE FOUND. THIS INFORMATION IS NECESSARY IF REALISTIC DOSING LEVELS, AND MODES OF EXPOSURE ARE TO BE USED IN EFFECTS STUDIES. EMPHASIS WILL BE ON THE DEVELOPMENT OF EXPOSURE MODELS WHICH WILL PREDICT THE LEVEL OF THE POLLUTANTS IN THE ENVIRONMENT RESULTING FROM AN OCEAN DUMPING ACTION AND ON THE PARTITIONING (DISTRIBUTION) OF POLLUTANTS BETWEEN THE DISSOLVED PHASE AND THE PARTICULATE PHASE.

C. EFFECTS ASSESSMENT

THE EFFECTS ASSESSMENT PORTION OF A HAZARD ASSESSMENT PROCEDURE WILL DEFINE THE LIMITS OF POSSIBLE ECOLOGICAL IMPACTS OF OCEAN DUMPING. TO MAKE AN ACCURATE HAZARD ASSESSMENT FOR SPECIFIC OCEAN DUMPING

PRACTICES AND PARTICULAR WASTES IT IS NECESSARY TO DETERMINE THE BIOLOGICAL RESOURCES. EMPHASIS WILL BE ON DETERMINING THE EFFECTS OF VARIOUS EXPOSURE PATTERNS IN THE WATER COLUMN AND ON DETERMINING THE CHRONIC EFFECTS AND PERSISTENCE OF POLLUTANTS ON BENTHIC/EPIBENTHIC SPECIES NEAR OCEAN DUMPING SITES.

DRILLING FLUIDS RESEARCH

DUE TO INCREASED OUTER CONTINENTAL SHELF (OCS) OIL AND GAS EXPLORATION AND DEVELOPMENT ACTIVITIES, MORE INFORMATION IS NEEDED ON THE CONSEQUENCES OF THESE ACTIVITIES IN THE MARINE ENVIRONMENT. EPA IS RESPONSIBLE FOR ISSUING PERMITS FOR THE DISCHARGE OF DRILLING FLUIDS INTO MARINE WATERS ON THE OCS UNDER THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM. THIS RESEARCH PROGRAM IS DESIGNED TO PROVIDE A TECHNICAL DATA BASE TO ASSIST THE AGENCY IN PROCESSING THESE PERMITS. THE RESEARCH EFFORT OF THE PAST FOUR YEARS HAS FOCUSED ON DERIVING INFORMATION ON THE TOXIC AND SUBLETHAL EFFECTS OF DRILLING FLUIDS ON MARINE BIOTA. IN RECENT YEARS, EMPHASIS HAS BEEN PLACED ON THE EXPOSURE ASSESSMENT OF DRILLING FLUIDS UNDER AMBIENT CONDITIONS. THE MAJOR OBJECTIVES OF THE PROGRAM ARE (1) TO PROVIDE A STATE-OF-THE-ART ASSESSMENT OF THE HAZARDS OF DRILLING FLUIDS DISPOSAL IN THE MARINE ENVIRONMENT, INCLUDING PROTOCOLS FOR MEASURING POTENTIAL IMPACT, AND (2) PROVIDE RESULTS OF BIOASSAY SCREENING FOR A WIDE RANGE OF DRILLING FLUID TYPES UTILIZING SEVERAL INDIGENOUS GROUPS OF MARINE ORGANISMS.

THIS PROGRAM WAS ORIGINALLY SCHEDULED FOR COMPLETION IN FY 83. HOWEVER, DUE TO BUDGETARY RESTRICTIONS IT WILL CLOSE OUT IN FY 82. THE FINAL YEAR OF THE PROGRAM WILL FOCUS ON SYNTHESIS OF INFORMATION, DEVELOPMENT OF A TRANSPORT MODEL, AND TOXICITY TESTING OF AN ARRAY OF

30-40 DRILLING MUD TYPES. THE INFORMATION FROM THIS PROGRAM HAS AND WILL HAVE CONSIDERABLE APPLICATION IN EPA'S REGULATORY PROGRAM.

OCEAN DISCHARGE (OUTFALL) RESEARCH

EMPHASIS WILL BE ON THE DEVELOPMENT OF TECHNIQUES FOR ASSESSING THE ECOLOGICAL IMPACTS OF DISCHARGES FROM OCEAN OUTFALLS AND ON CONDUCTING STUDIES WHICH SUPPORT MANDATORY MONITORING PROGRAMS FOR 301(H) PERMIT MODIFICATIONS. THE RESEARCH ACTIVITIES ON OCEAN DISPOSAL HAVE BEEN ORGANIZED INTO THE PROCEDURES FOR EVALUATING SEDIMENTS NEAR OCEAN OUTFALLS, AND MIXING ZONE DEFINITION.

A. PERSISTENCE AND FATE OF POLLUTANTS IN MARINE FOOD WEBS

THE OBJECTIVE OF THIS RESEARCH IS TO DETERMINE IF TOXIC POLLUTANTS FROM OCEAN OUTFALLS ARE A PROBLEM TO MAN. THIS RESEARCH WILL ANALYZE THE POTENTIAL FOR HUMAN EXPOSURE FROM FISHERIES SPECIES CONTAMINATED BY POLLUTANTS RELEASED FROM OCEAN OUTFALLS. DIRECT UPTAKE WILL BE COMPARED WITH FOOD CHAIN ACCUMULATION TO DETERMINE THE MOST IMPORTANT ENTRY ROUTE. RELATIONSHIPS BETWEEN INPUT ROUTES, SEDIMENT ACCUMULATION, ENVIRONMENTAL DEGRADATION PROCESSES, AND FOOD CHAIN UPTAKE WILL BE EXAMINED. IT IS EXPECTED THAT THIS RESEARCH WILL LEAD TO BETTER DEFINITION OF EFFLUENT RESTRICTIONS.

B. PROCEDURES FOR EVALUATING SEDIMENTS NEAR OCEAN OUTFALLS

THE OBJECTIVE OF THIS RESEARCH IS TO DEVELOP PROCEDURES TO EVALUATE THE LOCATION, SIZE AND IMPACT OF CONTAMINATED SEDIMENTS NEAR OCEAN OUTFALLS AND OCEAN DUMPING SITES. THESE PROCEDURES MAY BE USED

IN THE 301(h), 403(c), 404 AND OCEAN DUMPING PROGRAMS. THESE PROCEDURES COULD ALSO BE USED IN MONITORING PROGRAMS. EMPHASIS WILL BE ON: THE DEVELOPMENT OF RAPID, COST-EFFECTIVE SURVEY METHODS FOR DETERMINING BENTHIC ECOSYSTEM CONDITIONS NEAR MUNICIPAL OUTFALLS; EVALUATING THE INFAUNAL INDEX AS A MEASURE OF BIOLOGICAL RESPONSE TO SEDIMENT POLLUTION; AND DEVELOPMENT OF A BENTHIC MICROCOSM FOR USE IN EVALUATING THE IMPACT OF CONTAMINATED SEDIMENTS.

C. MIXING ZONE DEFINITION: NON-BOUYANT PLUMES

THE OBJECTIVE OF THIS RESEARCH IS TO DEVELOP/REVISE MIXING-ZONE CALCULATION METHODS FOR INDUSTRIAL DISCHARGES. EMPHASIS WILL BE GIVEN TO THOSE DISCHARGES CONTAINING FLUIDS, EMULSIONS, AND SUSPENSIONS HEAVIER THAN MARINE WATER, OR THOSE WHICH IN GENERAL BEHAVE DIFFERENTLY THAN THE MUNICIPAL WASTES FOR WHICH MATHEMATICAL MODELS AND LIMITED VERIFICATION DATA ARE AVAILABLE. LABORATORY AND FIELD VERIFICATION WILL BE CONDUCTED TO SUBSTANTIATE THE LEVEL OF CONFIDENCE IN PREDICTING WATER QUALITY CHARACTERISTICS FOR POLLUTANTS REGULATED BY NUMERICAL CRITERIA. THIS RESEARCH IS EXPECTED TO BE COMPLETED IN FY 82. COMPLETION OF THIS RESEARCH WILL MOST LIKELY RESULT IN A REVISION OF THE MIXING ZONE DEFINITION UNDER 403(c), AND MAY AFFECT THE REQUIREMENTS OF THE 404 AND OCEAN DUMPING PROGRAMS.

CONTAMINATED SEDIMENT RESEARCH

DREDGED MATERIAL WILL PROVIDE INFORMATION AND METHODOLOGIES TO BE USED IN THE ESTABLISHMENT, AND REVISION, OF CRITERIA AND STANDARDS FOR BOTH THE SECTION 404 PERMIT PROGRAM UNDER THE CLEAN WATER ACT AND THE OCEAN DUMPING PERMIT PROGRAM UNDER THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT. THIS RESEARCH WILL BE COORDINATED WITH THE CORPS OF

ENGINEERS THROUGH A JOINT COMMITTEE TO PREVENT DUPLICATION OF EFFORT. EMPHASIS WILL BE ON THE DEVELOPMENT OF TECHNIQUES FOR ASSESSING ECOLOGICAL IMPACTS OF DREDGED MATERIAL DISPOSAL, STUDIES OF THE TRANSPORT AND FATE OF SEDIMENT CONTAMINANTS COMMON TO DREDGED MATERIAL AND AN EXAMINATION OF THE SEDIMENT QUALITY CRITERIA CONCEPT.

A. TECHNIQUES FOR ASSESSING ECOLOGICAL IMPACTS OF DREDGED MATERIAL DISPOSAL

THE OBJECTIVE OF THIS RESEARCH IS TO DEVELOP AND VALIDATE BENTHIC BIOASSAY PROCEDURES FOR USE IN THE 404 AND OCEAN DUMPING PERMIT PROGRAMS. THESE PROCEDURES WILL BE USED TO MEASURE ACUTE AND CHRONIC EFFECTS AND BIOACCUMULATION. EMPHASIS WILL BE GIVEN TO SIMPLIFICATION OF BENTHIC BIOASSAYS CURRENTLY IN USE.

B. TRANSPORT AND FATE OF SEDIMENT CONTAMINANTS COMMON TO DREDGED MATERIAL

THE OBJECTIVE OF THIS RESEARCH IS TO DETERMINE IF TOXIC POLLUTANTS FROM CONTAMINATED SEDIMENTS ARE A PROBLEM TO MAN. THIS RESEARCH WILL FOCUS ON PCB'S TO DETERMINE THE RATE OF UPTAKE OF PCB'S FROM CONTAMINATED BOTTOM SEDIMENT BY ESTUARINE ORGANISMS; THE TRANSFER OF PCB'S FROM INFAUNAL TO PREDATOR SPECIES; AND THE FACTORS WHICH INFLUENCE THE MOVEMENT OF THIS CHEMICAL FROM BOTTOM SEDIMENTS TO ESTUARINE FOOD CHAINS OF HUMAN HEALTH IMPORTANCE. THIS RESEARCH WILL PROVIDE INFORMATION ON ECOLOGICAL RELATIONSHIPS ASSOCIATED WITH PCB CONTAMINATION IN ORDER TO IMPROVE THE BASIS FOR REGULATORY DECISIONS CONCERNING DREDGED MATERIAL DISPOSAL.

C. SEDIMENT QUALITY CRITERIA

ALTHOUGH POLLUTANTS ARE KNOWN TO ACCUMULATE IN HIGH CONCENTRATIONS IN ESTUARINE AND COASTAL SEDIMENTS, RELATIVELY LITTLE IS KNOWN ABOUT THE ECOLOGICAL CONSEQUENCES OF SEDIMENT CONTAMINATION. THE MAJOR GOAL OF THIS PROJECT IS THE DEVELOPMENT OF SEDIMENT QUALITY CRITERIA, I.E., ESTIMATES OF "SAFE" SEDIMENT CONCENTRATIONS OF COMPLEX WASTES AND SPECIFIC POLLUTANTS. QUESTIONS RELATED TO SEDIMENT QUALITY IMPACT A NUMBER OF EPA PROGRAMS (404, 403(c), 301(h), OCEAN DUMPING) THROUGH REGULATORY ACTIONS NECESSARY FOR THE PROTECTION OF BENTHIC ECOSYSTEMS. IT MAY BE DIFFICULT TO GENERATE UNIVERSALLY APPLICABLE SEDIMENT CRITERIA BECAUSE OF THE INFLUENCE ON TOXICITY OF SUBSTRATE PARTICLE SIZE DISTRIBUTION AND ORGANIC CONTENT. THEREFORE, CRITERIA MAY HAVE TO BE DEVELOPED FOR DIFFERENT SEDIMENT CLASSES, E.G., MEDIUM SAND, SILT-CLAY, ETC.

EXPLORATORY RESEARCH

THE OBJECTIVE OF THIS EFFORT IS TO CONDUCT LONG-TERM RESEARCH TO BROADEN OUR KNOWLEDGE CONCERNING MARINE ENVIRONMENTAL POLLUTION. MAJOR COMPONENTS OF THIS EFFORT ARE BIOMONITORING STUDIES, THE MARINE SCIENCES RESEARCH CENTER AND THE MINI-ASSESSMENT AND LONG-TERM GRANTS PROGRAM.

A. BIOMONITORING STUDIES

THE BIOMONITORING STUDIES ARE FOCUSED IN THE MUSSEL WATCH PROGRAM, THE COASTAL ENVIRONMENTAL ASSESSMENT STUDIES (CEAS), AND CARCINOGENIC BIOASSAY-BIOMONITORING. MUSSEL WATCH AND CEAS UTILIZE NATURALLY OCCURRING AND "CAGED" BIVALVE MOLLUSKS AS BIOLOGICAL MONITORS. THESE SYSTEMS CAN BE USED TO IDENTIFY PROBLEM AREAS, ESTABLISH BASELINE POLLUTANT LEVELS AND ASSESS THE RELATIVE HEALTH OF A SELECTED AREA. AMONG THE POLLUTANTS STUDIED ARE HEAVY METALS, RADIONUCLIDES AND HYDROCARBONS.

THE OBJECTIVE OF THE CARCINOGENIC BIOASSAY-BIOMONITORING STUDIES IS TO DETERMINE THE FATE AND EFFECTS OF CARCINOGENS IN NATURAL COASTAL WATER AND NATURAL POPULATIONS OF FISH AND SHELLFISH. TUMOR AND LESION TYPES COMMONLY FOUND IN FISH AND SHELLFISH WILL BE IDENTIFIED AND CORRELATED TO THE PRESENCE OF CARCINOGENS.

B. MARINE SCIENCES RESEARCH CENTER

A CENTER OF EXCELLENCE FOCUSES ON LONG-TERM RESEARCH WHICH PROVIDES THE LINK BETWEEN BASIS AND APPLIED RESEARCH AS RELATED TO EPA'S MISSION. A MARINE SCIENCES RESEARCH CENTER HAS BEEN ESTABLISHED AT THE UNIVERSITY OF RHODE ISLAND, AND IS DIRECTED TOWARDS INCREASING OUR ABILITY TO UNDERSTAND AND MANAGE COASTAL MARINE ECOSYSTEMS. THE RESEARCH FOCUSES ON THE DEVELOPMENT OF A LARGE MICROCOSM SYSTEM, THE MARINE ECOSYSTEMS RESEARCH LABORATORY (MERL) AND THE STUDY OF POLLUTANT DYNAMICS IN THIS SYSTEM. PHYSICAL, CHEMICAL AND BIOLOGICAL BEHAVIOR OF

SELECTED POLLUTANTS HAVE BEEN STUDIED. STUDIES OF NUTRIENTS, FUEL OIL, POLLUTED SEDIMENT AND ORGANIC COMPOUNDS HAVE BEEN CONDUCTED.

C. MINI-ASSESSMENT AND LONG-TERM GRANTS PROGRAM

MINI-ASSESSMENTS ARE SHORT-TERM STUDIES OF SELECTED ENVIRONMENTAL PROBLEMS TO DETERMINE THE POTENTIAL SCOPE OF THE PROBLEM AND IDENTIFY RESEARCH WHICH NEEDS TO BE CONDUCTED. THIS INFORMATION IS USED BY THE RESEARCH COMMITTEES IN THE PROGRAM PLANNING PROCESS. CURRENTLY A MINI-ASSESSMENT OF OCEAN DUMPING IS BEING CONDUCTED.

A GRANTS PROGRAM PROVIDING FOR STRONG PEER REVIEW HAS BEEN ESTABLISHED. EACH YEAR SOME GRANTS RELATED TO MARINE ACTIVITIES ARE AWARDED. THE NUMBER VARY FROM YEAR TO YEAR.

IT SHOULD BE NOTED THAT THERE ARE SOME RESEARCH ACTIVITIES NOT REFLECTED HERE WHICH HAVE A MARINE COMPONENT, E-G., WATER QUALITY CRITERIA AND STANDARDS, OIL SPILL PREVENTION AND CLEAN-UP, PESTICIDES AND TOXIC SUBSTANCES EXPOSURE AND EFFECTS ASSESSMENTS. THE CHESAPEAKE BAY PROGRAM AND THE GREAT LAKES PROGRAM ARE ALSO NOT INCLUDED, AS THEY ARE BEING PHASED OUT IN FY 82. RESEARCH ON MARINE WETLANDS WAS COMPLETED IN FY 81.

EPA'S MARINE RESOURCES

| PROGRAM | DESCRIPTION | RESPONSIBLE OFFICE | LOCATION IN BUDGET NARRATIVE | FY 81 (\$000) (actual) | FY 82 (\$000) (current) | FY 83 (\$000) (request) |
|---------------------------|---|------------------------------------|--|------------------------|-------------------------|-------------------------|
| Ocean Disposal | Ocean dumping program, including issuance of permits, designation of disposal sites and EIS's | Office of Water | Water Quality Strategies Implementation | 1613.5 | 3106.7 | 3566.6 |
| - Ocean dumping discharge | Technical support for offshore permitting decisions. | | - Ocean Disposal Permits pg. WQ84-86 | | | |
| | Offshore Oil and Gas Permit issuance. | Office of Water | Permit Issuance pg. WQ 118-121 | 250.0 | 300.0 | 75.0 |
| | Development of hazard assessment techniques, i.e. waste characterization, fate and effect assessment. | Office of Research and Development | Water Quality Non Energy - Environmental process and effects pg. WQ24-26 | -0- | 635.0 | 625.0 |
| | Determination of the fate and effects of drilling muds and oil in the marine environment. (e.g. Georges Bank, Flower Garden). | | Water Quality Energy pg. E34-56 | 5858.0 | 1031.0 | -0- |

| PROGRAM | DESCRIPTION | RESPONSIBLE OFFICE | LOCATION IN BUDGET NARRATIVE | FY 81 (\$000) (actual) | FY 82 (\$000) (current) | FY 83 (\$000) (request) |
|--------------------|--|------------------------------------|--|------------------------|-------------------------|-------------------------|
| <u>301(h)</u> | Technical review of requests for waiver of secondary treatment requirement for municipal source discharges into marine waters. | Office of Water | Municipal Source Control pg. WQ101-104 | 1090.0 | 1630.0 | 1565.0 |
| | NPDES permit issuance | Office of Water | Permits Issuance pg. WQ118-121 | | | |
| | Development of techniques for evaluating ecological impacts from ocean outfalls (supports 301(h) and 403(c)). | Office of Research and Development | Water Quality Non Energy - Environmental Processes and Effects. pg. WQ 24-26 | 1000.0 | 900.0 | 900.0 |
| <u>404 Program</u> | *To be provided | Office of Federal Activities | Water Quality Strategies Implementation Dredge/fill pg. WQ 82-83 | | To Be Provided | |
| | Definition of Wetland Boundaries | Office of Research and Development | Water Quality Non Energy - Environmental Process and Effects pg. WQ 24-26 | 200.0 | -0- | -0- |

| PROGRAM | DESCRIPTION | RESPONSIBLE OFFICE | LOCATION IN BUDGET NARRATIVE | FY 81 (\$000) (actual) | FY 82 (\$000) (current) | FY 83 (\$000) (request) |
|----------------------|--|------------------------------------|--|------------------------|-------------------------|-------------------------|
| 404 (cont) | Revision of sediment testing procedures for evaluating dredge materials for disposal. | Office of Research and Development | Water Quality Non-Energy Environmental Processes and Effects pg. WQ 24-26 | 255.0 | 375.0 | 219.0 |
| Exploratory Research | Mussel Watch, the Coastal Environmental Assessment Section Programs and Biomonitoring Programs | Office of Research and Development | Intermedia Non-Energy pg. I 11-15 | 739.0 | 729.0 | -0- |
| | Marine Center of Excellence | | (Management pg. I 11-15 Resources from Water Quality Non-Energy) | 360.0 | 420.0 | 420.0 |
| | Mini-Assessments of Environmental Problems and Longterm Grants in the Marine Area | | (Management pg. I 11-15 Resources from Water Quality Non-Energy) | 514.0 | 140.0 | ** |

* Dredge/fill program information is not included but will be provided in the near future.

** Depends on grant proposals received.

N.B. There are some program activities not reflected here which have a marine component and associated research activities, e.g. water quality criteria and standards, emergency spill prevention and control, pesticides and toxics exposure and effects assessments. The Great Lakes Program and Chesapeake Bay Study are also not included.

TOTALS

\$11,879.5 9,266.7 7,370.6

QUESTION 2 WAS CONCERNED WITH PROGRESS IN DESIGNATING DUMPSITES AS SPECIFIED IN FEDERAL REGISTER NOTICES, THE NATIONAL WILDLIFE FEDERATION V. EPA COURT SETTLEMENT AGREEMENT, AND TESTIMONY PERTAINING TO THE AGENCY'S REQUEST FOR AN INCREASE IN FY 82 AUTHORIZATION LEVELS.

EPA HAS BEEN DEVOTING A SIGNIFICANT AMOUNT OF RESOURCES TO THE DESIGNATION PROCESS FOR THE SITES REFERRED TO. AS YOU KNOW, IN JULY 1977, THE AGENCY OBTAINED A CONTRACTOR TO INVENTORY AND GATHER INFORMATION ON EXISTING INTERIM OCEAN DISPOSAL SITES. THE EFFORT INCLUDED FIELD SURVEYS WHERE HISTORICAL DATA WERE NOT SUFFICIENT TO EVALUATE SITES. THE CORPS OF ENGINEERS JOINED THIS EFFORT IN 1979 AND SINCE THAT TIME THE CONTRACT HAS BEEN JOINTLY FUNDED BY THE EPA AND THE CORPS. THIS COMPILATION OF INFORMATION AND THE CONDUCT OF NECESSARY SURVEYS HAVE BEEN COMPLETED FOR 32 OCEAN DUMPING AREAS, TO BE EVALUATED IN 29 ENVIRONMENTAL IMPACT STATEMENTS (EIS'S), AT A COST OF ABOUT 17 MILLION DOLLARS. THE CONTRACT WILL BE TERMINATED IN JULY 1982. OF THESE 29 EIS'S, 22 ARE BEING PREPARED UNDER THE COURT SETTLEMENT WITH THE NATIONAL WILDLIFE FEDERATION. SIX ADDITIONAL DREDGED MATERIAL DISPOSAL SITE DESIGNATION EIS'S WILL BE ISSUED UNDER AN AGREEMENT BETWEEN THE EPA AND THE CORPS. ONE ADDITIONAL NON-DREDGED MATERIAL DISPOSAL SITE DESIGNATION EIS HAS BEEN ISSUED. TWO OF THE DRAFT DREDGED MATERIAL EIS'S ARE CURRENTLY UNDERGOING PUBLIC REVIEW.

TO DATE, 5 FINAL DREDGED MATERIAL SITES, ALL IN HAWAII, AND 2 FINAL NON-DREDGED MATERIAL SITES, THE NEW YORK ACID WASTES SITE AND THE SAN NICOLAS BASIN DRILLING MUDS SITE IN THE PACIFIC, HAVE BEEN DESIGNATED. A FEDERAL REGISTER NOTICE PROPOSING FINAL DESIGNATION OF THE 106 MILE SITE AND SOLICITING COMMENTS ON REDESIGNATION OF THE 12 AND 60 MILE SITES IN THE NEW YORK BIGHT IS CURRENTLY IN FINAL STAGES OF AGENCY REVIEW.

A FULL SCHEDULE FOR PREPARATION OF THE 29 EIS'S IS ATTACHED. THIS SCHEDULE DOES PROVIDE FOR SOME SIGNIFICANT DELAYS FROM THE AMENDED SCHEDULE UNDER THE NWF SETTLEMENT AGREEMENT, AS PUBLISHED IN THE FEDERAL REGISTER DECEMBER 9, 1980. HOWEVER, THOSE DELAYS WERE LARGELY ATTRIBUTABLE TO LATE SUBMISSIONS BY THE CONTRACTOR COMPILING INFORMATION AND CONDUCTING STUDIES ON THE SITE. SINCE THOSE SURVEYS ARE NOW ALMOST ENTIRELY COMPLETED, WE BELIEVE THAT WE WILL BE ABLE TO FOLLOW THIS NEW SCHEDULE VERY CLOSELY.

PROJECTED OCEAN DUMPING EIS SCHEDULE (as of 2/19/82)

| Site | Draft | Final |
|------------------------------------|-----------|-----------|
| **New York 106 Mile | 6/25/79* | 2/27/80* |
| **New York Acid | 11/27/79* | 12/01/80* |
| **Hawaii | 10/20/79* | 9/30/80* |
| North Atlantic Incineration | 12/29/80* | 12/18/81* |
| **Vieques, Puerto Rico | 6/19/81* | 12/18/81* |
| **San Francisco Channel Bar | 2/26/82* | 7/82 |
| **New York Mud Dump | 2/19/82* | 7/82 |
| **New York Cellar Dirt | 3/82 | 8/82 |
| **Jacksonville, Fla. | 4/82 | 9/82 |
| **San Juan, Puerto Rico | 5/82 | 10/82 |
| **Galveston, Texas | 6/82 | 11/82 |
| **Columbia River | 7/82 | 12/82 |
| **Portland, Maine | 8/82 | 1/83 |
| **Tampa, Fla. | 8/82 | 1/83 |
| **Sabine-Neches, Texas & Louisiana | 9/82 | 2/83 |
| **Wilmington-Charleston-Savannah | 10/82 | 3/83 |
| **Pensacola-Mobile-Gulfport | 11/82 | 4/83 |
| **New Jersey-Long Island Inlets | 12/82 | 5/83 |
| **Long Beach | 1/83 | 6/83 |
| **Coos Bay | 2/83 | 7/83 |
| **Humboldt Bay | 3/83 | 8/83 |
| **San Diego | 4/83 | 9/83 |
| **San Francisco 100 Fathom | 5/83 | 10/83 |
| Calcasieu Bar | 6/83 | 12/83 |
| Atchafalaya | 7/83 | 1/84 |
| Houma | 8/83 | 2/84 |
| Barataria Bay | 9/83 | 3/84 |
| S.W. Pass Mississippi River | 10/83 | 4/84 |
| Mississippi River Gulf Outlet | 11/83 | 5/84 |

* Actual date

** Being prepared pursuant to settlement agreement in NWF v. Costle

QUESTION 3 ADDRESSED THE COORDINATION OF OCEAN DISPOSAL
MANAGEMENT AND RESEARCH PROGRAMS IN EPA.

THE PLANNING SYSTEM OF THE OFFICE OF RESEARCH AND DEVELOPMENT, INCLUDES SEVERAL RESEARCH COMMITTEES WITH THE MAJOR FUNCTION OF PLANNING AND COORDINATING PLANS. THE WATER QUALITY RESEARCH COMMITTEE FUNCTIONS AS THE PRINCIPAL MECHANISM FOR THE DISCUSSION OF RESEARCH NEEDS AND RESOURCES BETWEEN THE USER GROUPS (OFFICE OF WATER) AND THE PRODUCERS (OFFICE OF RESEARCH AND DEVELOPMENT) IN THE AREA OF OCEAN DISPOSAL.

ON A MORE TECHNICAL LEVEL, INTRA- AND INTER-AGENCY COORDINATION IS OFTEN ASSIGNED TO AN EPA LABORATORY FOR MAJOR PROGRAMS. TO CITE A FEW EXAMPLES, THE NARRAGANSETT LABORATORY HAS RESPONSIBILITY FOR THE DEVELOPMENT AND COORDINATION OF OCEAN DUMPING RESEARCH, BOTH WITHIN THE AGENCY, WITH OTHER AGENCIES, NOTABLY NOAA AND THE CORPS OF ENGINEERS, AND WITH THE PUBLIC AND PRIVATE SECTORS.

FOR RESEARCH AND TECHNICAL ASSISTANCE PERTAINING TO OCEAN OUTFALLS (301(H) WAIVERS), THE CORVALLIS LABORATORY HAS THE MAJOR RESPONSIBILITY FOR DIRECTING AND COORDINATING RESEARCH. MUCH OF THE INITIAL EFFORT WAS CLOSELY COORDINATED WITH SEVERAL NOAA REGIONS AND HEADQUARTERS.

OUR GULF BREEZE LABORATORY FOR THE PAST FIVE YEARS HAS BEEN THE CENTER OF OUR RESEARCH ON THE FATES AND EFFECTS OF DRILLING MUDS DISPOSAL. THIS PROGRAM REQUIRED SUBSTANTIAL COORDINATION NOT ONLY WITH THE ELEMENTS IN EPA DEVELOPING REGULATIONS AND PERMITS, BUT ALSO WITH OTHER AGENCIES (BLM AND NOAA) AND THE PETROLEUM INDUSTRY. TO FACILITATE COORDINATION AT EPA HEADQUARTERS ON ALL OCS MATTERS, AN OCS COORDINATING COMMITTEE HAS BEEN OPERATING FOR THE PAST FIVE YEARS.

QUESTION 4 RAISED THE ISSUE OF THE ABILITY OF FEDERAL RESEARCH PROGRAMS TO PRODUCE TIMELY SCIENTIFIC ANSWERS THAT ARE NEEDED FOR MANAGEMENT DECISIONS.

IT IS TRUE THAT, IN THE PAST, THE AGENCY HAS HAD SOME DIFFICULTIES COORDINATING MANAGEMENT DECISIONS WITH RESEARCH PLANS. THIS WAS DUE IN LARGE PART TO THE FACT THAT MANAGEMENT DECISIONS WERE BASED ON THE ASSUMPTION THAT WASTE DISPOSAL IN THE OCEAN WOULD BE DECREASING, SO THAT ONLY MINOR RESEARCH AND MONITORING WOULD BE NECESSARY. THIS ASSUMPTION IS NOW CHANGING, BASED ON NEW INFORMATION ON OCEAN PROCESSES, RECENTLY IDENTIFIED RISKS OF LAND-BASED WASTE DISPOSAL, AND THE DECISION IN THE NEW YORK CITY SUIT. THEREFORE, WE ARE IN THE PROCESS OF EVALUATING OUR OCEANS PROGRAMS, AND HAVE ALREADY BEGUN IMPLEMENTING CHANGES SO THAT MANAGEMENT DECISIONS AND RESEARCH PLANS ARE COMPLEMENTARY AND ENSURE THAT NO UNREASONABLE DEGRADATION OF THE MARINE ENVIRONMENT WILL OCCUR.

ONE WAY IN WHICH WE HOPE TO IMPROVE MANAGEMENT OF THE OCEANS PROGRAMS IS BY PLACING THEM ALL IN ONE ORGANIZATIONAL UNIT. THIS WILL ALLOW CONSISTENT AND EFFICIENT USE OF AVAILABLE INFORMATION AND PLANNING OF FUTURE RESEARCH PROGRAMS. ANOTHER WAY IS BY INCREASING OUR RESEARCH AND DEVELOPMENT PROGRAM TO SUPPORT THE REGULATORY DECISIONS WHICH MUST BE MADE REGARDING DISCHARGES INTO THE MARINE ENVIRONMENT. A FULL DESCRIPTION OF THESE RESEARCH PROGRAMS IS CONTAINED IN ANOTHER RESPONSE ATTACHED TO THIS TESTIMONY.

INCREASED COORDINATION WITH OTHER AGENCIES WILL EXPAND OUR RESEARCH CAPABILITIES AND IMPROVE OUR REGULATORY DECISIONS. FEDERAL RESEARCH PROGRAMS ANALYZING THE MARINE ENVIRONMENT, HAVE BEEN IN EFFECT AT THE CORPS OF ENGINEERS AND NOAA. EPA'S PROGRAM MANAGEMENT HAS, FOR THE PAST YEAR, BEEN USING THIS INFORMATION TO REVISE THE

OCEANS PROGRAMS AND TO DETERMINE WHAT MANAGEMENT'S INFORMATION NEEDS REALLY ARE. THIS ASSESSMENT OF EXISTING INFORMATION RESULTED IN THE DEVELOPMENT OF A MEMORANDUM OF AGREEMENT BETWEEN EPA'S PROGRAM OFFICE AND THE NARRAGANSETT LABORATORY. THIS MOA PROVIDES FOR COOPERATIVE EFFORTS ON A PROGRAM OF RESEARCH TO IDENTIFY THE HEALTH OF THE MARINE ENVIRONMENT, CHANGES TO THE MARINE ENVIRONMENT AT TEST SITES WHERE WASTES ARE DISPOSED AND AT CONTROL SITES, AND TO VERIFY LABORATORY TESTS ACCORDING TO THE RESULTS OF THE FIELD SURVEYS. OUR NARRAGANSETT LABORATORY IS ALSO WORKING CLOSELY WITH THE NATIONAL MARINE FISHERIES SERVICES (NMFS). THIS COOPERATIVE EFFORT HAS ALREADY BEGUN IN THE NORTHEAST ATLANTIC COAST INCLUDING THE NEW YORK BIGHT AREA, AND IS PROGRESSING ACCORDING TO SCHEDULE. NMFS HAS ALREADY ISSUED A VALUABLE REPORT ON THE HEALTH OF THE MARINE ENVIRONMENT OF THE N.E. ATLANTIC CONTINENTAL SHELF. AS THESE STUDIES CONTINUE, MORE INFORMATION WILL BE PROVIDED TO MEET MANAGEMENT'S NEEDS.

THUS, FEDERAL RESEARCH PROGRAMS ARE ALREADY PRODUCING TIMELY SCIENTIFIC INFORMATION NECESSARY FOR GOOD MANAGEMENT OF THE OCEAN PROGRAMS. AS WE CONTINUE TO IMPROVE OUR PROGRAMS AND WORK MORE CLOSELY WITH THE RESEARCH ARMS OF THE GOVERNMENT, WE WILL BE ABLE TO DIRECT RESEARCH PROGRAMS ALONG MANAGEMENT'S INFORMATION NEEDS. THE FIRST STEP, APPLYING THE EXISTING RESEARCH ALREADY DONE TO REGULATORY PROGRAMS, HAS BEEN TAKEN. FUTURE STEPS WILL INCLUDE IMPROVING REGULATORY PROCEDURES AND MONITORING TO ENSURE THAT THE PROPER MANAGEMENT DECISIONS ARE BEING MADE.

IT SHOULD BE NOTED HERE THAT MUCH OF THE FEDERAL RESEARCH PROGRAM IS CARRIED OUT OR REVIEWED BY INDEPENDENT SCIENTISTS FROM INSTITUTIONS SUCH AS THE SCRIPPS INSTITUTE OF OCEANOGRAPHY, THE WOODS HOLE OCEANOGRAPHIC INSTITUTION, AND CAL TECH. WE BELIEVE THAT BY RELYING ON SUCH A WIDE BASE OF SCIENTIFIC OPINION, WE CAN ENSURE THAT THE PROPER SCIENTIFIC BASIS IS DEVELOPED AND USED FOR OUR DECISION MAKING.

PART OF QUESTION 4 AND QUESTION 5 ADDRESSED THE ABILITY OF EPA TO RESPOND TO A POTENTIAL INCREASE IN APPLICATIONS GIVEN THE CURRENT INCREASED INTEREST FOR OCEAN DUMPING AND POSSIBLE MECHANISMS TO RECAPTURE COSTS.

IT SHOULD BE CLEAR FROM TODAY'S DISCUSSION THAT ANY EXPANDED USE OF THE OCEAN FOR WASTE DISPOSAL WILL BE DONE PRUDENTLY BY THIS AGENCY. WHEREAS PAST OCEAN DISPOSAL OCCURRED AT HISTORICAL SITES, FUTURE EFFORTS WILL BE MADE TO FIND NEW SITES THAT ARE BEST SUITED FOR PARTICULAR WASTES. THE USE OF FIELD MONITORING WILL ALSO PLAY A SIGNIFICANT ROLE TO ASSURE THAT DISPOSAL PRACTICES ARE NOT CAUSING ENVIRONMENTAL PROBLEMS. WHILE IT IS DIFFICULT TO ESTIMATE THE POTENTIAL GROWTH OF OCEAN DUMPING IN THE NEAR FUTURE, THE AGENCY HAS EVALUATED USER FEE SYSTEM ALTERNATIVES TO HELP FINANCE THE EXPANDED PROGRAM OF SITE DESIGNATION, RESEARCH, AND MONITORING THAT MAY BE NEEDED FOR MUNICIPAL AND INDUSTRIAL DISPOSAL.

THE BEST ALTERNATIVE APPEARS TO BE A TWO PART FEE SYSTEM. ONE FEE WOULD RECOUP PERMIT PROCESSING COSTS. THE SECOND FEE WOULD RECOVER THE COSTS OF RESEARCH, SITE DESIGNATION, MAINTENANCE AND MONITORING. WE ARE CURRENTLY EXPLORING THE POSSIBILITY OF MAKING THE FEES PAYABLE DIRECTLY TO THE EPA'S ACCOUNT FOR ADMINISTRATION OF THE PROGRAM. ADOPTION OF SUCH A SYSTEM WOULD REQUIRE AMENDING THE STATUTE.

THE AGENCY WOULD CHARGE ALL PERMIT APPLICANTS A UNIFORM FEE COVERING THE COSTS OF PERMIT PROCESSING. THIS UNIFORM FEE WOULD REFLECT THE AVERAGE COST OF PROCESSING A PERMIT (\$8,000 IS THE CURRENT AVERAGE COST FOR PROCESSING A PERMIT). THIS SYSTEM WOULD ALSO ALLOW THE AGENCY TO WAIVE OR REDUCE THE FEE IF, FOR EXAMPLE, THE APPLICATION IS FOR RENEWAL OR DE MINIMIS DUMPING REQUIRING MINIMAL PROCESSING WORK.

A SEPARATE FEE SYSTEM WOULD RECOUP THE COSTS OF RESEARCH, SITE DESIGNATION, MONITORING, AND SITE MAINTENANCE FROM THOSE PERMITTEES WHO OCEAN DUMP. THE TOTAL YEARLY PROGRAM COSTS WOULD BE ALLOCATED AMONG THE PERMITTEES ON A PER TON BASIS. THE FEE MIGHT BE DETERMINED IN THE FOLLOWING WAY: THE AGENCY WOULD PROJECT COSTS FOR THE NEXT FISCAL YEAR. EXISTING PERMITS WOULD BE REVIEWED TO ESTIMATE TONNAGE FOR THE FOLLOWING YEAR. A STANDARD COST PER TON FEE WOULD BE ESTABLISHED TO RECOUP PROJECTED COSTS AND CHARGED TO ALL APPLICANTS DISCHARGING IN THE FOLLOWING YEAR. AT THE END OF THE YEAR, THE ACTUAL COSTS AND TONNAGE WOULD BE CALCULATED AND APPLICANTS WOULD BE EITHER REIMBURSED OR ASSESSED ADDITIONAL CHARGES DEPENDING ON ACCURACY OF PROJECTED COSTS AND TONS DUMPED DURING THE YEAR. USER FEES WOULD MAKE OCEAN DUMPING PERMITTEES INTERNALIZE THE ADMINISTRATIVE COSTS OF OCEAN DUMPING.

Mr. D'AMOURS. Thank you, Ms. Hurd. We are going to suspend now because of a series of six suspension votes scheduled on the floor of the House. This committee will recess and we will get to the questioning after we return. We will recess until 5 minutes past 11.

[Recess taken.]

Mr. D'AMOURS. The subcommittee hearing will resume. We thank you for staying with us, Ms. Hurd.

I have a few questions to start the questioning. You have advocated in your testimony a simple reauthorization of the law, but it is becoming pretty clear that existing law is open to a number of interpretations.

Don't you think that it would be helpful if Congress established some clarification of, for instance, how the weight of economic considerations ought to be taken into consideration in determining unreasonable degradation?

Do you think that is clear today, and do you think that your current system does that?

Ms. HURD. I believe so. In section 102(a) of the bill in the existing legislation, there are nine different factors to be considered in determining unreasonable degradation, and most of those deal with environmental factors.

As we are looking at managing this program, economics is not the major decision point. There is no question that it is a secondary factor in making decisions.

It may come into play more when we are looking at comparable different types of disposal options that have about the same type of environmental impact.

Mr. D'AMOURS. Well, how about weighing environmental considerations? How do you weigh the environmental considerations to

be taken into consideration on land dumping vis-a-vis ocean dumping? What is your standard?

Ms. HURD. Right at this point in time, we do not have a major policy or a set of regulations in the sludge area. One of the major priorities in our agency over the next 9 months to a year is to develop a comprehensive policy on sludge and a set of regulations and guidelines.

At this point in time, we have a work group. We have put together a work plan. We have done an extensive review on the documents that are in existence on health effects, on environmental impacts. We recognize some of the weaknesses of those reports. We will go back, and with technical experts, evaluate and redo those documents, and put into place guidance to the people out in the field who have to manage the sludge.

Mr. D'AMOURS. Well, I understand that, and I understand that you are working on these questions, but I am talking about the law. Do you think the law is clear? You are working on regulations that you hope will clarify this, but we are talking about the congressional responsibility of working with the law. Do you think the law is clear?

Ms. HURD. We believe the law establishes a good framework so we can develop a workable program. Yes.

Mr. D'AMOURS. Well, you were in my office when we met with Anne Gorsuch and a group of Congressmen—

Ms. HURD. Yes.

Mr. D'AMOURS [continuing]. Asking her—praying to her—to appeal the Sofaer decision. If you remember, much of the conversation centered around the problem of vagueness in the law.

Has the EPA changed its position? Has the law since then become clear to you? Has it clarified itself in some way?

Ms. HURD. The reason why we did not appeal the New York court case was the fact that we felt that our regulations were not in conformance with the Federal law. Basically, the issue was the EPA should consider all the statutory factors that are set forth in section 102(a) of the act to determine whether ocean dumping unreasonably degrades the ocean.

Mr. D'AMOURS. Well, I was asking you to remember the conversations we had in my office that dealt with the lack of clarity of the law. Do you remember those?

Ms. HURD. I remember the conversation. Yes.

Mr. D'AMOURS. Do you now think the law is pretty clear as to how we establish degradation and unreasonable degradation?

Ms. HURD. I believe, again, that the law establishes a framework. It establishes a number of factors that should be—

Mr. D'AMOURS. So what you are saying then is you think that the determination of unreasonable degradation ought to be made in the bureaucracy rather than in the Congress.

Ms. HURD. I believe it should be made through a process that we have technical experts help us establish that program. Yes.

Mr. D'AMOURS. In your testimony, you referred to revenue sharing. Have you seen the revenue sharing in the proposal, in the draft amendments that we have circulated?

Ms. HURD. Yes. Steve has reviewed it in detail.

Mr. D'AMOURS. Do you have any problems with them?

Mr. SCHATZOW. We have a few problems with the way it is set up. My staff and I have met with the committee staff members and we have discussed in detail our reactions to a number of the provisions.

In terms of the financial management provision or the user fee provision that was in the proposed committee draft—we had some problems in terms of our ability to administer it because it was unclear as to how one would deal with the site-selection process when more than one applicant might use the site over a period of time. When we go designate, for instance, a new site, or when we go with a monitoring program at a site, who actually pays? Does the existing dumper pay? Does he bear the complete cost? Does the new dumper bear the charge? We just felt that administratively it was too complicated.

That is why, I think, in our comments we are looking for a management fee system which is much easier to administer.

Mr. D'AMOURS. Do you have any other specific problems with the staff recommendations?

Mr. SCHATZOW. I have a number of concerns. Although the Agency has not taken an official position on it, I would like to share with you some of my concerns.

I think it ties in very much with the question which you were asking as to wouldn't it be helpful to the Agency in administering this act to get much more explicit guidance from the Congress as to the meaning of the terms.

I think that might be a very good idea. Our problem is that when we look at this draft, it was unclear that we were going to get the guidance. I think the issues are very difficult to wrestle with. Let me go through a few of them.

One thing in very general terms which the draft attempted to do was to get away from the notion of unreasonable degradation and the balancing of alternatives, and instead to substitute the notion of degradation, seemingly to avoid the balancing.

I guess that I have a number of concerns. I am not at all sure how the word "degrade" or "degradation" would be defined. I am not sure what we are really talking about when we are talking about adverse effects. Are we talking about any adverse effects? Are we talking about any level of bioaccumulation? Are we talking about any effect at all in the environment?

The language itself appeared to us to be as difficult to implement as the present statute in terms of making those kinds of judgments unless its purpose was to define all disposal alternatives which have any negative impact at all, no matter how slight, as those which degrade.

Within the definition, itself, there seems to be an inconsistency. Part 4 of the definition appeared to allow marine impacts so long as the area could restore itself after dumping is terminated. Yet, part 2 of the definition apparently would classify any adverse impact as degradation. Therefore, it is unclear to us what the intention was there. Was there an intention to allow at least temporary degradation within areas, within the dump site? Outside the dump site?

Another area where we had problems was in terms of section 102(a)(1)(d) which contained a complete ban on the ocean dumping

of known or suspected carcinogens, mutagens, and teratogens without any consideration of the concentrations of such materials and wastes.

For example, all materials contain some level of radioactive substances in at least trace quantities, as naturally occurring radionuclides. Now, these radioactive substances are recognized carcinogens. Under this definition, all materials would be banned from ocean disposal. A complete prohibition of ocean disposal of radionuclides or other carcinogens could foreclose ocean disposal options without an adequate scientific basis in that it would not relate to the concentration and the possibility of harm from those substances. That was another concern which we had.

We would suggest that section 102(a)(1)(d) should be shifted to section 102(a)(1)(e) where trace amounts of known and suspected carcinogens could be allowed.

Mr. D'AMOURS. That is a good recommendation and it is already our intention.

Mr. SCHATZOW. I see. Thank you, Mr. Chairman.

Another provision of the staff draft was section 102(a)(1)(f) which provided for a phaseout of dumping in New York Bight Apex. We believe this position is premature. The Agency has a rulemaking package now going through the final stages of Agency review which will propose the designation of the 106-mile site for municipal wastes and which will seek comment on a petition by New York City and a number of New Jersey municipalities to redesignate the 12-mile site. It will also be seeking comments on the 60-mile site which was designated as an alternate site back in 1977.

We believe that going through that process of public debate and consideration and hearings both from the public and the scientists on the relative merits and demerits of those three sites is an appropriate way to go.

Mr. D'AMOURS. While you are on the question of the New York Bight, it has been referred to as one of the most polluted areas of ocean anywhere in the world.

Do you have any objection to moving to the 106-mile site to some other place? The only difference would be cost, I suppose. We were told just a minute ago that cost wasn't terribly relevant.

Would there be any reticence about moving to another site, if it would help the Bight Apex to restore itself?

Mr. SCHATZOW. I think that is the controversial issue in terms of the Bight Apex. NOAA has testified on this issue a number of times. The critical question is what is the contribution of sewage sludge to the total contamination of the New York Bight Apex?

NOAA's testimony has been that the Bight Apex is in a steady state, that sewage sludge accounts for approximately 3 to 7 percent of the degradation at that site, and that removing the sewage sludge—

Mr. D'AMOURS. What was the percentage figure? I missed that.

Mr. SCHATZOW. I believe it is 3 to 7 percent. Removing the sludge, stopping the sludge dumping at the 12-mile site, is not likely to have any significant impact on the degradation at that site.

Mr. D'AMOURS. All right. This is not a debate. It is testimony. We don't share your view on that, but go ahead.

Mr. SCHATZOW. To respond on some other portions of the staff draft—

Mr. D'AMOURS. You will have to do that in answer to some other member's question because I have just been advised that my time has expired.

Mr. Forsythe.

Mr. FORSYTHE. I yield to the gentleman.

Mr. BREAUX. Thank you, Mr. Chairman. Thank you, Mr. Forsythe, for yielding. I apologize. I have to leave at 11:40.

Thank you for your testimony. We have been working on this problem for an awfully long time. I have been impressed recently with some of the studies that I have been informed of and have heard discussed by some of the members of the scientific community regarding the effects of ocean disposal of sewage sludge.

I am also familiar, and I have looked at, the report of the National Advisory Committee on Oceans and Atmosphere on ocean dumping. In that report, they say that the EPA policy that no ocean-dumping permit will be issued when any land-based alternative exists should be reversed. I agree with that.

I know that there are a number of universities that have looked at this problem which also take the same position. I would like to have, Ms. Hurd, your comments on both NACOA's suggestions and also some of the university reports.

Ms. HURD. All right. We do support the NACOA report. Of course, we have been evaluating a number of the scientific evaluations that have been done.

The disposal of sludge is a major problem. Look at where we are today in this country. I think that we have to examine every disposal option that we have, but to preclude the use of the ocean, and at the same time a number of our incinerators have been shut down because of their emission problem, and then we look at land-base alternatives where more recently we recognized that we have problems in that area—there have been some proposed interim regulations that have come out in the last couple of years for the distribution and marketing of fertilizers from sludge—many of the municipalities would have to eliminate that as an option.

Land-fill capacities are becoming very short in volume. Therefore, at this point in time, a number of the communities in this country have tremendous volumes of sludge, and they must be dealt with.

We recognize when we come out with our guidelines and do our evaluations, we need to look at managing that problem in looking at each case-by-case decision as to what disposal option would have the minimal impact on the environment.

We have to look not only at oceans, but we have to look at some of the evaluations of land and air as well.

Mr. BREAUX. Are you familiar with the work that Scripps and Woods Hole have done on the subject?

Ms. HURD. Tudor has.

Mr. DAVIES. Yes, sir.

Mr. BREAUX. What were their recommendations?

Mr. DAVIES. Their recommendations, I think, are to use the assimilative capacity of the ocean if we can show that we do not have unreasonable degradation resulting from that action.

We should, in fact, look as Ms. Hurd said at the hazard assessment alternatives of land-base disposal, incineration, and ocean disposal.

Mr. BREAUX. Well, I think this committee could benefit a great deal from looking at these impartial studies done by some very respected universities in this country with regard to the ocean. Their recommendation is that we should not legislatively close the door to at least considering whether the ocean is a viable alternative for waste disposal.

It is not saying that we dump it all in the ocean, but it is saying that we should study it. We should have at least the option to consider and balance it against the effects of other alternatives, such as land-based disposal.

That is something which I support. I am glad to see that apparently it is the position of EPA also.

Thank you. Thank you, Mr. Chairman. Thank you, Mr. Forsythe.

Mr. D'AMOURS. The gentleman from Massachusetts, Mr. Studds.

Mr. STUDDS. Thank you, Mr. Chairman. I have some questions on the general subject of ocean dumping. First of all, I was not here at the very beginning. May I clarify for the record and for myself whom we have here? I get confused by what is left of EPA bureaucracy.

Ms. HURD. I am Merna Hurd. I am the Associate Assistant Administrator in the Office of Water.

Mr. STUDDS. What is an Associate Assistant Administrator? Where do you fit?

Ms. HURD. I act as a deputy to the Assistant Administrator.

Mr. STUDDS. Oh.

Ms. HURD. I have a special project right now to coordinate the sludge activities in the Agency.

Mr. STUDDS. Does that make you the senior person at the table?

Ms. HURD. Yes.

Mr. STUDDS. May I ask, are you a professional EPA career person or are you a political appointment?

Ms. HURD. I am professional.

Mr. STUDDS. You are. Is everybody at the table in that category?

Ms. HURD. Yes.

Mr. STUDDS. Therefore, we cannot get angry at you about policy matters? [Laughter.]

Ms. HURD. You certainly can.

Mr. STUDDS. But it would do us little good. [Laughter.]

I would like to ask a question based on a recent issue of Science magazine—and I guess I will start with you, Ms. Hurd, since you are the senior person. There is reference to EPA's being in the throes of drafting new regulations governing all ocean dumping activities, including the marine disposal of radioactive wastes, and that EPA is expected to publish its proposals in the next few weeks. Is that true?

Ms. HURD. No. We have been working on the regulations. We have had several drafts. We have identified a number of different issues. Particularly, as we get into looking at other options, as well, we need to do some revisions in land and air.

What we are currently doing is thinking about putting out a concept paper immediately on these various issues, and in the interim,

also work on our site-designation criteria, our monitoring strategy requirements in the permits, the bioassay procedures and test procedures, along with the reevaluation of the land and air.

We are putting together a schedule for completion this year or the first part of next year with public input and also scientific input through the Science Advisory Board to advise us on structuring the regulations to be able to put out something in a proposal later this summer, so we will be able to structure a management program which will adequately protect the ocean, land, and air.

Mr. STUDDS. Well, that is a remarkable sentence. I almost forgot my question. Are you or are you not in the process of drafting new regulations?

Ms. HURD. We have put together some drafts, yes. There are a number of issues which we have identified, and we will work with people for input on how to resolve those issues.

Mr. STUDDS. Well, that is what we do in this Government, as you know.

Ms. HURD. Yes.

Mr. STUDDS. What I want to know is whether you are revising the regs? Are you about to come up with new draft proposed regulations? If so, what is the timeframe?

Ms. HURD. We are working on what the schedule is going to be.

Mr. STUDDS. We are working on what the schedule is?

Ms. HURD. Yes.

Mr. STUDDS. So you do not have a schedule. You don't know when regs are going to be published, is that correct? Anyway, it is not in the next few weeks. Is that correct?

Ms. HURD. It is not the next few weeks.

Mr. STUDDS. I see. Well, that is reassuring.

Let me read you another excerpt from this article to which I would like to have you respond.

It says, "These rules may soon be relaxed"—the current regulations, that is, that go back to 1977, as you know. "According to an early draft of the proposed revisions"—that may be what you termed a "concept paper". I am not sure—"the new rules will incorporate and present a major shift in EPA ocean-dumping policy toward making ocean dumping a viable option for waste disposal. The revisions, according to one EPA official who asked to remain anonymous, are based on the principle that ocean dumping, like other actions that affect the environment, should be governed by cost-benefit analysis," an approach that the Reagan administration has been trying to incorporate into environmental policymaking as we have all noticed. "This approach can now be applied to ocean dumping, the anonymous EPA official argued, because there is sufficient scientific understanding of the impact of many pollutants on the marine environment to assess the hazards of ocean dumping. Since the Ocean Dumping Act was passed, he said, we now know more about what the oceans can assimilate."

Can I have your response to that quotation?

Ms. HURD. I believe in our testimony this morning, we did address the fact that in certain circumstances ocean disposal is an option and can assimilate particular domestic type wastes and different types of dredge materials.

Mr. STUDDS. Would you care to comment on the accuracy of the two paragraphs I just read to you?

Ms. HURD. I also testified earlier that economics was not going to be a major factor.

Mr. STUDDS. Economics is not going to be a major factor?

Ms. HURD. It is not the major factor.

Mr. STUDDS. Is it a major factor?

Ms. HURD. It is a secondary factor.

Mr. STUDDS. It is a secondary factor. OK. Let me ask you, if I may, some specific questions with respect to Massachusetts Bay and the dumping there. I think, Mr. Janes, you were at our hearing last fall in Boston.

What is the current status of the monitoring program, with respect to Massachusetts Bay, which we discussed at such length last September?

Mr. JANES. We have implemented some monitoring. The monitoring plan for the complete survey of the Bay is not complete but it will be complete by July when we intend to do the sampling in the Bay.

Mr. STUDDS. You intend to do the sampling when?

Mr. JANES. In July.

Mr. STUDDS. I have just been informed that my time has expired.

Mr. Chairman, how strict are you being? I was just given an anonymous note here.

Mr. D'AMOURS. I did not hear the gentleman's question. If he is asking whether your 5 minutes has expired, you can be sure that although I did not send the note, it is accurate.

Mr. STUDDS. I am sure of that. Is there going to be a second round of questioning, because I had just begun.

Mr. D'AMOURS. The gentleman is welcome to stay and I will give him an opportunity.

Now, the gentleman from New Jersey who I should have recognized earlier, Mr. Forsythe.

Mr. FORSYTHE. Thank you, Mr. Chairman. I am sorry I created some confusion but I do thank the witnesses this morning.

I think I would like to deal primarily in the area of the ocean monitoring program and what its effect is going to be under the budget proposals that are now before us. To what extent does NOAA work with EPA in monitoring dump sites and how is that responsibility shared?

Mr. DAVIES. Last year, the EPA research arm reinstated its ocean dumping program and one of the first actions that we have taken is work with water programs and with—particularly the National fisheries in the Northeast—to work very closely together on monitoring the dump sites in the Northeast.

We have also been working quite extensively with the Office of Marine Pollution Assessment which has an ocean dumping program and we are trying very hard to define the specific roles that each research organization has in this monitoring activity.

Mr. FORSYTHE. Then what will be the effect of the proposed budget on this program?

Mr. DAVIES. I cannot speak for NOAA, but I do not think it will impact—

Mr. FORSYTHE. In your proposed budget you would have adequate funds to carry out your responsibilities on the program that has been in existence in the New York Bight area.

Mr. DAVIES. Particularly for ocean dumping, yes.

Mr. FORSYTHE. Before I do forget, Mr. Chairman, I would like to ask permission for Mr. Lent to incorporate a statement in our record and permission for all members to submit questions?

Mr. D'AMOURS. Without objection.

Mr. FORSYTHE. Thank you, Mr. Chairman.

[Statement of Mr. Lent follows:]

STATEMENT BY HON. NORMAN F. LENT, A REPRESENTATIVE IN CONGRESS FROM THE
STATE OF NEW YORK

This is the first day of authorization hearings on the Marine Protection, Research, and Sanctuaries Act (Ocean Dumping Act) since EPA decided not to appeal the Sofaer judgment in *The City of New York v. EPA*. As such, it offers an appropriate time to consider where we go from here regarding the role of the ocean as a waste disposal option.

Under the Sofaer judgment, EPA's dumping regulations were remanded to that agency for revision to conform to the requirements of the Ocean Dumping Act. Those requirements call for a balancing of the environmental impact of various sludge disposal methods on a case-by-case basis, to determine that which is the least environmentally harmful. I am anxious to hear about the status of EPA's efforts to develop such regulations and how the agency intends to monitor sewage sludge disposal to protect the environment.

In addition, I am greatly concerned about site designation determinations which will be made. There is evidence that ocean disposal of sewage sludge in the New York Bight does not unreasonably degrade the marine environment. Yet, many of my constituents in Long Island are concerned about the impact of continued dumping in the Bight area and are anxious to see a full evaluation of other potential sites for disposal of sewage sludge and other wastes.

For example, I recently met with representatives of Long Island's fishermen who have evidence that the dumping area may be expanding and the dumping activity adversely affecting their fishing activities. They told me their fishing nets come up littered with waste caused by "short dumps" and that controls are needed to make sure the dumping occurs at the designated site. They say that so long as dumping is necessary, the 106-mile site is the best place to dispose of wastes. I urge EPA to give most serious consideration to this point.

While the National Advisory Committee on Oceans and Atmosphere (NACOA) has reported to Congress that scientific information available to date does not support a total ban on the ocean disposal of all sludge or all industrial wastes, NACOA recommended that ocean waste disposal research should continue. I believe further research can lead us to the answers to questions such as the fishermen raised to me. We may not be able to eliminate the risks involved with waste disposal entirely, but surely we can minimize risks by studying various options available to us, and then choosing the path of least environmental harm. I believe that is what the American people want and certainly what my constituents on Long Island see is necessary.

As one who supports a multi-medium approach to waste management, and one who believes that the ocean should remain a waste disposal option for use on a case-by-case basis, I pledge to support efforts to assure an environmentally sound waste management program is implemented.

Mr. FORSYTHE. You have carried out extensive monitoring activities, never excessive, on the New York and New Jersey beach areas in the past. What has been the cost per year for these activities, do you know?

Ms. HURD. We will submit that for the record, sir.

Mr. SCHATZOW. If we may.

Mr. FORSYTHE. Maybe this next question will have to be answered the same way, but do you know what amount was requested for monitoring those dumping activities in fiscal 1983?

Mr. DAVIES. I think it is a combination. I would like, perhaps, to come back to you with this one too to give you some precise figures. They do show an increase from an EPA standpoint.

[The following was received for the record:]

COST OF MONITORING ACTIVITIES

From 1975 through 1980, the Environmental Protection Agency has spent approximately \$200,000 per year for those monitoring activities. In fiscal year 1983 \$2.6 million has been requested overall for monitoring and site designation. Roughly \$750,000 will be spent in the New York Bight area.

Mr. FORSYTHE. They do show a——

Mr. DAVIES. They do show a significant increase from the EPA standpoint.

Mr. FORSYTHE [continuing]. A significant increase?

Mr. DAVIES. Yes.

Mr. FORSYTHE. That is encouraging.

EPA must review and process individual permit applications for ocean dumping. Can you tell us what the average cost to process these permits is?

Ms. HURD. About \$8,000 per permit.

Mr. FORSYTHE. Thank you. Are the dumpers charged for permit processing? If so, what percentage of the cost of processing an individual permit is covered by this charge?

Mr. SCHATZOW. Under our regulations there is a charge of \$1,000 for evaluating ocean dumping permits. That fee, however, is waived for public entities such as municipalities.

What we discussed earlier is that we are considering a financial management system which would require the payment of a substantial permit application fee that would cover the costs of permit application processing.

Mr. FORSYTHE. Which would be in the area of about \$8,000?

Mr. SCHATZOW. About \$8,000, that is right.

Mr. FORSYTHE. Does the permit fee go back into your budget to cover your costs or does the money go to the General Treasury?

Mr. SCHATZOW. At this time the money goes to the General Treasury.

Mr. FORSYTHE. Are you proposing that it go directly back to your budget?

Mr. SCHATZOW. I think we would be proposing that it go directly back to our budget, yes sir.

Mr. FORSYTHE. What is the cost involved in designating a site, including the amount associated with conducting field surveys, preparation of the EIS and for administrative processing?

Ms. HURD. About \$1 million.

Mr. FORSYTHE. How many sites do you anticipate will be designated in each fiscal year through 1985?

Ms. HURD. Five per year, I believe.

Mr. FORSYTHE. A total of 20 sites.

Mr. SCHATZOW. Well, I think there are going to be. We have a separate ongoing program in terms of the designation of dredge and fill sites, sites for dredge material under an agreement we have with the corps and under a court order. I can submit for the record the schedules for those site designations under that provision.

In terms of other site designation beyond the dredge material sites, I think it is somewhat unclear other than the site designation I mentioned previously in terms of our consideration of the 106-mile site——

Mr. FORSYTHE. 206?

Mr. SCHATZOW. 106-mile site, and the petition by New York and the New Jersey municipalities to redesignate the 12-mile site.

Mr. FORSYTHE. Can you tell us what amounts are contained in your budget request for the fiscal years 1983, 1984, and 1985 for site designation?

Mr. SCHATZOW. We do not have any budget submission for the fiscal years 1984 and 1985. For our 1983 submission I believe it is in the vicinity of \$2 million. Let me check on that. It is \$3.5 million to include costs of personnel and extramural support.

Mr. FORSYTHE. Thank you. I see my time has expired. Thank you Mr. Chairman.

Mr. D'AMOURS. Thank you Mr. Forsythe. The other gentleman from New Jersey, Mr. Hughes, is recognized.

Mr. HUGHES. Thank you, Mr. Chairman.

My colleague from Delaware has another major commitment and I would like to yield to him if I may.

Mr. EVANS. I thank my friend from New Jersey for yielding.

Ms. Hurd, I will be very brief. First of all, I would like you to pass on to Ms. Gorsuch, the Administrator, that I am still concerned about EPA's failing to question Judge Sofaer's decision in the Southern District Court of New York. I think it was your responsibility to appeal that decision and you did not do so.

I am also very concerned about the adequacy of the level of funding for research and monitoring. Specifically, you have mentioned in your statement, I believe, on page 4, that dumping at the original Philadelphia dump site that was just 10 miles off Cape May, N.J., and then dumping at the new Philadelphia dump site 40 miles farther out to sea, was stopped in 1980. The reason that was stopped was because we told them to stop. It was an incentive to stop dumping harmful sewage sludge in the ocean. You further say that the site has also purified itself to the extent that recent studies by FDA show that it can be reopened to shell fishing in the near future. Is EPA also monitoring this site?

Ms. HURD. NOAA runs the monitoring program.

Mr. EVANS. You imply that the FDA will reopen it to shell fishing in the future. Are they going to reopen it or not? And how big of an area was closed at that dump site?

Mr. DAVIES. The dump site is closed. I do not think there is any pressure to reopen the site at the moment but I do agree that the last FDA survey of the site showed a significant decline.

Mr. EVANS. I would also like to suggest to Ms. Hurd that the budget for NOAA to monitor ocean dumping is substantially down and I am concerned about that. If NOAA is not going to do it and if the EPA is not going to do it, then who?

Ms. HURD. Sir, we are very concerned about it too and that is why we have taken the position on a financial system to insure that we have adequate research and monitoring on sites.

Mr. EVANS. Do you know how big that dump site was?

Ms. HURD. Which site, the Philadelphia or——

Mr. EVANS. The Philadelphia site.

Mr. DAVIES. The closure was 10 square miles. I am sorry, a 10-mile radius.

Mr. EVANS. A 10-mile radius. That is substantially different from 10 square miles. We need to help our fishing industry as much as we possibly can. I do not think going back in there with harmful dumping of sewage sludge is the answer and I think Judge Sofaer's decision sets a horrible precedent. I am extremely concerned over your inability to question it.

Thank you for being here.

Thank you, the gentleman from New Jersey.

Mr. D'AMOURS. The gentleman from New Jersey.

Mr. HUGHES. I have some additional time, I presume?

Mr. D'AMOURS. You have 5 minutes.

Mr. HUGHES. First, I want to thank the panel for their testimony. Let me just pick up on the radius of the Philadelphia dump site which is 30 miles off of Cape May City. Was it a 30-mile radius dump site?

Ms. HURD. Ten-mile radius.

Mr. HUGHES. That was a major shellfish producing area prior to the dump site, was it not?

Mr. DAVIES. Yes.

Mr. HUGHES. What makes you suggest that there is no pressure on EPA to open up that dump site?

Ms. HURD. Pardon, I did not hear the last part?

Mr. HUGHES. What makes you believe that there is no pressure on you to open up that dump site?

We have questioned EPA about that dump site every time you come here.

Mr. DAVIES. My understanding is that the original Philadelphia dump site was a shell fishing area. The far dump site, the one that was recently closed, has never been a shell fishing area.

Mr. HUGHES. We are talking about the original dump site, are we not?

Mr. DAVIES. I think we are talking about both. There is some confusion.

Mr. HUGHES. My point really is that I do not know why you are saying that there is no pressure on you to open up the dump site. Every time you come here I ask you about it. We are anxious to open it up as soon as you feel it is safe.

Mr. SCHATZOW. The original dump site, the original Philadelphia dump site has been opened for shell fishing by FDA. The subsequent, the second Philadelphia dump site, which was where the dumping was terminated in 1980, is a further out site. It is not my understanding a commercial shell fishing area.

Mr. HUGHES. Let us talk in terms of miles. Which dumps are you talking about, the 30-mile site or the site that is beyond that, I believe it is 40 miles?

Ms. HURD. Congressman, I would suggest that we send to you a prepared statement on the details of both sites to clarify it.

Mr. HUGHES. OK. And consider today's hearing as pressure if you have not considered it as pressure in the past, so there is no confusion.

[The following was received for the record:]

NEW AND OLD PHILADELPHIA DUMPSITES

The original Philadelphia dumpsite ("old site") was about 12 miles Southeast of Cape May. In 1973, when EPA began management of the ocean dumping permit program under MPRSA, the dumpsite was moved 50 miles southeast of Cape May, a location which was about 40 miles east of Ocean City, Maryland ("new site").

This action was taken because the old site was in a productive shellfishing area and the area had been closed for shellfishing because of the sewage sludge dumping. Two years after dumping stopped at the old site, it was reopened for shellfishing based on studies by the Food and Drug Administration (FDA) at the site.

The new site was not used for commercial shellfishing at the time sewage sludge dumping was started at the site. In 1976, as a precautionary measure the FDA closed the new site to shellfishing. Dumping at the new site stopped in December 1980. An FDA survey in the spring of 1981, showed that some bacterial contamination still existed. Present plans are to resurvey the site in the summer of 1982, to see if the site can be reopened to shellfishing.

Mr. HUGHES. You make a statement on page 8 of your testimony to the effect that we unfortunately cannot determine scientifically the ocean's full ability to absorb and biologically process toxic waste, nor can we fully track the fate and effects of potentially contaminated sludges, which, I think, is a fair statement of the state of the art and is where we have arrived technologically and scientifically.

Now, when is it that we are going to reach that position in the New York Bight, and tell me in terms of months, what we are doing that is irreversible?

Ms. HURD. The New York Bight is impacted by a number of different sources of waste including the Hudson River and sewage—

Mr. HUGHES. I understand that. We understand that 300 to 500 million gallons of raw sewage goes into the Hudson every day that contaminates and we understand that there is runoff and we understand that there is sludge and we understand that there is dredge spoil. My question is at what point are we going to be so contaminated in the New York Bight that it is going to be irreversible. Someday we are going to wake up and find that we have done immeasurable damage and, perhaps, irreversible damage, to that particular area of the ocean.

Ms. HURD. I cannot answer that question. I know that NOAA has done a—

Mr. HUGHES. Do you think anybody can answer that question?

Ms. HURD. Probably not.

Mr. HUGHES. I think that is an important point. You suggested that sewage sludge accounts for 3 to 7 percent of the contamination. How much is accounted for because New York City is now pumping raw sewage into the Hudson River. What percentage is that?

Mr. SCHATZOW. I do not have that percentage.

Mr. HUGHES. What percentage of runoff is—

Mr. SCHATZOW. Substantially greater. Both of those are substantially greater than 7 percent.

Mr. HUGHES. Now would you not agree that you have to start somewhere?

Mr. SCHATZOW. I agree we have to start—

Mr. HUGHES. Three to seven percent is not insignificant. Would you agree with that?

Mr. SCHATZOW. It is less significant, obviously, than those other sources.

Mr. HUGHES. But it is not insignificant. It is a significant contribution to the pollution problem that exists. Now, would you also agree that as we build more wastewater treatment facilities as we are now doing in New York that we are going to have more sludge and more dumping of sludge?

Mr. SCHATZOW. We are certainly going to have more.

Ms. HURD. Correct.

Mr. HUGHES. So that means that the raw sewage is going to decrease and the sludge if, in fact, we develop other alternatives is going to increase?

Ms. HURD. That is correct.

Mr. HUGHES. That seems logical to me.

Now, under those circumstances, how are we going to find out, first of all, that what we are doing in the New York Bight is creating irreparable harm at this point so that we can prevent that from occurring? Or, are we going to end up at some time recognizing that we have done that and unfortunately policies have led us to the point where there is nothing that we can do about it. When do you project that we can find out about the damage that we are doing so that we can make some policy decisions? Who will give us guidance?

Ms. HURD. The first step in looking at the New York situation is to look at the alternatives in the evaluation of this next year with New York on what the best options are. We will be looking at the 106 site, the 60-mile site, as well as land alternatives and air alternatives.

Mr. HUGHES. Well, the point is that this committee is the Merchant Marine and Fisheries Committee and we made a policy decision, and it was based upon a number of factors, not the least of which is that we can contain on land, a lot better than we can in the ocean, the sludge and other things we do not know what to do with. No one disputes the fact that we just cannot control substances once we put them in the ocean.

As a general rule we cannot track them very well, we do not know what the ultimate impact is going to be, as you indicate in your statement. This committee made a policy determination that we want to force municipalities and others to look at other alternatives and not look at the cheapest and easiest way out as other communities have done.

Ms. HURD. We are not talking about allowing any type of dumping at any site and there are a number of technical reports that talk about certain types of sludge, when managed at the appropriate site, can be assimilated into the ocean.

We also have a number of other studies when sludge is not properly managed on land or with incinerators with air emissions can also cause an impact.

Mr. HUGHES. Well, we know that the mercury and the cadmium that we are dumping in the New York Bight is not being assimilated, do we not? From the General Accounting Office reports and other reports we know that those particular substances are far beyond your established safety level.

Ms. HURD. I am not aware of any increase in the cadmium of the marine organisms on the east coast.

Mr. HUGHES. That was not my point. EPA has established what is a safe level for things such as cadmium and mercury and we know that in the New York Bight in the instance of mercury, I believe it is now 100 times EPA's established safety level.

We know that that is not being assimilated, do we not?

Ms. HURD. In our proposed regulations, our position in the London Dumping Convention, also controls the amount of cadmium to trace amounts for any disposal in the ocean.

Mr. HUGHES. My time is up. I recognize that. I just want to echo what my colleague from Delaware has said. I always thought that the Congress developed policy but in 7 years I have learned one thing, we do not develop policy, we think we do. We now have the tail wagging the dog, in essence. In the failure to appeal the Sofaer decision, the failure to carry out what was the clear intent of the Congress by the EPA which I just think is an absolute violation of responsibilities under the law.

I agree with my colleague from Delaware and I just regret that we have decided to retreat for the sake of convenience and cost on what I think is good ocean policy.

Thank you.

Mr. D'AMOURS. The gentleman from Washington, Mr. Pritchard.

Mr. PRITCHARD. Mr. Chairman, I yield to the gentleman from New York.

Mr. CARNEY. Thank you, Mr. Pritchard.

I would like to ask Ms. Hurd, is there any comprehensive program designed now, using the three agencies that are involved in ocean dumping to study the three different methods of getting rid of sludge? And, if so, who is going to take the lead role?

Ms. HURD. There is a major effort within the EPA at this time to develop a comprehensive sludge policy looking at all disposal media. In the appropriate areas we are coordinating, not only with NOAA in the ocean disposal area, but also with the Department of Agriculture and FDA on land disposal.

Mr. CARNEY. OK. You are evaluating the problem from the standpoint of looking at the three different options?

Ms. HURD. Yes.

Mr. CARNEY. And you are again coordinating the efforts within all agencies to do precisely this?

Ms. HURD. Yes.

Mr. CARNEY. Do you have a time frame so we might be able to have some type of preliminary report as to the progress?

Ms. HURD. We have a work plan and at this point in time we are talking about an initial proposal by the end of this year, January 1.

Mr. CARNEY. And what would the initial proposal entail?

Ms. HURD. Basically to look at the risk assessment of disposal in all three media, to look at the technology, to look at the administrative feasibility of managing sludge in all three areas, and to come up with a set of guidelines on how best to manage in each area.

Mr. CARNEY. Keeping that in mind, you said that within a year we will have some sort of direction—

Ms. HURD. We probably will not answer all questions; we will do a major cut.

Mr. CARNEY. I can appreciate that. It is a very difficult problem to try to come up with the solutions too. However, keeping that in mind, before us today we have a piece of legislation. I was just wondering, what do you think we, as a Congress, should do with this legislation, now knowing that we are probably 1 year to 2 years away from having some reasonable scientific data to give this Congress a better direction?

Ms. HURD. Well, we believe that the existing law is quite sufficient. We believe that concurrently with developing the work that is ongoing we also can work with New York to evaluate, and that can be sort of a prototype of the various options that they have.

We concurrently have a number of research projects within our agency dealing with ocean disposal.

Mr. CARNEY. Do you feel that you have the necessary resources, primarily the money, to do the in-depth research necessary to come up with the answers in that time frame?

Ms. HURD. The first cut, yes. There has been a tremendous amount of work done. This has been going on for some time. There are stacks of reports of work that has been done on land and air and it is taking that information and going back and looking at a lot of these assumptions, the safety factors, the health effects work, and putting it together for some decisions.

Mr. CARNEY. I fully appreciate the problem that you are faced with and you can be assured that if you make a quick decision and that is the wrong decision, someone from EPA will be sitting in that same desk 5 years from now, and we will be telling him why are you so dumb. But, we will be putting pressure on you to make a decision.

Ms. HURD. I think it is very important for you to do that, sir.

Mr. CARNEY. In a time frame that we can live with.

Going to another area, if I might. I would like to know how much information and how much research is being conducted on the ocean incineration technology?

Mr. SCHATZOW. I cannot speak to the specifics of the research. We have an ongoing program in terms of ocean incineration where we have standards for an ocean incineration that require both destruction and combustion efficiency. When we grant a permit application for ocean incineration, we inspect the vessel, certify the vessel and the adequacy of the incineration.

Our experience in the past is that we have had both combustion and destruction efficiencies of over 99.99 percent. We had a test burn recently in the gulf, I guess it works out to about 220 miles offshore, where we have got the results from the ship in terms of that we had two observers on board and, again, the combustion efficiency was over 99.99 percent.

Mr. CARNEY. Will this technology be incorporated in the study that we talked about before, looking at all the various methods?

Mr. SCHATZOW. It will be to some extent. Clearly the ocean incineration is an economically feasible alternative only for small amounts of concentrated waste. I do not believe that we will be looking seriously at ocean incineration as an alternative for large volumes of less toxic wastes such as sewage sludge. I do not believe we will be looking at that.

Mr. CARNEY. Unfortunately, I was just handed a very important notice, "Your 5 minutes has expired."

I will yield back to the Chair.

Mr. D'AMOURS. There will be a second round of questioning. I thank the gentleman from New York.

Mr. CARNEY. Thank you, Mr. Chairman.

Mr. D'AMOURS. Just two quick questions from me on the second round. This question of the New York Bight seems to be becoming more and more important as the questioning goes on. I was very interested in Mr. Hughes' questions. For instance, are you aware that NOAA estimated that we can expect an increase from the current 7 million wet tons of sludge in the area to about 17 million wet tons over the next 5 years?

Mr. SCHATZOW. Those are the projections assuming an increase in population and an increase in secondary treatment.

Mr. D'AMOURS. Well, but that is a very significant increase.

Mr. SCHATZOW. Yes.

Mr. D'AMOURS. That 3 percent, if that is the correct figure, and I am not sure that it will likely grow, will it not?

Mr. SCHATZOW. And that is something that we will very seriously consider in our rulemaking as we consider whether the 12-mile site should be redesignated and, if redesignated, for what quantities.

Mr. D'AMOURS. That brings me to my next question EPA's draft of the revised Ocean Dumping Regulations reads, and I quote—

When data collected from field investigations are used for making a determination, the material proposed for dumping may be considered acceptable for ocean dumping at the proposed site when it is sufficiently similar in chemical and physical characteristics to material previously dumped at the site and it may be expected to have similar effects and there is no statistically significant increase in the constituents of concern in organisms from within the dump site as compared to those from outside the dump site.

There are some people who think that the section was written specifically for the New York Bight Apex. It seems to me that the section says that once you get a site so polluted, more pollution because it will not make a whole lot of statistical difference you can go ahead and add, even though a little more may be terribly toxic or cause degradation.

Mr. SCHATZOW. That is, of course, just a staff draft. That is certainly not the intent of that.

Mr. D'AMOURS. What could the intent possibly be if not that?

Mr. SCHATZOW. The intent was for other materials particularly, such as dredge materials, where we are familiar with the characteristics of the material and where we have an adequate site, an appropriate site.

Mr. D'AMOURS. But is not the significance of this that you can dump anything at a site as long as it does not statistically and significantly increase the constituents of concern, which could be any kind of toxic element?

Ms. HURD. That is not the intent.

Mr. D'AMOURS. Well, what does that mean? I understand what it means, but does it mean that you can, if you have a polluted site, and you are not increasing the percentage of pollution so drastically, you can go ahead and dump?

Mr. SCHATZOW. The intent of that provision was not to deal with polluted sites or heavily degraded sites at all but to deal with sites and materials that were appropriate sites and where there was not evidence, in terms of past dumping of any significant degradation.

Mr. D'AMOURS. Well, why do you say, "to have chemical or physical characteristics similar to material previously dumped at that site?"

Mr. SCHATZOW. To avoid the necessity of testing when there had been safe materials dumped at a particular site and where there had been no significant environmental impact and to assure that when you had similar materials to those that had been dumped that they could be dumped there. If the materials were not similar, if there were for instance elevated levels of any constituents, such as mercury or cadmium or PCB's compared to the levels that had been dumped there previously, that they would not be allowed to be dumped there but there would have to be further testing.

Mr. D'AMOURS. Well, I wonder why we use the words, "constituents of concern in organisms" which means constituents about which we are concerned as to their polluting effects or degrading effects?

Mr. SCHATZOW. The perception again, I think, by my staff people that drafted this provision, is that when you do have some of these toxic constituents in trace amounts that have been dumped previously and there have not been significant environmental impacts, that you may be able to allow additional amounts to be dumped as long as they are not significantly different than the substances that have been dumped there previously in terms of the levels of those constituents. As long as those levels are still at trace amounts, and unlikely to cause environmental degradation.

Mr. D'AMOURS. Well, I hope that if ever what this thing seems to say gets to court that this colloquy will shed some light on it.

Mr. SCHATZOW. I think we will go back and look at that very carefully and clear that up so there is no misunderstanding.

Mr. D'AMOURS. One final thing, Ms. Hurd, and this is my final question.

You said that you were very concerned about the cutback in NOAA funding, what are you doing about it? Are you doing anything within the administration? Everybody is concerned but nobody seems to be doing very much.

Ms. HURD. I do not believe that I made that statement. I said we were concerned about making sure that we had adequate research and monitoring and that is why we recommended a financial system to be put into place so that we would be assured that we had monitoring.

Mr. D'AMOURS. You said that you had enough funds to continue the job you have been doing, even though you have been cut in prior years and somebody mentioned that NOAA had been cut significantly and you said, "yes and I am concerned about that." Are you part of any move? Is anybody doing anything to restore NOAA funding so that they can continue to do the research and monitoring that is needed?

Ms. HURD. Dr. Byrne can address that. In the management of this program there will be coordinating committees between

NOAA, the Coast Guard, and the Corps of Engineers as to what is required to adequately manage the program, sir.

Mr. D'AMOURS. My time is up.

Mr. Studds?

Mr. STUDDS. Thank you, Mr. Chairman.

I have never seen Mr. Hughes quite so calm on this subject before. Unfortunately, I think that was attributable to the fact that you, as I said before, are not the people toward whom his anger is most appropriately directed, although one at least or more of you were present at the meeting months ago with the administrator of the Environmental Protection Agency in which the people who wrote the law in question told her what they meant and she looked them straight in the eye and said, "Oh no, you did not." Sometimes I wonder whether the Administrator's contempt is greater for the ocean or for the law, quite frankly.

Every single person of both parties in this committee who wrote the law in question told you that, in the unlikely event you were unable to read the legislative history which says precisely the same thing as what they meant in writing the law. We were in turn told by the administrator of EPA that that was not what the Congress meant.

In this Alice in Wonderland world which has befallen us in the last couple of years one wonders which language to turn to, given the obvious inadequacy of the English language, in order to convey one's intentions these days. Mr. Hughes might feel a little better if somebody said that since he was very close to saying it.

If I can go back to the Massachusetts Bay question, let me start again, Mr. Janes I assume that you are the appropriate person to ask this of. If you could state once again and more clearly, what is the current status of that monitoring plan?

Mr. JANES. When we testified last September, we indicated to you, to the subcommittee, that we intended to—

Mr. STUDDS. Could you put the microphone a little closer or speak up a little?

Mr. JANES. When we testified last September before the subcommittee we indicated that it was our intention to go forward with a survey of the principle dump site in Massachusetts Bay.

Shortly following the hearings there was some side scan sonar work done in cooperation with NOAA and we have located some targets on the ocean floor to look at. The marketplace sampling has been put in place both there and at two other sites and the initial samples have been analyzed. The marketplace sampling will be repeated again in April. There have been, on various occasions, I think, spanning periods from July, September, November, and perhaps even later, samples of both biota and fish collected for us by NOAA and most of those have been analyzed.

In all the analyses that we have conducted so far we have seen nothing unusual.

Mr. STUDDS. Were those sites at which the tests were conducted chosen randomly?

Mr. JANES. Which tests?

Mr. STUDDS. From which the samples were taken—the biota? In other words, did you identify radioactive waste containers before you took the samples?

Mr. JANES. We are not in a position yet to be able to identify radioactive waste containers. We have identified locations of containers but we do not know whether they are radioactive or not.

Mr. STUDDS. Are you able to do that by the use of underwater cameras and can you pinpoint where these damn things are so that you can take some tests that have some meaning rather than just sailing about the Bay and taking them from place to place? We know they are there. Can we locate them with precision and test in those precise areas?

Mr. JANES. I am not going to promise you that we will find them but we are certainly going to attempt to. When we begin the survey in July we will use underwater cameras, underwater television.

Mr. STUDDS. OK. That is what I want to get at.

What is the projected cost of the monitoring plan?

Mr. JANES. For Massachusetts Bay?

Mr. STUDDS. Yes.

Mr. JANES. I would be happy to supply that for the record, but I do not have it in my head.

[The following was received for the record:]

The projected cost of the monitoring plan is \$100,000 and 3 person years.

Mr. STUDDS. Can you give me an approximation? I will not hold you to it, just a ball park figure, as we say.

Mr. JANES. Well, we are anticipating from the Office of Radiation programs supplying something like six-person weeks or so but I do not have the figures.

Mr. STUDDS. Six person weeks? You have that left? That is wonderful.

Have any funds been budgeted for this or do you just have to draw people out of other duties?

Mr. JANES. For this one we are drawing people out of other duties.

Mr. STUDDS. In other words the EPA budget for that is zero?

Mr. JANES. Well, we have some monitoring responsibilities that we can put this under as well.

Mr. STUDDS. What is your reaction—not you personally but the Agency's reaction—to the contention by the General Accounting Office that monitoring past dump sites does not make a lot of sense and should be curtailed?

Mr. JANES. We, in general, have taken the position that in terms of developing information for assessing the adequacy of future dump sites, that there is not much information—there is not much more information to be gained by monitoring dump sites as shallow as the dump sites that were used in the past.

Mr. STUDDS. Is that because you do not propose to use equally shallow sites in the future?

Mr. JANES. I think it is fairly evident that if any dumping is resumed it will go at a minimum to the international recommendations and those are 4,000 meters or deeper.

Mr. STUDDS. Am I correct that your statement then rests on the the assumption that any future dumping will occur in deeper waters where the effects will not be analogous and, therefore, not relevant?

Mr. JANES. That is my contention; yes, sir.

Mr. STUDDS. You know what bothers me here, obviously, is that you keep assuring us, or your draft regulations or your concept papers or whatever it is that is in vogue at the moment at EPA, that we have enough information, that there is no need for concern about these things and yet we have not done the studies on what we have done in the past. If we do not know what we have done in the past—and you will recall last fall that we found out that you did not have the slightest, foggiest, if I may be polite, notion of what had been dumped in Massachusetts Bay, you had not even talked to the people who dumped it—if we do not even know that, how in the world can you assure us that we can proceed with relative equanimity and calm to dumping in the future? Maybe logic, again, is also out of vogue, but I do not understand how, in the absence of sound, scientific research with respect to activities of the past one can give such bland assurances with respect to activities of the future. It does not sound very scientific to me.

Mr. JANES. There are two ways of approaching an evaluation of what has happened in the past and I do not think I would agree with you that for all of the dump sites that we have looked at that we do not have good information or reasonable information.

Mr. STUDDS. We do not have any information.

Mr. JANES. We do have.

Mr. STUDDS. We did not last fall when we started asking the questions. You obviously would not have done it if we had not pressed you. One wonders what about all the rest of these things.

I know that my time is up. I trust that the Environmental Protection Agency at every level is aware of the fundamental difference—a fundamental difference—between land and water. They are different elements. We can retrieve mistakes on land but in dealing with the ocean there are some mistakes that you can only make once. It just seems to me that a good dose of humility might be in order at this point before we take off in who knows what direction with those parts of the ocean that we have not managed yet to spoil in our ignorance and arrogance in the past.

Again, you are all very nice people and you are not in charge, which is probably one reason why you are so nice, but someday we will have the rest of them here.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Mr. Hughes?

Mr. HUGHES. Thank you, Mr. Chairman.

Let me pick up where I left off with regard to permits being granted for the New York Bight area.

When did the initial Sofaer decision come down?

Mr. SCHATZOW. In April, the judge—

Mr. HUGHES. Early April?

Mr. SCHATZOW. Came up with a tentative decision to give the parties an opportunity to react to correct his opinion.

Mr. HUGHES. Early April is your answer.

In early April, when the decision came down, how many permit applications were pending before EPA for dumping in the New York Bight?

Mr. SCHATZOW. I am not aware of how many were pending at that point. There were, at that time—

Mr. HUGHES. It was a handful, was it not?

Mr. SCHATZOW. I am not exactly sure how many permits were pending at that point and how many we had already rejected on the basis that the designation of the 12 mile site expired, would expire, and, in fact, has expired as of December 31, 1981.

Mr. HUGHES. In that connection, you indicate that from 1973 to 1980, 300 applicants or permittees were denied permits or phased out of the ocean. How many of those were phased out between the years 1977 and 1980?

Mr. SCHATZOW. I do not have that information. We can supply that for the record.

[The following was received for the record:]

Regarding your second question, a total of 322 permittees have been phased out since 1973. Since 1977, 60 permittees were phased out, while 272 were phased out in the years 1973-1977.

Mr. HUGHES. Would it be safe to assume that there were a significant number that were phased out during that time? After the 1977 ban was put in place?

Mr. SCHATZOW. I believe that it is safe to assume that but I will have those numbers for the record.

Mr. HUGHES. How many permits are pending before the EPA for dumping in the New York Bight?

Mr. SCHATZOW. We have not received any applications for dumping in the New York Bight apex from any municipalities that are not presently dumping in the New York Bight apex. I believe that is correct.

Mr. HUGHES. For instance, I understand that Washington, D.C., just applied for a permit to dump. Where are they going to dump?

Mr. SCHATZOW. Washington, D.C., has submitted to our region 3, a preliminary application. It is not a full permit application for dumping of their sewage sludge at the 106 mile site, not at the New York Bight 12-mile site.

Mr. HUGHES. How about Philadelphia? Has Philadelphia come forward and reapplied yet?

Mr. SCHATZOW. We have not received any permit application from Philadelphia, nor from any other city other than—that is not presently dumping—other than Washington, D.C.'s application for the 106-mile site.

Mr. HUGHES. How about the city of Baltimore?

Mr. SCHATZOW. We have not received an application from the city of Baltimore.

Mr. HUGHES. How about the Boston Metropolitan District?

Mr. SCHATZOW. To the best of my knowledge we have not received any applications from the city of Boston or anywhere in the Boston Metropolitan area.

We have received some informal inquiries from a number of people.

Mr. HUGHES. All right. So these are all just informal inquiries in most instances.

How about Middlesex County Sewage Authority? What is the status of that?

Mr. SCHATZOW. Middlesex County Sewage Authority is dumping, and has historically dumped at the 12-mile site.

Mr. HUGHES. Do they presently have a permit application pending?

Mr. SCHATZOW. I believe they do. They have a request for a rule-making asking us to designate the 12-mile site and asking us to revise our ocean dumping regulations.

Mr. HUGHES. These preliminary inquiries all came after the Sofaer decision?

Mr. SCHATZOW. The preliminary inquiries from the municipalities that are not now presently dumping came after the judge's decision.

Mr. HUGHES. So we can reasonably assume that it was the Sofaer decision which has prompted this rash of inquiries and intent to seek permits to dump in the ocean.

On April 7, Walter C. Barber, who was then Acting Administrator of the EPA, sent a memo to Richard Dewling and to you, Mr. Schatzow, in which he indicates that:

President Reagan recently directed this Agency to explore possible resolutions to disputes with New York City over disposal of municipal wastes in the New York Bight. In response to the President's directive I have reviewed the situation and determined that because the environmental and legal complexities in the matter and in the interests of all concerned, it will best be served by securing a period of time to assess whether ocean dumping of some or all their wastes is a permissible alternative to land waste disposal.

And it goes on to say:

Consequently, I am directing you to attempt immediately to arrange a meeting with representatives of New York City and other affected municipalities to explain that the Agency's position is as follows:

First, the Agency believes, that is, EPA believes that it does not have the authority to authorize dumping of sewage sludge after December 31, 1981, the statutory deadline for cessation of ocean dumping of sewage sludge contained in the Ocean Dumping Act and that there is no satisfactory administrative action which EPA can take which will provide relief before the 1981 deadline.

Is that still a position of the EPA?

Mr. SCHATZOW. It is the position of the EPA that it—

Mr. HUGHES. Yes, or no?

Mr. SCHATZOW. EPA does not have the authority to issue an ocean dumping permit for any municipal sludge that would unreasonably degrade the environment.

Mr. HUGHES. That is true of your position.

No. 2:

Ocean dumping of sewage sludge in the current 12 mile site must be ended as soon as possible, but no later than December 31, 1981.

Available data indicate that environmental and navigational conditions at this site make it unacceptable for use for the ocean disposal of such waste.

Now, is that still the policy of the EPA?

Mr. SCHATZOW. No, that is not the policy of the EPA.

Mr. HUGHES. What happened in the interim that would change that policy? What have we done now to clean up the New York Bight to make it environmentally acceptable? Because you have done one heck of a job since April 7.

Mr. SCHATZOW. We have not done anything specifically. I think, as I mentioned earlier, the Agency's position now is that the question of dumping at the New York Bight Apex area, the 12 mile site, can best be resolved through the rulemaking process and by responding to New York City's petition to dump at the 12-mile site.

Mr. HUGHES. You have not answered my question. Maybe that is your intent, but I hope not. I am asking you what has occurred to make this an environmentally acceptable site because as of April 7—

Mr. SCHATZOW. The Agency has made absolutely no determination that this is an environmentally acceptable site.

Mr. HUGHES. Well, that is what this memo says. This memo says that that is Agency policy. You must be aware of Agency policy because it was directed to you.

Mr. SCHATZOW. What I am suggesting, Congressman Hughes, is that the Agency's position, at this point, is that it is unclear as to whether that is or is not an acceptable site and we are going through a rulemaking process to resolve that issue.

Mr. HUGHES. Was Mr. Barber incorrect then at that time?

Mr. SCHATZOW. Mr. Barber was the Acting Administrator of the Agency at that time.

Mr. HUGHES. I know he was the Acting Administrator at that time. That is a profound statement. "Mr. Barber was the Acting Administrator." We know that. My question is was he incorrect at that time in saying that the site was environmentally and navigationally unacceptable?

Mr. SCHATZOW. He reviewed the data available and that was evidently his determination—

Mr. HUGHES. Was he correct or incorrect at that time? Was he right or wrong?

Mr. SCHATZOW. I think that—

Mr. HUGHES. And if he was wrong on what basis do you make such a statement?

Mr. SCHATZOW. I am not saying whether he was right or wrong. I am saying that he made a decision at that point and the subsequent Agency decision was that it was an issue that should be addressed through the rulemaking process.

Mr. HUGHES. I am going to let you off the hook because my 5 minutes are up.

Mr. SCHATZOW. Thank you, Congressman.

Mr. HUGHES. But that points up exactly, I think, what is wrong with this whole business before this committee.

Let me just tell you something in connection with the monitoring. At the same time that we have a rash of new applications for new permits in the New York Bight and at other dump sites, we are cutting back in monitoring, we are cutting back in research and development. We are cutting back across the board and it just does not make sense.

Thank you.

Mr. D'AMOURS. Thank you, Mr. Hughes.

Mr. HUGHES. Thank you, Mr. Chairman.

Mr. D'AMOURS. Mr. Studds?

Mr. STUDDS. Very quickly for the record just two questions.

Has the Agency begun to evaluate the Department of Energy's plans to dispose of contaminated soils in the ocean? That is, assuming we will still have a Department of Energy.

Mr. JANES. We have had some discussions with the Department of Energy but we do not have a formal proposal to evaluate.

Mr. STUDDS. How about the Navy's plans to dispose of all or part of their nuclear submarines and the reactors therein in the ocean?

Mr. JANES. We have had some informal conversations with the Navy as well but we have certainly not gotten and do not anticipate receiving any form of permit request from the Navy until they complete their evaluation. It will be announced in the Federal Register to do an environmental impact statement to let them look at their options.

Mr. STUDDS. Who is doing the EIS, you or the Navy?

Mr. JANES. The Navy.

Mr. STUDDS. Is EPA doing any of its own studies with respect to the potential hazards of dumping either nuclear submarine reactors or contaminated DOE soils in the ocean?

Mr. JANES. Yes, we are trying to align ourselves to be in a position to technically evaluate either proposal should the Agency receive one.

Mr. STUDDS. Thank you.

Mr. D'AMOURS. Thank you.

We thank the panel for staying with us and for your testimony. We will look forward to seeing you again in the not too far distant future.

Our next panel is composed of Dr. Byrne, Administrator of the National Oceanic and Atmospheric Administration and Brig. Gen. Forrest Gay III, Deputy Director of Civil Works, U.S. Army Corps of Engineers.

Gentlemen, would you approach the bench.

Mr. HUGHES. Mr. Chairman, while they are getting settled down, if I can make a part of the record this memorandum of April 7, 1981, which I think is extremely pertinent.

Mr. D'AMOURS. Without objection, it is so ordered.

[Memorandum of April 7, 1981, follows:]

[Memorandum]

U.S. ENVIRONMENTAL PROTECTION AGENCY,
Washington, D.C., April 7, 1981.

Subject: Directive to Seek Resolution of Disputes Over Ocean Dumping of Municipal Wastes in the New York Bight.

From: Walter C. Barber, Acting Administrator (A-100).

To: Richard T. Dewling, Acting Regional Administrator, Region II. Steven Schatzow, Deputy Assistant Administrator, for Water Regulations and Standards (WH-551).

President Reagan recently directed this Agency to explore possible resolutions to disputes with New York City over disposal of municipal waste in the New York Bight. In response to the President's directive I have reviewed this situation and have determined that, because of the environmental and legal complexities of this matter, the interests of all concerned would best be served by securing a period of time in which to assess whether the ocean dumping of some or all of their wastes is a permissible alternative to land-based disposal. It is important that during this period of review any disposal of wastes be done in a manner which is both environmentally sound and which does not foreclose future alternatives.

Consequently, I am directing you to attempt immediately to arrange a meeting with representatives of New York City and other affected municipalities to explain that the Agency's position is as follows: The Agency believes that it does not have the authority to authorize dumping of sewage sludge after December 31, 1981, the statutory deadline for cessation of ocean dumping of sewage sludge contained in the "Ocean Dumping Act" and that there is no satisfactory administrative action which EPA can take which will provide relief before the 1981 deadline; ocean dumping of sewage sludge at the current "12 mile" site must be ended as soon as possible, but no later than December 31, 1981. Available data indicated that environmental and navigational conditions at this site make it unacceptable for use for the ocean dis-

posal of such wastes; we would be willing to join New York City and other municipalities with which we are in litigation in seeking a solution which authorizes the continued dumping of sludge while data are developed to determine whether ocean disposal of municipal wastes may be authorized under Agency regulations; the appropriate method to implement such a solution is a consent judgment which restricts the ocean dumping of municipal wastes to the "106 mile ocean dump site," is for a limited period of time, and contains schedules for development of additional data; the Agency believes that this is the appropriate resolution for all municipalities currently disposing of wastes at the "12 mile" site and which will not have ceased ocean dumping by December 31, 1981; and in the absence of an appropriate resolution, EPA will commence enforcement actions against municipalities which are ocean dumping wastes without an approved ocean dumping permit.

Mr. D'AMOURS. You may proceed in whatever order you would like.

STATEMENT OF DR. JOHN V. BYRNE, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE, ACCOMPANIED BY CAPT. LARRY SWANSON, NOAA OFFICE OF MARINE POLLUTION ASSESSMENT

Dr. BYRNE. Thank you, Mr. Chairman. I am accompanied by Capt. Larry Swanson who heads the NOAA Office of Marine Pollution Assessment.

There is a statement which has been prepared which I would like to submit for the record.

Mr. D'AMOURS. I appreciate that. Your testimony will be made a part of the record.

[Statement of Dr. Byrne follows:]

PREPARED STATEMENT OF DR. JOHN V. BYRNE, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

Mr. Chairman and members of the subcommittees, I am pleased to be here today at this hearing on reauthorization of Title II of the Marine Protection, Research, and Sanctuaries Act.

In my statement I will, as requested in the Chairman's letter, review NOAA's activities related to ocean pollution, including ocean disposal, during the period fiscal year 1980-82 and make an assessment as to how the proposed fiscal year 1983 budget reductions will affect our ocean pollution research program.

The overall NOAA program addressing ocean pollution is comprised of 16 different activities carried out by 9 major program elements in NOAA. The President's fiscal year 1983 budget would allow us to continue with 12 activities with a total budget of \$13.0 million. NOAA will defer a number of lower-priority projects and will address the highest priorities in the area of ocean pollution, including the problem of ocean dumping. I shall address this point more fully later in my statement.

RECENT FISCAL YEAR 1980-82 AND PLANNED FISCAL YEAR 1983 ACTIVITIES

In response to the Subcommittee's request for a description of NOAA's fiscal year 1980-82 activities pertaining to ocean disposal and marine pollution and planned activities in fiscal year 1983, I will first discuss Title II activities, which are the primary concern of this reauthorization hearing, and then describe in brief form the other ocean pollution-related activities we carry out in response to other legislation. We recently prepared for internal purposes a descriptive summary of the NOAA ocean pollution program focussing on fiscal year 1981-82. I will be pleased to make that document available to the Subcommittees, if desired.

TITLE II

The Ocean Dumping Program was established by NOAA in 1976 to implement Section 201 of the Act. It is currently funded at \$2,470,000 and its purpose is to increase understanding of the environmental consequences of ocean dumping and to transfer that understanding in useful forms to regulatory and resource managers at all levels of government. The program consists of investigations of specific wastes or specific dumpsites and a complementary laboratory research effort.

In the period fiscal year 1980-82, our activities in ocean dumping dealt primarily with the effects of dumping and its relationship to other pollutant sources, with the intent of achieving a comprehensive view of the problem. These efforts encompassed studies and sewage sludge, industrial waste, and dredged material dumpsites, and work on living marine resources in the immediate vicinity of those dumpsites.

Our sewage sludge dumping studies included work at the active New York Bight site and the discontinued Philadelphia site. In the New York Bight, some of our efforts were focussed on synthesizing the conclusions and findings of previous research at the 12-mile sewage sludge site. Our current findings continue to show that sludge dumping alters benthic communities in an area some 240km² around the dumpsite, has a detectable contribution to poor water quality only over small time and space scales, and is not responsible for swimming-associated illness at coastal beaches. We have, however, found that a significant fraction of the bacteria, protozoa, and viruses reaching the sediments of the inner Bight is probably derived from sewage sludge.

Use of the Philadelphia dumpsite was discontinued in late 1980. Our data show that rock crabs no longer show evidence of gill blackening, and fecal coliform counts in sediments have declined to zero. However, longer-lived pathogenic amoebae and human intestinal viruses were found in sediments some six months after dumping stopped.

We continued major efforts to analyze industrial waste dumping at the 106-mile site and at a site north of Puerto Rico, emphasizing long-range dilution and dispersion characteristics and studies of low-level and chronic effects. Evaluation reports were issued on disposal at the 106-mile site and at a discontinued site in the Gulf of Mexico reporting on work in earlier years.

With regard to deepwater dumpsites, our findings are that wastes are dispersed over wide areas, do not accumulate on the seafloor, and do not harm planktonic organisms, except within an area of about 50km² for the first day following a dumping event. One still unanswered question is whether disposal could be increased, possibly by a large amount, and still continue to have minimal effects.

Our studies of dredged material disposal emphasized basic questions of how to minimize impacts. Such disposal in the marine environment will continue in U.S. coastal regions for the foreseeable future. We examined mechanisms by which contaminants could be transferred over long periods of time from sediments to water and organisms, and how this could be minimized or prevented. We are paying special attention to the New York Bight, where the sediments are particularly contaminated. We are investigating the feasibility, for example, of putting contaminated material into borrow pits and capping the material with clean sand.

In fiscal year 1983, studies of processes affecting particle settling rates will expand to include consideration of discharges of concentrated suspensions which would be the result of sewage sludge dewatering and of pipeline discharges of sludge. We also will be working to develop methods for detecting contaminant affected plankton communities. Philadelphia sludge dumpsite studies will analyze several years' worth of EPA data on sediment chemistry. Dredged material investigations will focus on abiotic release of chemicals to the water column. No further work will be conducted off Puerto Rico because the current waste dumping there will be replaced by a nearshore pipeline discharge.

Funding for the Ocean Dumping Program is included in the NOAA budget line item Regional Projects and Ocean Dumping Research, which is among the reductions proposed in the Administration's fiscal year 1983 budget. Nevertheless, we plan to continue with the more critical elements of the program using funds available from the Section 202 program (described next) and funds the agency has available to implement Section 6 (Financial Assistance Program) of the National Ocean Pollution Planning Act (Public Law 95-273). Inasmuch as the Federal Plan for Ocean Pollution assigns high priority to continued research on ocean dumping, support of our Ocean Dumping Program from these sources would be quite appropriate and certainly within the intent of the legislation.

The Long-Range Effects Research Program was established in 1979 to carry out the mandate of Section 202 of the Act, which is that NOAA have a comprehensive and continuing program of research on the possible longer-term impacts of man's activities on the oceans. The current funding for this program is \$4,835,000 and consists of an in-house segment and an extramural grants program. Investigations are focussed on five general problem areas: synthetic organic substances, processed petroleum products, metals, the role of organic particulates, and ecosystem dynamics. In-house, we have four Fisheries Service laboratories and three Environmental Research Laboratories examining such things as: the role of organics in the transport of pollutants in the ocean; the long-term effects of oil on marine organisms; the cy-

cling of toxic substances in the Great Lakes ecosystem, estuarine pollutant transport (Puget Sound); and the impacts of estuarine degradation on striped bass in San Francisco Bay.

In the extramural program, in fiscal year 1981 NOAA committed a total of \$1,600,000 in support of 18 research projects carried out in 11 different universities and private sector research organizations around the country. A listing of these projects can be made available to the Subcommittees, if that is desired.

Funding for the Long-Range Effects Research Program will not be affected by the President's fiscal year 1983 budget.

OTHER ELEMENTS OF THE NOAA PROGRAM

Public Law 95-273.—NOAA has responsibility for implementing the various provisions of the National Ocean Pollution Planning Act of 1978 Public Law 95-273, as amended. This includes preparation of a Federal Plan every two years and the coordination of agency implementation of each plan. An interagency committee has been established to oversee this effort and a small office, the National Marine Pollution Office, has been set up in NOAA to carry out the necessary staff work. Most of the activity during the Fiscal Year 1982 period involved preparation and clearance of the first two federal Plans.

Section 6 of the Act authorizes NOAA to provide financial assistance in the form of grants or contracts for research, development, and monitoring projects or activities needed to meet priorities set forth in the Federal Plans. In fiscal year 1981, sixteen research projects totalling approximately \$1,300,000 were approved by NOAA for funding.

Finally, under Section 8 of the Act, NOAA has responsibility for ensuring that the data and information produced from the Federal Program is disseminated in a timely manner and useful form for users. The major accomplishments in this area include: the establishment of what is called the Central Coordination and Referral Office; and a contract initiated to design the Ocean Pollution Data and Information Network (OPDIN).

Current funding for all Public Law 95-273 activities is \$3,000,000. We are requesting the same funding in the fiscal year 1983 budget.

The Hudson-Raritan Estuary Project (HREP) was developed as a result of the findings from the New York Bight Project (1973-81), which identified the estuary as the major source of pollution impacting the Bight. Planning for HREP began in fiscal year 1980 and initial studies were carried out in fiscal year 1981 with funds reprogrammed from the New York Bight Project.

In the Hudson-Raritan Estuary, we are studying how contaminants move through and out of the Estuary and how they become available to organisms. We are also examining which parts of the Estuary contain the most contaminants in the sediments, and how long it takes the Estuary to react to increases or decreases in contaminant input. Field studies will probably begin in fiscal year 1982.

A second regional project has been carried out in Puget Sound since 1975. The purpose of the Project is to develop an understanding of the environmental impacts of human activities, primarily the introduction of chemical contaminants, upon the living resources of selected environmentally stressed subsystems of Puget Sound and, thereby, permit predications of the probable ecological consequences of those activities.

A major portion of Project resources is allocated to studies characterizing the sources, fates, and effects of synthetic organic chemical compounds and, to a lesser extent, petroleum hydrocarbons and heavy metals. Biological abnormalities and mortalities associated with contaminant stress are included in research objectives with a view toward ultimately establishing cause/effect relationships. The Project is currently focussing its studies on Elliott Bay (near Seattle) and Commencement Bay (near Tacoma).

The Administration proposes to conclude this Project this fiscal year since the essential objectives of the Project have been achieved. Therefore, early closure of this Project Office will have a minimal effect on programmatic objectives. Any additional work needed in this region that is in the national interests could be conducted by the National Marine Fisheries Service facilities in Seattle and the Northwest Office of the Office of Marine Pollution Assessment.

The Great Lakes Environmental Research Laboratory (GLERL) was established in 1974 in Ann Arbor, Michigan to provide a focus for NOAA's research in that region. Approximately 40 percent of GLERL's budget is related to lake pollution problems. Basically this laboratory's effort in lake pollution includes: development of models to stimulate the cycling and transport of selected toxic organic substances, studies of

planktonic succession as influenced by pollution, eutrophication studies, provision of environmental information to resource managers and others users, and development of prediction models for use in fashioning cost-effective environmental management strategies for the Great Lakes.

The President's budget for fiscal year 1983 proposes to close this laboratory. While NOAA recognizes the importance of the Great Lakes to the nation and the need to continue to do research to help resolve many resource-use conflicts in the lakes, an evaluation of GLERL in comparison to other NOAA marine and atmospheric laboratories indicated that, in the context of NOAA's mission, GLERL was less critical than the others. The program at GLERL is more regional in nature than those at the other laboratories since state and local governments have most of the management responsibility for the Great Lake resources, and therefore should support continued research activities.

A considerable part of the Habitat Investigations Program of the National Marine Fisheries Service is devoted to ocean pollution investigations, including monitoring. This Program addresses problems related to effects of contaminants and of physical alterations on marine resources and their habitats. We are also looking at the impacts which increased offshore development will have on survival, reproduction, and growth of fish populations. A part of this Program is a pilot monitoring effort off the Northeast coast. This Northeast Monitoring Program carries out systematic measurements of key environmental parameters in the offshore waters from Maine to Virginia. We are documenting both present pollutant levels and any long-term trends which could threaten offshore ecosystems, particularly in the vicinity of active dumpsites.

The President's fiscal year 1983 budget would reduce but not eliminate funding for these NMFS activities. We believe that mission objectives can still be met in a substantial way even with the reduced level of spending proposed by the Administration.

As your Subcommittees are aware, the Administration proposes to terminate the National Sea Grant Program by fiscal year 1983. Inasmuch as the future of Sea Grant is a separate budget issue on which I have testified previously, I will not address it on this occasion.

Other activities of NOAA related to ocean pollution include: (1) the Hazardous Materials Response Program; (2) planned environmental studies of the Deep Seabed Mining and the Ocean Thermal Energy Conversion Programs; (3) Ocean Resources Coordination and Assessment; and (4) engineering support to the NOAA program by the Office of Ocean Technology and Engineering Services. If the Subcommittees require information on these activities, I would refer you to the document I mentioned earlier. None of these last-mentioned programs would be affected by the President's fiscal year 1983 budget.

With respect to reduce shiptime in fiscal year 1983, the overall NOAA fleet capability has been reduced, but we expect that support to priority ocean pollution programs will be maintained.

NOAA'S ABILITY TO RESPOND TO RESOURCE MANAGEMENT

Information needs.—In fiscal year 1983 we will devote an increasing portion of our research efforts to studying the impact of possible increases in sewage sludge disposal in the ocean. We will also make an increasing effort to provide the necessary scientific underpinnings for management strategies to minimize the impacts which must occur when man uses marine waters. We are working with EPA in the identification of important elements of a national monitoring framework, involving the Federal agencies and the states. We believe we can also make an important contribution with our research on deepwater sites as well as assist EPA in its responsibilities for designating ocean dumpsites.

OTHER FUNDING MECHANISMS

With regard to possible funding mechanisms to recapture costs associated with NOAA's ocean pollution research, our position is—as previously stated—that we will do everything possible to maintain a posture in the agency sufficient to produce timely information for the management decisions needed. Funding mechanisms, such as user fees, reimbursables, or fines levied in permit enforcement actions, have been discussed. While no specific approach on this subject has yet been determined, I assure you that we will continue to explore very reasonable possibility of securing supplemental funding to support our programs.

COMMENTS ON DRAFT AMENDMENTS

Mr. Chairman you requested in your letter that we provide comments and suggested changes to draft amendments to the Ocean Dumping Act. We will need a certain amount of time to involve all concerned organizational elements of NOAA in this endeavor, and to coordinate with other concerned Federal agencies.

REAUTHORIZATION OF TITLE II

The Administration requests an authorization of \$4,835,000 for implementing Section 202 for fiscal year 1983 and such sums as may be necessary for fiscal year 1984.

Mr. Chairman, this completes my statement, and I will be pleased to answer any questions.

Dr. BYRNE. I was prepared to summarize my statement in some detail but, in the interest of time, I will just, very briefly alert the committee to the topics that are covered in the statement and then we can proceed with further discussion.

NOAA has been involved with research activities in the area of ocean dumping and marine pollution.

The statement addresses the type of research which has been going on together with some of the activities, some of the findings of our research activities involving sewage sludge, the Philadelphia dump site, and industrial waste. We address some of the discoveries we have made with respect to deep water dump sites and comment on dredge materials. We address the impact that the 1983 budget will have on the programs and look at some of the long-range effect research programs which will continue.

We have addressed other elements of our research programs which are covered under other pieces of legislation; some focus on activities that have been carried out in the Hudson Raritan Estuary and Puget Sound, activities that have been carried out in the Great Lakes, and then addressed to a slight extent the role that has been played in our habitat investigations program within the National Marine Fishery Service. We have talked of the activities that we anticipate carrying out in the future in terms of hazardous materials and activities carried out by our ocean resources coordination assessment program; and things that will be investigated under the deep sea bed mining and ocean thermal energy conversion program.

Then, we concluded our statement with a short note that indicates that we would like to provide, for the record, comments on the draft amendments which your staff has provided. We are not prepared to do that at this time however, we look forward to doing so in the future.

I would be pleased to address any of the specific elements of the testimony that I have so quickly and simply summarized for you, but I suspect that you may have other questions that are not included in the testimony that might be more appropriately addressed.

Thank you, sir.

Mr. D'AMOURS. Thank you, Dr. Byrne. I appreciate your brevity and your summary.

General Gay, you may proceed.

STATEMENT OF BRIG. GEN. FORREST T. GAY III, DEPUTY DIRECTOR OF CIVIL WORKS, U.S. ARMY CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY, ACCOMPANIED BY COL. MAX IMHOFF, COMMANDER, WATER RESOURCES SUPPORT CENTER; DAVID MATHIS, PRINCIPAL BIOLOGIST; DR. ROBERT M. ENGLER, CORPS SCIENTIFIC ADVISER TO THE U.S. DELEGATION OF THE LONDON DUMPING CONVENTION AND CHAIRMAN OF THE OCEAN DUMPING TECHNICAL COMMITTEE; CHARLES CALHOUN, PROJECT MANAGER FOR DREDGING OPERATIONAL AND TECHNICAL SUPPORT OF THE CORPS' ENVIRONMENTAL LABORATORY; AND COL. WALTER M. SMITH, DISTRICT ENGINEER FROM NEW YORK DISTRICT

General GAY. Mr. Chairman, thank you very much.

I, as well, have a prepared statement which I will submit for the record. I have a shorter reading text which I have cut even more to save some time for us.

[Statement of General Gay follows:]

PREPARED STATEMENT OF BRIG. GEN. FORREST T. GAY III, DEPUTY DIRECTOR OF CIVIL WORKS, U.S. ARMY CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY

Mr. Chairman and members of the subcommittees, I am Brigadier General Forrest T. Gay III, Deputy Director of Civil Works, U.S. Army Corps of Engineers. In addition, I hold the position of Corps policy advisor in the U.S. Delegation to the London Dumping Convention. In this capacity, I attended the Convention meetings in London last fall. I appreciate this opportunity to appear before you to discuss reauthorization of Titles I and II of Public Law 92-532, The Marine Protection, Research and Sanctuaries Act of 1972, as amended (MPRSA). With me are members of my staff who will assist in answering questions you may have.

Through the years, domestic and international navigable waterways have played a vital role in this Nation's and the world's economic growth. The Corps, in fulfilling its mission to maintain, improve and extend waterways of the United States is presently responsible for approximately 25,000 miles of Federal channels and over 1,000 harbors. The Corps' dredging operations in support of this navigation mission necessitate the disposal of from 250 to 300 million cubic yards of dredged material each year.

The Corps, acting on behalf of the Secretary of the Army, is also responsible for issuing permits for the discharge of dredged or fill materials into the navigable waters of the United States, as well as for the transportation of dredged material for the purpose of disposal in ocean waters. Dredged material disposal in freshwater and in coastal areas to the outer boundary of the territorial sea is regulated under the Clean Water Act (CWA). Although the Corps does not issue permits for its own activities, the Corps is required by law to comply with the same criteria applied to permit applicants.

SECTION 103 ADMINISTRATION

Since 1973, an average of 61 million cubic yards of dredged material, or about 20 percent of the average total annual quantities dredged under Federal jurisdiction, have been disposed in ocean waters each year. On the basis of volume, dredging is the largest single source of materials dumped in the ocean. In 1979, as an example, the 72 million cubic yards of dredged material which were disposed in the ocean, constituted nearly eight times the combined tonnage of industrial wastes, sewage sludge, construction debris, and other waste materials disposed in the ocean during that year. Under existing criteria implementing the MPRSA, ocean disposal of dredged material is regarded as a last alternative and is then only allowed after these materials have undergone and passed toxicity and bioaccumulation laboratory testing protocol.

Nationwide, disposal by others under section 103 has averaged less than seven percent of the total annual quantities of ocean disposed dredged material, with the remainder originating from Federal projects maintained by the Corps. However, in certain coastal areas, ocean disposal under permit plays a vital role in port and harbor development and accounts for a much larger percentage of the total quantity

of dredged material ocean disposed in these areas. For example, in the New York Harbor area, disposal under permit accounts for approximately 30 percent of the total annual quantity of dredged material that is disposed of in the ocean. Since 1976, we have received an average of only 34 Section 103 permit applications annually, with an average of 21 permits (61 percent of total applications received) issued each year. The vast majority of these permits have been to Federal, state and local agencies. Thus, for the most part, the MPRSA has been primarily a Government-regulating regulation.

Under the MPRSA, EPA is assigned lead responsibility for designating ocean disposal sites. This site designation responsibility includes approximately 130 ocean sites which have historically been used for the ocean disposal of dredged materials. Each of these sites has received at least interim designation. On an average, approximately 50 to 60 of these sites are used annually for ocean dredged material disposal.

Before each of these interim designated sites can receive final designation for continuing use, environmental baseline studies must be conducted, and, in some cases, Environmental Impact Statements (EIS) must be prepared. To assist the EPA in this site designation process, the Corps entered into an agreement in 1978 to have EPA collect baseline data and prepare EIS's for the designation of approximately 57 of the Corps top priority dredged material disposal sites. These sites receive, on an average, over 90 percent of the dredged material disposed of in ocean sites each year.

To date, the total cost of this site designation effort has been approximately \$17 million, of which the Corps has provided over \$11 million. We continue to place a high priority on the timely completion of this ocean site designation program, as we consider the program vital to carry out our navigation responsibilities.

We are also working closely with EPA in assessing requirements for our remaining historically used ocean sites. We have developed a standardized sampling procedures manual, in conjunction with EPA, which will be used to develop the required site-specific baseline information for final designation of these remaining sites.

We anticipate that some of these remaining sites can be designated based either on available site-specific data or on data obtained under EPA's ongoing program to designate the Corps' top priority sites. However, a number of the remaining sites will require detailed field surveys in order to adequately characterize baseline environmental conditions as required prior to final designation. Collection of data in the open ocean environment is quite expensive, and we anticipate that these remaining site designation efforts will have to be accomplished over a period of several years.

In addition to these efforts, the Corps field offices have spent over \$3 million during each of the last two years in limited monitoring of existing ocean dredged material disposal sites, as well as in obtaining baseline data to characterize several new ocean disposal sites which will be required for planned channel deepening projects.

RESEARCH EFFORTS ON CONTAMINATED SEDIMENTS

The Corps regulations for issuing ocean dumping permits, as well as permits issued under CWA authority, are based on criteria and guidelines developed by EPA, in consultation with the Corps. Therefore, the Corps must be and is actively involved from an applied research standpoint as well as from a direct participating role in criteria and guidelines development.

We estimate that between one to ten percent of the sediment in waterways and harbors have become contaminated to potentially unacceptable levels due to man's industrial, urban, and agricultural activities. The Corps Dredged Material Research Program (DMRP), which was initiated in 1973 and successfully completed in 1978, provided the first definitive information on the existence of contaminants in dredged material disposed in marsh, estuarine, freshwater, and upland areas, including disposal alternatives for contaminated sediments. This research has resolved technical issues related to short-term or acute effects of disposal and has dispelled many public fears expressed at the time.

Technical conclusions from that program include the following:

Water column impacts during disposal are minimal to nonexistent, and the effect is predominately aesthetic in nature.

Leaching of toxic metals from aquatic disposal site mounds into the water column appears no greater than from natural sediments of similar geochemical characteristics. Chlorinated hydrocarbon release to the solution phase was not detected in the laboratory or field. Nutrients were released in concentrations greater than back-

ground and the mixing process within the disposal site water column mitigated any effect.

The major impact, and usually the only impact found at aquatic dredged material disposal sites, was the physical mounding of the material. Benthic recolonization of the mounds was found to be relatively rapid on fine grained sediments and somewhat slower on coarse grained material.

"Bulk" or total sediment analysis or inventory does not relate to any mobile or biologically available chemical fraction of a sediment, nor can it predict or evaluate potential environmental consequences.

Petroleum and chlorinated hydrocarbon uptake studies suggest minimal uptake by organisms from the solid phase of sediments with no apparent movement of contaminants out of the dump site.

Land-based alternatives can be considered more environmentally and sociologically complex than water-based alternatives. Further, in regard to the disposal of contaminated sediments, land-based alternatives appear to offer limited additional protection in relation to human health impacts, as compared to ocean disposal.

Section 103 of MPRSA, as well as Section 404 of the CWA require the Corps to assess long-term effects of dredged material disposal from Federal and non-Federal projects. However, due to the relatively short time frame of the DMRP, all questions related to long-term effects of dredged material disposal were not addressed. Although the Corps and EPA have developed first generation predictive procedures to evaluate long-term effects, differences in interpretation of these procedures between regulatory agencies continue.

Since the completion of the DMRP, the Corps has continued to conduct low level monitoring at several field sites which were established under the DMRP. However, beginning this fiscal year, we have formally established a new R&D effort specifically to evaluate the potential long-term effects of our disposal operations.

The basic objectives of this effort, entitled the Long-Term Effects of Dredging Operations, or LEDO Program are to provide new or improved technology to predict long-term (including cumulative) environmental impacts of dredging operations and to address methods of minimizing any adverse impacts. Specific areas of research include:

Concurrent field and laboratory studies to establish the significance of, and to develop or improve predictive techniques for, assessing contaminant bioaccumulation and biomagnification associated with the aquatic disposal of dredged material.

Continued field tests of procedures to eliminate or minimize adverse impacts of dredged material disposal through capping contaminated material with non-contaminated material.

Improved plant and animal bioassays for predicting impacts of dredged material disposal within alternative disposal media, such as wetland and upland areas.

Concurrent field and laboratory studies to assess geochemical changes that occur with time within upland containment areas for dredged material, and to develop improved techniques for predicting contaminant concentrations in the effluent from these sites.

In addition to this major program, a unique opportunity for dredged material research has recently been identified and is now underway within the Black Rock Harbor Federal navigation project in Connecticut. This study, which is a joint effort between the Corps and EPA, will address the issue of objective evaluation of disposal alternatives by documenting and verifying techniques for predicting environmental effects of contaminants due to aquatic, upland, and wetland (marsh creation) disposal. This will all be done with dredged material from a single routine maintenance operation, providing an unusual opportunity for direct comparison of overall environmental consequences of the same material under different disposal conditions.

Under this program, existing bioaccumulation techniques, as well as promising new predictive techniques recently developed by EPA, will be thoroughly tested in the laboratory for reproducibility and precision, and verified in the field as to the accuracy of each technique in predicting environmentally significant changes in biological communities and ecosystems. In out-years, techniques which prove useful at this site will also be field verified at other aquatic, upland, and wetland sites to demonstrate their wide applicability.

The Corps is also the lead Federal agency for the international exchange of scientific and engineering techniques regarding the management of bottom sediments containing toxic substances. Joint meetings on this subject have been held each year since 1976 between senior scientists and engineers of the United States and Japan. Major topics of information exchange under this Memorandum of Understanding (MOU) have included advances in dredging technology; assessment of innovative

aquatic disposal alternatives, such as capping and sand overlaying for contaminated dredged material, design, construction and management of diked containment areas for contaminated dredged material; and, improved analytic methods and management tools for assessing dredged material impacts. Information gained through the MOU was used extensively in the DMRP and continues to be used in current research. For example, the majority of the Corps guidance on resuspension of sediments during dredging operations is based on Japanese data. We hope to implement, in the near future, several joint United States/Japan studies involving the use of specialized equipment for dredging contaminated sediments. The successful exchange of information under this program has recently led to the signing of a similar MOU between the Corps and the Dutch government.

The MPRSA requires that the substance of agreements reached by the Contracting Parties to the London Dumping Convention (LDC) through international treaty (Public Law 92-254) be accounted for in the ocean dumping regulations of the United States. As the regulation of and research in dredged material disposal activities in the United States is a direct Corps responsibility, the Corps provides both a policy and a scientific advisor on the U.S. delegation to the consultative sessions, and a scientific advisor to the scientific sessions. I am the Corps policy advisor.

The LDC has developed a set of broad dredged material exclusions from the mandatory biological and chemical testing for prohibited materials that are required for other waste materials proposed for ocean disposal. In a recent session, representatives to the LDC expressed significant interest in innovative aquatic disposal site management techniques such as "capping" as a means of "rapidly rendering harmless" contaminants associated with dredged material. However, the consensus of delegates was that these efforts should continue at present as experimental efforts and be fully researched and monitored. The delegates also felt that these techniques were within the legal restrictions of the LDC. The Corps is presently evaluating these and other experimental approaches to aquatic disposal of contaminated materials at several sites within the northeastern United States.

It became apparent during the latter portion of the DMRP that it would be necessary to provide a technology transfer activity to ensure that the large volume of engineering/scientific data and results of the DMRP, as well as regulatory and other research on dredged materials, would be available to the Corps divisions and districts as well as to the engineering/scientific community at large. To meet these needs, the Dredging Operations Technical Support (DOTS) Program was established by the Corps in April 1978, and the responsibility for the management of the program was assigned to the Waterways Experiment Station's Environmental Laboratory. The DOTS program also supplies needed expertise on an "on call" basis to Corps districts and divisions when site specific problems arise.

The Corps' responsibilities for regulating the disposal of dredged material, including contaminated materials, directly involve and impact upon a number of environmental media, including inland waters, wetlands, estuaries, terrestrial habitats, and the ocean. It is our responsibility to insure the maximum possible protection to each of these media in our Federal activities, as well as in the management of our dredged material regulatory programs.

Two fundamental management conclusions drawn from the DMRP have been quite instrumental in guiding our research on dredged material disposal and in formulating our approach to regulating our own as well as permitted dredged material disposal activities. The first is that there is no single dredged material disposal alternative that presumptively is most suitable for a region, for a type of dredged material, or for a group of projects. Correspondingly, there is no inherent effect or characteristic of a dredged material disposal alternative that rules it out of consideration from an environmental standpoint prior to specific on-site evaluations.

It is not technically sound, for example, to make the general statements that ocean disposal must be phased out or that all material in the Great Lakes classified as polluted must be confined behind dikes. To do this would be contrary to research results that have indicated that there can be situations where there is greater probability of adverse environmental impacts from confined disposal than from open-water disposal. Yet, in other situations, such as when certain types of contaminants are present in unacceptable amounts, confined disposal may provide the greatest degree of environmental protection.

Implications of this conclusion from a management point of view are fully recognized. Case-by-case evaluations are time consuming and expensive and may seriously complicate advanced planning and funding requests. Nevertheless, such an approach is needed to insure that tens of millions of dollars are not spent for alternatives that contribute to adverse environmental effects rather than reduce them.

The second basic conclusion is that environmental considerations are acting more strongly than possibly any other force to necessitate long-range regional planning as a lasting, effective solution to dredged material disposal problems. No longer can disposal alternatives be planned independently for each dredging operation for multiple projects in a given area. While each project may require a different specific solution, the interrelationships must be evaluated from a holistic perspective and thought given to replacing particular disposal alternatives as conditions change. Regional disposal management plans not only offer greater opportunities for environmental protection ultimately at reduced project cost, but also meet with greater public acceptance once they are agreed upon.

The development of long range disposal management plans is particularly critical for many of our coastal projects, as suitable inland disposal sites are becoming exceedingly difficult to obtain, and, in some areas, are essentially non-existent. A number of the Corps coastal districts, including New York, Mobile, and Norfolk, and presently developing these long-range disposal plans for critical ports and harbors within their jurisdiction.

DEEP-DRAFT NAVIGATION CONSIDERATIONS

Considerable congressional interest has been expressed recently in the improvement of the U.S. deep-draft port facilities. I believe that this interest exists and is intensifying because these facilities must be adequate to accommodate both critical domestic and international requirements for coal-related and other energy products.

Few improvements to the entrance channels of our Nation's port facilities have been undertaken since World War II, and none of these has been on the scale of the deep-draft harbor improvements at Rotterdam, Gulf de Fos, and Zeebrugge. Consequently, the U.S. lags significantly behind the rest of the world's major economic centers in port improvement and development.

Navigation improvements to a number of our port facilities to depths from 50 to 55 feet will involve the removal of large volumes of dredged material and, in turn, consideration of the associated disposal problems. As an example, we estimate that, for the four existing coals ports of Norfolk, Baltimore, Mobile, and New Orleans, planned channel deepening to accommodate deep-draft navigation would involve the dredging and disposal of over 460 million cubic yards of dredged material. Recent reports have identified other U.S. ports as having a potential for serving increased steam coal exports.

Because these materials would originate from new work dredging, we do not anticipate problems with contaminated sediments. However, the extremely large volumes of sediments involved would necessitate a careful consideration of all reasonable disposal alternatives, including innovative approaches to the disposal of dredged material. This is particularly critical, considering the growing shortage of traditional inland disposal alternatives for many of our coastal projects.

It is our opinion, based on available scientific evidence, that the ocean may, in many cases, provide the best available alternatives for minimizing the environmental impacts of disposing of these large volumes of dredged sediments. Our research, as well as information resulting from a number of independent studies of both domestic and international origin, have demonstrated that the ocean has a significant assimilative capacity for degradable compounds and dredged sediment, in contrast to inland disposal alternatives. This scientific information is well documented in a number of recent reports including one of the National Advisory Committee on Oceans and Atmosphere (NACOA) and the proceedings of symposia of the National Assembly of Engineering Symposium of June 1981.

Results of the DMRP and other research have also demonstrated the feasibility of using certain types and quantities of dredged materials for such productive uses as creation and restoration of marshes and wetlands and for beach nourishment. However, our experience to date with productive uses of dredged material, is that these disposal options are frequently limited. These limitations result from inappropriate types and quantities of material. This is due, in part, to logistic considerations and, in part, to existing regulatory requirements. As an example, dredging requirements do not always coincide with requirements for beach nourishment or other productive uses of dredged material. Thus, stockpiling of appropriate quantities and types of dredged material, and possibly of multiple sites for rehandling at a later date, would be required to insure maximum utility of certain of these disposal options.

These, and all other feasible disposal options, are routinely considered in the planning process for our projects and are utilized to the maximum practical extent. However, adequate flexibility in dredged material disposal criteria and guidelines would not only increase the utility of these and other disposal options on our exist-

ing projects, but would be essential in the planning process for deeping projects for deep-draft navigation to insure that impacts to the total environment are minimized.

Mr. Chairman, in your letter to the Chief of Engineers requesting that the Corps present testimony there today, you also requested our comments on, and suggested changes to, a discussion draft of Ocean Dumping Act amendments prepared by your staff. However, as we have only recently received these draft amendments (March 5, 1982), we are not in a position to provide you with a detailed assessment of anticipated impacts without formal coordination within the Administration.

In summary, the predominant scientific opinion, including that of NACOA, which was established to provide advice to the President and Members of Congress, is that the ocean is an environmentally acceptable disposal option for dredged material. Further, available scientific research clearly indicates that the ocean disposal of dredged material should be regarded equally viable to any other disposal alternative from an environmental perspective, and that ocean disposal should not be disregarded for reasons other than scientific knowledge of unacceptable effects upon dumping. The point has been fully recognized by representatives to the LDC and is reflected in the fact that the LDC has developed a scientifically-based set of broad dredged material exclusions from the mandatory biological and chemical testing for prohibited materials that are required for other waste materials proposed for ocean disposal.

This concludes my formal statement, Mr. Chairman. We will be pleased to respond to any questions you may have.

General GAY. I brought with me today to assist in answering questions, Colonel Max Imhoff, who is the Commander of the Water Resources Support Center; and his staff biologist, Mr. David Mathis; I also have Dr. Robert M. Engler, the corps' scientific advisor to the U.S. Delegation of the London Dumping Convention and also chairman of the corps' Ocean Dumping Technical Committee; Mr. Charles Calhoun, project manager for dredging operational and technical support of the corps' environmental laboratory; and, to perhaps answer questions that might arise on New York and dredging operations in New York our district engineer from the New York district, Col. Walter M. Smith.

The Corps of Engineers in fulfilling its mission to maintain, improve and extend waterways of the United States is presently responsible for approximately 25,000 miles of Federal inland waterways and over 1,000 harbors. These channels and harbors are of vital importance to the economic well-being of this Nation. The corps, acting on behalf of the Secretary of the Army, is also responsible for issuing permits for the transportation of dredged material for the purpose of ocean disposal under section 103 of the Ocean Dumping Act, as well as for the discharge of dredge or fill material under section 404 of the Clean Water Act.

Although the corps does not issue permits for its own activities, the corps is required by law to comply with the same criteria which would apply to a permit applicant.

Since 1973, an average annual volume of 61 million cubic yards of dredged material, or about 20 percent of the total quantity dredged under Federal jurisdiction each year, has been disposed in the ocean. On the basis of volume, dredging is by far the largest single source of materials disposed in the ocean.

Under the existing ocean dumping criteria, ocean disposal of dredged material is regarded as a last alternative and is then allowed only after these materials have undergone and passed toxicity and bioaccumulation laboratory tests.

Under the Ocean Dumping Act, EPA is assigned lead responsibility for designating ocean disposal sites. This site designation re-

sponsibility includes consideration of approximately 130 ocean sites which have historically been used for the ocean disposal of dredge materials. Each of these sites has received at least interim designation by EPA. On an average, about 50 to 60 of these sites are used each year.

We are continuing to place a high priority on the timely completion of this ocean site designation program in conjunction with the EPA since we consider the program vital to carrying out our navigational responsibilities.

In addition, we are also working closely with EPA in assessing requirements for remaining historically used sites.

The corps recently completed a detailed, 5-year study of the effects of dredging, authorized and funded by the Congress, called the Dredge Material Research program or DMRP. This \$34 million effort led to two fundamental management conclusions which have been quite instrumental in guiding our subsequent research on dredged material disposal and in formulating our approach to regulating our own as well as permitted, dredged material disposal activities.

The first of these is that there is no single dredged material disposal alternative that presumptively is most suitable for a region for types of dredged material or for groups of projects. Correspondingly, there is no inherent effect or characteristic of a dredge material disposal alternative that rules it out of consideration, from an environmental standpoint, prior to specific onsite evaluations.

The second basic conclusion is that environmental considerations are acting more strongly than possibly any other force to necessitate long-range disposal planning as a lasting, effective solution to dredged material disposal problems. No longer can disposal alternatives be planned independently for each dredging operation for multiple projects in a given area. While each project may require different specific solutions, the interrelationships must be evaluated from a holistic perspective and thought must be given to replacing particular disposal alternatives as conditions change.

This comprehensive research program provided the first definitive information on the consequences of dredged material disposal in marsh, estuarine, fresh water, ocean and upland areas, including disposal alternatives for contaminated sediments. This research has resolved technical issues related to short term or acute effects of disposal and has dispelled many public fears expressed at the time.

Foremost among the technical conclusions of the DMRP was the fact that the major, and usually the only effect found at aquatic dredged material disposal sites was the physical mounding of material with a resulting short-term and reversible impact on bottom dwelling organisms. In regard to toxicity and biological uptake of heavy metals, petroleum and chlorinated hydrocarbons from dredged material, minimal impact or no impact was found on organisms within the dump site and measureable effects were limited strictly to the dump site proper.

Land-based alternatives for dredged material were found to be more environmentally and sociologically complex than water-based alternatives. Further, in regard to the disposal of contaminated sediments, land-based alternatives appear to offer limited, addition-

al protection in relation to human health impacts as compared to ocean disposal.

The Ocean Dumping Act, as well as the Clean Water Act, require the Corps to assess long-term effects of dredged material disposal in Federal and non-Federal projects. However, due to the relatively short timeframe of the DMRP, all questions related to long-term effects of dredged material disposal were not addressed. Although the corps and EPA have developed first-generation predictive procedures to evaluate long-term effects, differences in interpretation of these procedures between regulatory agencies continue.

Our present research efforts, which are being conducted in close cooperation with EPA, are concentrating on providing new or improved technology to predict long-term, including cumulative, environmental impacts of dredging operations and to address methods of minimizing any adverse effects.

The London Dumping Convention has developed a set of broad exclusions which exempt dredged material from the mandatory biological and chemical testing for prohibited materials that are required for other waste materials proposed for ocean disposal.

In a recent session, Representatives to the London Dumping Convention expressed significant interest in innovative aquatic disposal site management techniques, such as capping, as a means of rapidly rendering harmless, which is convention language, the contaminants associated with dredged material. However, the consensus of delegates was that these efforts should continue at present as experimental efforts and be fully researched and monitored. The delegates also felt that these techniques were within the legal mandate of the London Dumping Convention. The corps is presently evaluating these and other experimental approaches to aquatic disposal of contaminated materials at several sites within the Northeastern United States.

Navigation improvements to a number of our port facilities to accommodate deep draft navigation will involve the removal of large volumes of dredged material, and in turn, consideration of the associated disposal problems. As an example, we estimate that for the existing coal ports of Norfolk, Baltimore, Mobile, and New Orleans, planned channel deepening to accommodate deep draft navigation, so-called super colliers, involves the dredging and disposal of over 460 million cubic yards of dredged material.

Recent reports have identified other U.S. ports as having a potential for serving increased exports of steam coal. Because these materials would originate from new dredging, we do not anticipate problems with contaminated sediments. However, the extremely large volumes of sediments involved would necessitate careful consideration of all reasonable disposal alternatives, including innovative approaches to the disposal of dredged material. This is particularly critical considering the growing shortage of traditional inland disposal alternatives for many of our coastal projects.

Available scientific evidence indicates that, in contrast to inland disposal alternatives, the ocean has a significant assimilative capacity for dredged sediments. Therefore, the ocean may, in many cases, provide the best available alternative for minimizing environmental impacts of disposal of these large volumes of dredge materials.

In summary, the corps responsibilities for regulating disposal of dredged material, including contaminated materials, directly involve and impact upon, a number of environmental media including inland waters, wetlands, estuaries, terrestrial habitats, and the ocean. It is our responsibility to insure the maximum possible protection for each of these mediums in our Federal activities as well as in the management of our dredged material regulatory programs.

The predominant scientific opinion, including that of the National Advisory Committee on Oceans and Atmosphere, which was established to provide advice to the President and Members of Congress, is that the ocean is an environmentally acceptable disposal option for dredged material. Further, available scientific research clearly indicates that the ocean disposal of dredged materials should be regarded as equally viable to any other disposal alternative from an environmental perspective and that ocean disposal should not be disregarded for reasons other than scientific knowledge of unacceptable effects on dumping. This point has been fully recognized by Representatives to the London Dumping Convention and is reflected in the fact that the London Dumping Convention has developed a scientifically based set of exclusions which exempt dredged materials from the mandatory biological and chemical testing for prohibited materials that are required for other waste materials proposed for ocean disposal.

Mr. Chairman, in your letter to the Chief of Engineers requesting that the corps present testimony here today, you specifically requested our comments on several areas. I have covered all of those areas in my prepared statement except those which relate to suggested changes to the Ocean Dumping Act amendments which have been prepared by your staff. Unfortunately, we did not have adequate time to prepare comments fully coordinated within the administration, but we ask that we be allowed to present those comments later for the record.

This concludes my oral statement, Mr. Chairman, and I will try to respond to your questions.

Mr. D'AMOURS. Thank you very much, General Gay, and again Dr. Byrne.

Dr. Byrne, you were in the room earlier and you heard quite a bit of the discussion about your Agency during the EPA testimony. Given the large increase we can expect in utilization of the oceans for waste disposal, and the large cuts in NOAA's budget—do you think NOAA is going to be able to provide the research and information we need in a timely manner?

Dr. BYRNE. That is a difficult question to answer, Mr. Chairman. The part that makes it difficult is the aspect of a timely manner.

We find that whenever we deal with the environment, as our research unfolds we frequently turn up more questions that we do answers. I am sure this is the case with respect to addition of substances to the ocean as well.

It is clear that, with the urgency of this particular problem, if we were to apply all of the required resources and all of the talents of the researchers available to us to deal only with this particular problem we still would feel, within a year or so, or whatever the

period of time was, that there were a number of very critical questions still unanswered.

The answer that I must give you is that we will use whatever resources we have available to address these particular problems. The approach that we are taking in the 1983 budget is to begin to focus on the fundamental problems that involve the addition of particulates and chemical substances to the ocean through a better understanding of the chemistry of the ocean and the physics of the environment into which these materials are added.

Mr. D'AMOURS. From fiscal year 1982 to fiscal year 1983 your budget is being cut about 60 percent, right?

Dr. BYRNE. The 1982 budget—

Mr. D'AMOURS. Your research budget?

Dr. BYRNE. I was going to address it strictly from the pollution aspect. Would you repeat the question?

Mr. D'AMOURS. Is it true that your research budget—research related to ocean disposal to be more specific—is being cut about 60 percent?

Dr. BYRNE. I would say of the order of 50 percent. I do not know what figures you have at your disposal.

Mr. D'AMOURS. I have an internal NACOA document of about February 19 which says 60 percent.

Dr. BYRNE. We would be prepared to give you the specific figures for 1981 and 1982 and the proposed for 1983 if these would be helpful. But, yes, I think that is about the right order of magnitude.

Mr. D'AMOURS. Well, given that large cut, whether it is 50 or 60 percent, do you think that you can do the kind of research that we need in a timely fashion?

Dr. BYRNE. Well, as I tried to answer, I am not sure that we can do all the research that is necessary in a timely fashion. I think I indicated that we would take the resources that are available to us and provide as much focus on this problem as we possibly can.

If we can define the questions that need to be answered specifically, we can make an assessment and probably come much closer in predicting where we would be with respect to those specific questions.

Mr. D'AMOURS. OK. Mr. Studds earlier had questioned EPA and got into the concept of the ocean's assimilative capacity. Does NOAA believe that there is sufficient scientific information available to apply the assimilative capacity concept on a practical management basis?

Dr. BYRNE. Again, that is a difficult question to answer. We find as we investigate the problem, that for certain substances we do have answers that we did not have a few years ago. For the total assimilative capacity of the ocean, for all of the materials that we attempt to put in it, I doubt that we will ever have the answer. So, it is a matter of the degree to which the knowledge-base will serve us with respect to implementing regulations.

In the absence of knowledge, in the face of ignorance, I think that we frequently—and probably wisely—take a conservative position where we, in a sense, I hesitate to use the term, but in a sense overprotect, which I think is the wise position. Then, as the knowledge-base increases, as we learn more and more about the substances and their interactions with the ocean, the regulations are

more in tune to the actual conditions that take place in the environment.

Mr. D'AMOURS. Well, given this lack of knowledge and given your very severe budget cuts would you suggest at this time that we depart from that conservative approach that you have just outlined?

Dr. BYRNE. The position that I would take is that on the basis of knowledge that we have, which is considerable, any regulations that are adopted be based on that knowledge. I think that wisdom would say that we should not go beyond that base of knowledge. We are not in a gambling game. We are attempting to provide rational use of the ocean on the basis of what we know about it. So, I think the short answer to your question is that I would take the conservative approach.

Mr. D'AMOURS. Thank you. Last year, NOAA testified as to how bad the pollution of the New York Bight Apex is, calling it one of the most degraded open coastal areas in the whole world. They also said that one source of the contaminants is from the Hudson Raritan Estuary. I understand that the Hudson Raritan Estuary research project is being abandoned, why is that?

Dr. BYRNE. This is a budget priority situation, sir. In our judgment we have learned some things about it. It was an area that was cut back strictly on a budgetary basis.

Mr. D'AMOURS. But, given the earlier testimony again from EPA on the problems involved with the New York Bight, and a percentage of 3 to 10 percent of the pollution, only coming from sludge disposal and the major sources being elsewhere, would you not think that before we continue dumping in the New York Bight that we should undertake this kind of research?

Dr. BYRNE. Let me say that the shift that we have taken and the focus that we are providing is to conduct the fundamental research on the effects of the chemicals and other substances have when we put them into the environment. We have had, on a generic basis, a number of investigations underway looking at the effects of estuarine conditions, whether they happen to be the New York Bight area, the Hudson Raritan Estuary or Puget Sound. So there is a great deal of fundamental information which is available. However, I would say that this particular project, which is specific with respect to the region and the locale, is being terminated and we will have to draw on the available knowledge that we have from our overall body of knowledge with respect to estuarine conditions.

Mr. D'AMOURS. OK. Thank you, Dr. Byrne.

General Gay, I also have questions of you but we are following a 5 minute clock here so that everybody can have a chance to ask questions. I will get back to you on the second round.

Mr. Carney?

Mr. CARNEY. Thank you, Mr. Chairman.

I will start with the General, I believe. General, in your statement, you are talking about putting 20 percent of your average total annual quantities of dredged material under Federal jurisdiction having them disposed in the ocean. But geographically that would change drastically, would it not?

I cannot imagine that only 20 percent of the dredging that takes place, let us say in the New York Harbor, would be put in ocean dumping.

General GAY. The changes as a result of the proposed amendments to the Ocean Dumping Act?

Mr. CARNEY. No. I am just trying to get in my mind how much of the dredging activities in my particular area would be dumped in the ocean as opposed to other methods.

General GAY. About 90 percent of the dredging in New York Harbor is disposed in the ocean.

Mr. CARNEY. OK. If this battle continues as to the best methods for dumping both dredged material and sludge and sludge—this is something I will ask Dr. Byrne about—and for some reason there would be a prohibition of dumping in the ocean in the New York area. What would the impact of that be on New York Harbor?

General GAY. I think it would be significant, Mr. Carney. With 90 to 95 percent being disposed in the ocean and with the lack of available land based alternatives, it would mean that the Harbor would slowly silt up if we could not dispose in the ocean.

I would like to add that, nationally, about 95 percent of this material that we dredge is in the clean category; it is sand, silt and fine grain sediments which we characterize as clean material. So it should not be associated with sludge.

Mr. CARNEY. No, I said that. Dr. Byrne is the sludge man. You are the dredge man.

General GAY. Actually he is very clean.

Mr. CARNEY. But, the point being, is that we would have a big problem on our hands.

General GAY. A very large problem.

Mr. CARNEY. If we closed ocean dumping, do you have areas available to you, other resources available to you—land fill—

General GAY. There are a number of those alternatives available and we always look at them. There are contained disposal facilities; for instance, in the Norfolk area, Craney Island, we dispose of dredged material in a contained facility. That is suitable where it is close and economically feasible and biologically acceptable. There are other areas in the Great Lakes where we dispose in contained facilities. But, by and large, the upland disposal sites are very hard to come by, particularly in areas which are densely populated, as you might imagine.

Mr. CARNEY. So, we would be again in somewhat of a bind in the Port area of New York to find land-base disposal methods?

General GAY. That is correct. If you would like for Colonel Smith to expand a little bit from his personal experience it might be helpful for the record.

Colonel SMITH. Thank you, sir. At the current time, there are no other alternatives to ocean disposal to satisfy the requirements of New York Harbor.

We are involved right now in a long-range research program due to be completed in 1985, which will look at all the potential alternatives to ocean disposal to satisfy the requirements of New York Harbor. At the current time, until that research is completed, there is in fact, sir, no credible alternative.

Mr. CARNEY. And that research will be completed in 1985?

Colonel SMITH. Yes, sir.

Mr. CARNEY. But that would only tell us what might be an alternative, and then we would have to proceed with types of projects so we could utilize that alternative. You just cannot say, "Yes, we are going to put it on the Hoboken Pier." I mention the Hoboken Pier because today it was turned back from the Federal Government to the city of Hoboken.

The point I am trying to bring out is that if you come up with an alternative, it is not something you can probably start to utilize immediately. There would be site preparation, there would be EIS's required and everything. So you are talking about 1985, perhaps 1987 or 1988 before you can do anything with dredged material from New York Harbor other than dump it into the ocean?

Colonel SMITH. That is correct. By the end of 1985 we hope to have enough information to have evaluated the viability of those other alternatives.

Mr. CARNEY. And, in that time span, it would be safe to say that the New York Harbor would be sufficiently silted that you would probably stop all commerce?

Colonel SMITH. I think that is probably an overstatement, sir, to have the word, "all" in there. If you were to stop ocean dumping in New York Harbor, in a very short period of time—less than a year—you would in fact affect commerce in the New York Harbor and each year the effect would grow.

Mr. CARNEY. Then your problems are not associated with the main entrance, you might say, with the New York Harbor. The problems become more acute as you move into the harbor, the varied channels that—

Colonel SMITH. There are side channels and slip areas that would all of a sudden be prevented from being used. The major problem with the entrance channel at New York Harbor, which is dredged to 45 feet, is the sand moving up from New Jersey and Long Island. But there are areas and slips in New York Harbor that are only dredged to, say, 35 feet which would be filled in long before that.

Mr. CARNEY. Right. Now, that type of problem is not a big problem from the standpoint that dredged material is contaminated when you are talking about the littoral drift along Coney Island and that sort of thing. That is pretty clean stuff, right?

Colonel SMITH. That is very clean stuff. I would emphasize that 90 to 95 percent of the material we dredge from New York Harbor that is disposed in the ocean, is extremely carefully tested and managed by all the Federal agencies, all the Federal environmental agencies, subjected to public review, and unless it meets the current dumping criteria, is not disposed of in the ocean.

There are a lot of channels in New York Harbor that people would like to dredge right now but they cannot do so.

Mr. CARNEY. I am glad you brought that point up. Has any permit to dump in the ocean been turned down because the dredged material has not met the criteria?

Colonel SMITH. I would say it a little differently, sir. There are several permits, or people who would like to dredge in the New York Harbor area who are being prevented from dredging because their material would not qualify for ocean disposal. They have been unable and we have been unable to find a credible alternative to

that disposal. Basically, what happens is that all biological testing is required to be completed by an applicant at his expense prior to the time he makes a permit application. If he finds out through that testing that he is not going to qualify for ocean disposal he is not going to go through the time, effort and expense of applying for that permit.

Mr. CARNEY. There is a prescreening then?

Colonel SMITH. Yes, sir.

Mr. CARNEY. Because I was somewhat concerned, my research indicates to me that there has been only one application turned down by the Corps of Engineers, and they reapplied, and then the criteria was met.

What you are saying then, basically, is that this occurs because of a prescreening process of the applicant?

Colonel SMITH. That is correct.

Mr. CARNEY. Can you identify some applicants that, perhaps, are in a situation like that?

Colonel SMITH. I would be happy to provide that for the record. I can tell you that there are certain channels, like Gowanus Creek and Newtown Creek, that are not being dredged. There are people that would like to have them dredged, but the sediments are too contaminated and they are just not under consideration for ocean disposal.

[The information follows:]

DENIAL OF OCEAN DUMPING PERMIT REQUESTS AND THE IMPACT OF IMPLEMENTATION OF THE 1977 EPA OCEAN DUMPING REGULATIONS AND CRITERIA ON PERMIT PROCESSING IN THE NEW YORK DISTRICT

Though no permits applications have been formally denied by the New York District, applications have been withdrawn as a result of noncompliance with the Ocean Dumping Criteria. Since November 1977, NY District has received eighty-four requests from non-Corps applicants to dispose of dredged material into the ocean. Three of the eighty-four have not complied with the Criteria and their applications were withdrawn.

Thirty-three reaches or portion of Federal navigation channels have been reviewed under the Criteria since 1977. Three of the thirty-three projects have not been able to comply with the Criteria and dredging of these projects has been precluded pending the further evaluation of alternative disposal options.

In addition to projects being precluded from ocean disposal, implementation of the Ocean Dumping Criteria has resulted in serious delays in accomplishing dredging projects in New York Harbor. The Criteria required new testing procedures which resulted in implementation and quality control complications at the few commercial laboratories available to perform such testing. In addition, interpretation of bioassay and bioaccumulation test results became a controversial subject. Refinements in testing procedures were effected, a quality assurance program was established, and interpretive guidance was developed and coordinated with all Federal agencies involved in New York District's Ocean Dumping Program. Though implementation problems have gradually been resolved, delays in permit processing have curtailed dredging operations in the Port.

Below is table of dredging volumes which reflects time periods before and after implementation of the 1977 Ocean Dumping Regulations and Criteria.

YEARLY AVERAGE VOLUME OF DREDGED MATERIAL DISPOSED AT THE MUD DUMP SITE

[In millions of cubic yards]

| | 1972-77 | 1978-81 |
|-----------------------------------|---------|---------|
| Federal maintenance projects..... | 5.1 | 4.3 |
| Non-corps projects..... | 2.6 | 1.4 |

A combination of inflation and the Criteria implementation have resulted in a decline in dredging and disposal operations since 1978. The most dramatic decline as a result of Criteria implementation is evidenced in non-Corps projects. Potential permit applicants have hesitated from submitting ocean disposal requests for a variety of reasons which relate to the implementation and application of the Ocean Dumping Criteria. A significant decline in permit applications was evidenced in 1979 and 1980. It is believed that the following concerns with the Criteria have chiefly been responsible for the noted decline:

(1) The applicants' uncertainty of knowing what information is required for decision making; (2) How decisions are reached based upon testing information; (3) What the time frames are for decision making; and (4) The high cost of bioassay and bioaccumulation testing.

Mr. CARNEY. What do you do with the 5 or 10 percent that is not the type of spoils that are acceptable?

Colonel SMITH. Some is clean sand, like inlet dredging, where we nourish beaches directly with it. We place it back onto the beach directly or put it back into the littoral drift which will indirectly place it on the beach. In other areas, where we or the applicant can find an upland site—Liberty State Park in New York Harbor is a good example where dredging was done by the State of New Jersey—the material was, in fact, deposited directly on Liberty State Park.

Mr. CARNEY. I have been handed my notice, I will yield back to the Chair and take the second round.

Thank you.

Mr. D'AMOURS. Mr. Hughes?

Mr. HUGHES. Thank you, Mr. Chairman. Thank you, Dr. Byrne and General Gay.

First, General Gay, in the New York Harbor I know that we have a tremendous problem and I know that you have some studies underway trying to identify land-based alternatives to the dumping of what is certainly a less than desirable content of sludge, the sediment that comes out of the New York Harbor. How much of that content will be reduced as we reduce the dumping of raw sewage into the Hudson? Has anybody ever looked at that figure to see if it is going to be significantly reduced as we bring on line more waste-water treatment plants?

General GAY. I would like to ask Dr. Engler to answer that question.

Dr. ENGLER. Mr. Hughes, we have no experience, in that regard, in the New York area. An area where we do have experience is San Francisco Bay where we have had complete control of waste-water discharges. We have seen heavy metal—toxic heavy metal—content decreasing, in some cases, in orders of magnitude, because the sedimentation process in rivers and estuaries continues to occur. In San Francisco Bay, the sediment is clean material. It intermixes, dilutes, and covers the older contaminated material, and, in fact, you have a much cleaner environment. Theoretically, this would happen in New York eventually. How long it would take it would be impossible to say.

Mr. HUGHES. And you do not know what percentage. Obviously, a lot of the hard metals are due from run off into the Harbor.

Dr. ENGLER. Yes sir, from industrial input, sanitary outfall and so on.

Mr. HUGHES. So, you do not have any breakdowns on the New York Harbor area.

Dr. ENGLER. No, sir.

Mr. HUGHES. OK.

Dr. Byrne, on page 3 of your statement you bring the committee's attention to some of the conclusions of your work which was directed in the New York Bight. You indicate that your findings, based upon research over a period of time, has found that the sludge dumping does border the benthic communities in the area of some 240 square kilometers around the dump site and has a detectable contribution to poor water quality. Then, you indicate that you also found a significant fraction of the bacteria, protozoa and viruses reaching the sediments of the inner bight is probably derived from sewage sludge. I wonder if you can tell me, are you talking in terms of those viruses and bacteria finding their way into the seaweed and other substances?

Dr. BYRNE. Mr. Hughes, I would like to ask Captain Swanson to address that question as he is involved with that project and I think he can provide more details.

Captain SWANSON. Congressman, basically, the material that we are talking about here is found in the fine, muddy sediments of the Christiansen Basin.

Mr. HUGHES. Well, are there any living organisms at all in the New York Bight?

Captain SWANSON. Yes, sir.

Mr. HUGHES. Does it contain seaweed also?

Captain SWANSON. Not seaweed. We do see material building up in some cases in marine organisms, however.

Mr. HUGHES. Have your studies found that there have been any transfer of those viruses into the living organisms in the bight?

Captain SWANSON. I cannot answer that with respect to living organisms.

Mr. HUGHES. I cannot believe that there is not some organisms like seaweed, for instance, that is in the New York bight area. You are saying that there is no such material in the bight?

Captain SWANSON. Not in the Christiansen Basin to any large extent. It is mostly fine, sediment material.

Mr. HUGHES. How about in the Philadelphia dump site that was phased out in 1980 where you found that in some of the living organisms there were viruses present? Is there seaweed and other substances there?

Captain SWANSON. I cannot answer with respect to seaweed.

Mr. HUGHES. Would it be fair to assume that we know that seaweed which washes up on our beaches from time to time, as a result of storms, would contain any of those viruses?

Captain SWANSON. I do not think so. Most of the seaweed does not come from offshore. It comes from the estuarine and very near coastal areas.

Mr. HUGHES. You do not think that there is in the coastal area any seaweed or that type of material?

Captain SWANSON. Certainly there are in the coastal area. I do not think there are extensive amounts in the vicinity of the dump site.

Mr. HUGHES. I see.

Has anybody conducted any studies at NOAA on any of the transfer of these viruses or bacteria into the food chain at all?

Captain SWANSON. We have certainly found the viruses in some organisms as is reported here with the Philadelphia dump site.

Mr. HUGHES. So we can assume that some of those organisms go outside of this area and perhaps are picked up by our commercial fishermen?

Captain SWANSON. That is correct. Some of the commercially available fish pass through the area and do accumulate certain contaminants.

Mr. HUGHES. I see, thank you. I see my time is up.

Before I yield back my time, however, I just want to express my concern, for the record, over the zero funding for much of your monitoring. I just think it is absolutely crazy at a time when we are going to see significant increases in applications for permits to dump in the ocean, to stop monitoring, to cut back in research and I also have great concerns, as you know, Dr. Byrne, over the transfer of any of the personnel in a massive program to Washington.

Dr. BYRNE. May I comment on that, sir? As a result of our earlier discussions we have put a hold on that situation. We are in the process of very careful analysis of our entire approach to the location of personnel with respect to the needs on the west coast and the east coast, and I suspect we will be able to report a decision to you probably within a day or so.

Mr. HUGHES. Thank you. I congratulate you on at least being willing to take another hard look at what was, I think, just a tentative decision. I think that once you get into it in more depth and given the facts as they now exist with regard to increasing ocean dumping, hopefully, you will see that it is more important for us to keep those scientists here in the Northeast.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Hughes.

General Gay, as you know, the draft amendments which you have seen, propose that there will be no further dumping in the Bight after 3 years. How much time do you think you would need to find alternatives to dredged material dumping in the New York Bight Apex?

General GAY. I would like to ask Colonel Smith, who is involved in the study of finding those alternatives, to respond to that.

Colonel SMITH. Our research, sir, is concentrated on evaluating all of the alternatives. We may conclude as a result of our studies that there is not a viable alternative to some continued ocean dumping. I am not, at this point, confident—

Mr. D'AMOURS. My question was not clear. I meant ocean alternatives to the Bight.

Colonel SMITH. Our research will be completed, as I say, in 1985. I think then we will have the information available to evaluate all of the alternatives. At the present time, EPA is involved in evaluating the alternative ocean dumping sites that might be available in the New York Harbor area.

Mr. D'AMOURS. How much time do you think it would take to have these sites designated?

Colonel SMITH. We are talking about alternative ocean dumping sites, sir, and I would have to defer to EPA.

Mr. D'AMOURS. All right.

Dr. Byrne, what is your reaction to the draft amendments? Do you have any particular problems with any of them in particular? Can you give us any rundown on some of the, perhaps, more grievous errors that that draft presents?

Dr. BYRNE. As I indicated earlier, Mr. Chairman, we would be prepared to comment in writing for the record. We have a number of the elements within NOAA looking at the draft amendments now and we would like to coordinate that activity before we respond to you with that.

Mr. D'AMOURS. So you would rather not comment at all on any of the draft amendments at this time?

Dr. BYRNE. That would be my desire, yes.

Mr. D'AMOURS. I have no power to compel it right now and I would not try even if I had the power to do so.

Thank you very much.

Mr. Carney?

Mr. CARNEY. General, just a clarification—in your statement you said that new dredging is comparatively clean. Mostly the dredged material that has the heavy contaminants in it exists in areas that are being utilized for commerce and that type of thing?

General GAY. That is correct. For the new work, you are dredging material that has not been disturbed. Therefore, it has not had a chance for contaminants to get into it.

Mr. CARNEY. Perhaps this question should be addressed to Colonel Smith, or whoever would like to answer the question.

The New York Bight area—if you continue to dump the dredge material from the New York Harbor into the New York Bight area from now until 1985, would it have an adverse effect on the bight? And, if it does, to what extent would that be measured?

General GAY. I think that we have three people here who would say no to that, I for one.

Colonel SMITH. As I was saying, very clearly, everything we know right now, all the data, all the research we have done, comparative analysis to what exists in the mud dump site right now versus what is in the surrounding area, would clearly say, no. We would not significantly degrade the bight.

Mr. CARNEY. You added a phrase in there, “not significantly.” The General said “no,” period. Maybe I should not put a colonel and a general at odds with each other. It might be a great disadvantage to the gentleman who is running New York.

Dr. ENGLER. The term “significantly” refers to the regulations. The regulations require an assessment of a significant impact. Obviously, if you dispose clean sand in a mound, there is an effect and it is a measurable effect. As far as adverse effect from toxic pollutants, bioaccumulation, movement in the food chain, we have seen no effect whatsoever occurring at the mud dump site.

Creatures living on the mud contain body burdens or exotic and natural materials as you find anywhere in the New York Bight area; they are certainly not in excess.

We found no measure of toxics anywhere near the FDA limits regarding human consumption of foodstuff. Other than the physical mounding which is measurable—and one could say significant—you have a mound of material where no mound existed. But from the toxicological standpoint, the answer is clearly no.

Mr. CARNEY. Dr. Byrne, do you believe—I should not say, “Do you believe”—would you like to comment on the New York Bight? The question that was asked of EPA—if it will reach a point where it might be irreversible, no matter what you do. If you stop dumping in the New York Bight, you are not going to change it at all. You cannot recover. Would you like to render your opinion on that? Do you think it is at a point where it might be irreversible? Do you think it could get to a point, if it is not, that it might be irreversible?

Dr. BYRNE. Again, difficult question to answer. I suspect that if we did not continue to monitor it, to understand the processes involved and so on, that if we had not done research on the waste disposal problem, we could inevitably reach a point where we spoiled it sufficiently that it was significant.

On the other hand, we have carried out a significant amount of research that indicates to some degree what safe levels are, what safe processes are. I think that the realistic answer is that we will not reach that point. We will not reach the point where we have so degraded that particular portion of the ocean that it will never recover. That is my answer to your question.

Mr. CARNEY. Thank you.

You have the dubious distinction to be dealing with sludge today. Certainly we cannot stop producing it. We are going to be producing more and more of it. Will NOAA have a role in the evaluation of the other alternatives? Other than ocean dumping?

Dr. BYRNE. Well, to the extent that we work with EPA and the Corps of Engineers and so on, I am sure that as far as this dialog is concerned, we will have a role. We have a role with respect, certainly, to understanding the ocean, ocean research. So my answer to your question is, “yes.”

Mr. CARNEY. Do you agree with the EPA testimony? I am not sure whether you were in here—

Dr. BYRNE. It was a long testimony, sir.

Mr. D'AMOURS. The part of the testimony where they said they think they could have preliminary answers to the research going on in the multimedia aspect of the various methods of sludge dumping. They said they could have preliminary answers or direction within a year and you are taking part in that study. Would you agree that that time frame is accurate? And before I ask this question I want to make one point clear. I, personally, as the chairman of this subcommittee, and I know the staff, does not think that disposal of dredge material is one of our critical problems and I think it only confounds, perhaps, the issue from our perspective. But, nor do we think it is not at least a small part of a broader problem.

I thought I heard you say that if we did remove ourselves from the bight and dumping of dredge, that it would not make much of a difference and that if we continue dumping that it would not do much either further to degrade the area. The Mitre Corp. did a report in May 1979 and the sponsor was the U.S. Army Corps of Engineers, New York district, in which they said that up to 30 percent of the New York Bight's inputs of selected contaminants—and I am not sure I know what selected contaminants means in this case—results directly from the disposal of dredge material. So,

there is some effect, is there not, inasmuch as many scientists are concerned? It is difficult to pin down any one cause because there are several but that ought not to be an excuse for doing nothing, which I think to be the attitude I picked up from EPA earlier. How would you respond to what I see as maybe not a contradiction, but a shade in difference in meaning between this Mitre report and your answers to Mr. Carney.

General GAY. Let me ask Doctor Engler who leads our research to respond.

Dr. ENGLER. The Mitre report—this particular aspect of the report—was concerned with toxic metals. The dredged material that goes out to the New York Bight does account for a large quantity of heavy metals that go to the bight. But, these metals exist naturally in the Earth's crust, in sediments and soils. So, when we measure and analyze a sediment, we are also measuring those natural quantities. Zinc, for instance, 100 parts per million or 50 parts per million wet weight is not uncommon at all, it is an average crystal abundance. If you dumped 10 million cubic yards, which is about 10 million tons, theoretically you have dumped about 500 tons of zinc. These are the figures that comprise that 30 percent of loadings of select contaminants cited in the Mitre report. It is a gross inventory of everything that goes out there, but it is a mix of natural and contaminated material. It also measures what goes out naturally, so it gives an unrealistically high measure of the actual contaminant level of pollution. Obviously there are sediments that are highly contaminated with metals as a result of certain management plans that include point dumping at the bight. That is, one load is dumped, another load is dumped over that. This is the material that passes the bioassay and bioaccumulation, yet still may be somewhat high in metals from an analytic standpoint. These loads are continually covered and the materials are sequestered from the environment, or removed from the environment.

There is some ongoing research on disposal of contaminated material, followed by capping of this material with very clean sediment. So, my answer is based on the fact that we are able, through management considerations, to isolate the unacceptable material from the aquatic environment and for the intermediate contaminated material that passes our environmental criteria. Although we have some element of concern for it, we use a similar management technique such as covering one dump after another. So, that is the basis for my answer.

Mr. D'AMOURS. Thank you very much.

Mr. CARNEY. Mr. Chairman, I have to admit that my stomach could not take another 5 minutes of questioning; it is growling, so I will yield back to the Chair.

Mr. D'AMOURS. Mr. Hughes?

Mr. HUGHES. Thank you, Mr. Chairman.

When you say "sequestered" are you saying that it is buried? Is that what you mean?

Dr. ENGLER. Yes; we know how deep the benthic organisms burrow into the sediment and it is less than 1 meter in depth. Once this material is covered to that depth, it is essentially removed from the environment. We do not find the leaching of contami-

nants. Leaching is a surface effect and, even there, we cannot detect leaching of contaminants from the sediment mound.

Mr. HUGHES. So the storms and the drift and all the other currents do not affect that?

Dr. ENGLER. In the New York mud dumping site we can account for approximately 95 to 99 percent of the material that has been dumped there historically, through subbottom profile measurement of mounds.

Mr. HUGHES. You know, one of the problems that we have is trying to eliminate, through pretreatment and otherwise, things like mercury and cadmium, hard metals from material. Now, are you involved in that effort at all?

Dr. ENGLER. Dealing with the EPA solid waste management program?

Mr. HUGHES. Yes; what role do you have with EPA and other agencies?

Dr. ENGLER. We stay very aware of their programs through our interactions with the Water Programs Office in EPA. We are not directly involved. Now, the corps may well be involved in the Superfund program which deals with the cleanup of hazardous waste fills. With regard to cleaning up permitted discharges at this time, we stay very aware of what they are doing. We certainly feel that the waterways themselves—

Mr. HUGHES. Any efforts at pretreatment that is done by EPA, you are not involved in that at all?

Dr. ENGLER. EPA and the States.

Mr. HUGHES. I see. OK.

Dr. Byrne, EPA testified as follows:

Unfortunately, we cannot determine scientifically the ocean's full ability to absorb and biologically process toxic wastes nor can we fully track the rate and effects of potentially contaminated sludges.

I suspect you have probably heard that statement, Ms. Hurd gave it. Do you agree with that? Dr. Byrne, I think that I alluded to this earlier that we would never have all the answers in that regard. So, you basically agree?

Dr. BYRNE. Yes, but our knowledge base is continually increasing.

Mr. HUGHES. I understand that. The reason that I bring that up is because I was interested in something you said before in response to my colleague from New York about the situation never getting to the point where it is irreversible. I question, scientifically, whether we can say, before it occurs, that that is going to happen. Just as I am not so sure that as long as a jury is still out on this whole area of what we can dump without creating serious health and other problems for us.

Dr. BYRNE. The response that I was making, sir, was from a humanistic point of view. We have a society which is concerned about this problem. If we were to disregard it then my answer would be entirely different. We could conceivably, I am sure, and I think everyone in the room is probably sure, sufficiently degrade any portion of the environment such that it would never recover under certain circumstances.

Mr. HUGHES. Let me just run through a couple more things very quickly.

First of all, it is obviously important for us to have an ongoing research program to try to carry on research that we have undertaken, to learn as much as we can about what we are doing. We cannot do that without money, can we?

Second, it is important to monitor whatever we are doing using whatever base-line studies that exist, to see what changes are taking place and try to factor that into our research. Would that be a fair assumption?

Dr. BYRNE. That is a fair assumption.

Mr. HUGHES. Is it also fair to assume that if we do not do that we could end up someday, finding out after the fact that we have dumped something, that it is irreparable?

Dr. BYRNE. That is a fair assumption also.

Mr. HUGHES. Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you gentlemen for coming.

This meeting is adjourned.

[Whereupon the subcommittee was adjourned at 2:42 p.m.]

[The following was received for the record:]

QUESTIONS SUBMITTED BY MR. D'AMOURS AND ANSWERED BY THE CORPS OF
ENGINEERS

Question. The staff draft established a procedure for reviewing alternatives to ocean dumping if a material is deemed to degrade the marine environment. Given the establishment of this balancing review, do you think that the waiver provision is still necessary?

Answer. The waiver provision would be considered for overriding economic reasons in terms of evaluating alternatives, as well as for national interest reasons. In regard to national interest considerations, the timely dredging of Federal navigation channels, such as the entrance to New York Harbor or the Mississippi River, which are of regional as well as national economic importance, is essential to insure that the flow of commodities such as fuel oil is not unduly impeded.

In several cases throughout the U.S., maintenance of major Federal navigation projects has been unduly delayed because of differences of opinion between resource agencies in interpreting results of laboratory bioaccumulation tests which were developed to implement the provisions of the Act. This has often led to last minute, crisis-oriented meetings between regulatory and resource agencies which have usually resulted in only temporary solutions to the disposal problems. These crisis-oriented situations are often recurring and are becoming increasingly complicated by an increased inavailability of inland disposal alternatives.

The National Environmental Policy Act (NEPA), MPRSA, the Clean Water Act and other appropriate regulatory provisions, require the Corps to carefully evaluate all feasible disposal alternatives. Our evaluations carefully consider environmental as well as economic factors. The Clean Water Act, the MPRSA and other regulations were established for a single purpose and/or for a single disposal medium, and, quite often at the environmental expense of other disposal media. The proposed amendments to the MPRSA have not resolved this problem and, in fact, we feel that the proposed amendment would increase the restrictive regulation of ocean dumping at the expense of alternative disposal media.

Thus, we strongly feel that the waiver provision is still required as a last alternative for certain situations where economic considerations in the national interest would clearly override disposal medium-specific environmental considerations.

Question. How many waivers have been sought since enactment of the Act?

Answer. The prerogative to grant a waiver belongs to EPA, not the Corps. To date, the action with EPA has centered around development of ocean dumping criteria, development of scientific tests and the interpretation of test data. EPA determines whether a particular discharge meets the criteria. If EPA determines that the criteria are not met and if the Corps believes the waiver should be granted based on national economic interests, then such a waiver would be requested. However, the Corps practice has been to try to modify the project in such a way that the

criteria would be met, thus avoiding the need for a waiver. Also, the Corps practice has been to make full disclosure to an applicant at the outset regarding the waiver procedure so that an applicant is fully aware of what would be involved in requesting a waiver.

The waiver provision was considered in the case of dredging the entrance channel at Calcasieu, LA when ocean disposal was the only economically feasible alternative. The EPA Region rejected ocean disposal based solely on the fact that laboratory tests indicated the potential for bioaccumulation. However, the tests were found to be faulty. The material was tested again and found to be acceptable for ocean disposal. Accordingly, the waiver provision was not actually required.

The waiver provision was a potential consideration in the case of dredging in New York Harbor when the material was found to contain PCB concentrations. A controversy developed with EPA over the interpretation of test results, but the matter was favorably resolved, avoiding the need to pursue a waiver.

Question. How many have been denied because of the adverse impacts?

Answer. No permits have been denied because of adverse impacts. A number, mostly from the New York Harbor, have become quite controversial as stated above.

Permits for the ocean disposal of dredged material are quite hard to get due to the exacting alternatives analysis and stringent and costly testing requirements imposed for decision making. In some instances, the difficulties encountered cause private applicants to withdraw or simply stop pursuing a permit before any decision is made. This may have nothing to do with whether or not there are any anticipated adverse impacts—the applicant simply gets worn down and gives up.

Question. Do you have any operational concerns with the sections of the proposed amendments that pertain to site designation procedures, prudent and feasible alternatives and the definition of degradation?

Answer. Yes. The terms “degradation” and “prudent and feasible alternatives,” as defined and used in the proposed amendments, would increase the restrictive regulation of the ocean environment at the expense of other dredged material disposal media, including estuaries and wetlands. The expanded environmental factors of the proposed amendments, which must be considered for all wastes proposed for ocean dumping, would result in prohibiting the ocean disposal of most, if not all, dredged material. Research has shown that most ocean dredged material disposal results in a localized and predominantly physical perturbation to the marine environment. While research has shown that this perturbation is only temporary, it would be prohibited under a strict interpretation of “degradation” as defined. Since the economics of ocean disposal are not a primary consideration in the determination of “prudent and feasible alternatives” within the proposed amendments, either a significantly greater use of the dredged material waiver would be required for ocean disposal, based solely on national interest considerations, or a significantly increased need for land-based alternatives would result. In many coastal areas, these disposal alternatives are not available for the large quantities of sediments that must be dredged.

Available scientific data clearly demonstrate that, for many dredged materials, land disposal in many cases represents the most environmental damaging disposal alternative. These data strongly suggests that, to insure equal consideration of, and equal environmental protection to all disposal media for dredged material, ocean disposal regulations should require that no “unreasonable degradation” is permitted outside the boundaries of established ocean disposal sites. Further, economic factors, as well as other public interest factors, should be given equal consideration to environmental factors in the overall assessment of dredged material disposal impacts and in the evaluation of “prudent and feasible alternatives.”

Available research also indicates that, in evaluating “prudent and feasible alternatives” for disposal of contaminated materials, land-based alternatives may, in many cases, offer little, if any, improved protection to human health as compared to aquatic disposal options. Land-based alternatives have often been found to drastically change the geochemistry of dredged sediments, with a subsequent enhanced release potential of chemical constituents. The Corps is conducting research on innovative aquatic disposal alternatives such as capping to assess the utility of these measures in isolating contaminated sediments from the aquatic environment, and, in turn, to “rapidly render harmless” the contaminants associated with these sediments. The international scientific community has strongly encouraged the pursuit of and experimentation of such innovative aquatic disposal options for contaminated dredged material. Representatives to the LDC feel that the pursuit of these and other innovative aquatic disposal options is within the legal restrictions of the LDC. Therefore, strong consideration should be given to providing sufficient flexibility in amendments to the MPRSA to insure the continued experimental evaluation of

these and other innovative aquatic disposal measures for dredged material, as well to insure the judicious application of these aquatic options, should scientific research demonstrate their environmental acceptability.

The draft of proposed amendments also states that any ocean site with an interim designation on such date of enactment of the amendments, could not be further used until required site designation requirements, including characterization of baseline environmental conditions, are fully compiled with. To date, we have received final designation for five of the Corps approximately 130 historically-used, and interim designated ocean sites. If the proposed amendments to discontinue use of interim ocean sites pending final designation are enacted by this Congress, we estimate that continued disposal at over 90 percent of the Corps ocean sites would be prohibited. In our judgment, this proposed action would create a significant economic hardship to coastal communities throughout the United States, and would, in turn, seriously disrupt our national economy.

Finally, the draft of proposed amendments requires monitoring of all designated ocean disposal sites. Date collection of any kind within the open ocean is extremely expensive. The judicious use of field monitoring is certainly desirable, but, in the case of ocean dredged material disposal sites, only where this need is clearly indicated and only for selected parameters for which research indicates potential environmental concern. In addition, it is not clear within the present language of the MPRSA, nor within the proposed amendments, as to a specific responsibility for monitoring ocean dredged material disposal sites.

QUESTIONS SUBMITTED BY MR. FORSYTHE AND ANSWERED BY THE CORPS OF ENGINEERS

Question. What funds were contributed by the Corps to EPA for the designation of ocean disposal sites for dredged materials in fiscal year 1981?

Answer. \$3.2 million.

Question. What do you estimate will be the Corps' contribution in fiscal year 1982 and fiscal year 1983?

Answer. Fiscal year 1982—\$1.6 million. Fiscal year 1983—\$1 million.

These monies include additional field data requirements for nine navigation projects and, at minimum, eleven interim designated ocean dredged material disposal sites. All required data collection efforts, as well as the preparation of site designation EIS documents for eight of these projects, will be undertaken by the Corps' district offices.

Question. What percentage of the total cost of the program is represented by these funds from the Corps?

Answer. Considering ship time costs which were contracted separately by EPA, the Corps' contribution is approximately 50 percent of overall program costs to date.

Question. Are processing fees charged for dredged material permits and, if so, what percentage of the cost of processing an individual permit is covered by this charge?

Answer. Fees are charged for some ocean disposal permits. The fee is \$100.00 for commercial applicants. No fees are charged to governmental entities, Federal, state or local. The Corps does not keep precise figures on processing costs for ocean disposal permits as generally only about thirty are issued each year, compared to approximately 18,000 per year issued under Section 10 and Section 404 authorities. On average, the Corps spends about \$2,000 to process a permit. Ocean disposal permits, because of the more exacting nature of information requirements and review, may cost two to three times this figure.

Such an estimate may be somewhat misleading, however. Permit applications are reviewed by EPA as required by the Ocean Dumping Criteria. Additional review is provided by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service under the Fish and Wildlife Coordination Act. On some occasions additional review is provided by the National Oceanic and Atmospheric Administration. Such review should legitimately be considered part of permit processing. The Corps has no figures on the costs of these reviews.

Question. Have you considered collecting fees from the permittees to cover the costs of research and monitoring?

Answer. Of all the dredged material which is disposed in the ocean, over 93 percent is from Corps dredging activities. The remaining 7 percent disposed in the ocean is regulated under permit from the Corps. The Corps issues, on an average, about 30 permits per year for commercial dumping, but those quantities are insignificant in comparison with Corps ocean disposal activities. Primarily for this reason, the Corps has not considered user fees to help defray research and monitoring costs. While there could be some monies collected from such a fee, we believe

that the administrative bookkeeping burden on the Corps would be much greater than that collected. Also, the applicant for a permit for ocean disposal already bears substantial costs in terms of biological testing and other expenses associated with complying with the requirements of the permit application.

Question. How many ocean dump sites have received final designation status for the disposal of dredged materials?

Answer. Five of the 57 sites included in EPA's national program. Each of these sites is located in the State of Hawaii.

Question. How many sites are presently going through the designation process?

Answer. The remaining 52 sites under EPA's national program. In addition, site designation efforts are being undertaken by the Corps at Norfolk, Mobile, Galveston, Crescent City, CA, and Coos Bay, OR in conjunction with proposed deepening of these navigation projects.

The Corps is presently placing its priority on completing site designation requirements under EPA's existing national program. Depending on availability of funds and other factors, the Corps will initiate action to designate the remaining interim designated sites (approximately 70) based on the results of the existing program and after EPA has promulgated its planned revisions to the ocean dumping criteria.

Question. What percentage of your active sites are being monitored?

Answer. The major disposal sites (e.g. sites used frequently) are routinely monitored to insure that sediment buildup does not interfere with navigation. Approximately five percent of the sites were monitored in fiscal year 1981 for other effects such as uptake of selected chemical constituents by benthic organisms. Major monitoring efforts include the New York Bight, selected sites within the New England Division, and sites at Coos Bay, Oregon.

Our research indicates that, for the majority of our dredged material disposal sites, the impacts are strictly physical and short-term and are predictable without the requirement for monitoring. This is particularly true of the approximately 70 ocean sites which presently have an indefinite interim designation. Most of these sites are used infrequently (3-5-10 year cycles) and are used for the disposal of clean sand which originates from longshore sediment transport.

At present there is a gray area in the MPRSA as to which Federal agency is responsible for monitoring dredged material disposal sites. NOAA is the lead Federal agency for monitoring overall effects of ocean disposal under the Act. Out of necessity, NOAA's priorities in funding ocean monitoring efforts must remain flexible. These priorities, at present, are in other areas besides dredged material disposal.

The Corps will continue to monitor selected sites, in close consultation with NOAA and EPA. We intend to establish national monitoring guidelines based in part on the results of EPA's ongoing national ocean site designation program and, in part, on results of our ongoing research which is evaluating the long-term effects. We anticipate that specific sites such as the New York Mud Dump will be monitored routinely for certain types of parameters as defined by ongoing programs. However, for most of our 130 ocean sites, a regional approach may be more appropriate where selected representative project types would be monitored and results applied to other projects of that type within the region.

Question. What do you anticipate will be needed to fund your research effort on the long-term effects of disposal operations?

What have you requested in your fiscal year 1983 budget for these activities?

Answer. We anticipate that this effort will require approximately \$10,650,000. The program is scheduled to be complete in 1990. We have included \$1,040,000 in the fiscal year 1983 budget request for our program on Long Term Effects of Dredging Operations.

Question. Do you think new technology could reduce the problem related to the disposal of contaminated dredged materials in the oceans?

Answer. Yes. As we stated in our testimony, scientific data clearly indicate that aquatic (including ocean) disposal of "contaminated" dredged materials may, in many cases, prove less harmful to human health than land-based disposal alternatives. This is due to the fact that, when the dredged sediments are taken from an aquatic environment of near neutral pH, low dissolved oxygen etc., to an upland confined site, the geochemistry of the material may be drastically altered. Through oxygenation, changed pH, temperature changes, etc., the geochemistry of contaminants may be altered from a state in which they are tightly bound to the sediments to a new state in which they become readily available to biota and, ultimately, to humans. This availability can be through plant uptake, runoff from the confined areas back into receiving waters and introduction of available forms of contaminants into groundwater supplies. A similar phenomenon occurs with garden soils, where fertilizers, lime, etc., are added to alter the geochemistry of the sediment so

that the nutrients, trace metals, etc. associated with the soil, are present in a form which can be utilized by garden plants.

Even in ocean disposal, it is quite often desirable to confine these materials within a designated site, as opposed to dispersing the material. The Corps, with great encouragement from Representatives to the LDC, is actively seeking out and evaluating innovative aquatic disposal techniques such as capping contaminated materials with clean sediment, disposal in subaqueous, anaerobic borrow pits, etc., as a means of confining these materials, maintaining the original geochemistry of the dredged sediment, and, in essence, isolating the associated contaminants from the aquatic environment.

If ongoing research on these and other innovative aquatic disposal alternatives for contaminated materials proves them to be environmentally feasible, then the next research step would be to evaluate appropriate existing and/or innovative dredging and disposal technologies to maximize the environmental acceptability of these methods while simultaneously insuring maximum economic efficiency of the dredging/disposal techniques.

Question. What differences exist between the Corps and EPA in interpretation of predictive procedures to evaluate long-term effects of ocean disposal of dredged material, as noted on page 6 of your testimony?

Answer. The acute, or short-term predictive tests (laboratory bioassays for toxicity) and the long-term predictive tests (laboratory bioaccumulation tests) were developed by a joint EPA/Corps technical committee composed of senior scientists and ecologists from each agency's research community.

As stated in the implementation manual for these tests, which was prepared by the joint technical Committee, the results of these predictive tests are not to be used as a sole determinant on decisionmaking regarding impacts, but should be used, along with other available scientific knowledge, in making a final decision regarding impacts. The tests require use of "anticipate worst case disposal conditions" as well as the use of highly sensitive marine test organisms, to include species known to bioaccumulate heavy metals, chlorinated hydrocarbon constituents such as PCB's, etc.

Existing differences between regulatory agencies in interpreting test results center almost exclusively on the fact that several EPA regional offices and other Federal agencies consider that, if laboratory test results indicate any bioaccumulation, then the material is considered totally unacceptable for ocean disposal. However, this is contradictory to the intent of the tests which were developed as a conservative predictor, or "red flag", of impacts to be used along with other scientific knowledge in assessing impacts. The extensive research conducted to date by EPA and the Corps as well as independent, national and international research has demonstrated that many marine species naturally regulate heavy metals and other contaminants of concern. This research shows not clear-cut trends regarding impact from bioaccumulation.

The Corps and EPA have initiated joint research on long term effects of dredged material disposal to include an assessment of the ecological significance, if any, of bioaccumulation.

QUESTIONS SUBMITTED BY MR. D'AMOURS AND ANSWERED BY NOAA

Question 1. Preliminary estimates from NOAA indicate that sewage sludge dumping could increase from the current seven million wet tons to 17 million wet tons per year in the Boston-Washington corridor by 1987. Has NOAA made a forecast of the possible impact from such dumping?

Answer. We have hypothesized the consequences of transferring the present annual sewage sludge volume of seven million wet tons from the New York Bight to the 106-mile site. Forecasting the impact of a larger volume is difficult due to the unknown character of the sewage sludge and what sites might be used.

Question 2. Does NOAA believe that we have sufficient knowledge to implement a multi-media waste management program on a regional basis?

Answer. NOAA and the community of marine scientists can define the expected environmental consequences of ocean disposal. Other agencies can evaluate the environmental effects of disposal in other media, including the economic ramification. A cooperative effort should be successful in developing comprehensive, regional multi-media waste management plans.

Question 3. Current federal regulatory measures are generally directed at individual pollutants or activities, yet marine ecosystem degradation results from the accumulated impacts of all pollution sources, including adverse effects of habitat change or loss. Does NOAA have any recommendations on how to deal with this problem?

Answer. The consequences of ocean disposal on the quality and quantity of wastes and the method and location of discharge. Knowing the actual or projected quantity and chemical/physical characteristics of all wastes slated for disposal at a given site should allow estimation of the steady-state and accumulating distribution of contamination, as will sound knowledge of the physical and biological characteristics of the disposal site.

Once wastes are in the ocean, it is more difficult to differentiate among several which may have been discharged at the same site. The site should be managed on a total use basis, not with each potential waste being considered independently of all others. This implies that comprehensive regional waste management plans be drawn up that consider total waste identification and source control.

QUESTIONS SUBMITTED BY MR. BIAGGI AND ANSWERED BY NOAA

Question. Is the New York Bight Apex among the most intensively studied areas of the world's oceans?

Answer. Although it would be difficult to rank areas in absolute terms, the Apex and surrounding area is generally recognized by scientists and environmental managers to be among the most intensively studied coastal regions in the world, both in terms of level of activity and breadth of scientific and managerial inquiry.

Question. During the period when the New York Bight has been subject to scientific study, has there been any indication that there is progressive degradation? If so, please list the type of progressive degradation observed and provide details as to how such progressive degradation of the Bight has been determined?

Answer. During this relatively short period there has been so detectable increase in the areal extent or intensity of degradation. The less than 10 years of intensive research in the Bight follows more than 100 years of domestic and industrial waste inputs. On balance, the waste inputs to the Bight have remained somewhat similar for at least twenty years. The lack of a detectable increase in degradation could mean that the Bight is approximately in steady state with regard to pollution, or the variations in its state may be large enough to obscure any trend which does exist.

Question. If sewage sludge dumping at the 12-mile site were to cease would there be any measurable improvement in the New York Bight Apex within one year? Five years? Twenty years?

Answer. If sewage sludge dumping were to cease at the 12-mile site some relatively minor improvements would probably occur over a five to 20 year period.

A possible decrease in human pathogens at and around the 12-mile site might lead the Food and Drug Administration (FDA) to consider reopening some areas to shellfishing (but the region around the dumpsite is not a major bivalve-producing area). But it is also possible that existing pathogens would persist in the sediments for years and preclude reopening the inner Bight to shellfishing.

A definite improvement should occur in public confidence and assurance in using New Jersey and Long Island beaches. Water quality at beaches and beach quality, per se, will not be improved, however, as they are determined by local activities and by stranded materials from widespread sources.

Concentrations of artifacts derived from sewage sludge dumping will probably decrease in the topographic lows north of the Christiaensen Basin.

There should be measurable decreases in the amounts and concentrations of PCBs, and bacterial pathogens and indicators in sediments and in associated biota.

The slight amelioration of measurable impacts will occur over a limited geographical area—some 200–1,000 km² (80–400 mi²).

The benthic community in the small area immediately west of the sewage sludge site should tend to become more normal, but the benthic degradation over wider areas (80–400 mi²) may not change noticeably.

Question. Was sewage sludge dumping a major causative factor in either the anoxia of 1976 of the beach contamination of that same year?

Answer. Sewage sludge dumping was not a major causative factor in either of these 1976 environmental episodes. Both episodes have been the subject of considerable study by NOAA and others. A MESA Special Report entitled "Long Island Beach Pollution: June 1976" was published February 1977 and a NOAA Professional Paper (No. 11) entitled "Oxygen Depletion and Associated Benthic Mortalities in New York Bight, 1976" was published in December 1979. Natural, but anomalous meteorological conditions were found to be the important factors which affected the transport and accumulation of material in both instances. Evaluation of the origin of material found on Long Island beaches showed most to be floatables from numerous sources, the majority of which were located within the Hudson-Raritan Estuary.

In the case of the oxygen depletion episode, most of the oxygen demanding material which accumulated in the affected region (and accounting for the oxygen consumption in bottom waters) was the dinoflagellate, *Ceratium tripos*. This organism was widely distributed throughout the Middle Atlantic Bight in unusual abundance during the spring. Model studies have concluded that sewage sludge in the absence of the dinoflagellate would not have caused the episode in 1976.

Question. Is sludge dumping a principal source of contaminants such as trace metals, synthetic organics, and pathogens to the New York Bight Apex?

Answer. No, sewage sludge dumping contributes only 1 to 10 percent of the total inputs of most contaminants. PCB's are an important exception; nearly one-fourth (25 percent) of the total loading of PCB's to the Bight comes from ocean dumped sewage sludge. The fraction of pathogens entering the Bight via sewage sludge is discussed in answer to Congressman Forsythe's question 2.

Question. Has the incidence of fish diseases in the New York Bight Apex changed over the past few years? If so, how?

Answer. The incidence of fin fish disease thought to be related to pollution has decreased over the past decade. This does not mean that water quality has improved. Current hypotheses are numerous, but some investigators believe that a range of fish species may "develop an immunity" to pathogenic bacteria and viruses.

Question. Except for those species that live or migrate into Raritan Bay and the rivers, are any organisms found within the New York Bight highly contaminated with toxic compounds such that they are unsafe for human consumption according to FDA standards? If so, is there any evidence that the contaminants in these organisms are obtained primarily from sewage sludge?

Answer. Species that live or migrate throughout the New York Bight, but not through the Hudson-Raritan Estuary, are seldom contaminated with toxic compounds such that the tissues exceed FDA levels. However, many fish taken from the New York Bight and Middle Atlantic Bight do contain measurable amounts of PCBs, petroleum hydrocarbons, and other organic contaminants.

Because of the multiplicity of sources of these contaminants their presence in fish tissues cannot be directly attributed to sewage sludge.

QUESTIONS SUBMITTED BY MR. FORSYTHE AND ANSWERED BY NOAA

Question 1. Will the elimination of funds for fiscal year 1983 for the ocean dumping program under Section 201 of the MPRSA affect the investigations on specific wastes or specific dumpsites? How will the decreased funding affect the laboratory research effort?

Answer. NOAA has identified portions of the present ocean dumping program that are of relative lower priority and that will not be continued with funds budgeted under other activities. Work will end at the pharmaceutical waste site near Puerto Rico. The wastes are now processed and discharged through a sewage treatment facility; plans to compare the marine environmental impacts of this means of disposal with the previously used ocean dumping technique have been cancelled. NOAA will also discontinue its investigation of the impacts associated with disposing fish processing wastes; because these wastes do not contain significant quantities of toxic materials, disposal options seem to be sufficiently known. Studies of the impacts of dredged material disposal will be discontinued, although staff time will be allocated for keeping abreast of results from Corps of Engineers studies on this subject. Since there is no active radioactive disposal at this time, NOAA will discontinue its small effort in this area.

The complimentary laboratory research previously supported by Section 201 funds will be eliminated, as will support for the Northeast Monitoring Program. However, approximately 20 percent of the funds in the Section 202/Section 6 budgets will be used to conduct fundamental research on the fate and effects of contaminants which will have direct relevance to ocean disposal of sewage sludge.

Question 2. You made a statement that your current findings show that sludge dumping is not a significant contributor to the low water quality of the New York Bight nor is it responsible for swimming-associated illness. However, you go on to say that a significant fraction of the bacteria and viruses reaching the sediments of the inner Bight is probably derived from sewage sludge.

What do you mean by "probably" derived from sewage sludge?

Do we know whether this is having an adverse impact on the marine ecosystem or whether it is a human health hazard?

Answer. In testimony on March 18, 1982 NOAA stated that sludge dumping "has a detectable contribution to poor water quality only over small time and space

scales". This is due to the flushing characteristics of the Bight which transports out of the Bight those sludge-derived contaminants which remain in the water column. Bacteria and viruses from sludge which are not associated with rapidly settling particles would be transported away from bathing beaches and therefore are not the cause for swimming-associated illnesses. Such illnesses are more likely caused by bacteria and viruses discharged with sewage effluent in rivers and estuaries. Available data shows that more than 99 percent of the total load of bacteria and viruses of human origin to the Bight are introduced through the Hudson-Raritan Estuary. These remain in the coastal zone. However, sludge is probably the source for most of whatever bacteria and viruses are found in the sediments near the 12-mile site.

No adverse ecological impacts from sewage sludge bacteria or viruses are evident at present. Sewage sludge contributes in a minor way to the human bacterial and viral concentrations of Apex sediments, but probably contributes most significantly to a potential public health hazard from shellfish consumption. This has led to shellfish closures by the Food and Drug Administration within a circle of radius 6 n mi around the sewage sludge dumpsite, and shoreward to New Jersey and Long Island.

Question 3. With regard to your studies at the deepwater dumpsites, are you going to continue with studies to determine whether or not increased dumping would have minimal effects?

Are there alternative strategies to dumping at just the one deepwater site?

Answer. Projects funded in fiscal year 1982 deal specifically with the physical oceanography of deep water beyond the northeast continental shelf, sewage sludge settling behavior, and responses to sludge of open ocean organisms. This will continue in fiscal year 1983, using long-term effects funds.

The 106-mile site is the closest deepwater site to New York, but it is not unique relative to other deepwater locations off the U.S. east coast. Much of what is learned or projected about dumping at the 106-site is readily transferable to consideration of other sites. If a number of east coast communities do, in fact, become sources of sewage sludge to the deep ocean, it may be better environmentally and economically that they not all use the 106-site. The major argument for all deep ocean dumping at a single location would be that—if a benthic accumulation of waste is inevitable (so that some benthic life is lost)—piling all waste at the same place would limit the spacial extent of damage. However, if waste is dispersed so that benthic organisms do not suffer, then dumping at a variety of sites should enhance effective dispersion.

Question 4. You have indicated that you will continue with the critical elements of the ocean dumping program using funds budgeted for Section 202 and Section 6 activities.

What do you consider to be the "critical elements"?

How much money will be diverted to cover these critical elements?

What activities will not be funded as a result of this diversion of funds?

With regard to your Long-Range Effects Research Program, what percentage of the funds will be directed toward ocean dumping-related problems?

Answer. We consider the most critical elements to be continued characterization of the 106-mile dumpsite, because there are strong indications it may be proposed for sewage sludge disposal; accelerated study of the behavior and fate of sewage sludge particles; development of guidelines for disposal site selection; and development of useful monitoring techniques. We intend to use \$1,000,000 in other funds to support these efforts in fiscal year 1983. As a result of this diversion of funds, we will be unable to continue our support for research on cycling of toxic organics in the Great Lakes, will suspend completion of Environmental Sensitivity Index mapping of the coastlines, and eliminate planned efforts on the assessment of fate and risks of hazardous chemical spills and on development of new trajectory analysis for spill contingency planning.

Approximately 10 percent of the Long-Range Effects Program and 70 percent of the Hazardous Materials Response Project budgets will be diverted to support the critical elements described above. In addition, a significant portion (about 20 percent) of the combined LREP/Section 6 effort will support fundamental research on fate and effects of contaminants which will have direct relevance to sewage sludge dumping.

Question 5. Should the oceans be considered as a disposal medium for all types of wastes?

Answer. In theory, the oceans can be considered as a disposal medium for all wastes. However, the extreme toxicity or persistence of certain types of wastes make ocean disposal environmentally unacceptable unless elaborate controls were to be established. Another means of disposal may then be preferable, such as incineration of concentrated organic chemicals, either on land or at sea.

Question 6. Are changes needed in the Ocean Dumping Act in order to preclude the dumping of harmful wastes and, if so, why?

Answer. The Act has been in force since 1973. Except for dredged material, no permits have been issued to any waste generator except those already using the ocean prior to 1973. The Act is probably adequate to discourage ocean-use if properly interpreted and implemented, although there is always room for minor improvements.

Question 7. Will the effect of the Sofaer decision be to allow more coastal cities to go back to the oceans for disposal of their wastes because of the "economic" considerations?

Answer. While we cannot foretell the ramifications of legal decisions, it appears the Judge Sofaer decision implies that all consequences of all alternatives to sludge disposal be considered prior to prohibiting one (ocean dumping). Economics will be one consideration in this process.

Question 8. Your budget justification for substantial decreases in your ocean dumping program indicates that many of NOAA's activities focus on local or regional projects which should be carried out at that level. Will the states take responsibility for their ocean dumping activities that may affect another state's waters or marine environment?

Do the states have the expertise or appropriate research vessels to carry out these activities?

Answer. We do not know if states will continue projects initiated by NOAA. Some states have expertise and access to vessels, if they house oceanographic institutions or universities with oceanographic departments. However, all the particular expertise required in a given situation may not be within the state. There are, to our knowledge, no state government agencies comparable to NOAA in concept or overall expertise. Further, difficulties may arise concerning problems cutting across state boundaries and jurisdictions.

Question 9. Is it possible to determine the economic value of a fishery resource and its food source within a designated site area?

Answer. It is possible to assign an economic value to a fishery resource with limited movements (particularly sedentary shellfish) within a designated site area. It is also possible to assign an economic value to the portion of a more mobile fishery resource which migrates through a particular site, but the extent of resource loss or degradation will generally be unknown in such migratory cases.

The economic value of resource food sources within a site area can be assigned only arbitrarily, whatever rationale is employed. While such arbitrary values may be useful for perspective, they may have little relationship to the broad social value of the food resource.

Question 10. Do we know the long-term sublethal effects of pollutants, individually or in combination, on marine species throughout the food chain?

Answer. Our knowledge of long-term sub-lethal effects of pollutants is limited but increasing rapidly. For contaminants such as PAHs, specific PCBs, several heavy metals, and certain gross petroleum hydrocarbons, we do know something about long-term sub-lethal effects. For example, exposure to certain PAHs or petroleum hydrocarbons results in implementing the production of mixed function oxidases. These enzymes break down certain organic molecules into simple constituents. We also know that certain materials such as a range of the DDTs are also broken down into simple molecules which may be even more toxic than the parental molecules. We know, further, that a range of marine organisms, when exposed to toxic metals, develop an immunity to them. Equally important, we are beginning to understand something about the ability of marine animals to accumulate low levels of pollutants through increased enzyme levels, development of partial immunity, or other mechanisms.

Finally, we know from laboratory studies, and more recently from certain field studies, that exposure to very low levels of the aforementioned contaminants can result in impaired reproduction, survival of eggs and larvae, and even mortality in adult organisms.

Question 11. Are you under any time constraints in providing EPA with new information or analyses in support of their site designation program?

Have you requested sufficient funds to produce scientific information in time to meet decision deadlines?

Answer. We understand that there is an EPA requirement to designate approximately 130 dumpsites, about 124 of which are dredged material sites. NOAA reports, data, and comments were used in designating those sites which are now legally established.

We are working with EPA to establish a timeframe for production of dumpsite assessments required if ocean dumping of non-dredged wastes increases and decisions on amounts and locations are required. We have not requested additional funds for this activity.

Question 12. Is there agreement among Federal agencies and in the scientific community as to what would be considered an adequate research and monitoring program for ocean dumping and, if so, what are the most essential features of such a program?

Do we have an adequate program now?

Answer. There is general agreement that research and monitoring should include work on the overall effects of multiple wastes, effects of dumping mixed wastes in deep areas, and the need for evaluating the ability of waters to accept certain volumes and concentrations of wastes with acceptable impact.

The present research and monitoring program does not meet all the needs required in the immediate future, but does stress accomplishment of the most urgent problems.

Question 20. To what extent does NOAA work with EPA in monitoring the dumpsites?

Answer. Based primarily on research by NOAA in the New York Bight, the New York Bight Project of OMPA developed a monitoring plan with emphasis on the most contaminated inner Bight. The plan was implemented by OMPA, in close collaboration with EPA, from 1977 to 1980. In fiscal year 1980 NOAA integrated its monitoring activities off the entire northeast coast. This Northeast Monitoring Program (NEMP) incorporated the OMPA monitoring plan. NEMP was designed in consultation with EPA, and works closely with EPA to provide the information required by EPA in managing dumpsites. Such information includes any change in the ecological status at and near dumpsites, warning of exceptional oxygen depletion, and monitoring long-term changes in pollutant concentrations and biotic effects. In addition to NOAA providing information to EPA, data is routinely exchanged by the agencies and assessments are made jointly. Currently, NOAA's Northeast Fisheries Center is also working with EPA (Environmental Research Laboratory, Narragansett) in monitoring specific dumpsites.

QUESTION SUBMITTED BY MRS. SCHNEIDER AND ANSWERED BY NOAA

Question. What is the position of NOAA regarding whether or not disposal of nuclear wastes on or under the seabed could be authorized under the ocean dumping permit program pursuant to the MPRSA?

Answer. Disposal of low-level radioactive wastes at-sea is allowed under the MPRSA, although the U.S. has not done so since the mid-1960s. As a contractee to the London Ocean Dumping Convention, the U.S., if it were to resume such radioactive waste dumping, would be constrained by the Convention's limitations on amounts and locations. Dumping on the continental shelf, for example, would be precluded.

The London Ocean Dumping Convention and the MPRSA both define high-level radioactive waste and prohibit its being ocean dumped. It is our opinion that disposal of high-level nuclear wastes on or under the seabed is prohibited under the MPRSA.

QUESTIONS SUBMITTED BY MR. D'AMOURS AND ANSWERED BY EPA

Question. Does EPA consider the London Dumping Convention (LDC) legally binding on the U.S.?

Answer. Yes. As long as the U.S. is a signatory of the Convention, its provisions are binding on the U.S. and, of course, the Agency. Furthermore, EPA's ocean dumping criteria are specifically required to be at least as stringent as the LDC under the MPRSA. EPA believes that it has, in the past, acted in compliance with the LDC, and intends to continue to comply fully with its provisions in the future.

Question. The NACOA Ocean Dumping recommendations specified that "The federal program for ocean pollution research, development, and monitoring must emphasize research and monitoring relevant to the disposal of wastes of all kinds on various oceanic environments."

Have designs for the monitoring of ocean dumpsites been developed within the Agency? What is the timetable for implementation?

Will the Agency include field assessments of long-term bioaccumulation in any research and monitoring plan?

Does EPA plan to do long-range assessments of environmental impacts of ocean dumping of different waste materials?

Answer. EPA and NOAA are collaborating on a number of ocean monitoring and ocean pollution issues. One of the most advanced projects is a joint monitoring program for the Atlantic continental shelf from New England to North Carolina. We are now monitoring the major waste dumpsites as well as the general marine environment using an expanded list of environmental measures. Measurement of materials known or suspected of bioaccumulation is an important feature of this monitoring plan. Results of the first year's operations should be available in the fall.

EPA is also doing long range assessments of environmental impacts of ocean dumping. Our work in this area is divided into two parts. First, we are developing better laboratory test procedures for characterizing wastes and thus potential for long-term impacts. Second, we are evaluating different areas in the ocean for their suitability to accept and safely process different kinds of wastes. We have been testing dredged spoil for some years now. Sewage treatment residues are being tested this year using this approach.

Question. Preliminary estimates from NOAA indicate that sewage sludge dumping could increase from the current seven million wet tons to 17 million wet tons per year in the Boston to Washington corridor by 1987. Do you agree with this forecast? Has EPA made an analysis of the possible impacts from such dumping?

Answer. Assuming that the municipalities currently ocean dumping their sludge continue such dumping, it is projected that by 1987 approximately 12 million wet tons per year will be dumped. The NOAA projection assumes that new municipalities will also be ocean dumping sludge by that year. However, as of now it is not clear that all of the municipalities now ocean dumping will continue to ocean dump their sludge, or which, if any, municipalities will begin ocean dumping. EPA is currently cooperating with NOAA/NMFS to assess the potential impacts of municipal sludge dumping in or near the New York Bight. This evaluation will be used for site designation purposes. Assessment of the possible impacts of dumping particular municipal sludges must be made on a case-by-case basis. Such an analysis will, of course, be made before any municipal sludge ocean dumping permit is issued.

QUESTIONS SUBMITTED BY MR. BIAGGI AND ANSWERED BY EPA

Question. Do you support the concept of multimedia risk assessments in evaluating waste disposal options? Does the regulatory framework which currently exists under the MPRSA embody such an approach?

Answer. We believe that integrated waste management should be used in determining the best waste management and disposal options in any given situation. Such a management approach would include multimedia risk assessments of the human health and environmental impacts of feasible alternative disposal options. It would also enable us to encourage the recycling or reuse of materials and the reduction of the quantities of sludges produced, where feasible.

The regulatory framework under which we are currently operating the ocean dumping program does embody this approach.

Question. Do you concur in the recommendations of the National Advisory Committee on Oceans and Atmosphere study ("The Role of the Ocean in a Waste Management Strategy") that the ocean should be considered an environmentally sound alternative for waste disposal?

Answer. Yes, we concur with the recommendations of that NACOA study that the ocean should be considered an environmentally sound option for the disposal of certain kinds of wastes. We also agree with that study that proper testing and analysis must be conducted before wastes are permitted to be dumped in the ocean, and that continuing monitoring is necessary to ensure that unreasonable degradation of the marine environment does not occur. We further agree that materials should be recycled or reused where feasible.

Question. Various environmental statutes under the jurisdiction of EPA regulate the disposal of waste materials. Can you address the following potential conflicts between regulated medium: Is it easier or more difficult to effectively monitor ground-water or ocean waters for contamination from waste disposal?

Answer. Monitoring of environmental media such as ground and marine waters is comprised of monitoring pollutant concentrations and monitoring the effects of pollution.

Monitoring pollutant concentrations is more easily done in groundwater. This is because movement and dispersion of groundwater pollution is so slow. In the oceans there is rapid dispersion of a waste dump over and through an enormous volume of water. In this case, contaminants are almost impossible to find because of the very low concentrations that result from high dilutions and rapid dispersion.

Monitoring the effects of pollution in the ocean has been done in a number of cases, and in this regard the monitoring of the oceans and groundwater are more nearly equal.

Question. Is the potential for recovery from contamination greater in the ocean or the groundwater?

Answer. There are a number of forces that diminish the import of pollution in the ocean. They include a large volume of water that can dilute the pollutant, and the opportunity for sedimentation which can remove pollution from the water column to the ocean floor, where it will be eventually covered. The oxidation and biological degradation of waste materials is common in the ocean environment.

While any of these natural pollution abatement systems found in the ocean can be overwhelmed by wastes of certain quality or of sufficient volume, most of these natural systems do not benefit groundwater, or if they do, do so at an insignificant rate. While some groundwater contamination can be removed through bacteriological action, the usual method of groundwater treatment is to withdraw (pump) the groundwater to the surface for treatment. The general consensus is that, absent treatment after extraction, contaminated groundwater remains contaminated indefinitely.

Question. Does contaminated groundwater pose a potentially greater human health and environmental risk than contamination of a similar area of coastal ocean?

Answer. As far as direct human health risks are concerned, evaluating groundwater contamination against ocean pollution is best done by comparing two things, the potential paths to humans and the adequacy of preventive surveillance of those paths.

In the case of groundwater, the paths are simple—direct consumption as a water source, or physical contact where the contaminated groundwater emerges to become surface waters. Both paths are very common in the United States. Unfortunately, surveillance of most small well systems for contamination is non-existent.

For ocean and coastal waters the direct human health links are through body contact and ingestion through swimming or through consumption of contaminated food stuffs. Fortunately, city, State and Federal health agencies routinely monitor these pathways and cases of illness due to contaminated food stuffs or swimming in contaminated ocean beaches are virtually non-existent. However, because of ocean currents and movement of aquatic life, a direct cause and effect relationship is more difficult to define within the ocean environment.

Question. Is there any waste material currently dumped which it can be stated unequivocally does not contain some concentration of carcinogens, teratogens, or mutagens? Would a prohibition on dumping of carcinogens, teratogens, and mutagens prohibit issuance of a permit for ocean disposal of sewage sludge, of dredged materials, and/or of all currently ocean dumped materials?

Answer. It cannot be stated unequivocally that any given material does not contain some amount of carcinogens, teratogens, or mutagens. For example, all materials contain some background levels of radionuclides, which fall into these categories. Therefore, an absolute prohibition on the ocean dumping of carcinogens, teratogens and mutagens, regardless of concentration, would probably prohibit the issuance of ocean dumping permits for all materials, including those currently being ocean dumped.

Question. Has EPA published guidance documents setting forth acceptable sewage sludge bioassay and bioaccumulation testing procedures?

Answer. Separate bioassay tests for different types of material have not been developed. The bioassay procedures applicable for any material are included in two separate manuals. "Bioassay Procedures for the Ocean Disposal Permit Program," published by EPA in 1978, contains appropriate bioassay tests for the liquid and suspended particulate phases of sewage sludge. "Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters," published jointly by EPA and the Corps of Engineers in 1978, contains appropriate bioassay tests for the settleable solid phase of sewage sludge.

Question. Have the dredged materials disposed of at the site remained relatively stable over the course of the disposal there?

Answer. Dredged material, when disposed of in the ocean, is subject to the normal currents of the area. This results in the gradual dispersal of the dredged material over a wide area. Occasionally, storm events result in a faster and more extensive dispersal. It is this dispersal over wide areas that is depended on to prevent environmental degradation outside the site boundaries. In this sense, the Mud Dump has remained relatively stable over many years of disposal.

Question. Does the 35' mound at the Mud Dump site pose a hazard to navigation? At projected levels of dredged material disposal, what is the future capacity of the Mud Dump site?

Answer. The mound in the northwest corner of the site presently does not pose a navigational hazard. A continued buildup of this mound could have resulted in a hazard. However, since direct dumping of dredged material in this area was directed to other areas, there has been erosion of the mound. An EPA sponsored survey in 1980 indicated that the height of the apex of the mound had decreased about four feet since 1978.

Because of the many variables involved, it is not possible to firmly predict the life of the Mud Dump site. However, based on the information available at this time, we estimate the useful life of the site to be in the neighborhood of 10 years.

Question. Do you concur with the estimate in the Draft EIS on the Mud Dump Site that relocation of the disposal site to a 106 mile location would result in increased transportation costs of between \$43 million to \$66 million without any environmental benefit?

Answer. Based on the transportation cost of \$0.06/yd³/nmi and annual dredging of 8 to 11 million yds, estimated additional annual costs of \$48 to \$66 million are correct. However, the cost of transportation of dredged material varies with several factors, and the \$0.06/yd³/nmi may now be on the low side. Thus, these projected annual costs may be slightly low.

The Draft EIS, on page xiii, stated that relocation of the 106 mile site would result in "... added economic costs without significant environmental benefits. . . ." This conclusion was reached after balancing the environmental benefits and environmental detriments of such a move to the affected areas. The specific reasons for rejecting the 106 mile site are summarized on page 2-7 of the Draft EIS and explained more completely on page 2-9. We believe these reasons are still valid, and so concur with the conclusion that relocation to the 106 mile site would result in increased costs without significant environmental benefits.

Question. What would the energy costs be of moving the site to the 106 mile location? Would it be logistically possible to dispose of dredged materials from the New York Harbor at the 106 mile site?

Answer. The energy costs are a substantial portion of the estimated \$48 to \$66 million annual costs. Logistically, it is "possible" to dispose of the dredged materials from New York Harbor at the 106 mile site. However, because such factors as more open water to traverse and hauling time, the logistics of disposal at the 106 mile site would be more complicated than disposal of a site nearer shore. As explained in the Draft EIS, these costs and delays of relocating the site to the 106 mile site would not be offset by significant environmental benefits.

Question. What research and monitoring have been performed on the Mud Dump Site and, in summary form, what are the findings?

Answer. A list of studies conducted in the vicinity of the Mud Dump site and summaries of the results of these studies from the Draft EIS on that site are attached. The composite evaluation of the results of these studies provided the basis for recommending the permanent designation of the Mud Dump Site. Continuing research and monitoring activities by EPA and the Corps of Engineers are currently ongoing at the site.

DRAFT EIS
 TABLE B-1
 HISTORICAL SURVEYS IN THE VICINITY OF THE MUD DUMP, 1948-1980
 (abbreviations listed at the end of the table)

| Date | Sponsor/ Investigator | Purpose | Source |
|------------------|--------------------------|--|----------------------------------|
| Jan 1980 | EPA/IEC | Bathymetric survey of the Mud Dump and Cellar Dirt Sites | This report |
| Oct 1979 | EPA/IEC | Geochemical and biological survey of the Mud Dump and Cellar Dirt Sites | This report |
| May-June 1979 | EPA/IEC | Geochemical and biological survey of the Mud Dump and Cellar Dirt Sites | This report |
| Summer, 1978 | CE/OGE | Bioaccumulation study on <u>Homarus americanus</u> | O'Brien and Gere Engineers, 1979 |
| Aug-Sept 1978 | CE | Bathymetric survey of the Mud Dump | NYD-CE files (unpublished) |
| Jun 1978 | EPA/TERECO | Development and application of a biological ocean monitoring system to study ocean-dumping impacts | Pequegnat et al., 1978a; 1980 |
| May 1978 | NOAA [*] /SUNY | Geochemical study of the dredged-material deposit | Dayal et al., 1980 |
| Jan-Dec 1977 | NOAA/NMFS | Monitor dissolved-oxygen levels | Steimle, 1978 |
| Sept 1976 | NOAA [*] /ACML | Water-column characterization cruise† | Hazelworth et al., 1977a |

TABLE B-1. (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|-------------------|--------------------------|---|------------------------------------|
| Aug-Sept 1976 | CE/Enviroqual | Chemical contaminants in dredged sediments | Lee and Jones, 1977 |
| Aug-Sept 1976 | CE/Union Texas | Evaluation of elutriate tests to predict con- tamination in open- water dredged material disposal sites | Lee et al., 1978 |
| July-Sept 1976 | NOAA/NMFS | Investigate oxygen depletion phenomena | Steimle, 1976a,b |
| June 1976 | NOAA*/ACML | Water-column characterization cruise† | Starr et al., 1977 |
| Apr 1976 | NOAA*/ACML | Water-column characterization for water-movement analysis | Hazelworth et al., 1977b |
| Dec 1975 | NOAA*/ACML | Water-column characterization cruise† | Kolitz et al., 1976b |
| Sept-Oct 1975 | NOAA*/ACML | Water-column characterization cruise† | Starr et al., 1976b |
| May-June 1975 | NOAA*/ACML | Water-column characterization cruise† | Kolitz et al., 1976a |
| Apr 1975 | NOAA*/ACML | Water-column characterization cruise† | Hazelworth and Darnell, 1976 |

TABLE B-1 (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|------------------------|--------------------------|---|---------------------------------|
| Mar 26- Apr 9, 1975 | ERDA/BNL | Food-chain dynamics | Walsh et al., 1976, 1978 |
| Mar 1975 | NOAA* /NMFS | Obtain data on demersal finfish | Azarovitz et al., 1976f |
| Mar 1975 | NOAA* /NMFS | Obtain data on demersal finfish | DOC, 1975 |
| Feb-Mar 1975 | NOAA* /ACML | Water-column characterization cruise† | Hazelworth and Darnell, 1976 |
| Jan 1975 | NOAA* /ACML | Water-column characterization cruise† | Starr et al., 1976a |
| Oct 1974 | L-DGO | Water-stratification studies | Gordon et al., 1976 |
| Sept-Oct 1974 | NOAA* /NMFS | Study of demersal- finfish catches by by species and station | Azarovitz et al., 1976e |
| Aug-Sep 1974 | NOAA* /NMFS | Determine distribution and abundance of benthic invertebrates | Pearce et al., 1976a |
| July-Nov 1974 | NOAA* /ACML | Water-column characterization cruise† | Hazelworth et al., 1975b |
| Apr-Nov 1974 | NOAA/ACML | Oxygen-depletion studies | Segar and Berberian, 1976 |

TABLE B-1 (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|----------------------|--------------------------|---|--------------------------|
| June 1974 | EPA | Collection of salinity, temperature, dissolved-oxygen, and coliform data | EPA, 1974 |
| Mar-May 1974 | NOAA* /ACML | Water-column characterization cruise† with recovery of bottom pressure gauges | Charnell et al., 1976 |
| May 1974 | NOAA* /NMFS | Fish-egg mutagenesis | Longwell, 1976 |
| Apr-Jun 1974 | NOAA* /ACML | Water-column characterization cruise† | Hazelworth et al., 1975a |
| Apr-May 1974 | NOAA/NMFS | Obtain data on demersal finfish | DOC, 1974b |
| Apr-May 1974 | NOAA* /NMFS | Study of demersal-fish catches by species and station | Azarovitz et al., 1976d |
| Mar 1974 Feb 1975 | NOAA* /NMFS | Determine baseline seabed oxygen consumption | Thomas et al., 1976 |
| Mar-May 1974 | NOAA* /ACML | Water-column characterization cruise† with deployment of bottom pressure gauges | Charnell et al., 1976 |
| Jan-Aug 1974 | NOAA* /MSRC | Provide data on sea surface movements | Hardy et al., 1976 |
| Jan-Feb 1974 | NOAA/NMFS | Collected phytoplankton, benthos, trace metals, salinity, and temperature data | DOC, 1974a |

TABLE B-1 (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|------------------|--------------------------|---|--|
| Oct-Nov 1974 | NOAA * /NMFS | Study of demersal- finfish catches by species and station | Azarovitz et al., 1976c |
| Sept-Nov 1973 | NOAA/MESA | Study of suspended particulate matter | Drake, 1974 |
| Autumn 1973 | NOAA/AMOL | Organic carbon in sediments | Hatcher and Kaister, 1976a,b |
| Aug-Nov 1973 | NOAA * /ACML | Water-column characterization cruise† | Hazelworth, 1974 |
| Aug 1973 | NOAA * /NMFS | Determine abundance and distribution of benthic invertebrates | Pearce et al., 1976b |
| Jun-Aug 1973 | NOAA * /CE | Bathymetric survey of the Apex | Freeland and Merrill, 1976; Freeland et al., 1979 |
| June 1973 | NOAA * /NMFS | Determine abundance and distribution of benthic invertebrates | Pearce et al., 1978 |
| May-June 1973 | NOAA * /NMFS | Study of demersal- finfish catches by species and station | Azarovitz et al., 1976b |
| Oct-Dec 1972 | NOAA * /NMFS | Study of demersal- finfish catches by species and station | Azarovitz et al., 1976a |
| Sept-Nov 1971 | NYOSL | Zooplankton distri- bution | Austin and Dickinson, 1973 |

TABLE B-1 (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|-----------------------------|--------------------------|--|---------------------------|
| Sept 1971 | NYOSL | Determine baseline data for physical, chemical, and biological characteristics of the New York Bight | NYOSL, 1973 |
| Jan 1971 | CE/WHOI | Physical, chemical and biological effects of sewage sludge and dredged material on environment | Horne et al., 1971 |
| 1969-1979 | NOAA | Physical oceanographic data | Charnell and Hansen, 1974 |
| July 24- Sept 9, 1958 | NL Industries | Study the Acid Site in relation to other fishing grounds in the region | Westman, 1958 |

MULTIPLE-YEAR PROJECTS

| | | | |
|-------------------------|-------------|---|---|
| June 1974- June 1975 | NOAA/NMFS | Determine distribution and densities of fish | Wilk et al., 1977 |
| Feb 1974- June 1975 | NOAA/NMFS | Fin rot disease studies | Murchelano and Ziskowski, 1976 |
| Sept 1973- Aug 1974 | NOAA/CCNY | Phytoplankton productivity | Malone, 1976 |
| Aug 1973- Sept 1974 | NOAA* /SHL | Five cruises to determine distribution of benthic invertebrates | Pearce et al., 1977 |
| Aug 1968- Dec 1971 | NOAA* /NMFS | Determine distribution and abundance of benthic invertebrates | Pearce et al., 1976c; SHL, 1972, vol. 2 |

TABLE B-1 (continued)

| Date | Sponsor/ Investigator | Purpose | Source |
|-----------------------|---------------------------|--|-------------------------|
| 1968-1974 | USPHS/NETSU | Total and fecal coliforms in sediments and water column | Verber, unpublished |
| 1968-1970 | CE/SHL | Collect data to determine the effects of ocean disposal on the environment | SHL, 1972 |
| 1965-1974 | NOAA* /NMFS | Historical data on bivalve mollusks | Ropes and Merrill, 1976 |
| July 1964 May 1977 | USPHS/NETSU | Collect coliform counts to determine safe shell-fish fishing grounds | Verber, unpublished |
| Feb 1948- Jan 1950 | NRC & USFWS/WHOI & MIT | Assess the hydrographic processes of the area | Katchum et al., 1951 |

| | |
|-------|--|
| AOML | = Atlantic Oceanographic and Meteorological Laboratories |
| BNL | = Brookhaven National Laboratory |
| CCNY | = City College of New York |
| CE | = U.S. Army Corps of Engineers |
| EPA | = Environmental Protection Agency |
| ERDA | = Energy Resources Development Agency |
| IEC | = Interstate Electronics Corporation |
| L-DGO | = Lamont-Doherty Geological Observatory |
| MIT | = Massachusetts Institute of Technology |
| MSRC | = Marine Science Research Center |
| NETSU | = North East Technical Support Unit, FDA |
| MFS | = National Marine Fisheries Service |
| NOAA | = National Oceanic and Atmospheric Administration |
| NRC | = National Research Council |
| NYOSL | = New York Ocean Science Laboratory |
| OGE | = O'Brien and Gere, Engineers |
| SHL | = Sandy Hook Laboratory |
| SUNY | = State University of New York, Stony Brook |
| USPHS | = U.S. Public Health Service |
| USFWS | = U.S. Fish and Wildlife Service |
| WHOI | = Woods Hole Oceanographic Institution |

* Cosponsored with the Marine EcoSystems Analysis Program (MESA)

† Data collected consisted of salinity, temperature, dissolved oxygen, nutrients, meteorology, and density.

BIOTAPLANKTON

Phytoplankton and zooplankton (particularly larval forms) exhibit mortalities or growth abnormalities when heavy metals, pesticides, and other substances are present. However there is no evidence of any major effects on the planktonic communities in the vicinity of the disposal sites in the Bight.

In a laboratory study by Young and Barber (1973), bottom waters collected from the Mud Dump were not inhibitory to initial phytoplankton growth. Sediments from the site, however, did cause a slight to moderate (up to 5 days) lag before exponential growth began; the degree of inhibition depended on seasonal changes in bottom water characteristics. This temporary inhibition did not occur when the sediments were heated to destroy organic matter; consequently, the lag was probably due to toxic organic materials rather than to heavy metals. Even a slight lag is not biologically important because phytoplankton are most abundant in surface waters and do not photosynthesize in close association with sediments in the Apex.

Sullivan and Hancock (1977) stated that "natural fluctuations in zooplankton populations are so large, field surveys would practically never be useful." Earlier, the Sandy Hook Laboratory of the National Marine Fisheries Service reported that dredged material did not appear to affect zooplankton populations (SHEL, 1972).

NEKTON

The transient turbidity plume associated with the disposal of dredged material poses no significant threat to fishes. Suspended particles can cause gill damage, reducing fish respiratory surface area (Ritchie, 1970), but this type of gill damage has not been positively identified as harmful to fishes in terms of overall survival. The functional decrease in gill surface area can be offset by using reserve surface area (not all of the gill surface is used

for respiration) or a compensatory increase in the gas-exchange capacity of the blood (O'Conner et al., 1977b). Turbidity plumes associated with dredged material disposal are so brief that there is no significant threat to fish.

After dumping, fish are often attracted to disposal sites by the exposure of food items in the dredged material and by the mound formed by dumping (Oliver et al., 1977). Adverse effects are not expected because (1) disposal has only short-term, transient effects on water-column parameter, (2) foraging activity by the fish is not restricted to the disposal site, and (3) fish have not been shown to accumulate contaminants associated with dredged material.

BENTHOS

Benthic animals live on (epifauna) and in (infauna) the sediments. Epifauna are usually dominated by echinoderms and crustacea, whereas the infauna primarily consist of small, segmented worms (polychaetes) and mollusks. Sedentary benthic organisms are important indicators of disposal-related effects because they are directly exposed to a stressed environment. They are also important because many are commercially valuable (e.g., shellfish) or are food sources (e.g., polychaetes or amphipods) for demersal finfish.

Wright (1978) concluded that dredged material may physically bury sessile and possibly some mobile organisms. Some organisms survive by burrowing through the overburden material, but others cannot and die as a result. The intensity of this effect varies with type of dredged material, thickness of the overburden, frequency of dumping, and benthic organisms involved. The factors discussed below are the basis for comparing the effects of disposal on the benthos at the sites.

A significant alteration in the composition of natural sediments by the introduction of dredged material may change the suitability of the substrate for benthic fauna, and eventually alter the benthic community. The sizes of the interstitial spaces between sediment grains are critical to many smaller infaunal species which occupy a narrow range of sediment sizes. Various deposit-feeding benthic animals are highly specific in their particle-size selection. Furthermore, certain benthic species have planktonic larvae which must settle on specific types of substrate in order to continue development.

The CE (1977) observed that animals can burrow up through deposited sediments which resemble those in their habitat, but may suffocate under dissimilar sediments. Active burrowers and epifauna are more likely to excavate themselves than sluggish or sedentary animals, such as those living in permanent burrows. The thickness of the layer through which the animals must travel affects the possibility of escape.

Following disposal operations, Hirsch et al. (1978) noted an immediate decrease in the abundance and number of species, caused by physical burial, although chemical factors may have had an influence. Recolonization of the affected area usually takes place within months; the colonizing organisms are often different from those which had been present prior to disposal. After some time (if the sediments are similar), the original communities may return. Conversely, habitat alteration (i.e., a change in the physical nature of the substrate) by disposal may favor the establishment of a community different from that which previously existed. Hirsch et al. (1978) documented a number of instances where habitat change and succession have taken place following dredged material disposal.

The above effects are restricted to the site itself, and have not been observed beyond the disposal area. Recent (1979) and past (1973-1974) surveys show that the actual area of the Mud Dump is nearly barren due to the frequency and volume of dredged material dumped, but that effects are largely contained within the site boundaries (see Appendix B).

If toxic substances are present in the disposed material in a biologically active and/or available form, the benthic community may be adversely affected. Potentially toxic substances include trace metals, organohalogens, and oil and grease (EPA, 1976). After disposal, these substances may also move across the sediment-water interface into the water column. Modeling studies indicate that changes in water parameters are brief and restricted to the immediate vicinity (within several hundred meters) of the site (Conner et al., 1979; see Appendix B). Simpson (1979) reported that the Hudson estuary was the dominant source of soluble metals to the Apex, and that release of soluble metals from sediments in dumping areas did not seem to be a significant source.

Contaminant uptake is of considerable importance in the benthic community because the organisms are exposed to potentially toxic substances. Many benthic organisms are deposit feeders. While sediments are passing through their digestive tracts, changes in pH, digestive enzymes, and other factors may increase the mobility of some substances (especially metals) and cause them to be absorbed into the tissues or excreted in a form available to other organisms (EPA, 1976).

Species found in the sediments at the Christiaensen Basin Site and Mud Dump are characterized as pollution tolerant deposit and suspension feeders (Pearce et al., 1976d). Biomass and species diversity in both areas will be low. Dredged material disposal has caused low absolute numbers of individuals at the Mud Dump, but this effect is limited to the actual region of repeated disturbance. The Outer Apex Site will be affected initially by mortality of the benthic organisms because the site has not been previously used for the disposal of dredged material.

Benthic communities serve a critical role in the normal nutrient cycling and energy pathways found in a marine ecosystem, but it appears that continued disposal at a site would directly affect only a relatively small area of the bottom. If dredged material disposal were discontinued at a site, persistent contaminants or pollution from other sources in the Apex might delay recovery of the benthos at the site.

MOUNDING

A circular mound about 4.8 km in diameter and centered in the northwest corner of the Mud Dump has resulted from dumping dredged material during the past 37 years (Freeland and Merrill, 1976). The geometry of the mound suggests that most dumping was controlled and restricted to the site.

Depths at the alternative sites are not sufficiently different that the amount of dredged material reaching the bottom as a cohesive mass will be variable. Thus the amount of sediment which will accumulate on the bottom will be about the same. However, the slightly greater depth at the Christiaensen Basin Site might reduce effects of mounding. Freeland et al. (1979) reported that the rate of accretion or erosion of the floor of the Christiaensen Basin was so low between 1936 and 1973 that consistent trends could not be determined. Only storms, particularly with northeast winds, create bottom currents fast enough to erode muddy sediments in the Christiaensen Basin and upper Hudson Shelf Valley. The greatest erosion (more than 0.6m) is at the head of the 120-foot contour, which is near the southern boundary of the indicated site.

The effects of mounding at the Outer Apex Site resemble those at the Mud Dump. Impacts will be restricted to the site, unless short-dumping occurs.

WATER COLUMN

TURBIDITY

The duration of the turbid plume resulting from sediment disposal depends on particle size, currents, and turbulent mixing (Wright, 1978). A turbid plume composed of fine particles will persist longer than one made up of coarser particles. Water density is a factor. A plume which has disappeared from the surface may persist near a pycnocline at intermediate depths or near the bottom because of sediment resuspension. As the turbid plume moves, planktonic organisms may be carried with it, and may be exposed longer than mobile animals which temporarily avoid the area.

Dredged material disposal causes an increase in turbidity of the receiving waters for a short period (2 to 5 hours). During previous dredged material ocean-disposal operations, the highest surface concentration of suspended matter observed by Tetra Tech was approximately 30 mg/liter (reported in Conner et al., 1979). Chave and Miller (1978) reported surface concentrations of over 60 mg/liter 14 minutes after dredged material release. Long-term increased suspended solids resulting from disposal are not apparent in bottom waters. Analysis of near-bottom (less than 3m) suspended-solid concentrations, performed for this EIS, did not show any correlation between the levels of suspended solids and the presence of a dump site (Mud Dump or Sewage Sludge) or a natural geographic feature (Christiaensen Basin or Hudson Shelf Valley).

High suspended sediment concentrations associated with dredged material disposal are unavoidable but short-term. Most organisms are not seriously affected by the suspended sediments in the water (Hirsch et al., 1978). Generally, only concentrations of suspended sediments well above those created during most disposal operations cause mortality. Organisms normally associated with mud environments are highly tolerant of suspended sediments; organisms not closely associated with muddy habitats are more sensitive. Turbidity created by disposal is probably not a major environmental concern, but it could be an aesthetic problem if a dense plume approached beaches. The alternative sites are sufficiently far from shore (Table 2-2) that this effect could not occur.

NUTRIENT RELEASES

Phytoplankton require nitrogen and phosphorus to photosynthesize and grow. Nutrient releases from dredged material disposal can stimulate biological activity and under certain conditions lead to rapid growth of undesirable organisms or toxic concentrations (Pequegnat et al., 1978b). The potential occurrence of either effect depends upon environmental factors, such as dissolved-oxygen levels and mixing and dilution rates.

Nutrients associated with disposal operations are of little direct concern to the benthic or planktonic community because no significant numbers of photosynthetic organisms are present on or near the bottom. Nutrients which do escape from the sediments after disposal and enter the water column would be diluted below toxic levels within 10m of the disposal point (Conner et al., 1979).

OXYGEN DEMAND

Release of dredged material in water often causes a small initial dissolved-oxygen decrease which varies from 0.006 to 0.02 mg/liter/min (Lee et al., 1975). During dredged-material disposal, Goeggel (1978) reported that surface dissolved-oxygen concentrations were reduced for a few minutes before returning to ambient levels. In other instances, oxygen reductions of lesser magnitudes were observed. Such short-term depressions are insignificant and will not have any adverse effects on the biota.

From June to October 1976, lower-than-normal dissolved-oxygen concentrations and extensive fish and shellfish mortalities were observed in the Bight. This anoxic phenomenon reflected natural, but extreme, meteorological and hydrographic conditions occurring in the Bight during the months preceding the actual fish kill (Sharp, 1976), and was not associated with the disposal of dredged material. Falkowski et al. (1980) reported that the chain of events leading to the 1976 anoxia were:

"... a warm winter with large runoff, a low frequency of spring storm events, a deep summer thermocline, persistent southerly winds with few reversals, a large autochthonous carbon load (e.g., Ceratium tripos), and low grazing pressure by zooplankton. Our calculations suggest that anoxia could have occurred off the New Jersey coast in the summer of 1976 without any carbon loading from New York City, and that anoxia in this open shelf system can result from natural physical forcing and biological response."

TRACE METAL AND ORGANOBALOGEN ACCUMULATION

Toxic levels of trace metals for most marine organisms have not been established, partially due to extreme variabilities in the sensitivities exhibited by organisms during their different life stages. The form of chemical

contaminants is difficult to determine in the natural environment, but is important in determining toxicity. Trace metals present in dredged material may follow many pathways when introduced to the site environment; for instance, the trace metals can: (1) be released into the water while the dredged material is settling or after deposition on the sea floor, (2) remain adsorbed to site sediments, and/or (3) be ingested, primarily by benthic organisms.

Laboratory and field tests on dredged material indicate that, under certain conditions (e.g., oxidizing or reducing environments), some trace metals are released from dredged material into seawater in concentrations well above background levels (Lee et al., 1975). Manganese was released in the greatest quantities under both oxidizing and reducing conditions. Under reducing conditions, substantial amounts of iron and lead were released. Zinc was taken up from water under both oxidizing and reducing conditions, while copper, lead, and cadmium were neither released nor taken up under oxidizing conditions. Actual increases over background values which did occur were insignificant (parts per billion or less), so that considerable analytical difficulties are encountered in even detecting the contaminants. Furthermore, there is little evidence to indicate that such low levels would cause adverse effects on marine organisms during the extremely short time before the concentrations were diluted to the original background levels (Pequegnat et al., 1978b).

Some test organisms have accumulated PCB's or DDT from some dredged material. However, field studies at the Mud Dump have not conclusively shown higher levels of PCB or DDT accumulation in organisms (Appendix B). Pequegnat et al. (1980b) reported that concentrations of organochlorine residues in organisms showed little correlation to the presence of the respective contaminant in the sediments. Organisms from the control area (uncontaminated sediments) had contaminant levels comparable to organisms from the dump site (contaminated sediments). This problem is currently under investigation; West and Hatcher (1980) indicated that most PCB's in the Apex were derived from the dumping of sewage sludge.

Question. What chemical, biological and sedimentological testing is required for the issuance of an ocean disposal permit? What portion of dredged material passes these tests?

Answer. The testing requirements are contained in 40 CFR Part 227. In brief, these require detailed chemical characterization of the material, measurements of toxicity and bioaccumulation potential using bioassay procedures, and assessment of grain size distribution where appropriate. About 95 percent of the dredged material tested has passed these tests.

Question. Are there upland disposal sites in the greater New York area capable of receiving even a portion of the dredged material and sewage sludge generated annually in the New York-New Jersey area? What are the special problems associated with disposing of such materials at upland areas, including contamination of groundwater, release of contaminants previously bound to the sediment, dike integrity failure, or competition for limited upland areas?

Answer. There are some inland sites in the greater New York area that might be available for the disposal of some dredged material or sewage sludge. However, such sites are limited and competition for their use, not only for waste disposal but also for other purposes, is very strong. Each potential area has its own special problems depending on the type of material to be disposed of, the proximity to inhabited areas and farmland, the geological nature of the site, and other uses of the area. Each site would need to be carefully assessed prior to its use for disposal of a particular waste material.

The municipalities in the area have studied these alternatives to ocean disposal, and feasible sites are still being evaluated. However, the municipalities have found that some constraints exist on all municipal sludge disposal alternatives. The Corps is currently studying these potential sites, and in the near future will assess in detail the special problems associated with use of sites that appear to be suitable for dredge spoil disposal.

QUESTIONS SUBMITTED BY MR. FORSYTHE AND ANSWERED BY EPA

Question. Should individual ocean dumping permittees be responsible for monitoring programs or should this be a responsibility of EPA?

To what extent do permittees currently conduct compliance monitoring of their ocean dumping?

How useful is this information?

Answer. At the present time all permittees are required to do a limited amount of compliance monitoring, and to provide periodic reports to the permitting authority. Permittee monitoring is restricted to assessment of the characteristics of the waste being dumped to show that the material being dumped does not exceed the limits stated in the permit. This information is useful in monitoring compliance with permit conditions. It would be inappropriate to require permittees to conduct the broad scale environmental monitoring necessary to assess the overall impacts of many different wastes at a site. For the future, EPA plans to continue to require permittees to conduct monitoring, but EPA should also conduct its own monitoring and site characterization program, in conjunction with NOAA, and verify the results of permittee monitoring, to assess the overall impacts of dumping, and to select the most environmentally acceptable sites for ocean disposal.

Question. Can municipal sludges currently being dumped under interim permits pass the environmental criteria for special permits?

If dumping procedures were changed or if dumping occurred at other sites, would the sludges pass the environmental tests?

Do you expect that the environmental criteria will change in the new regulations, and if so, how?

Answer. The municipal sludges that have been tested so far, except for those from primary treatment plants, would all meet the environmental criteria for special permits if they could be dumped at a slower rate than is permitted at the existing site. The data available on primary sludges suggest that some primary sludges would meet the environmental criteria and others would not. The environmental criteria are being reconsidered and there may be some changes in the interpretation of the results. However, we do not anticipate major changes in the criteria at this time, and we do not expect that the environmental criteria will change significantly in the new regulations insofar as they would affect sewage sludges.

Question. What is the fiscal year 1983 budget request for processing permits? Does this take into account the potential increase in the number of permit applications?

Answer. Approximately \$1,000,000 of the fiscal year 1983 budget request will be used for processing permits, reviewing COE permits, and providing technical sup-

port. This does not take into account a potential increase in number of permit applications.

Question. When a site is designated for ocean dumping, do we know its capacity and what types of wastes it can receive?

Answer. Before an ocean dumping site is designated, extensive studies are conducted to determine the potential impacts of dumping a particular type or types of material at that site. Whether or not a given site should be designated for disposal of a particular waste is determined by the environmental characteristics of the site and the demand in that area. Appropriate limits on the types, quantities, and concentrations of wastes which can be dumped at a site are included in the formal site designation. More specific limits, based on the capacity of the site, are incorporated into the permits issued for that site.

Question. Pursuant to the recent New York case, will you be able to prove there will be unreasonable degradation in a particular area if you think a site should not be designated?

Answer. To the extent that data are available on a particular site, we will be able to assess actual impacts of dumping and determine whether or not additional dumping may be done at the particular site without causing degradation beyond the levels specified as acceptable in the regulations. In selecting new sites we will carefully examine the relevant characteristics of proposed sites and of several alternatives, and will designate for use only those sites with acceptable characteristics. It is not necessary to show that unreasonable degradation would result from dumping at a site in order to not designate that site, but a site would not be designated for materials if such dumping would cause unreasonable degradation.

Question. Do you need more funds appropriated to complete a study on a more comprehensive approach to waste management? What funding is available to conduct the comprehensive study of sludge disposal options?

Answer. It does not appear that additional appropriations will be necessary to prepare regulations and guidance under section 405 of the Clean Water Act, which will provide a framework for comparing the risks of ocean disposal of industrial and municipal treatment sludges to disposal options involving the land and air.

The EPA Comptroller has recently reprogrammed up to a total of \$480,000 for the current effort. This sum will be added to other funding associated with the Agency's previously planned sludge management work under its research, solid waste, water and ocean programs.

Question. Should the oceans be considered as a disposal medium for all types of wastes?

Answer. The oceans should be considered as a potential disposal medium for some types of wastes. The assimilative capacity of the oceans regarding man-made organics is not well understood, and so wastes containing significant quantities of persistent man-made organics should not be considered for ocean dumping. Of course, the ocean is not a viable disposal medium for materials the disposal of which is prohibited by the Ocean Dumping Act.

Question. Are there any major environmental problems currently associated with at-sea incineration?

Is this activity expected to increase and, if so, for what types of materials?

Answer. Incineration at sea was first used in Europe in the late 1960's as a technique for destruction of certain types of liquid organic wastes. The technique provides virtually complete destruction of the wastes and results in emission products that are compatible with the marine environment and have no adverse impacts. The first incineration at sea activities in the United States took place in 1974 and 1975. These were conducted on a research basis with extensive monitoring of the stack emissions and the ocean near the incinerator vessel. Destruction efficiencies were in excess of 99.99 percent, and no effects on the marine environment were found. In 1977, Herbicide Orange was incinerated in the Pacific Ocean, also on a research basis, with equally high destruction efficiencies.

Incineration is an environmentally sound method of disposing of organochlorine wastes and other organic wastes which can be completely destroyed at high temperatures. This includes organic materials which have a heat content in excess of 6000 Btu/lb. We anticipate that there will be an increase in this type of disposal activity in the future.

Question. Section 205 of the Ocean Dumping Act authorizes EPA to do a study to evaluate technological options for removal of heavy metals and other materials from the New York City sludge and to examine options available to reduce the pollutants entering the system. Have you completed this study which was due July 1, 1981, and if not, why?

Answer. This study has not been conducted since, although it was authorized, no funds were appropriated for it. The Agency has however, studied the effects of industrial pollutants on municipal treatment systems in general. The Agency's recently published Assessment of the Impact of Industrial Dischargers on POTW's is based on data on the quality of the influent and effluent of 2,000 POTWs. The assessment concludes that local pretreatment programs have been successful in reducing industrial pollutants from POTW influent.

The Agency is undertaking a national combined sewer overflow (CSO) study to determine the source of magnitude of priority pollutant contaminants in CSO's. Areas of Brooklyn's 26th Ward will be used in a pilot study to test monitoring and sampling techniques which will eventually be used in the national study.

Question. What funds are available to EPA in 1982 and have been requested for 1983 to carry out their responsibilities under Title II of the Ocean Dumping Act?

Answer. Title II of the Ocean Dumping Act places responsibility for research and monitoring regarding ocean processes and pollution with the Department of Commerce. EPA's responsibilities and funding fall under Title I. The only EPA authorization in Title II is in section 205, which authorized EPA to conduct a study to evaluate options for removal of pollutants from New York City's municipal sludge and for reducing the amounts of such pollutants entering the system. However, no funds were ever appropriated for that study (discussed in a previous answer).

Question. With regard to any permit applications you may receive, do you consider alternative strategies to dumping at one site only?

Answer. Generally, permit applications specify the site to be used for the proposed ocean dumping. The permitting process involves consideration of alternatives to the proposed dumping, at the proposed site, including evaluation of any alternative ocean dumping sites.

Question. During the case-by-case consideration of site designations and permit reviews, are the cumulative impacts of other dumping activities or other pollutant sources considered, and if so, how?

Answer. In each action on a permit application, the entire body of data on the dumpsite, the types of wastes that have been dumped there in the past, and the anticipated impacts of the wastes proposed for dumping are considered. To the extent that data are available to show the cumulative effects of past dumping, these are considered in determining the potential for additional adverse effects that may be caused by more dumping. This done on a case-by-case basis for each dumpsite and each permit application, using in particular the information presented in the EIS for each dumpsite.

Question. Is the 106 mile deepwater dumpsite being considered by the Department of Energy as a disposal option for the radioactively contaminated soils referred to in your testimony?

Answer. Yes, the Department of Energy is considering use of the 106 mile site. However, EPA has not yet made a determination whether or not that site would be suitable for such dumping.

Question. Will the designation of the 106 mile site be for dumping of specific types of wastes, and if so, for what types of wastes?

Answer. All ocean dumping site designations specify the types of wastes that can be dumped at that site. The proposed designation of the 106 mile site will be for aqueous chemical wastes and municipal sludge.

Question. Would ocean sites previously used for the disposal of radioactive wastes be considered for designation as low-level radioactive waste dumpsites?

Answer. No, primarily because none of the previously used sites meet the current minimum depth requirement of 4,000 meters contained in the IAEA criteria for radioactive waste sites. There are also other criteria which have been developed since that disposal, and so were not considered in the selection of those sites.

QUESTION SUBMITTED BY MRS. SCHNEIDER AND ANSWERED BY EPA

Question. What is the position of EPA regarding whether or not disposal of nuclear wastes on or under the seabed could be authorized under the ocean dumping permit program pursuant to the MPRSA?

Answer. Under the MPRSA, the disposition of low-level radioactive wastes on the seabed, in ocean waters, could be authorized by an ocean dumping permit. Similar disposal of high-level radioactive wastes would be prohibited under the MPRSA.

REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT, TITLES I AND II

TUESDAY, MARCH 23, 1982

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY AND SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, D.C.

The subcommittees met, pursuant to recess, at 10:07 a.m., in room 1334, Longworth House Office Building, Hon. Norman E. D'Amours and John B. Breaux (chairmen of the subcommittees) presiding.

Present: Representatives D'Amours, Breaux, Jones, Biaggi, Hughes, Hutto, Hertel, Smith, Forsythe, Pritchard, Evans, Carney, and Schneider.

Staff present: Edmund B. Welch, Howard Gaines, Darrell Brown, Mary Pat Barrett, Christophe Tulou, John Long, Ann Land, William Stelle, Jeff Curtis, Michael Toohey, Barbara A. Wyman, Dale Brown, and Debbie Storey.

Mr. D'AMOURS. This joint meeting of the Subcommittees on Oceanography and Fisheries and Wildlife is called to order.

This is the second day of testimony on the reauthorization of the Ocean Dumping Act. One other day of testimony is scheduled next Friday, and we hope we will proceed to markup by the end of April.

Last Thursday we heard testimony from the Environmental Protection Agency that we should make no changes in the current act, other than to extend its authorization. At the same time, though, EPA admitted that it is still groping for answers to the important policy questions that are key to the implementation of the act and that apparently were not clearly enough resolved in the 1977 amendments.

What EPA is asking for essentially is a blank check to formulate ocean dumping policy as broadly or as restrictively as might please the EPA bureaucrats.

I am sure I do not need to remind anyone on this panel that the overall environmental record of the current regime at EPA has been highly questionable, and that its commitment to protecting the environmental quality of our oceans has been particularly disturbing. This is the agency that quite literally rolled over and played dead when a single judge of the New York Federal court, the lowest court of Federal jurisdiction, ordered it last year to

ignore a legislatively mandated ocean-dumping deadline and thereby reverse years of EPA policy.

But beyond all of this, it is the task of the peoples' representatives in Congress to set the policy on this matter, not the bureaucrats at EPA. If the present law is ambiguous, then it is up to those who originally wrote that law to clarify those ambiguities.

It should be clearly stated that we of the subcommittees do not propose that all ocean dumping be terminated. We recognize that some degradation of the ocean environment is inevitable and even occurs naturally. We are aware that the oceans have a very great assimilative capacity. All we propose is that whatever degradation modern society must impose on our ocean environment be undertaken in the absence of reasonable alternatives and in the most careful and responsible manner practicably possible.

We must measure the ocean dumping alternative against the reality that the ocean is the cheapest and the most politically convenient place for coastal areas to dump their toxic wastes. There is not in this situation of ocean dumping the inhibiting effect of a nearby affected group of concerned citizens to protest the resulting hazards that might be created. As someone recently remarked, "Fish don't vote." It is up to the members of these subcommittees and of the full Committee on Merchant Marine and Fisheries to act responsibly as the constituents of a sound ocean policy. It is we who are specifically charged with the mandate of protecting our citizens and our future generations from the tragedy that we will surely allow if we do not insure them a healthy and unpolluted ocean environment.

Our first witness today is Capt. Jacques-Yves Cousteau, whom this committee is very honored to entertain as a witness and to whom we are particularly grateful. Captain Cousteau has absolutely nothing to gain in this issue, except as a world citizen, which he truly is. He has traveled at great length to be with us today, starting off in Martinique, arriving just this morning, and he has to be in Paris by this evening.

That being the case, I am going to advise members of the subcommittee, as I have privately, that we would like very much to terminate the Captain's testimony and all questions to Captain Cousteau by 11:25 so that he can make it to the airport, catch a shuttle to New York, and then with good luck and Godspeed and good weather, the Concorde to Paris.

Captain Cousteau, we are very grateful for the trouble you have taken to demonstrate your interest in this issue and for the prestige you bring to our efforts. With that, we happily anticipate hearing your testimony.

**STATEMENT OF CAPTAIN JACQUES-YVES COUSTEAU, CHAIRMAN,
THE COUSTEAU SOCIETY AND THE FOUNDATION COUSTEAU**

Captain COUSTEAU. Thank you, Mr. Chairman.

Mr. Chairman and subcommittee members, I apologize for giving you a few details about myself, because I would not like you to consider me only for my television films.

I am chairman of the Cousteau Society and of the Foundation Cousteau, the European organization of the same kind. They are

two organizations devoted to giving the public, by means of mass media mainly, accurate information about the aquatic and marine environments of our planet. I am also director of the Oceanographic Institute of Monaco, and it is within this institute that I succeeded in bringing the International Atomic Energy Agency, the agency's laboratory called now the International Marine Radioactivity Laboratory, which is monitoring the dispersal, the bioconcentration, flocculation, and absorption of every single radioactive element in the marine environment. We have been doing this for 20 years, and I am one of the four members who decide the programs every year.

I am also secretary general of the International Commission for the Scientific Exploration of the Mediterranean and have been for 12 years. We are concerned about all the problems and we are following very closely the problems concerning pollution and dumping in the Mediterranean. My organization has helped UNEP in their beautiful efforts which ended last year with the signature of the Mediterranean action plan to preserve the health of the Mediterranean waters.

This commission, ICSEM, has launched a 10-year program to study pollution in the open Mediterranean Sea from atmospheric fallout. We had been studying very carefully coastal pollution and various dumping operations in the Mediterranean. But something that has never really been studied is to what extent the damage done to the ocean is due to atmospheric fallout, and how the elements that fall in the ocean disperse in the water.

After 46 years of active life at sea, I am still conducting the CALYPSO operations. As you know, we are going to study the ecology of Amazonia in Brazil. But our major effort with CALYPSO to study the environment was in the Mediterranean in 1977, when we explored and measured pollution in the coastal waters of nine nations and also around the coast of Venezuela 2 years ago. We are now preparing, after the Amazon, to work in the Caribbean very closely.

The result of these many years of studies have proven to me that the pollution originating in rivers, in water spraying along the continents and into the sea, loaded with all the pollutants that you can imagine—I do not want to enumerate them—had some local effect of very serious consequences. But the damage or degradation that we were measuring in such seas as the Mediterranean or the Caribbean may be attributable, at least for an equal part, to mechanical degradation, such as abuses in fishing methods or landfills or dredging for gravel or sand on the Continental Shelf. All these mechanical actions have, we found, a combined effect with pollution and increase the effects of pollution by making the environment more vulnerable.

The science of the pollution of the environment is a new science, and some scientists have found a new name for it. If you do not know it, I will tell you: It is molismology. This barbaric name is soon going to be used as much as biology or geology.

I do not pretend, and I underline this, to be a specialist of dumping and of pollution in this area. As I told you, I worked mainly in the Mediterranean and in the Caribbean. But I think that the problems are the same everywhere. We are convinced that on this

planet there is only one ocean system, and that what happens on the coast of America will sooner or later have consequences elsewhere, as well as what we are doing in Europe will sooner or later come here. The problems of municipal dumping, or industrial dumping, are the same in most industrialized countries, as well as in Japan.

A decade ago, it seems that this country was on the right way. Americans are learning that they need to act if they want to preserve the integrity of the water on their shores. Marine pollution had indisputably already damaged the environment, but a great effort was made to overcome it. Shellfish had been contaminated with hepatitis virus, polio virus, and other pathogens. Pollution had closed 20 percent of the commercial shellfish beds in this country, masses of sea creatures died, and some beaches were closed.

The public awareness of this fact was certainly influential in suggesting the proper legislation, and I think that the United States was the first country to take such measures as the Clear Air and the Clean Water Act and the Endangered Species Act. We outside of the United States were watching this progress with envy, and we were promoting in other countries the same type of legislation, with some success I must say.

The public, too, have made a contribution in becoming more educated. When people ask me if there has been progress in pollution control, I say the mere fact that you are asking the question today is something. You would never thought of doing that 15 years ago. So this proves that there has been progress, and education of the masses has been done. The mere fact that these questions may be discussed in the street is a wonderful proof of mass education.

Despite these efforts and this new awareness, we carry on facing a serious situation. Governments and decisionmakers, private decisionmakers, have unfortunately thought that environmental awareness was a fad and that it would fade out. Recently, there was an offensive to say all this is emotional, not based on any scientific proof, and we have other problems of a more urgent nature, mainly economic, and with a number of public promotional efforts we can change the mind of the public. Some industrial lobbies have thought that they could do so by buying pages in magazines and by putting aggressive youngsters in airports.

But opinion polls show that they have failed. There is now a tremendous move in public opinion to go back to a stronger set of initiatives in environmental protection. I am telling you that because I follow these things very clearly, and I think it will be a mistake for legislators and decisionmakers to be late and not realize this. It is happening under our eyes. Already in Europe, 35 percent of the public are putting on the list of their worries environmental care as No. 2, just after unemployment. In this country, minor opinion polls have shown also that almost 70 percent of the public was concerned with environmental problems to various degrees.

These surges of public opinion are very carefully followed by the UN environmental program, and they are aware that they are riding a wave, that they are not in a period of recess.

When we see the recent actions of decisionmakers to put the brakes on, the major consideration was and is the world economic situation. I understand that this is a big problem. Today, millions

of tons of sewage sludge continue to be dumped in various places of the world each year, very often with levels of cadmium and mercury that exceed the safe amounts many times. Most of this waste is dumped directly on the Continental Shelf, which is the most vulnerable place in the ocean.

One of the arguments is that ocean waters have a capacity to cleanse themselves, with the help of sunlight, of chemical reactions, and of bacteria. This is true. But the ocean waters have no ability whatsoever to neutralize some extremely stable toxins. These stable toxins accumulate timelessly, ever adding to the poisons of the sea. A very small portion of those stable toxins may be dispersed in the upper layer of the sediment, but the wet spot of the upper layer of the sediment at the bottom of the sea is very thin, about 1 or 2 feet, and the heavy metals, radioactive materials that are dumped in the sea may be dispersed into the layer but do not go any further. We have made some measurements, and I can assure you of that.

All these stable toxins dispersed in the sea are absorbed, as you all know, by plankton, and after that by fish, and they end up very often on the plate of the supreme predator, man, in a boomerang effect.

We have a big problem with city dumping. Major cities throughout the world, coastal cities, have a particularly difficult problem. They have grown up relying on the ability of coastal waters to accept their discard, and we have to temporarily consider the political and economic difficulties faced by the leaders of these cities as they seek reasonable solutions to what is in reality a problem resulting from a relatively recent understanding of the potential harm such practices might bring about indefinitely into the future.

As an internationally focused organization, the Cousteau Society defers to the more specific expertise of scientific and public policy interests in these particular cases. However, as decisions are made whether to institutionalize such dumping to accommodate future growth, the use of the oceans—and indeed, dispersal of wastes into any facet of the environment—must be subjected to the same careful consideration I am outlining here. Continuation of present dumping practices must be considered the transient solution, pending the technological and economic availability of alternatives.

The approach to be taken and the questions to be addressed today are far from being completely understood. They require very careful, responsible, as well as pragmatic consideration. And, of course, this consideration will have to be based on data, and we do not have enough data.

Dumping practices should be governed by many concerns. Let me quickly itemize most of them. We have to understand how a substance affects living marine organisms and their reproductive capacity. We have to understand how a substance will affect the humans that ingest the contaminated sea creatures. We have to understand how waste will react to other chemical compounds in the ocean, which means what the synergistic effect will be. We have to consider whether the waste will interfere with the ocean's ability to produce materials, such as phytoplankton, which is the foundation of the food chain and the impact waste will have on recreational areas or other traditional uses. Of utmost and often un-

predictable importance is the relationship between ocean conditions and the toxicity of a substance that might, on its own, be harmless.

You understand that at the moment we do not have the knowledge to answer all these questions. The consequence of this is to foster more marine research, not less. It also underlies the fact that when decisions must be made without the appropriate information and scientific data, the public is not told the truth and because these decisions are often impossible to justify. This emphasizes the necessity of the existence of an independent, nongovernmental groups, nonindustrial groups, and citizens groups, receiving no subsidy from anybody but large enough to conduct their own independent assessment and to spread the results to the public.

The Cousteau Society takes today two firm positions. They are obvious, and I am sorry to repeat them, because a 7-year-old child could invent them. Unfortunately, they are not followed. First, substances capable of causing irrevocable damage, nondegradable toxic compounds for example, should be flatly prohibited. Any dumping containing such compounds must be prohibited, sooner or later. These substances are enumerated on "blacklists."

There are a number of blacklists, some of them incomplete, that are generally annexes to international conventions. There are a number of international conventions aimed at regulating dumping, the most serious of them is the London Convention that the United States has occupied, but there are many local conventions such as the Oslo Convention, the Paris Convention, and the Barcelona Convention. Most of these conventions have itemized blacklisted compounds.

Then some other substances, the most common of them, that have transient consequences perhaps can be tolerated under carefully examined circumstances, until such time as techniques are developed to recycle them economically. These products could be rendered harmless, or they can be substituted altogether. These compounds comprise the "gray" list. Both lists are appended to various international conventions. But in developing the "black" and the "gray" lists, marine experts find out in many cases that we are lacking adequate information.

Now let us come to the heart of the question. Our society is supporting the spirit expressed in the legislation being offered by Congressman D'Amours. This represents continued progress in the right direction. Those who have discussed waste legislation have offered various suggestions that they would like to consider here.

First, some have proposed postponing the deadline for prohibiting hazardous waste proposal until research better defines how hazardous some dumpings can be. We agree that the research efforts should be intensified, but they should be intensified before the damage can be done, not after.

The second thing I am worried about is the remark that "the sea is the cheapest disposal unit." This theory may seem attractive in an era of fiscal difficulty, the kind of times in which we now live and in which we may expect to live for some years. But the problem is to know if such behavior is really economic. If it is not a shortsighted view. What is the cost of environmental health, for example? What is the cost of the reduction of the fishery yield? What

is the cost of the damage to the shell beds? It is very difficult to say. It is certainly advantageous for the one who dumps to dump in the most economical way, but we have to consider the consequences to others. The community is the unit that we have to talk about.

I remember when I was testifying to the California senate, I was recommending several years ago something that is still true. Today, the toxic materials are allowed to accumulate and to mix into two different areas, the sludge that we are dumping and also the large purifying plants that we think it is necessary to build to purify the water that we drink or that we send for agriculture.

In our opinion, it is too late at this point. We have to watch carefully the origin of each toxic product, where it is produced, and that is the place where it should be eliminated from the water system. The cost of such a multiplicity of small purification plants would be far less than the cost of the huge purification plants and the precautions or the alternatives to ocean dumping.

That cost, instead of being borne only by the industry which generates them, should be divided in three: One part only to the industry, one part to the local community, and one part to the Federal Government. The damage done by pollution or by bad care of the environment is costing the community a tremendous amount of money. In 1978, the Federal Government made a study on the economy of the Clean Air Act. This act had cost the Nation in 1978 something like \$14 or \$16 billion, but it had proven to benefit \$2 or \$3 billion more to the Nation. The same thing happens in the sea.

When we are talking about an economic way of disposal, that is not the problem. The problem is to know if in the long run it is an economic solution; and if it is not possible, by joining forces with the economic experts, the environmental experts, and the technologists and scientists, to see if there are not new ways of disposing of these toxic products and ways to recycle them and make them economic. This is the real problem. We are addressing ourselves most of the time to the wrong problem, a false problem. The real problem is that we have waste of our civilization that we do not know what to do with today. But with every day going by, we know better how to recycle and how to take advantage of our wastes.

Pollution control must indisputably be sought first and foremost in the economic sphere. But what can we do? I can assure that, with the present swing in public opinion, which overwhelmingly supports the maintenance of environmental quality, it will soon be profitable for producers to recycle most of the waste we consider useless today.

The final suggestion regarding ocean dumping is without doubt the most significant. It concerns a general call to consider alternate dump sites and to see the oceans, as some witnesses to this body have said, as part of a total environment.

I most wholeheartedly agree that alternative methods of disposing of wastes must be explored. Similarly, I join with those who urgently emphasize the dangers of other waste disposal methods that endanger life, such as landfills that pollute ground waters. There are today available techniques to make sure that such infiltrations do not take place. I leave it to the representatives of organizations

which have studied these issues specifically to testify on the subject in greater detail.

Maybe most important of all, we urge, and this is possibly the biggest issue, that those who would use the oceans to subsidize their enterprises ought to bear the burden of proof that no irreversible damage will result now or in the future.

I have not told you about my experiences of some ocean dumping that happened in the Mediterranean. There are two of them, of different character. The Pechine Regine Culman Co. in France has a huge aluminum factory in Gardin, as you know, treating the mineral to obtain aluminum has produced enormous heaps of red tailings. Around Gardin, mountains of these were accumulating, and one day this company said they had to get rid of that and put it in the ocean. But they did it very carefully.

They commissioned a number of universities to study what kind of damage these tailings could do in the ocean. We have been voluntarily doing that, refusing the money, and we found out that as for vertebrates and for invertebrates, these tailings, when put on the bottom of an aquarium were not interfering with life, even of sensitive creatures. The tailings were slightly alkaline, and it seemed to me that the disposal of this red mud in great depths in the Mediterranean was at least to be tried on an experimental basis.

The company built a long pipeline from the coast to the drop-off zone at about 600 feet, and from then millions of tons of this red mud were progressively, day after day, dumped into the ocean. We periodically visit the site with our submarine.

The damage done here is mechanical, not chemical. On huge areas, this red mud that is practically harmless spread on the bottom, burying all the bottom life, filling in little holes in which all the animals seek refuge. Before these animals have time to make a new life on the surface of this material, another wave arrives and displaces them.

There is some damage done occasionally, even with inert material, not to be compared with the other kind of dumping that they have witnessed, the dumping by Monte Disson Co. of Italy of industrial tailings containing high doses of sulphuric acid. They were dumped at the north of Corsica for years. The uproar of the population succeeded not only in stopping the dumping but in putting the president of the corporation in prison. The thing that I have personally witnessed is that the whales that were swimming in this area were losing their skin, literally. The black skin of the whales could be peeled off by hand because of damage by sulphuric acid.

There are also examples I would like to mention of accidental dumping, due to accidents in navigation. We have witnessed one of them very carefully. A Yugoslavian ship was rammed off Otranto in the south of Italy, in 90 meters of water, with a cargo of the lead compound that you put in gasoline, the antiknock compound. It is a very active position. Together with a little judge of Otranto, our society was lobbying the Italian Government to do something about it. Finally, \$12 million were allocated by the Italian Government to recover the drums and their recovery almost paid for the salvage operation.

Recently, another such action occurred with the dumping of arsenic in the northeast of Sardinia. There, again, the Government of Italy allocated immediately funds to get those products out of the sea.

I would like to give the two decisions of the Italian governments as an example for the world. Finally, these governments have understood that water was the last place to put toxic material. They allocated considerable sums of money already to be consistent with this opinion, and I think this should be emphasized everywhere and given as examples.

We have other problems which are not so much talked about because they touch military problems: The dumping of decommissioned nuclear subs and the dumping of nerve gas when the containers are obsolete. I am not going to give here the solution for both, but these are very serious problems. If the Navy could consider dumping one or two nuclear subs, what an example for the other nations—the Russians, the French, the English. If everybody is dumping their obsolete nuclear subs with high levels of plutonium radioactivity, I think that would be a disaster.

Some time ago, the American Army dumped nerve gas containers on an old liberty ship in depths that are probably—I was not there—2,000 meters. Sooner or later, these containers are going to corrode and the nerve gas will be liberated. We had examples like this after World Wars I and II, where containers of gas finally opened up in the sea and where children bathing on the beaches were badly burned. With the nerve gas, it would even be more serious.

I am giving you these examples because recently scientists have discovered an enzyme that neutralizes this nerve gas. If instead of hurriedly dumping these nerve gas containers we had waited a little, technology always gives an answer, but we have to wait until the answer is given before we do the contamination. I think these examples should remain in our heads.

I heard the chairman say that fish do not vote. I must say that the chairman of our advisory committee, Ed Wenk, was recently writing an article saying that fish do vote, because of the surge of public opinion that is behind them.

To finish these statements, I would like to insist that we be responsible to future generations. Pollution of any nation's water is an international issue; it is not a local issue, and it is not a national issue. The waters bathing the Antarctic Continent are already showing signs of pollution that originated in other parts of the world. While we were working along the eastern side of Venezuela, aboard *Calypso* we have clearly identified an upwelling, an ascending current, of Antarctic waters that have traveled thousands of miles along the abyssal plains all the way from the Antarctic to the Equator. Nothing in the sea is provincial. Both use and abuse of the sea is of consequence to all people. That is why a global ocean policy must be established to define a common set of principles and of rules for activities of individual nations and a fortiori for states and cities.

The Pilatus syndrome—that is, dump it and wash you hands—is no longer an expediency. It has now developed into an entirely new, fundamental moral issue. What we dump out of sight in the

sea will not remain for long out of mind. The anonymous crime of conventional poison dumping is aimed at no one in particular, but it may bring about agonies around the world. The ultimate conceivable escalation consists in threatening not just other nations who are endangered by our recklessness but whole generations to come.

To fulfill a moral obligation that the legacy of the oceans be continued, our first concern must be directed to the future. Risks for our progeny must be weighted against anticipated short-term provincial benefits. We have no right to draw checks to be paid by our descendants. We have no right to sacrifice their fundamental options for present conveniences. Our responsibility toward them is overwhelming.

Each one of the cells of our bodies is a miniature ocean. Poisoning the sea will inevitably poison us. Let us act with wisdom, foresight, and prudence. Thank you.

[The statement of Captain Cousteau follows:]

PREPARED STATEMENT BY JACQUES-YVES COUSTEAU, CHAIRMAN, THE COUSTEAU SOCIETY AND THE FOUNDATION COUSTEAU

Mr. Chairman and Subcommittee Members: I am Jacques Cousteau, Chairman of The Cousteau Society, and of the Fondation Cousteau, two organizations devoted to giving the public, by means of the mass media, accurate information about the aquatic and marine environments of our planet. I am also Director of the Oceanographic Institute in Monaco. It is within my Institute that the International Atomic Energy Agency established the International Marine Radioactivity Laboratory which has studied the effects of radioactive elements on the marine environment and on the food chain for twenty years. I am Secretary General of the International Commission for the Scientific Exploration of the Mediterranean (ICSEM). This Commission last year launched a ten-year program to study pollution in the open Mediterranean Sea, which originates mainly from atmospheric fallout.

I have been exploring oceans, seas, lakes, rivers and polar seas for 46 years, and I am still doing so. On board the Research Vessel CALYPSO, I recently conducted two marine environmental surveys in the coastal waters of nine Mediterranean countries and of Venezuela in the Caribbean. We are currently evaluating pollution in coastal waters as well as mechanical degradations, such as fishing abuses, landfills, diversion of rivers, dredging for gravel and sand.

For almost half a century, I have sponsored research for dozens of international marine scientists and experts, and have worked closely with them. In spite of the fact that initially I specialized in diving physiology and underwater acoustics, I have become a generalist, trying to put together parts of the gigantic puzzle to which science everyday brings another small piece.

I do not pretend to be a specialist of pollution problems, and I believe that, in the present state of our knowledge, nobody can pretend to be, considering how complex and intertwined these questions really are. I am a modest witness who has observed nature through his own eyes as well as with those of his scientific colleagues and their instruments.

Congressional consideration of the Marine Protection, Research, and Sanctuaries Act, as passed in 1972 and subsequently amended, provides us with an opportunity to reassess some general considerations of ocean dumping problems.

A decade ago, Americans were just beginning to learn that they needed to act if they wanted to preserve the integrity of the water that lapped on their shores. Marine pollution had indisputably damaged the environment; shellfish often contained hepatitis virus, polio virus and other pathogens; pollution had closed 20 percent of the commercial shellfish beds in this country; masses of sea creatures died; beaches were closed.

In the past ten years, many protective regulations have been enforced, not just in the United States, which imposed the strict regulations we are reviewing today, but in other countries as well. Signatories to the London Dumping Convention—which the U.S. ratified immediately—have collaborated to reduce and prevent such pollution. Even as we speak here in Washington, other matters of international importance pertaining to the sea are under discussion in New York, and most partici-

pants are optimistic that they will eventually bring constructive suggestions to the Convention on the Law of the Sea.

The public, too, has made a positive contribution in the act of becoming educated. People have abandoned the misconception that the ocean is immense. Of course it is known that the oceans cover two thirds of the globe. The average depth, four kilometers, appears immense on the human scale; but on a world scale it is minute. The dimensions of the ocean have been reduced by the dimensions of industry and human enterprise.

Despite these efforts and new awareness, we as citizens continue to face a serious situation. Governments are considering an intensification of the dumping of radioactive wastes. Millions of tons of sewage sludge continue to be dumped into the sea each year, with levels of cadmium and mercury that exceed the "safe" amounts. Most of this waste is dumped directly onto the continental shelf, where a considerable proportion of marine life reproduces.

It is true that ocean waters have a certain capacity to cleanse themselves, with the help of sunlight, chemical reactions and bacteria, but they have no ability whatsoever to neutralize some extremely stable toxins. They accumulate timelessly, ever adding to the poisons of the sea. Plankton absorbs some of them. Sea creatures feeding on plankton concentrate the poisons until man, the supreme predator, becomes the final victim.

Ocean dumping, once a tradition with no long-lasting effects or irreversible damages for the environment, can no longer be considered an insignificant act, due to the formidable changes in man's activities and industries.

Major coastal cities throughout the world have a particularly difficult problem. They have grown up relying on the ability of coastal waters to accept their discards. We must temporarily consider the political and economic difficulties faced by the leaders of these cities as they seek reasonable solutions to what is, in reality, a problem resulting from relatively recent understanding of the potential harm such practices indefinitely might bring about.

As an internationally focused organization, The Cousteau Society defers to the more specific expertise of scientific and public policy interests in these particular cases. However, as decisions are made whether to institutionalize such dumping to accommodate future growth, the use of the oceans—and indeed, dispersal of wastes into any facet of the environment—must be subjected to the same careful considerations I am outlining here. Continuation of present dumping practices, as with all waste dispersal, must be considered a transient solution pending the technological and economic availability of alternatives.

The approach to be taken and the questions to be addressed today are far from being completely understood. They require very careful, responsible, as well as pragmatic, consideration.

Dumping practices should be governed by many concerns: How a substance affects living marine organisms and their reproductive capacity; how a substance will affect the humans that ingest contaminated sea creatures; how a waste will react with other chemicals and chemical compounds in the ocean (synergistic effects); whether the waste will interfere with the ocean's ability to produce materials such as phytoplankton, the foundation of its food chain; the impact a waste will have on recreational areas and other traditional uses. Of utmost and often unpredictable importance is the relationship between ocean conditions and the toxicity of a substance that might, on its own, be harmless.

Given the present state of knowledge, no one can answer all of these questions. Thus The Cousteau Society takes two firm positions: First, substances capable of causing irrevocable damages (non-degradable toxic compounds) should be flatly prohibited. These substances are enumerated on "black lists"; then, substances producing transient consequences perhaps can be tolerated under carefully examined circumstances until such time as techniques are developed to recycle them economically, to render such products less harmful, or to substitute for them altogether. These compounds are comprised in a "gray list". Both lists are appended to the various international conventions addressing ocean disposal of wastes.

In developing the "black" and "gray" lists, marine experts find that in many cases, adequate information is not available today.

The Cousteau Society supports the spirit expressed in the legislation being offered by Congressman D'Amours. This represents continued progress in the right direction.

Those who have discussed waste legislation have offered various suggestions that I would like to consider here. Some have proposed postponing the deadline for prohibiting hazardous waste disposal until research better defines how hazardous some dumpings can be. We agree that it is essential that research efforts be intensified in

basic marine sciences, and in the more specific areas of pollutant behavior and transport through the environment as well as the potential impacts on marine life and the food chain leading to man. This research, however, must be done BEFORE hazardous materials are disposed of; not after they have been swept irretrievably into the current of our world waters. Environmental management must emulate preventive medicine, anticipating and avoiding tragedy rather than simply mourning it after the death knell sounds.

Others suggest that we ought to continue dumping hazardous material because the sea is the cheapest disposal unit. This theory may seem attractive in an era of fiscal difficulty, the kind of era in which we now live and in which we may expect to live in the foreseeable future. But it is both economic and environmental health that we should seek, and they are compatible if we think ahead. If not drastically forced by public opinion, some decision makers have a tendency to focus only on today's immediate problems and to delay strategic action, however urgent and important. Yet we, that is the public and our leadership together, must learn to see the relationship between today's costs and tomorrow's costs. Ecology and economy can be reconciled. Both have the same duty; the art of harmoniously managing our household, the water planet, Earth.

Pollution control must indisputably be sought first and foremost in the economic sphere. What can we do? We can persuade the producer. Because of the present swing in public opinion, which overwhelmingly supports the maintenance of environmental quality, it will soon be profitably for producers to recycle most of the waste we consider dumping today.

The fact that the ocean appears—superficially and inaccurately—to be an inexpensive sewage system has also been put forward as a sufficient rationale for the United States, perhaps in violation of the London Dumping Convention. At a time when the integrity of a nation in keeping its bilateral and international word has consequences that concern the very survival of the species, it is impossible to understate the lack of wisdom in taking such a risk.

The final suggestion regarding ocean dumping is, without doubt, the most significant. It concerns a general call to consider alternate dump sites and to see the oceans, as some witnesses to this body have said, as part of a total environment.

I most wholeheartedly agree that alternative methods of disposing wastes must be explored. Similarly, I join with those who urgently emphasize the dangers of other waste disposal methods that endanger life—such as landfills that pollute groundwaters. But there are today available techniques to make sure that such infiltrations do not take place. I leave it to the representatives of organizations which have studied this issue specifically to testify on the subject in greater detail.

Maybe most important of all, we urge that those who would use the ocean to subsidize their enterprises ought to bear the burden of proof that no irreversible damage will result now, or in the future.

Pollution of any nation's water is an international issue. The waters bathing the Antarctic continent are already showing signs of pollutions that originated in other parts of the world. While working along the eastern coast of Venezuela, we on CALYPSO clearly identified an ascending current (upwelling) of Antarctic waters that had travelled thousands of miles along the abyssal plains and finally surged to the surface in the tropics. Nothing in the sea is provincial. Both use and abuse of the seas are of consequence to all peoples; a GLOBAL OCEAN POLICY thus must be established to define a common set of principles and rules for activities of individual nations and "a fortiori" for states and cities.

The Pilatus syndrome—that is, dump it and wash your hands—is no longer an expediency. It has now developed into an entirely new, fundamental moral issue. What we dump "out of sight" in the sea will not remain for long "out of mind". The anonymous crime of conventional poison dumping is aimed at no one in particular, but it may bring about agonies around the world. The ultimate conceivable escalation consists in threatening not just other nations who are endangered by our recklessness, but whole generations to come.

To fulfill a moral obligation that the legacy of the oceans be continued, our first concern must be directed to the future. Risks for our progeny must be weighed against anticipated short-term, provincial benefits. We have no right to draw checks to be paid by our descendants. We have no right to sacrifice their fundamental options for present convenience. Our responsibility toward them is overwhelming.

Each one of the cells of our bodies is a miniature ocean. Poisoning the sea will inevitably poison us. Let us act with wisdom, foresight and prudence.

Mr. D'AMOURS. Thank you, Captain Cousteau.

I must say I find myself, in general, in almost universal, agreement with your statement. I do not have many bones to pick with you, but I would like you to expand on a few small points. I agree with you that it is difficult to conceive of the pollution of oceans as a national issue; it truly is a worldwide, international issue.

I think I heard you say earlier in your testimony, that the United States is being perceived internationally as a leader in this effort. Is that correct?

Captain COUSTEAU. It was.

Mr. D'AMOURS. When did that perception cease to exist?

Captain COUSTEAU. When the rules were being relaxed.

Mr. D'AMOURS. You mean, it is very recent?

Captain COUSTEAU. Yes.

Mr. D'AMOURS. You talk, Captain Cousteau, about a lack of knowledge about the assimilative capacity of the oceans and the tendency to go ahead and use our oceans rapaciously to dump based upon that lack of knowledge. Do you have any idea when the scientific community might be in a position to give us the kinds of more detailed knowledge that might enable us to move ahead more intelligently?

Captain COUSTEAU. That is a very good question, Mr. Chairman, because your question happens at a time when allocations to research are cut. I would say that with the previous development of marine research, we could have accumulated not enough but a very substantial portion of what is needed in about 10 years. Today, I do not know, because everywhere I go, universities, NOAA, NASA, everybody complains, "No money. No money. We do nothing." So, I cannot answer your question.

Mr. D'AMOURS. Captain, when you say that allocations for research are cut, are you speaking internationally? Do you find this pattern being followed worldwide?

Captain COUSTEAU. No, sir. As you are aware, women follow the fashion, where the skirt lengths go up and down, and the fashion leaders are generally French; but for oceanographic "fashion," it is America. So, that what we are afraid of is that the tendency and the decisions in America might, in 2 or 3 years, be followed by other nations. My country, France, has increased research funds for oceanography by 35 percent.

Mr. D'AMOURS. Captain Cousteau, I want to thank you very much. Because of the time limits under which you are operating, I will cease asking questions at this point and turn to Mr. Pritchard, the ranking minority member.

Mr. PRITCHARD. Thank you.

We welcome our very distinguished guest here and thank him for taking the time to come down.

Let me pose the question which people ask me and that is the other side of the coin. They say, "Look, Congressman, we have a city the size of New York, with 10 million people, with immense problems, teetering on the balance of being able to govern itself and get through a crisis time. You may want us to drastically change the way we are handling our waste procedures, but there is a timing factor here. If you move too rapidly, you are going to tip our city into bankruptcy, and 10 million people are going to have

chronic and major problems that will affect children and old people. So, can you not give us some more time?"

What is your answer to that?

Captain COUSTEAU. I think I have answered, sir, by saying that we must temporarily consider the political and economic difficulties faced by the leaders of these cities. I have answered your question. The only thing I am asking is that these measures be only transient, because it is impossible to carry on like this for a long time.

Mr. PRITCHARD. I would agree. I will yield, because I know everyone wants to ask questions.

Mr. D'AMOURS. The chairman of the Fisheries and Wildlife Subcommittee, Mr. Breaux, from Louisiana.

Mr. BREAUX. Bienvenue, Monsieur Cousteau. We are pleased to have you. You have been before our committee in the past and always made a very viable contribution. None of us, as you will probably learn very quickly if you do not suspect it already, is a scientist or a person who has made a career of studying oceans and the effects of dumping in the oceans, but we are all very concerned with trying to get the best possible information that we can.

We had our Deputy Assistant Administrator of the U.S. Environmental Protection Agency testify before this committee last week. On the question of the effects of dumping sewage sludge or some dredged materials in the oceans, she says that it has been studied extensively over the last 10 years, and her conclusion in testifying before our committee was that the ocean does have a capacity to assimilate both naturally occurring organic material, such as domestic sewage and uncontaminated dredged materials. She pointed out, further, that they did have a serious concern over the disposal of sludge material which contained toxic organics or high concentrations of heavy metals.

She based her testimony on a number of scientific publications she referred to, one being the so-called Crystal Mountain Workshop, which was a workshop that brought in scientists from Johns Hopkins, the Scripps Institute on Oceanography, the Woods Hole Oceanographic Institute, and from our National Oceanic and Atmospheric Administration. She said the results of these studies indicated that we have a choice between trying to dispose of this material on land, which can create problems, and marine disposal, which has potential adverse impacts on the oceans. Their conclusion was that the oceans should still continue to be considered as an alternative for certain kinds of waste. I am wondering whether you would agree with that position.

Captain COUSTEAU. No; I do not, but not in an abrupt way. Our problem is due to the fact that the sludge and these products are complex. Some of the compounds are beneficial to the ocean. Some of them are poison. It would be highly desirable if it were possible to separate them, and I know it is not possible in today's technology. But another reason for me to be very skeptical is that every week two or three new products that we know nothing about are added to the extremely complex compositions of these dumping materials.

How can we follow up if we do not know? What I proposed earlier is that we purify at the source, instead of waiting until we have

an impossible mix that we do not know how to handle. If we are purifying at the source, we would end up with a sludge that would be inert and harmless, because the vast tonnage of this material is harmless. The problem is that it is mixed up with toxins.

Mr. BREAUX. We appreciate your being with us and your help and assistance and your recommendations.

Mr. D'AMOURS. The gentleman from New Jersey, Mr. Forsythe.

Mr. FORSYTHE. Thank you, Mr. Chairman.

I also thank you very much, Captain, for being here to present a detailed presentation on what is a serious problem for our society. You spoke of various international conventions and specifically mentioned the London Convention. You said that some had good lists and some bad. I am wondering, with respect to the London Convention, whether you agree with the annex I and annex II lists?

Captain COUSTEAU. Not necessarily, because the London Convention was on purpose very vague in its terms, and I think they were right to do so at the level of the state of the art then. They are going to meet again in February of next year, where one of the purposes is to be more specific about these lists and to update them. I do not say that they are going to solve all the problems in February of next year. But they are going to add to our knowledge by gathering information from all those countries which contribute. I think it would be wise not to lift a finger before we know better, and February 1983 is not that far away.

Mr. FORSYTHE. You discussed in your statement the very serious problems encountered by the cities. I am not sure the waste disposal problem is limited to cities. In my area of South Jersey we have very sensitive water aquifers that are very close to the surface and disposal of any kind of waste can quickly find its way into our water aquifer. This is not the only area. I know my colleague from Long Island also has a problem in that they are almost totally dependent upon surface water aquifers. Would you care to comment on this problem and whether there is a need for our being very cautious in what we do there as well in terms of forcing any kind of land disposal?

Captain COUSTEAU. I am not familiar with the nature of the products you are mentioning, and I can only express an opinion when I know better. But anything that is stable and toxic should be isolated from humidity and water. It should be kept in complete dryness.

The reason for this is that, after all, we are water animals. We are made of water. We are eating and drinking food and drinks that are made of water. We are depending heavily on the quality of the water system. It boomerangs to us every time we make a mistake.

It is a new situation, relatively new, because even at the beginning of the industrial era in the past century, the quantities were minimal compared to what we are doing today. The awareness of the problem is a recent one, and we are facing a new problem that we do not yet know how to solve, whether in river dumping or ocean dumping.

This is an opportunity for me to restate what I have already said. There is not water pollution, air pollution, and land pollution.

There is only one pollution; it is water pollution, because everything ends up in the water anyway, by rain and so on. Our first care is to keep that water system as clean as we can. It is vital for our life, for the lives of our children and our grandchildren. It is a basic truth; there is nothing we can do against it. We can discuss, discuss, discuss, but the basic truth is there: without pure water, we cannot survive.

Mr. FORSYTHE. Whether the water is in the oceans or whether it is on the land, it is water.

Captain COUSTEAU. Exactly. The ice caps, the snow, the ice, the lakes, the rivers, the oceans: it is all the same.

Mr. FORSYTHE. Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Forsythe.

The chairman of the full committee, Mr. Jones.

Mr. JONES. Thank you, Mr. Chairman.

Captain Cousteau, we are certainly delighted to have you here this morning. I would like to express our gratitude for your explorations and inventions that have enabled a worldwide awareness and appreciation of the marine environment and its resources.

I am especially concerned about the proposal to dump nuclear waste from subs in the ocean, because the U.S. Navy suggests dumping them off Cape Hatteras, a district which I represent. Does your society have scientific expertise on this issue?

Captain COUSTEAU. No, sir, we do not, but I am working in Monaco with the International Marine Radioactivity Laboratory to know as well as we know today what each radionucleii becomes in the ocean and what effect they have on the bioconcentration chain, yes. There is something that we cannot judge. We are not given the information from the Navy about what exactly are the elements that are left in the section of the sub that is radioactive. They say they have taken the core out, but what is actually the nature of the radioactivity left in that section. As long as we do not know, how can we judge? My instinct is to say, keep it apart in a dry place until we know better.

Mr. JONES. Thank you, Captain.

Thank you, Mr. Chairman.

Mr. D'AMOURS. The gentleman from New York, Mr. Carney.

Mr. CARNEY. Thank you very much, Mr. Chairman.

Welcome, Captain Cousteau. From your work in the oceans and coastal regions around the world, do you have any data that would indicate whether the marine waters under the jurisdiction of the United States are in better or worse condition than those of the rest of the world?

Captain COUSTEAU. From pollution or from wildlife?

Mr. CARNEY. From a pollution standpoint.

Captain COUSTEAU. The more industrialized a country is, I think the more the coastal waters have a tendency to be polluted. However, as I said, the United States has been the first country to take some drastic measures, and it has paid off. There are many, many areas where we are amazed to see the vitality of the oceans still. For example, we were diving last year on the wreck of the *Monitor*, off Norfolk, Va., and North Carolina, it is a very deep wreck, the amount of fish circling the ship is phenomenal. We were very agreeably impressed by the vitality of these waters off Virginia.

Mr. CARNEY. Captain, do you have any idea or any data that would substantiate the fact that the Marine Protection, Research and Sanctuaries Act has improved our coastal waters? Would you be able to answer a question of that nature?

Captain COUSTEAU. I cannot guarantee that my answer is right, but I have the impression that it has done a lot of good, yes.

Mr. CARNEY. Finally, Captain, you said that weekly we are finding new substances. I believe you said we are adding new substances. Would you suggest that they are new from a creative standpoint, or they are new from the fact that we have a greater ability to analyze?

Captain COUSTEAU. The chemical industry is producing new compounds every week. That is progress. The only problem is that they are very often dumped before we know what their consequences will be in the food chain. But we believe in progress. We do not want the chemical industries to stop. We just want them to purify their water at the outset of the plan; that is all.

Mr. CARNEY. Thank you very much, Captain.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Carney.

The gentleman from New York, Mr. Biaggi.

Mr. BIAGGI. Thank you, Mr. Chairman. I have a couple of quick questions.

Captain, you stated that the United States was in the lead, so far as environmental concerns and pollution. Have we been eclipsed by other nations? What other nations have gone to the forefront?

Captain COUSTEAU. In the scientific field or in pollution?

Mr. BIAGGI. In pollution.

Captain COUSTEAU. I would not say that you have been eclipsed. Other nations are progressing, but for the moment you have a few years lead.

Mr. BIAGGI. That is comforting. You made reference to the development of an enzyme which neutralizes some nerve gas, and had we stored that gas somewhere in the United States, we would have been in a position to have avoided the adverse consequences that you have related. What that indicates to me is that this suggests an approach to resolving issues surrounding the disposal of our nuclear waste.

Captain COUSTEAU. Yes.

Mr. BIAGGI. So you would encourage storage until research and science has produced satisfactory results?

Captain COUSTEAU. Absolutely. I am quite sure that we will be sorry someday to have dispersed our nuclear waste.

Mr. BIAGGI. You also stated that there were some beneficial elements in the sludge as well as adverse.

Captain COUSTEAU. Yes, sir.

Mr. BIAGGI. Would that not indicate that a continuation research and monitoring process is needed?

Captain COUSTEAU. You see, when you dump into the ocean phosphates and nitrates in great concentration in one area, it is detrimental. If you disperse it, it is beneficial. If we have too many phosphates and nitrates, the algae develop too much, take the oxygen off, and the fish die. But the primary production is limited by the lack of nitrates and phosphates in the ocean as a whole.

Mr. BIAGGI. If we were monitoring that, we would then be in a position to know that this condition has developed, and then we could shift the dumping sites?

Captain COUSTEAU. Yes. What our society is wishing is new, inventive approaches to solve these problems, not a negative stand. We need technology. We need invention to go ahead with progress instead of dragging those wastes behind us.

Mr. BIAGGI. I got the impression you said the ideal approach was to remove contaminants at the source.

Captain COUSTEAU. Yes.

Mr. BIAGGI. Then that would call upon all the resources of local government.

Captain COUSTEAU. If you want me to expand on that, all right. Looking at the moral picture, I do not believe that the villain is the industrial leader. The industry is not the villain.

Mr. BIAGGI. Then who is?

Captain COUSTEAU. Nobody is the villain. We face a new situation, whereby progress, jobs creation, generates toxic products for the community that benefits from the jobs, and the community must also contribute to the purification. It is very simple.

Mr. BIAGGI. If we are creating new forms of pollution, you said we should deal with it at the source. Then if I understand you correctly, you are talking about creating some innovative techniques to deal with new forms of pollution at the time they are created.

Captain COUSTEAU. Suppose you have a papermill. The mill is dumping mercury in its water effluents. It is relatively easy to take that mercury off there. Once it is mixed into the sludge, you cannot do it; it would cost you a fortune to do it. A very small purification plant would take the mercury out of the papermill.

Mr. BIAGGI. We come full cycle at that point.

Captain COUSTEAU. And that mercury could be recycled and would reduce the price of the purification. We do not do it just by neglect or by ignorance.

Mr. BIAGGI. I think we agree, but I want to get it straight. I said go to the source, but the source for the most part has been industry. Over the years, no attention has been focused on this problem with any great emphasis until the last several decades, and then there has been a complete reversal in attitude. Most industry has been cooperative, trying to comply. But again, we do have illustrations where industry has not complied. So we really should be looking to local governments, local enforcement agencies, to deal with this problem to see that all industry does not pollute at the source.

Captain COUSTEAU. I must add, industry is not the only one. Hospitals have terrible waste. We have to purify there, too.

Mr. BIAGGI. I am sure there is more than one industry involved.

Thank you, Mr. Chairman.

Mr. D'AMOURS. The gentleman from New Jersey who, in 1977, proposed the amendment that would have ended ocean dumping, Mr. Hughes.

Mr. HUGHES. Thank you, Mr. Chairman.

Welcome, Captain Cousteau. I gather from some of the studies and some of the reports I have seen that you have thoroughly studied the waters around the world. I wonder how much experience you have had in American coastal waters?

Captain COUSTEAU. Very little.

Mr. HUGHES. Have you ever had occasion to study the New York Bight apex we hear so much about?

Captain COUSTEAU. Never, sir.

Mr. HUGHES. One of the statistics that this committee used in 1977, when we composed the ban on all harmful ocean dumping after December 31, 1981, was a General Accounting Office study which was furnished to the Congress. The report, forwarded by the Comptroller General, dated January 21, 1977, outlined some of the substances contained in the sludge. It observed that the sludge contained cadmium or mercury that exceeded by more than 100 times the established safety level.

Captain COUSTEAU. I read this paper.

Mr. HUGHES. I wonder if you have found any areas around the globe that contain substances such as—mercury and cadmium—in such high concentration in any area?

Captain COUSTEAU. No. We have data about all the heavy metals in the Mediterranean and in the southern coast of the Caribbean that we took ourselves. We took samples, and they were analyzed by the U.N. Intercalibration Laboratory, so we know what we are talking about, and we have never had anything of that high a level.

Mr. HUGHES. One of the proposals in your draft study, you made some comment on phasing out all dumping at the 12-mile site off the New Jersey coast and the New York Bight after December 31, 1982. Do you find that is something that you would support or recommend?

Captain COUSTEAU. The 31st of December, 1981, has passed.

Mr. HUGHES. 1982.

Captain COUSTEAU. You switched one more year?

Mr. HUGHES. Yes.

Captain COUSTEAU. That is wise.

Mr. HUGHES. We have a very difficult situation. The fact is that we have gone beyond the ban.

Captain COUSTEAU. My answer to this is that we have to be prudent but realistic. If I had the decision on such an issue, I would only recommend a date after I would have made sure that all the data would be collected and the alternate technologies would be ready before I put the cities in trouble. You have to have a solution.

Mr. HUGHES. That is the difficult thing about setting a deadline: you have to develop alternatives. Because ocean dumping is so cheap, it is often easy for municipalities to let those commitments slide, because they have major problems and limited resources. Sewage sludge is just one of their problems.

Captain COUSTEAU. Some people have proposed a tax per ton of sludge dumped in order to finance the necessary research on the alternative techniques. It is the second best solution. The best solution would be that the Federal Government takes it over, but if it does not, I would favor that one.

Mr. HUGHES. One of the things you touched on, suggested by our chairman, was that insofar as the state of the technology, what we understand about the long-term impact of dumping, studies have shown that many of the marine organisms have accumulated vi-

ruses and bacteria, and there is some suggestion of transfer into the food chain, and some basic changes in marine organisms in areas around the dumpsites. I wonder if you can tell me if there is progress being made in the scientific community determining when we have created irreparable harm to the marine environment?

Captain COUSTEAU. We have already done some irreparable harm, but only partially. There are many places in the world which will never come back as they were. The problem that we have now is to limit this destruction, as little as we can, so as to preserve as much as we can for future generations. But irreparable damage has already been done in some areas. There are some coral reefs that will not come back before millions of years. There are coastal areas where certain algae will never come back for several thousands of years or maybe never. There are some animals that have been eliminated, and we will not see them any more. Destruction has occurred already.

What we are facing now is to stop doing that degradation. That is enough. We have done enough harm to the planet.

Mr. HUGHES. Thank you, Mr. Chairman.

Mr. D'AMOURS. The gentleman from Michigan, Mr. Hertel?

Mr. HERTEL. Thank you, Mr. Chairman.

Captain, it is a great honor to have you here. I want to ask you specifically about page 2 of your testimony, where you talk about some of the damage that has been done, at the bottom of that page, the fact that pollution has closed 20 percent of the commercial shellfish beds in this country, masses of sea creatures have died, and beaches were closed. I wonder, because of your extensive experience and personal travels, if you could give us some specifics of species in specific areas of this environmental damage related to our own ocean shelf.

Captain COUSTEAU. Let me make it very clear that this paragraph here is taken out of official reports of your country. I have been witnessing in other parts of the world the same thing. I am not, as I said already to another distinguished Congressman, a specialist on American waters. I have made that clear. These four lines here are taken out of an official report, and I did not want to hazard anything that was not admitted.

But these very same things happen in other countries. In the Mediterranean, I can make a list of fish that have practically disappeared from the northern coast of the Mediterranean. I have a list of algae that have also practically disappeared. When I took over the Oceanographic Institute in Monaco, we went diving along the cliffs and I was witnessing a relatively rich and varied wilderness. Today there is one type of algae that has invaded everything else, because it is the only one that resists the pollution. Damage has been done; there is no question.

The Nice Hospital has 10 times more dermatitis and skin accidents than 10 years ago. It is a fact. And this happens here also in this country; less, however, because you have taken measures earlier than we did, but with the Mediterranean Action Pact, I think we are going to do the same. I am optimistic.

Mr. HERTEL. Do you have a personal opinion as to other countries in the world which are the worst polluters?

Mr. D'AMOURS. Excuse me. Before this question is answered, I will call attention to the fact that it is now 11:26, and we are going to continue trying to get you out at 11:25, Captain Cousteau. It may have some effect upon the length of your answer.

Captain COUSTEAU. Thank you. I think that Japan today is one of the worst polluters. I would say so.

Mr. HERTEL. One brief question. We welcomed you to the Great Lakes of Michigan and the surrounding States, and I wondered how you found the environment of the Great Lakes when you visited there?

Captain COUSTEAU. When *Calypso* went to the Great Lakes, we did not enter Lake Michigan. We went to all the other lakes, and we were very pleased, in Lake Superior, to be able to drink the lake's water. The water of Lake Superior was drinkable, and we took advantage of that on board the ship. Lake Huron was almost drinkable and the other lakes, no question, no more.

Mr. HERTEL. We look forward to your returning.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Hertel.

Captain Cousteau, thank you once again for going through all this trouble to be with us. We wish you a good trip back to Paris.

Jean Michel, we also look forward to seeing you soon.

I hope you are as impressed and surprised as we are, Captain, with the self-discipline of the members of this committee. That was a lot of members questioning you in a very short period of time, which I think maybe sets a record for the U.S. Congress.

Captain COUSTEAU. Mr. Chairman, I am delighted to have had the opportunity to come. If I may contribute whatever I can, I am always available.

Mr. D'AMOURS. You already have. Thank you, Captain.

Our next witness is the Honorable Edward Koch, mayor of New York City, a former colleague of a good many of us and a personal friend of very many of us. I will turn to the gentleman from New York, Mr. Biaggi, to introduce Mayor Koch.

Mr. BIAGGI. Thank you, Mr. Chairman.

You stated that Mayor Koch is a former colleague and a clearly respected colleague. He has gone on to greater things and aspires to even greater heights in the field of politics, but more importantly, he has never severed the umbilical cord with this body in a relationship that has inured to the benefit of the people of New York City because of the respect and esteem with which he is held by his colleagues. We recall with fondness his many efforts to deal with critical issues over the period in which he has served and his very successful results in that area.

Today, he is accompanied by the commissioner of ports and terminals, Ms. Linda Seale, who has been most cooperative with the Subcommittee on Merchant Marine, which I chair, and the commissioner of the department of environmental protection, Mr. Joseph McGough.

Eddy, we welcome you as friend, as colleague, as witness, and we hope, soon, as the next Governor.

STATEMENT OF HON. EDWARD I. KOCH, MAYOR, NEW YORK CITY; ACCOMPANIED BY LINDA SEALE, COMMISSIONER, DEPARTMENT OF PORTS AND TERMINALS, NEW YORK CITY; AND JOSEPH T. McGOUGH, COMMISSIONER, DEPARTMENT OF ENVIRONMENTAL PROTECTION, NEW YORK CITY

Mayor KOCH. Mr. Chairman, it is a special pleasure to appear before you as a witness. I served with almost everyone who is sitting at this table, and none of you have grown any older—or at least I remember you all the way you were.

Mr. D'AMOURS. Whatever you want, Ed, you can have it. [Laughter.]

Mayor KOCH. I listened very avidly to the testimony of Captain Cousteau. Mr. Chairman, if I were putting together witnesses in support of the argument that we are going to make before you, I would have brought Captain Cousteau as our first witness to the table, because I do not disagree with anything he said.

I want to make a brief reference to something he said and also, with your permission, to file my full statement, which I will not read. I have a more brief statement, which I will make even briefer so we can take as many questions as you would like to pose to us.

The first reference I would like to make is to the captain's testimony. He said we have to look at the whole system. He said what he is concerned about is the water, because we are made up of 98 percent water, and we are originally water animals. He said we have to look at the snow, and we have to look at the lakes, and we have to look at the oceans, and the aquifers—the whole system; we agree.

That is exactly what we are asking this committee to consider—the whole system.

Captain Cousteau said that nobody is the villain; he is absolutely right. We all want to deal with the problem. He said we have to be prudent but realistic. Believe me, if you are a mayor, you know you have to be prudent and realistic. I want to say that when I was a Member of Congress, I had a very good environmental record. There were even years when I had 100 percent, and there were very few that had. It is easy to have a 100 percent environmental record as a Member of Congress. It is very tough as a mayor. The reason is a very obvious one, Mr. Chairman and members of the committee. There is a balancing of interests that a mayor has to employ to take a limited budget and to use it in a prudent but realistic way. I think that we are doing that, and I hope to convince you of that.

The last thing the captain said that I agree with, and I suspect every member here agrees with, is that the Federal Government should be collecting data on ocean impacts; and he is absolutely right. The data, he said, should be collected before the cities are asked to do something; he is right.

I will briefly set forth the amendments which are being proposed, which we are concerned about, so that I can address them. First, they would totally eliminate the ocean disposal of all currently dumped waste by prohibiting the disposal of any material containing known or suspected carcinogens, mutagens, and teratogens in any quantity. This mandate does not take into account the

harmful environmental impact of disposing of such materials on land.

As was pointed out by your colleague, Mr. Forsythe, you have to worry about the pine barrens; you have to worry about Norman Lent's situation in Long Island, where there is a single aquifer. I think there are only eight such instances in the whole country. They are the sole source of drinking water for the communities they serve. Shall we put these materials on the aquifer, as opposed to in the ocean? It would not make any sense, since we believe the impact is far more deleterious to do this than to dispose of these wastes where we currently are disposing of them.

I remember coming before the committee last year or perhaps 2 years ago. At that time, I said, "There is this deadline of December 31, 1981, and I do not know what I am going to do. What am I going to do? Take this sludge home with me and keep it in my apartment?" There has to be a place to put it until we find some other way to deal with it that is better. So we are working on it, as you are working on it, as the people around the country are. Until that better way is found, we do not think you should require us to take it from where we are currently putting it and put it someplace else where it will do equal or greater damage.

Second, the amendments proposed would ban any ocean dumping at sites within the New York Bight apex, in the face of a mass of scientific data which indicate that no significant adverse impact will be caused by continued dumping at those existing sites. The reason we do not want to move from that site, Mr. Chairman and members of the committee, is that we do not believe it would improve the environment by doing so. Further, we know that this will increase our disposal costs with no significant environmental gains.

If we are required to compost on land, our operating costs would be about \$45 million, as opposed to operating costs at the 12-mile site of \$4.09 million. There are construction costs for the composting facility, of which the Federal Government pays 75 percent, which would have a total cost of \$335 million, this represents a significant investment, but will not get you anything for your money. If New York City had to move its disposal operations to the suggested 106-mile site, our operating costs would go up to about \$27 million. The capital costs for upgrading the vessels would equal another \$50 million, I submit we would not be getting anything for our money—and when I say "our money," I mean local tax-levied dollars.

We consider Federal money to be as sacred a trust as local tax-levied dollars. We are simply saying to you that when you, the Congress, spend the money, you want to get something for it. If you require New York City to compost our sludge, you will get nothing meaningful in return; you will just have an expenditure of over one-quarter of a million dollars. If you require New York City to move its disposal site to 106 miles, and spend additional local tax-levied dollars, there will be no significant benefits, just an expenditure.

We are already suffering a reduction in Federal assistance of close to \$1 billion over the last 2 years in our operating budget. This has caused us to spend additional tax-levied dollars to make up for these funds which we desperately need for cops, firemen,

teachers, sanitation workers, and a whole host of other expenditures. To spend scarce dollars in exchange for no significant benefits, particularly during a time of budgetary pressure, would, in my judgment be a misplacing of priorities.

Finally, the proposed amendments replace the current test of "unreasonable degradation," which gives appropriate consideration to all environmental factors, with new tests that protect the ocean at all costs—where people do not live—over the land, the ground water, and the air.

Now just a brief word, Mr. Chairman, about the decision of Judge Sofaer. All that the *Sofaer* decision dictates is that EPA must consider the actual impact of continued ocean disposal of wastes and the environmental and economic consequences of available alternatives before compelling New York City to stop current disposal practices. He did not say, *carte blanche*, that we can dump with no restraint if environmental assessments show that we are degrading the environment to a greater degree by our current practices than if we dumped elsewhere. He simply said, which is eminently reasonable: weigh those factors, and then make a decision; and pending that decision, do not rush forward with new requirements.

We recognize the importance of adequate monitoring of ocean disposal activities. At the moment, the monitoring program required of those disposing of sewage sludge in the Bight Apex costs about \$300,000, of which New York City contributes about \$150,000 as one permittee. There are other local and Federal monitoring dollars being spent in the region and elsewhere in the country. It may very well be that our monitoring responsibilities should be expanded. I do not disagree with that at all.

Linda Seale points out that in Suffolk County, Mr. Carney's district, the purity of the water can be affected by land disposal. We want to make sure that does not happen to Long Island residents.

To conclude, Mr. Chairman, we know this committee wants to be reasonable: in the words of Jacques Cousteau, we should be "prudent and realistic." That is what he said. I concur, and I know that you do as well. Together, in a spirit of cooperation—because we are not adversaries; we are seeking to find an appropriate solution that is prudent and realistic—we will find a way to do what you want done, which is not to degrade the environment when this can be avoided. We all recognize that there is a balancing of interests and impacts.

I want to say that when I was in the Congress, the top two issues, in terms of everyday mail, were: "Mr. Congressman, save the whales." The second one was, "Save the porpoises." I am trying to save the people, as the mayor of the city of New York, in delivering services and making sure that there is a balancing of interests and that we do things in a prudent and realistic way. Thank you, Mr. Chairman.

[The statement of Mayor Koch follows:]

PREPARED STATEMENT OF EDWARD I. KOCH, MAYOR, NEW YORK CITY

Chairmen D'Amours and Breaux, members of this distinguished Committee, I am pleased to have this opportunity to testify before you this morning about the regulation of ocean disposal of waste materials under the Marine Protection, Research and Sanctuaries Act. Accompanying me are Commissioner Linda Seale of the New York City Department of Ports and Terminals and Commissioner Joseph T. McGough, Jr. of the City's Department of Environmental Protection.

The responsibility this Committee has for protecting the public health and environment from potentially adverse impacts associated with ocean disposal of wastes is a critical one. The Act in front of you is an integral component of the highly complex regulatory scheme which has developed over the past decade to protect our natural resources and environment from the byproducts of a highly industrialized society. As Mayor of a City with over seven million residents living in a very small space, and abutting the ocean, I fully share your concerns. New York City wants to work with this Committee to make certain that adequate protections, based on the best scientific evidence available, exist to protect the air we breathe, the land upon which we live, the water we drink, and the oceans which surround us.

In seeking to protect our natural resources, the Congress has moved to regulate the disposal of our society's wastes. How-

ever, the end result of this labor has been passage of a series of environmental statutes -- the Clean Water Act, the Marine Protection Act, the Clean Air Act, the Safe Drinking Water Act, and the Resource Conservation and Recovery Act -- which regulate waste disposal in a fragmented manner, with protections established for specific disposal mediums. This fragmented approach has not always permitted a dispassionate, scientific assessment of the risks and benefits associated with a variety of disposal options in particular settings.

Given the nature of the Congressional decision-making process, this is understandable. As a Member of Congress, I voted for all of these statutes myself. However, now that we stand at the end of a decade of legislating, it is important to come to grips with the outcomes that flow from a fragmented approach to waste disposal. I fear that the end result of this process is a progressive narrowing of the options available for disposing of our society's wastes and a rejection of the best scientific evidence we have with respect to the risks involved in competing waste disposal options.

The Marine Protection Research and Sanctuaries Act, as it now exists, is one of the few environmental statutes which recognizes that our environment is a highly complex, interrelated system and that waste disposal strategies involve difficult but

necessary trade-offs. This Committee has before it draft amendments to the Marine Protection Act which would largely ignore this undeniable reality. I understand the Committee's concern that the ocean not become the ultimate waste disposal medium by default. By the same token, I urge this Committee not to turn its back on a balanced, scientific approach to waste disposal. Rather, I urge the Committee to take up the challenge of directing the regulatory process towards an integrated, scientifically based approach to waste disposal decisions.

The ocean has an immense capacity to absorb, recycle, or dilute waste materials. This does not mean that this capacity is infinite. Nor does it mean that disposal of wastes in the ocean will not potentially affect ocean use for commerce, recreation, and food, or that waste disposal will not have some potential effects on marine ecosystems and human health. What it does mean, however, is that the ocean should not be automatically closed off as one option for waste disposal; that the impacts of proposed ocean disposal of specific material should be scientifically assessed in each particular instance where it is proposed, and compared with other options available; and that the impacts of direct waste inputs into the ocean should be put in perspective with regard to the total contaminant loading of the oceans.

Having established this general premise, I would like briefly to review for the Committee the impact of the proposed

amendments on waste disposal options in general and their more specific impact on New York City -- as best we have been able to assess them in the limited time available to us -- and to recommend a different course of action to the Committee than that contemplated by the amendments.

IMPACT OF DRAFT AMENDMENTS ON WASTE DISPOSAL OPTIONS

New York City is concerned that the proposed amendments will seriously impair EPA's ability to evaluate alternative disposal methods for wastes currently dumped in the ocean. Based on an assessment of the draft amendments and their implications, the City objects to a number of the proposed mandates and prohibitions included in the proposed amendments, all of which seem to be without technical justification. The City's major comments and concerns are as follows:

1. As drafted, the proposed amendments would totally eliminate the ocean disposal of all currently dumped wastes by prohibiting the dumping of material with known or suspected carcinogens, mutagens, and teratogens in any quantity. Such a prohibition is inappropriate in a law enacted to regulate, rather than to eliminate, ocean dumping especially since the alternative to dumping may lead to greater human exposure to such materials.

2. There is no technical justification for the proposed ban on ocean dumping at sites within the New York Bight Apex. These sites were designated only after careful consideration of information from comprehensive environmental impact statements, and the advice of responsible scientists and interested members of the public. The results of these assessments and other comprehensive studies indicate that no significant adverse impacts will be caused by continued dumping.
3. The proposed amendments set regulatory criteria, many of which are tentative and based on evolving technical knowledge, into legislation. Similar criteria already are incorporated into EPA's existing Ocean Dumping Regulations and the London Ocean Dumping Convention in a manner that allows for responsible scientific interpretation and implementation.
4. These amendments will compromise any efforts to balance New York City's disposal options for sewage sludge. The omission of the word "unreasonable" in the proposed definition of "degrade" and the new definition of "degrade" itself, coupled with the uniquely defined "prudent and feasible" test makes a meaningful assessment of impacts impossible. This

revision will upset the present system, which requires a balancing of disposal options to determine which constitute an "unreasonable" risk to human health and the environment.

These points and our other specific concerns are discussed in more detail in Technical Attachment A.

Impact of Draft Amendments on New York City

The City, along with other municipalities, will be significantly impacted by these amendments.

We provide secondary treatment to 1.3 billion gallons of sewage and, as a result, generate approximately 260 dry tons of sewage sludge each day.

This sludge is contaminated with heavy metals such as lead, copper and mercury, PCB's and other toxic organic materials, and therefore, must be disposed of with the greatest care. A comprehensive pretreatment program can improve the quality of this material to some degree, but will by no means eliminate the pollutants which are the cause for our concern. These contaminants stem largely from non-industrial sources, such as domestic sewage and storm water run-off, which flows into our treatment plants through a combined sewer system, and therefore will not be removed by pretreatment.

The sludge we produce at our plants is processed in digestion facilities -- which reduce the problem of pathogen contamination and generate useful waste energy -- and is disposed of in an area of the New York Bight lying 12 miles south of Long Island. This dumping is regulated by EPA, which imposes various operating requirements on us in order to minimize the environmental impact.

In 1977, the Congress amended the Act to create a deadline of December 31, 1981 for cessation of the ocean disposal of sludge which unreasonably degrades the marine environment. Upon enactment of this amendment, New York City proceeded to develop a land-based alternative to ocean disposal of sludge, involving the construction and operation of facilities at various locations in the City, which would convert sludge to compost. By early 1981, the City had completed the final design of these facilities. However, this program provided only a temporary, interim alternative, in view of the scarcity of land available in New York City to which contaminated compost might be applied, and the inability of the City to condemn property beyond its borders for sludge disposal purposes. Our experts estimated, in fact, that we would have to find some alternate means of disposal within seven years. This interim solution would have cost federal, state and local governments approximately \$335 million to construct, with 75% to be federally funded under the Wastewater Treatment Construction grants program. Under the scaled back program authorized by the Congress last year, these expenses are greater than the entire

annual allotment for all sewage treatment projects for New York State.

As the City and its consultants proceeded to develop this alternative, we experienced growing misgivings, shared by scientists at Columbia University and elsewhere, about the wisdom of a land-based alternative for sludge disposal. As planning continued, it became clear that the composting undertaken in connection with a land-based alternative would merely stabilize and partially sterilize sludge material and would not remove the heavy metals, carcinogens and toxic organics in the sludge. In turn, this posed the clear prospect that spreading such material on land might create more severe environmental impacts than ocean disposal, thus trading off one potential environmental problem against another, possibly more serious, one. Even with all these problems, composting was considered the best interim alternative disposal method available because incineration of sludge, or other thermal reduction techniques of disposal, posed the prospect of the generation of contaminated ash, the atmospheric release of carcinogenic and mutagenic compounds, the vaporization of heavy metals, and the increase of other air pollutant emissions in close proximity to large urban areas. Indeed, a portion of these emissions would be deposited in the Atlantic Ocean.

When we voiced these concerns to the staff at EPA, they indicated that they interpreted the 1981 deadline to be an absolute mandate, which required us to cease dumping, without regard to the land-based consequences.

It was at this point that the City of New York brought suit in the U.S. District Court of the Southern District of New York, arguing that the 1981 deadline only applied to sludge dumping which unreasonably degraded the ocean -- in light of all the criteria set forth in the Act, including those relating to the environmental consequences of available alternatives. In April 1981, Judge Sofaer of the District Court ruled favorably on the City's suit permitting continued ocean disposal of sludge because no adequate assessment had been made of the consequences of alternative modes of disposal. The judgement pursuant to this opinion directed EPA to revise its ocean dumping regulations to allow consideration of all of the statutory criteria and permitted the City to continue dumping until new regulations were promulgated and EPA went through the procedure of designating either the existing site, or a new site, for future disposal.

New York City is not the only local government concerned with potential hazards associated with alternatives to ocean disposal. Similar concerns exist, I believe, on the West Coast, in Massachusetts and in other neighboring municipalities on Long Island, Westchester and in New Jersey which currently dispose of sewage sludge in the ocean. For example, Long Island is one of

only eight areas in the United States with a designated "sole source aquifer" which meets all of the drinking water needs of its residents. Disposal of sludge-derived composted materials on Long Island could compromise the integrity of the aquifer, creating a public health crisis of major proportions. Ground-water resources are extremely fragile, and they can be significantly contaminated through landfill leaching and other processes. Once compromised, the integrity of such sources of drinking water is next to impossible to restore.

In fact, concern about the potentially dangerous impacts of such materials on land has led New York State to impose a ban on the use of sludge for agricultural purposes. Scientists at Cornell University recently suggested that the State's two-year ban be made permanent since they view sewage sludge as too toxic to use on land.

Weighed against these risks associated with non-ocean disposal are the scientific findings with respect to current disposal practices in the New York-New Jersey area. EPA concluded in their 1978 Environmental Impact Statement on Ocean Dumping of Sewage Sludge in the New York Bight that moving the sewage sludge disposal site out of the Bight Apex was "unnecessary and potentially more damaging to the environment than taking no action whatsoever." Research findings since that time have simply served to confirm that conclusion. After nearly sixty years of continuous dumping at the 12-Mile site, there has been no accretion

of sewage sludge at the site and virtually no evidence that the Bight has been unable to assimilate these wastes. Technical document B, which I will submit for the record, summarizes the most recent scientific evidence on the effects of sewage sludge on the New York Bight and nearby water areas. However, I would like to highlight several findings for the Committee:

- The digested sewage sludge which is barged to the Bight contains only 1-5% solids and is readily dispersed and diluted at the site.
- Ocean dumped sewage sludge contributes a minor fraction (generally 1-10%) of the total annual mass contaminant loads to the Bight. The Hudson River drains tens of thousands of square miles of land from upstate New York through the New York metropolitan area before emptying into the Bight. Direct municipal and industrialized wastewater discharges are another -- and the most significant -- source of pollutants to the Bight. Estimates published by NOAA in 1976 indicate that the major inputs of trace metals, suspended solids, nutrients, and coliform bacteria originated from the Hudson-Raritan estuary.
- A 1981 NOAA survey report on the Northeast coastal waters indicates that the occurrence of infectious and non-infectious fish diseases in the Bight is very low and none is unique to the New York Bight.
- The New York Bight Apex continues to support a valuable and viable sport and commercial fishery. Elimination of sludge disposal in the area would be of no benefit to the fishery.
- Continued use of the existing site is not a present threat either to public health or to water quality along the Long Island or the New Jersey beaches.
- Any potential human health impact from the consumption of sea food from the Bight is minimal and well below levels set by FDA for fish and shellfish.

Harbor dredging activities for the Port of New York and New Jersey would also be significantly affected by the proposed

draft amendments to the Act. The need for dredging the main navigation channels, anchorage areas, turning basins, entrance channels, slips and berths associated with the Harbor is clear. The Harbor's natural depth is 18 feet. The Army and users of the Port maintain channels at depths of up to 45 feet. Without dredging and a feasible means of disposing of dredged spoils, the Port would gradually close. Port activities currently provide almost 60,000 jobs, \$400 million in various regional tax revenues and almost \$6 billion in commerce. The Port serves as an entry point for goods used all over the Nation. To maintain the Harbor, some 10 million cubic yards of dredged material is removed each year, and deposited at the Mud Dump Site.

I would like to point out that dredged material is sediment transported from the estuary and channels and then redeposited in the marine environment. Dredging activities merely accelerate the rate at which sediment is transported to the Hudson-Raritan Plume, which is within the Bight Apex. The amount of dredged material deposited in the ocean by man is but a small fraction of the material that is naturally transported by rivers and streams.

In the last twenty years, there has been a great deal of research and monitoring to track and analyze dredged material deposited in the marine environment. The most recent study was conducted by the Environmental Protection Agency and is a draft environmental impact statement. This study focused on the pre-

vailing condition of the Mud Dump Site, the environmental implications of continued dumping activities and the feasibility of alternative disposal sites.

Areas outside the Apex were considered by the EPA but rejected for several reasons. Locations further out to sea present possible conflicts with biotic resources, such as fish and shellfish and with mineral resources, such as oil and gas. In short, they require added economic and energy costs to transport material out to sea without providing significant environmental benefits. Transportation to sites outside the Apex would add from \$48 to \$68 million a year to the cost of disposing dredged material.

The EPA concludes by recommending that the Mud Dump Site receive final designation as an approved site for dredged material in accordance with the Act and with EPA regulations. The EPA has selected continued use of the Mud Dump Site because it appears to be the most environmentally sound disposal alternative.

In addition, there are other studies referenced in technical attachment C, that conclude that the ocean may be the preferred disposal medium for dredged material. These studies include volumes of scientific data indicating that the ocean is the proper disposal medium for dredged material and the Mud Dump Site the proper location.

Upland disposal alternatives are out of the question. In

the Port of New York there is simply no area which has the capacity to receive 10 million cubic yards of dredged material each year. Unless we dredge those 10 million cubic yards, the harbor will begin to silt up and pose an even greater environmental danger. Vessels which cannot safely navigate port channels and waterways present a great risk for collisions and groundings. An oil or chemical spill resulting from such an accident would cause serious damage to the environment -- damage which could not be mitigated or reversed.

In short, the wealth of scientific evidence presented to date supports the continued use of the Mud Dump Site as part of an integrated management plan for waste disposal of dredged materials for the New York Harbor.

In underscoring these findings, and pointing out the environmental dangers associated with non-ocean disposal options in the New York area, I do not suggest in any way that I would have the ocean become the ultimate "dumping ground" for our society's wastes. Rather, I mean to suggest to the Committee the enormous complexities and stakes involved in disposing of our wastes given the options available to us.

I recognize the importance of attempting to minimize the production of such materials, and of limiting the contaminants present in them as much as possible. At the same time, decisions about waste disposal must proceed in a scientific

manner, which recognizes the needs and particular circumstances surrounding disposal in different communities and truly serves the public health and environmental goals we all share. We must also take note of our shrinking fiscal resources and energy supplies. Clearly, we should not be diverting hundreds of millions, or even billions, of dollars away from constructing wastewater treatment plants in order to build composting facilities that yield no environmental benefits, or may even pose significant environmental problems to the public.

Only a little more than one year ago, the National Advisory Committee on Oceans and Atmosphere (NACOA) issued a report to the President and the Congress entitled "The Role of the Ocean in a Waste Management Strategy" pursuant to their legislative mandate to undertake a continuing review of, among other things national ocean policy and the status of marine science. Surely NACOA cannot be accused of slighting the need to take necessary steps to protect our marine resources and ecosystems. This report was the culmination of a two year effort to formulate recommendations on the use of the ocean as a waste disposal medium.

Among the most prominent and important recommendations in the NACOA report is the recommendation that the Congress and the Executive Branch adopt an integrated approach to waste management which would modify the existing medium-by-medium approach to disposal and encourage policies which minimize risks to human health and the environment.

Recommendations for Committee Action

As a result of Judge Sofaer's decision, a decision which continues a ban on ocean dumping which unreasonably degrades the environment, a process has been set in motion to permit a comprehensive, multimedia assessment of the risks to the environment and public health stemming from ocean dumping and land-based alternatives for sludge disposal. EPA has just completed a five-year EIS on disposal of dredged spoils and the Corps is implementing a scientifically based five-year program for the Harbor. I urge this Committee to permit these processes to go forward, and to allow the scientists to develop the information necessary to provide a safe and sound waste disposal strategy for the New York area. The draft amendments would set back this process for years, and should not be adopted.

New York City has been and is currently committed to exploring all technically feasible and environmentally sensible options for disposal of its sewage sludge. The City believes the Marine Protection Act and supporting regulations provide a vehicle for undertaking such a comprehensive assessment. We believe that this is in the best interest of our citizens -- from a health and environmental point of view -- and that it is an approach which is endorsed by the scientific and environmental community.

The City is committed to active participation in the EPA proposed site-designation rule-making process, which will update the environmental information concerning the 12-mile site, and other possible sites further offshore. In addition, we plan to prepare a comprehensive Special Permit Application which will include the results of detailed chemical and biological testing, as well as multimedia analyses. These assessments will compare the specific risks to the environment and human health from ocean disposal and land disposal. Amending the Act in the manner suggested by the draft amendments under consideration would preclude these balanced efforts. It would also reverse a growing predisposition in the scientific community that multimedia assessments are the right approach for our increasingly complex society.

I can understand the frustration of some members of this Committee with delays that have occurred in undertaking comprehensive environmental assessments and appropriate research and monitoring on ocean disposal sites. In response, I can only assure you that New York City is fully committed to meeting our share of the responsibility for the work that is necessary to arrive at a reasoned decision on waste disposal issues in our region. If the City had not felt that the land disposal scheme pursued in the late 1970's was environmentally unwise, we would not have contested its implementation in Court. Judge Sofaer's opinion addressed the potentially grave impacts of an outright

ban on ocean dumping in the New York area on public health and the environment, and the absence of any serious consideration by EPA of these impacts on directing the City to go forward with a land-based alternative.

In reauthorizing the Marine Protection Act this year, I emphatically urge the Committee to permit the process that has now been set in motion for sludge disposal to come to fruition.

With respect to dredged materials from the Harbor, EPA's EIS indicates that designation of the Mud Dump Site in the New York Bight is the environmentally preferable alternative. In light of this analysis, it would be imprudent for this Committee to enact an outright ban on disposal of dredged material in the Bight, as the draft amendments would do, or to establish new criteria for disposal of dredged spoils in the ocean which, in essence, would ban ocean disposal. I can unequivocally state that no land sites are available in the New York area for storing these huge volumes of waste. In essence, it appears that the draft amendments would ultimately force the closure of New York Harbor -- with disastrous effects on the region's economy, -- for no discernible reason. Clearly, this would be a steep price to pay, especially when no environmental benefits will be forthcoming from such an action.

With respect to disposal of sewage sludge, I want to reiterate the absence of any scientific evidence that would justify

the environmental problems, dislocation and expense the draft amendments would impose upon the residents of the City. Feasible, permanent land-based options for sludge disposal in the City of New York, given the absence of land and large amounts of sludge produced by our treatment plants, do not exist. Moreover, significant environmental problems make these land-based alternatives unworkable even in the short term. In light of EPA's current efforts to revise its regulations, I urge the Committee to turn away from the pending amendments. By doing so it will permit the scientific community to develop the technical information necessary to make reasoned decisions on all of the substantive issues raised by the ocean disposal controversy. New York City is committed to participating actively in this process and taking on appropriate responsibilities for monitoring the impacts of our ocean dumping.

If the Committee believes that the process now in motion is compromised along the way, or EPA or other agencies fail to carry out their responsibilities, or that the stringent criteria already set out in the Act are ignored it can take action at a later date. To take action now would be premature and counterproductive.

That completes my prepared testimony. I appreciate the Committee's patience in hearing me out. As I have indicated previously, I am submitting along with my written testimony, attachments which analyze the specific provisions of the draft amendments to Title I of the Act, and summarize the existing scientific findings on ocean disposal of dredged materials and sewage sludge.

Commissioners Seale and McGough and I will be happy to answer any questions you might wish to ask of us.

TECHNICAL DOCUMENT A

SEWAGE SLUDGE
DUMPING AT THE
12-MILE SITE



A

TECHNICAL

SUMMARY

THE CITY OF NEW YORK

MARCH 1982

INTRODUCTION

The Marine Protection Research and Sanctuaries Act (MPRSA) of 1977 (Ocean Dumping Act) is currently before Congress for reauthorization. During this period, an Amendment to the Act will be proposed and Congressional hearings held. New York City is concerned about the overall implications of the proposed Amendment, dated 25 February 1982, and its impact on the City's sludge disposal options. For example, one change currently being considered will result in an outright ban on sewage sludge disposal at the 12-Mile Site.

New York City has been and is currently committed to exploring all technically defensible options for disposal of its sewage sludge. The City believes the existing Act and supporting regulations provide a vehicle for this comprehensive assessment. The City's current commitments include active participation in the Environmental Protection Agency's (EPA) proposed site-designation rulemaking process, which includes updating of the environmental impact statement issues for the existing 12-Mile Site, as well as plans to prepare a comprehensive Special Permit Application for the 12-Mile Site. This Special Permit Application will include the results of comprehensive chemical and toxicological testing and multimedia risk assessments. The multimedia assessments will balance risks to the environment and human health from ocean dumping and land-based alternatives.

Since the proposed Amendment to the Act could preclude the opportunity to make these assessments, NYC feels it is important to summarize key issues on ocean disposal of sludge and to identify problems associated with land-based alternatives. This information, based upon a preliminary review, should provide a better understanding of the overall issues relevant to sewage sludge disposal at the 12-Mile Site based on current scientific information as well as point out the lack of technical justification for a rigid ban on sewage sludge dumping in the apex of the New York Bight.

HISTORY OF THE 12-MILE SITE

- The present location of the sewage sludge dumpsite was selected by the states of New York and New Jersey in 1924 and has been in continuous use since that time.
- The site is located within the New York Bight Apex approximately 11.4 and 11.8 miles from the Long Island and New Jersey coastlines, respectively. It was originally chosen to maintain the integrity (in terms of public health and aesthetics) of Long Island and New Jersey beaches, as well as to avoid possible hazards to navigation within New York Harbor.
- In direct contrast to the House Committee's perceived need to close the Bight apex to ocean dumpers, EPA in their 1978 Environmental Impact Statement on Ocean Dumping of Sewage Sludge in the New York Bight, concluded that the "proposed action [to move the sewage sludge

disposal site out of the Bight apex] was unnecessary and potentially more damaging to the environment than taking no action whatsoever."

CHARACTERISTICS OF SEWAGE SLUDGE

- Sewage sludge is a general term used to describe the mixture of water and settled solids removed from municipal wastewater during primary and secondary treatment operations. The digested sewage sludge slurry that is barged to the 12-Mile Site generally contains only 1-5 percent solids (95-99 percent water) and like all municipal sewage sludges, variable amounts of nutrients, trace metals, microorganisms, and organic constituents. This slurry, which is slightly less dense than seawater, is readily dispersed and diluted at the disposal site. Additionally, primary and secondary treatment operations remove undesirable floatable materials from the sludge slurry prior to being barged to sea.

Sources of Contaminants

- Identified sources of wastes discharged into the waters of the New York Bight are numerous. The Hudson River drains tens of thousands of square miles of land from upstate New York through the heavily populated and industrialized areas of the New York City metropolitan region before emptying into the New York Bight apex. Direct municipal and industrialized wastewater discharges are the most significant sources of pollutants to the Bight, whereas direct urban runoff and accidental spills also are significant sources of some contaminants.

An additional source of pollution is atmospheric fallout to the New York Bight waters from industrial stack emissions, automobile exhausts, fossil fuel combustion, and other incineration sources.

In addition, ocean dumping of municipal and industrial wastes occurs at federally designated waste disposal sites (i.e., dredged material dumpsite, sewage sludge dumpsite [12-Mile Site], cellar dirt dumpsite, and acid waste dumpsite).

- Ocean-dumped sewage sludge contributes a minor fraction (generally 1-10 percent) of the total annual mass contaminant loads to the New York Bight. Estimates published by the National Oceanic and Atmospheric Administration (NOAA) in 1976 indicate that the major inputs of trace metals, suspended solids, nutrients, and coliform bacteria, originate from the Hudson-Raritan estuary. Those wastes reach the ocean in the high volume discharge of river water from the estuary to the Bight, and in the sediments dredged from the New York Harbor and redeposited at the existing dredge spoil dumpsite. Recent calculations generally are consistent with NOAA's earlier estimates. The most current data also indicate that sewage sludge is a minor contributor of synthetic organic compounds such as PCBs.

Environmental Considerations

- The much publicized 1976 Long Island beach pollution incident was studied extensively by federal, state, and local authorities to determine the sources of the floatables. NOAA's summary report indicates

conclusively that the beach pollution in 1976 was the result of land-based sources including a sewage treatment plant explosion, raw sewage discharges, combined sewer overflows, urban runoff, pier fires, and solid waste (garbage) barging operations within New York Harbor. Barged sewage sludge was, at most, a minor contributor--especially since properly operated primary and secondary sewage treatment operations effectively remove the floatable materials from the sludge.

- NOAA published a comprehensive report which concluded that the much publicized 1976 anoxia event was basically a natural event exacerbated by unusual meteorological conditions. Although digested sewage sludge does contain oxygen-demanding constituents, EPA's 1978 Environmental Impact Statement concluded "that ocean dumping of sewage sludge was not responsible for [this incident]: that it was at most a minor contributing factor."
- After nearly sixty years of continuous dumping at the 12-Mile Site, there has been no accretion of sewage sludge at the site and virtually no evidence that the New York Bight has been unable to assimilate these wastes. In 1974 newspaper and popular magazines reported that massive sewage sludge beds were moving towards Long Island beaches at rates of 0.7 nautical mile per year. These reports have not been supported by subsequent technical evidence and the consensus of the latest federal and state opinions on the "sludge monster" is reflected by NOAA's Dr. R.L. Charnell who stated in a 1975 report that "no evidence for a front of sewage sludge approaching the Long Island shore was observed."

- . Concentrations of contaminants in sediments of the Bight are elevated relative to pristine continental shelf areas. With respect to the Bight as a whole, the extent to which sewage sludge contributes to observed sediment, water column, and body burden loadings is considered to be roughly proportional to its percentage of all introduced contaminants--generally 1-10 percent depending on the specific constituent under consideration.

- . Published reports of a "dead sea...devoid of normal populations" are unfounded. Stable benthic (bottom dwelling) communities are established at the sewage sludge dumpsite, although they are abundant in pollution tolerant species as expected.

- . The incidence of many fish diseases in the New York Bight appears to be much lower than previously indicated. Many of the early 1970s monitoring reports circumstantially associated fish diseases with sewage sludge disposal in the ocean, basing their conclusions on extremely limited databases. However, a 1981 NOAA survey report on the health of the northeast coastal waters utilized a higher quality database and concluded that the occurrence of infectious and non-infectious disorders in the region is very low. The survey revealed the apparent good health of most of the fish examined.

- . Recent scientific literature indicates that the incidence of many fish and shellfish diseases reported in the New York Bight is not attributable to the ocean dumping of sewage sludge. Continued use of the 12-Mile Site for sludge disposal would not be expected to increase the

occurrence of fish or shellfish disorders. There are no infectious or noninfectious diseases that are unique to the New York Bight. Several fish and shellfish disorders previously associated with the 12-Mile Site also have recently been reported under hatchery conditions and the bacteria and fungi isolated from infected fish have been found widely distributed in most marine environments. The incidence of some fish and shellfish disorders in relatively unstressed environments has led authors to conclude that certain diseases are latent in most fish populations and may intensify periodically for natural reasons.

- The New York Bight apex continues to support a valuable and viable sport fishery despite current dumping practices. The recreational fin fishery of the New York Bight is composed primarily of migratory species with the fishing effort shifting spatially and seasonally among species. With the exception of large gamefish (marlin, swordfish, and tuna), which are caught along the outer edge of the shelf, most of the recreational fishery is concentrated in the more accessible inshore areas. Most of the catch comes from within 15 miles of shore with a high proportion of the take within 3 miles. Many of the major recreational fishing grounds are located in close proximity to the active Bight dumpsites and elimination of waste disposal in the area would not be expected to increase the fishery. Estimates of the number of anglers and the size of the recreational catch have increased steadily over the past two decades and the increase is expected to continue. The recreational landings from the Bight area for the major sport species approach or exceed commercial landings. Declines and fluctuations in most of the major stocks generally have

been attributed to overfishing, unregulated recreational and commercial catches, and natural environmental fluctuations.

- Sewage sludge dumping at the 12-Mile Site does not significantly interfere with the New York Bight commercial fisheries. Commercial finfish are caught in and around the disposal sites as well as throughout the New York Bight. Except for interference from relatively heavy ship traffic through the area, there appears to be little inhibition in utilization of the commercial fisheries resources of the Bight due to the disposal of wastes.
- Cessation of sewage sludge dumping at the 12-Mile Site will have little foreseeable benefit to commercial shellfishing in the New York Bight. A major contribution to the commercial landings of the mid-Atlantic region is from shellfisheries, particularly clams, sea scallops, squid, and American lobster. U.S. Food and Drug Administration (FDA) closures of shellfishery areas in the shore zone and Hudson-Raritan Bay complex are the result of local and estuarine drainage basin pollutional sources. These closures would be expected to remain in effect even if cessation of dumping and recovery of the dumpsites permitted reopening of the offshore area. Furthermore, because the closure zone around the dumpsite is very small relative to the distribution of commercially valuable shellfish stocks in the mid-Atlantic region, no significant increase in landings is likely as a result of reopening this zone.

- Much discussion has addressed the ocean dumping of potential pathogens at the 12-Mile Site. This concern is unfounded in light of NOAA-funded mass loading estimates that greater than 99 percent of the coliform bacteria (which are used as indicators of pathogens) enter the Bight at the shoreline much closer to urban populations via municipal wastewaters and urban runoff. In comparison, the combined barge dumping of sewage sludge, dredge spoil, cellar dirt, industrial acids, and chemical wastes were computed to contribute less than one-tenth of one percent of the coliform bacteria to the Bight, at distances at least five nautical miles from the shore.

- Concern has been voiced over the presence of large amounts of pollutants in tissues of fish and shellfish in the New York Bight. Analysis of data collected by NOAA under the Microconstituents Program could show no significant differences in pollutant levels in several important commercial fish species (winter flounder, scup, grey sea-trout, Atlantic mackerel, bluefish, and striped bass) collected from the New York Bight, Georges Bank, or an area 200 miles due east from the Bight. A NMFS-Sandy Hook study concluded, after many years of research, that the only statistically different tissue levels in New York Bight were those of silver in the red crab. None of the tissue levels observed even approached FDA action levels for fish tissue levels. A halt to the disposal of sewage sludge is not anticipated to result in any significant decrease in tissue concentrations of pollutants as sewage sludge contributes only a very small percentage of constituent inputs to the New York Bight.

- Predictions of New York Bight recovery following the elimination of sewage sludge range from skepticism to cautious optimism. From a technical standpoint, the prohibition of ocean dumping from the Bight apex will have absolutely no effect on contributions by the Hudson-Raritan estuary, surface runoff, or wastewater discharges, which are unquestionably the dominant sources of all contaminants to the Bight. Prior to the direct control of these more dominant sources, little improvement in the Bight Apex would be expected.

Human Health Considerations

- Potential human health impact from the consumption of biota from the New York Bight is minimal and well below the acceptable levels promulgated by FDA and EPA. Tissues concentrations in fish are far below those set by FDA as marketing restrictions. For carcinogens, mutagens, and teratogens, water quality parameters of the New York Bight are below promulgated water quality criteria.
- Intuitively, available land-based disposal options, such as landfilling, would introduce the same constituents currently dumped at the 12-Mile Site into areas closer to human populations and with more direct pathways to man.
- The Environmental Protection Agency's 1978 Environmental Impact Statement states specifically that "continued use of the existing site is not a present threat either to public health or to water quality along the Long Island and New Jersey beaches."

Land-Based Alternatives

- . In accordance with both the National Advisory Committee on Oceans and Atmosphere's (NACOA) 1981 recommendations and the recently issued federal district court decision (80 Civ. 1677), the City agrees that municipal sewage sludge should be disposed of in the manner and medium that minimizes the risk to human health and the environment within obvious financial limitations.

- . Numerous negative impacts would be expected to result from each of the feasible land-based alternatives that have been identified for the ocean disposal of sewage sludge. Because of the very large quantities of sludge generated in the New York metropolitan area, these land-based options are high technology, high cost alternatives, which are, in general, unacceptable to the general public. Furthermore, these options have not been shown to reduce the risks to human health relative to the well-studied effects of ocean dumping.

- . Thermal reduction techniques are categorized as either incineration or pyrolysis. Both have numerous, documented social and environmental problems including increased air emissions violations in areas where air quality is already substandard, the generation of contaminated ash, the release of carcinogenic and mutagenic compounds in close proximity to large population centers, high costs of construction and operation, and the eventual recycling of these atmospheric emissions back into the Atlantic Ocean.

Land disposal options include landfilling, composting, and numerous land application techniques. Potential impacts include: surface water and groundwater contamination with chemicals and pathogens, contaminant accumulation by plants and animals, the spreading of disease by environmental pathways or through direct contact, odor generation, and enormous problems with acceptance by homeowners and farmers. Furthermore, in the case of metropolitan New York, suitable tracts of land within a reasonable distance are unavailable for many of the land disposal alternatives when considering the large volumes of sewage sludge generated by the entire metropolitan New York area.

The 1981 report by the NACOA recommended to Congress a multimedia approach to waste management which "minimizes the risk to human health and the environment and at a price this nation is prepared to pay," and that ocean disposal of sewage sludge should continue to be a disposal option. This concept was endorsed by both the EPA (in their letter to NACOA dated 30 November 1981) and by the U.S. District Court (80 Civ. 1677). In addition the House Subcommittee on Natural Resources, Agriculture Research and Environment supported the multimedia (cross-media) assessment concept by making funds available to both NOAA and EPA for a multimedia study of sewage sludge disposal options.

CONCLUSIONS

The preliminary investigations of sewage sludge dumping in the New York Bight have resulted in the following conclusions. Sewage sludge has been continuously dumped at the existing 12-Mile Site since 1924 with no evidence of significant accretion or evidence that the New York Bight has not been able to assimilate these wastes. Sewage sludge is a minor (1-10 percent) source of total annual contaminant loadings to the New York Bight waters and removal of this input would be unlikely to result in any significant recovery. Similarly, the contribution of sewage sludge to constituent levels in sediments, the water column, and biota is relatively small and is related to the percent contribution relative to other Bight inputs.

The much publicized 1976 anoxia event, the Long Island beach pollution by floatables, and the sewage sludge "monster" have been studied extensively and it has been concluded that ocean dumping of sewage sludge was, at most, a minor factor. EPA concluded that continued dumping at the existing site is not a present threat to either public health or to water quality along New York and New Jersey beaches. Finally, each of the feasible land-based alternatives to ocean disposal have identified unavoidable adverse impacts. Technical evidence clearly does not justify removing sewage sludge dumping from the New York Bight apex--a conclusion recently supported by both NOAA and EPA.

Based on the current understanding of the (anticipated) effects of sewage sludge disposal via ocean dumping, incineration/pyrolysis, and land

application, it is imperative that a comparative assessment be performed to provide maximum overall protection to human health and the environment, and thereby manage sewage sludge disposal in a responsible manner. The City feels that the combination of the existing Ocean Dumping Act, the Ocean Dumping Regulations and Criteria, and the recently issued Sofaer decision adequately provide the necessary framework under which to conduct this comprehensive assessment. The proposed Amendment of the Act, however, will substantially limit the framework for this important assessment.

TECHNICAL DOCUMENT B

TECHNICAL ANALYSIS

of the

28 FEBRUARY 1982 DRAFT

"OCEAN DUMPING AMENDMENTS ACT OF 1982"

THE CITY OF NEW YORK

MARCH 1982

INTRODUCTION

The Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as enacted, is "[A]n Act to regulate the transportation for dumping, and the dumping of materials into ocean waters..." The Act establishes a national policy that ocean dumping must be strictly regulated to ensure that such disposal activities would not adversely affect human health, the marine environment, or economic potentialities. In 1977 Congress amended the Act to require the EPA Administrator to deny permits for the ocean dumping of harmful sewage sludge after 31 December 1981 and, at the same time, defined such sludge as the waste material generated by a municipal wastewater treatment plant, that when dumped into the ocean would "unreasonably degrade or endanger" human health, the marine environment, or economic potentialities. EPA was delegated the task of regulating ocean dumping and was further directed to establish and apply criteria for reviewing and evaluating ocean dumping permit applications to determine whether such dumping would result in unreasonable degradation.

EPA has rather strict criteria for evaluating permit applications and in designating acceptable locations for ocean dumping. As directed by the Act, these ocean dumping criteria include consideration of the "need" to ocean dump, which first and foremost involves consideration of the human health and environmental risks of land-based alternatives for waste disposal or recycling, as well as the costs associated with such alternatives. Under the present regulatory framework, unreasonable degradation can only be determined after consideration of all available waste disposal mediums, including the ocean. An optimal mode of disposal can

be selected with regard to risk to human health, the environment, and economic and technological feasibility.

The purpose of this document is to evaluate and comment on the draft Amendment (dated 25 February 1982) to the Act entitled "Ocean Dumping Amendments Act of 1982." The comments address the need for specific proposed revisions to the current ocean dumping act. In our opinion, the existing Act already provides the policy and provisions for adequate protection of the marine environment. The EPA regulations provide a framework for evaluating the most acceptable means of disposal. Further, these regulations are currently under review and are expected to be revised to reflect the present scientific knowledge. Specific provisions of the proposed Amendment will seriously impair the ability of EPA and the affected parties in properly evaluating and implementing acceptable disposal methods for wastes currently dumped in the ocean. Many of the proposed prohibitions and provisions are already incorporated into the existing and evolving EPA regulations in a technically sound manner consistent with the standards and criteria binding upon the United States under the London Dumping Convention and its Annexes. Incorporation of the proposed Amendment prohibitions will preclude some important multi-media comparisons currently mandated under the Act and required under the Regulations.

New York City is committed to active involvement in the site-designation rulemaking process and has undertaken a major effort to reevaluate the environmental effects of sewage sludge disposal at the 12-mile dumpsite based on the latest scientific information. The City is increasingly

concerned about potential risks to human health and the environment associated with proposed land-based alternatives to the ocean dumping of sewage sludge. Those risks will be fully evaluated as part of the preparation of a comprehensive Special Permit Application. However, the City is concerned that the proposed amendments will prevent EPA and the affected parties from making a technically sound decision on the most feasible mode of sewage sludge disposal in the New York metropolitan area. Our specific objections to the draft Amendment are briefly highlighted below. Major provisions in the proposed Amendment, as they affect the future of sewage sludge disposal in the ocean, are presented first followed by other noteworthy provisions on which we wish to comment.

MAJOR IMPLICATIONS

1. The major implication of the proposed Amendment may be the outright ban on dumping of sewage sludge at all existing or proposed ocean sites (e.g., 12-Mile, 65-Mile, or 106-Mile sites) due to revised provisions of the Act which directly prohibit specific constituents. Section 102(a) of the current Act prohibits radiological, chemical, and biological warfare agents and high-level radioactive waste from ocean disposal. The proposed amendment [Section 102(a)(1)] adds three additional prohibited materials. Each of these prohibited from the draft Amendment are discussed individually in the

the following sections.

1.A Subsection 102(a)(1)(D) prohibits,

known carcinogens, mutagens, and teratogens and any material suspected, by responsible scientific opinion, to be a carcinogen, mutagen, or teratogen. [Emphasis added.]

This prohibition is unqualified and would appear to prohibit any material in which even the most insignificant concentration of these materials can be found. All waste materials are expected to contain some amount, however small, of at least one of these constituents and thus would be unconditionally prohibited from being disposed of in the ocean.

This portion of the draft Amendment appears to have originated in EPA Ocean Dumping Regulations [Subsection 227.6(a)(5)]. However, the Ocean Dumping Regulations limited carcinogenic, mutagenic, and teratogenic waste constituents to trace concentrations that were determined by an evaluation of potential undesirable effects and the results from bioassay tests. The banning of materials to be dumped because there are detectable quantities of a carcinogen without balancing the potential or actual risks to the environment and human health is unreasonable. The case of arsenic is particularly interesting because, although it is classified by EPA as a suspected carcinogen, it is a natural constituent of all marine waters. Moreover, this absolute ban does not allow any consideration to be given to the potential risks involved with the alternatives to dumping which may lead to more probable and direct human contact with such materials.

No other federal environmental legislation forbids disposal of materials based upon the mere presence of carcinogens, mutagens, and teratogens. Freshwater and marine water quality criteria are defined in terms of unreasonable risk. None of the carcinogens, mutagens, and teratogens for which water quality criteria have been set are known to be present in the New York Bight at concentrations even approaching accepted lifetime risk levels as established by EPA.

Many carcinogens, mutagens, and teratogens occur naturally in the environment. In fact, chemicals which are essential to life at one concentration may be carcinogenic or teratogenic at other concentrations (e.g., selenium and vitamin A, respectively). Information on the vast majority of carcinogens, mutagens, and teratogens is rare, and for many of these chemicals no analytical procedures exist. Thus, this proposed prohibition is inappropriate and technically insupportable. At the London Dumping Convention meeting in 1981, the inclusion of carcinogens, mutagens, and teratogens as prohibited materials was proposed to be included in Annex I. The proposal was rejected specifically because of the inadequacy of technical information that could be interpreted in any meaningful regulatory manner.

To prohibit the ocean disposal of a waste due solely to the presence of an objectionable constituent, regardless of concentration, expected dilution, or potential effects, as proposed in the draft Amendment, is arbitrary and technically insupportable.

1B. Subsection 102(a)(1)(E) states,

any material which, on the basis of chemical and toxicological testing, is found to contain more than trace amounts of--

(i) one or more persistent inert synthetic or natural materials that may float or remain in suspension in ocean waters in such a manner as to interfere materially with fishing, navigation, or other legitimate uses of the ocean,

(ii) cadmium or any cadmium compound, mercury or any mercury compound, or any organohalogen compound, or

(iii) oil of any kind or in any form, including but not limited to, oil sludge, oil refuse, crude oil, fuel oil, heavy diesel oil, lubricating oils, hydraulic fluids, and any mixture of the foregoing; and [Emphasis added.]

This portion of the draft Amendment included certain chemical compounds that had been already identified in EPA's Ocean Dumping Regulations [Subsection 227.6(a)(1)-(4)] and prohibited when present in concentrations of greater than trace amounts. The draft Amendment differs from the Act and the current Regulations and can be interpreted as prohibiting the above waste constituents simply on the basis of concentration. The major difference between the two rests in the ability within the current Act and regulations to conduct multimedia assessments to balance the risk to man and the environment, relevant to sludge disposal options. The proposed Amendment will ban, outright, materials containing greater than trace amounts of the identified constituents, without allowing for the option to balance the relative environmental and human health risk for various disposal practices. The Ocean Dumping Regulations and the London Dumping Convention exclude existing applicable wastes from this prohibition if the compounds are present in nontoxic and nonbioaccumulative forms or if, once dumped, the compounds will be rapidly

rendered nontoxic or nonbioaccumulative [Subsection 227.6(f)] or "rapidly rendered harmless" [Annex I London Dumping Convention].

1.C Subsection 102(a)(1)(F) states,

any material of any kind whatsoever for dumping in the area of ocean waters lying westward of 73 degrees 30 minutes west longitude and northward of 40 degrees 10 minutes north latitude, except that--

(i) any permit for the dumping of material, other than dredge spoil, in such area that was issued before, and is in effect on, the date of the enactment of the Ocean Dumping Amendments Act of 1982 shall terminate at the close of December 31, 1982 or such earlier date as may be specified in the permit; and

(ii) any permit for the dumping of dredge spoil in such area that was issued before, and is in effect on, the date of the enactment of such Act of 1982 may be renewed after such date for a term ending on or before the close of December 31, 1982.

Subsection 102(a)(1)(F) sets forth the latitude and longitude coordinates which outline the apex of the New York Bight in the western north Atlantic Ocean plus portions of the north Pacific Ocean and the Bering and Beaufort seas. No material may be dumped in these areas except under valid permits which for dredged material may extend until 31 December 1985, or for all other materials only until 31 December 1982. The New York Bight Apex contains four major dumpsites--the 12-Mile Site for sewage sludge, the dredged material dumpsite, the cellar dirt dumpsite, and the acid waste dumpsite.

EPA and NOAA, the federal experts on ocean waste disposal in the New York Bight, have not concluded that this portion of the ocean is "unreasonably degraded" as defined in the Act. Their studies have

also not provided a technical foundation for this outright ban. In fact, EPA had intended to commence with a rulemaking proceeding shortly to explore the condition of the New York Bight and to determine whether sludge dumping in that area should be allowed to continue. This rulemaking procedure would allow the experts to determine whether the action Congress is now taking is appropriate.

The limitations and criteria within the Act and the Ocean Dumping Regulations are adequate to prevent and detect adverse environmental effects due to ocean disposal. This outright ban by the draft Amendment of dumping in the New York Bight is not substantiated, and is arbitrary and technically unfounded.

2. Similarly, the Findings and Policies portion of the Act has been greatly changed in the draft amendment. According to the bill, Congress has found that "certain ocean waters...are already unreasonably degraded as a result of dumping..." [Subsection 2(a)(2)]. Scientific evidence has not shown that the New York Bight has been "unreasonably degraded" due to sewage sludge dumping. On the contrary, studies show that the New York Bight Apex receives a diverse pollutant load and the contribution of sewage sludge is relatively small.

Congress also has stated in the draft Amendment that it found "...certain materials that have heretofore been dumped into the ocean waters have potential commercial value if appropriately recycled..." [Subsection 2(9)(3)]. While this may be true in some areas, it is

unlikely that metropolitan New York sewage sludges can be successfully marketed or found to have commercial value even when industrial pretreatment standards are enforced, as well as the lack of social acceptance for such materials, and the large quantities produced.

In the same portion of the draft Amendment, Congress stated that "...ocean sites that have heretofore been used for the dumping of materials have not been adequately studied to determine the full environmental effects of such dumping..." [Subsection 2(a)(4)]. This clearly does not apply to the 12-Mile Site which has been one of the most intensively studied marine areas in the world for effects of pollution and environmental stress. In addition, the determination of what constitutes a complete investigation is difficult and determining the "full environmental effects" of any activity is impossible.

The proposed Subsection 2(b)(1) represents a change in Congressional policy which eliminates rather than limits the ocean dumping of materials that require special care. This unduly restrictive policy is inherent in the draft Amendment definition of degradation of the marine environment and in proposed prohibitions under the ocean dumping permit program.

3. The concept of "unreasonably degrade" [emphasis added] has been eliminated from the Act in Subsections 101(4)(d) and 102(a) and replaced with just the word "degrade." This term is defined in draft

Amendment Subsection 3(m), with several overly broad and vague factors including the economic impact of continued dumping. Without the element of unreasonableness, this definition will lead to a prohibition if there is any potential change in the environment, however miniscule or insignificant. By contrast, the "unreasonable degradation" concept, as presented in the existing Act and Ocean Dumping Regulations, provides that a rational, comprehensive assessment based on current scientific knowledge be made as part of the ocean dumping permit application process. The Act does not define the term degrade. The definition in the draft Amendment was partially taken from the Act in Subsection 2(b) which sets U.S. policy.

4. The concept of a prudent and feasible alternative is defined in the draft Amendment [Subsection 102.(a)] by the following criteria:

(A) A prudent and feasible alternative exists if the probable adverse impact of utilizing alternative ocean locations or land-based locations and methods of disposal and recycling is less than or equal to the impact of the dumping; (B) A prudent and feasible alternative exists if an alternative location or method of disposal or recycling is available, or if improvements can be made in process technology or in overall waste treatment, at reasonable cost and energy expenditures. The cost and energy expenditures for any such alternative location or disposal, recycling, or improvement need not be competitive with the costs of ocean dumping in order to be deemed reasonable; [and] (C) The fact that the ocean dumping of the material may cost less, or be less difficult to implement, than an alternative means of disposal is not reason, in itself, for determining that the alternative means is neither prudent nor feasible.

This definition of a prudent and feasible alternative seems to be contrary to the current requirement for a balancing of all relevant

factors now contained in the Act. In addition, this vague definition of a prudent and feasible alternative may be interpreted several ways. One interpretation would require only that an alternative exists and has an adverse environmental impact equal to or less than ocean dumping. This could disregard effects which directly impact human health and could certainly lead to the expenditure of millions of dollars with little, or no, positive environmental result. Also, on a alternative disposal method may exist, but may not be legal as a result of air quality violations, RCRA conflicts or other laws. In such situations would ocean dumping be allowed or prohibited?

The draft Amendment has added the consideration of: (1) bioaccumulation of unspecified constituents from "the effects of the dumping," (2) the composition and vulnerability of biological communities that "may be exposed to dumped materials," and (3) effects of dumping "in conjunction with all existing and projected pollutant sources on human health and the marine environment." Consideration can no longer be given to the need to dump or the anticipated impacts of alternative disposal methods, therefore a meaningful balancing of factors will no longer be possible.

Disposal of any material in the environment should be permitted only after using optimization or cost-effectiveness assessments to choose the disposal option with the least overall risk. The eventual solution should have the optimum combination of highest social acceptability, minimal human health and environmental risk, and most reason-

able economic cost. This draft Amendment, by prohibiting certain options and being overrestrictive with others, makes a realistic consideration of disposal options impossible.

Proper balancing of criteria should be used in selecting the best disposal option for a particular waste. Unreasonable restrictions on available disposal options often result in both higher costs and risks. It also is contrary to common sense, and not a socially or economically acceptable route, to environmental regulation. As technology improves and more information is available, the optimal disposal method may change. However, to force selection of waste disposal options without due consideration and balancing of pertinent criteria is overly restrictive, unreasonable, and may result in unacceptably high risk to human health.

ADDITIONAL IMPLICATIONS

5. The bill includes language which indicates an increased awareness of the complexity of determining environmental impacts. However, this awareness did not extend to the difficulty in making the assessments that the new provisions would require. The Administrator of EPA may designate sites only after an analysis of environmental effects resulting from dumping and the Administrator must now specifically investigate the assimilative capacity of the waters at the dumpsite: "...the ability of the waters at the site to disperse, detoxify or neutralize the materials and sustain a normal ecosystem..." [Subsection 102(c)(1)], as well as other site-specific

characteristics. Further, the criteria for evaluating permit applications includes consideration of specific dumping "...in conjunction with all existing and projected pollutant sources on human health and the marine environment" [Subsection 102(a)(3)]. Under the existing Act, stringent criteria already have been established by EPA in the Ocean Dumping Regulations to regulate and minimize any adverse environmental and human health effects.

6. According to Subsection 102(c)(2) sites may be designated for a period of only six years. Designations may be renewed after repeating the initial site-designation process. (The draft Amendment specifies, perhaps incorrectly, that the Secretary of the Army is responsible for this renewal activity.) Neither the existing Act nor the Ocean Dumping Regulations presently limits the effective period of site designation; this was left to the discretion of EPA, where it seems more appropriate. The Ocean Dumping Regulations currently provide means by which dumping at a site may be modified or terminated [Subsections 228.10 and 228.11].

7. The draft Amendment would require that while "continuously" monitoring a designated dumpsite, the EPA Administrator is to evaluate whether continued dumping "will degrade, or aggravate the degradation" of the dumpsite at the end of the third year. Based on the findings of that evaluation, the site designation may be altered to either limit, suspend, or terminate the designation [Subsection 102(c)(3)].

Years of extensive monitoring have documented no progressive degradation due to dumping in the New York Bight Apex. Although relative high concentrations of some compounds considered to be pollutants have been found in the apex, it is difficult to detect nonnatural variations in their distribution, concentration, and there are no generally accepted methods to trace the source for many of the materials found in the marine environment. Monitoring methods would need to be extremely complex and precise to detect "degradation," as defined in Subsection 3(m) of the draft Amendment, and to attribute such degradation to a particular source. Such a monitoring program would require massive effort and commensurate funding. It is doubtful that after three years any monitoring program would be capable of actually detecting degradation. It seems more fitting to retain the flexibility presently inherent in the existing Act and Ocean Dumping Regulations which could more easily and appropriately incorporate new scientific or technical knowledge.

8. The draft Amendment states that it is United States policy "...to restore areas degraded by dumping in order that all reasonable and accustomed uses of marine resources may again be made..." [Subsection 2(b)(2)]. This concept is embodied in the draft Amendment definition of degrade such that an area is degraded when it "...cannot naturally restore itself, after dumping is terminated, to the environmental, esthetic, and economic posture existing before dumping in the area was authorized under this Act" [Subsection 3(m)(4)]. Although the concept of restoration is admirable, restoration would be extremely difficult to measure, especially in cases where several types of

waste materials are being dumped or discharged in close proximity to one another (i.e., the New York Bight Apex). Another problem is the length of time in which renovation is to be expected. In the case of the New York Bight Apex, there are multiple sources of waste materials dumped into the ocean and dumping of sewage sludge has been continuous since 1924.

The draft Amendment to the Act does not provide a way to determine the potential success of renovation. It would appear to become the responsibility of EPA to generate yet another set of regulatory criteria responsive to such a difficult determination.

9. Federal law should clearly state the intent of Congress and the broad scope for pertinent regulations. For laws affecting scientific and technical fields, it is important to allow current knowledge to be incorporated with ease into regulations. In contrast to giving the EPA Administrator discretion to develop regulations, the draft Amendment would add very specific requirements, criteria, and duties for the Administrator which would severely limit the flexibility of the Act, the flexibility of the Ocean Dumping Regulations, and the success of their implementation. The draft Amendment has borrowed language directly from EPA Ocean Dumping Regulations [Subsection 227.6] for part of a list of prohibited materials presented in Subsection 102(a). The draft Amendment also includes additional environmental permit application criteria in Subsection 102(a)(3), additional interim permit criteria in Subsection 104(c), and additional environmental site designation criteria in Subsection

102(c)(1) which must be evaluated by EPA. The Act provides that the EPA Administrator may establish and issue various categories of permits, whereas the draft Amendment proceeds to define an interim permit category.

SUMMARY AND CONCLUSIONS

1. As drafted, the proposed amendment would totally eliminate the ocean disposal of all currently dumped wastes by strictly prohibiting known or suspected carcinogens, mutagens, and teratogens in any quantity. Such a prohibition is inappropriate in a law enacted to regulate rather than to eliminate ocean dumping, especially since alternatives to such disposal may lead to greater human exposure to such materials.
2. There is no technical justification for the proposed ban on ocean dumping at sites within the New York Bight Apex. These sites were designated only after careful consideration of information from comprehensive environmental impact statements, and the advice of responsible scientists and interested members of the public. The results of those assessments were that significant adverse impacts will not be caused by continued dumping.
3. The proposed Amendments set regulatory criteria, many of which are tentative and based on evolving technical knowledge, into legislation. Similar criteria already are incorporated into EPA's existing Ocean Dumping Regulations and the London Dumping Convention in a

framework that allows for responsible scientific interpretation and implementation. Incorporating regulatory language in the Act will preclude EPA from readily revising their regulations to keep pace with advancements in scientific knowledge.

4. The proposed Amendment to the Act represents a change in Congressional policy from mandating strict regulation of ocean dumping to prohibiting dumping of any materials. This change will compromise any efforts to balance the impacts of disposal options for sewage sludge. The elimination of the word "unreasonable" in the proposed definition of "degrade", coupled with the unique and newly defined prudent and feasible test which prohibits dumping if an alternative exists, makes a meaningful basis for the assessment of impacts impossible. This unjustifiably deletes the presently required balancing of disposal options to determine which constitutes an "unreasonable" risk to human health and the environment.

The City of New York is committed to active participation in the upcoming-EPA site-designation rulemaking process. A comprehensive Special Permit Application, including testing, technical development, and multimedia risk assessments also will be prepared. The current Ocean Dumping Act provides the mechanism for this assessment. The proposed Amendment to the Act and its implications would eliminate the vehicle for this process. In addition, it will eliminate the option of all ocean dumping through the outright, unqualified prohibition of carcinogen, mutagen, and teratogen materials, which is technically unsubstantiated and unrealistic. Therefore, the proposed Amendment should be withdrawn.

TECHNICAL ATTACHMENT C
NEW YORK CITY
SUMMARY OF STUDIES
CONCERNING OCEAN DISPOSAL
OF DREDGED MATERIAL
MARCH 1982

1982 Environmental Impact Statement for New York Dredged Material Disposal Site Designation, United States Environmental Protection Agency, Office of Water Criteria and Standards Division (January 1982)

Summary:

* The EIS considers several disposal sites in an effort to confer final designation of an ocean site in accordance with the Marine Protection, Research and Sanctuaries Act (MPRSA) and EPA regulations.

* Areas outside the Apex -- offshore New Jersey or Long Island and off the continental shelf -- were considered as possible alternative locations. They were rejected due to possible conflicts with biotic resources (fish and shellfish) or mineral resources (oil and gas development and pipelines), unknown environmental effects (for deep-ocean sites) and added economic costs without significant environmental benefits.

* Non-ocean alternatives have limited volumetric capacities and cannot receive the bulk of the dredged material.

* Beneficial effects of conferring final designation for the Mud Dump site include: 1) the site is within the region of influence from previous dumping activities; 2) within the influence of the Hudson-Raritan Plume; 3) within the shellfish closure zone; 4) not filled to capacity with dredged material; 5) there has been considerable research and monitoring of the site; and 6) areas outside the site are not significantly affected because dredged material has not moved substantial distances after dumping.

* Biological productivity in the Apex is high. Commercial and recreational fishing activities occur throughout the area. Tropical and boreal migrants seasonally extend their ranges into the Bight, resulting in high abundance and diversity of finfish. Spawning, nursery and feeding areas occur over the entire Bight.

* Most environmental changes resulting from disposal are limited to the site. None of the effects preclude ocean disposal of dredged material. Management of the site and disposal operations based on monitoring data, as well as designating precise dumping areas or establishing areas closed to shellfishing, can minimize the potential adverse effects of dredged material.

* Several Federal departments and agencies participate in the implementation of MPRSA with the lead responsibility given to EPA. EPA issues ocean dumping regulations and criteria which establish review procedures for dredged material permits, permit conditions, environmental impact assessment and designation and management of ocean disposal sites.

* The no-action alternative to final designation is not considered acceptable. The interim designation of the Mud Dump site will expire in February 1983 without the permanent designation of that site or an alternative site for continued use. Without a designated site, the Corps of Engineers would be required to either: 1) justify an acceptable disposal method (e.g., land based), 2) develop information sufficient to select an acceptable ocean site for disposal, or 3) modify or cancel a proposed dredging project that depends upon disposal in the ocean as the only feasible method for the disposal.

* The distance from Ambrose Light to an off-Shelf site is approximately 100 miles. The annual increase in cost due solely to transportation would range from \$48 million to \$66 million (between 8-11 million cubic yards of material). Relocation of the site would not necessarily result in an environmental improvement in the open. In addition, there is the probability of causing environmental damage to an area heretofore unaffected by human activities.

Table 2-1

ALTERNATIVE SITES CONSIDERED

| | |
|--|---|
| Existing, Off-Shelf Site | Was considered, but was rejected for the following reasons: |
| * 106-Mile Site | <ul style="list-style-type: none"> * <u>Environmental information lacking for determining fate of dredged material dumped in the deep ocean and determining biological effects of dumping dredged material.</u> * <u>If adverse effects did occur, damage might be irreversible because of the reported extremely slow degradation processes in the deep ocean.</u> * <u>Located near Hudson Canyon, an important geological feature and possible biotic migration route.</u> * <u>Surveillance at the site is difficult and costly.</u> * <u>Extremely high transportation costs.</u> |
| <hr/> | |
| New, Off-Shelf Site | Was considered, but was rejected for the following reasons: |
| * Offshore New Jersey or Long Island (Northern and Southern Areas) | <ul style="list-style-type: none"> * <u>Extensive (and expensive) pre-disposal surveys are required.</u> * <u>Potential adverse environmental effects similar to 106-Mile Site.</u> * <u>Surveillance at the site would be difficult and costly.</u> * <u>Transportation costs would be given higher than at 106-Mile Site.</u> |
| <hr/> | |
| New, On-Shelf Site | Was considered, but was rejected for the following reasons: |
| | <ul style="list-style-type: none"> * <u>Commercially valuable shellfish resources located throughout the region.</u> * <u>Potentially valuable mineral resources (sand, oil and gas) located throughout the region.</u> * <u>Would introduce dredged material into an area little affected by other human activities.</u> |

Table 2-1 Continued

Offshore New Jersey or
Long Island (cont.)

Was considered, but was rejected
for the following reasons:

- * Previous EIS's considering sewage sludge, industrial wastes, and acid wastes have rejected this alternative for materials with less potential for chronic, long-term adverse effects.
- * Surveillance at site could be difficult and costly.
- * Extremely high transportation costs.

CONCLUSIONS:

* EPA proposes that the interim designated Mud Dump be permanently designated for the continuing use for dredged material disposal.

* The Mud Dump Site is a more acceptable location because of its prior use for the disposal of dredged material from the harbor.

* The Mud Dump Site is not a threat to public health or water quality and can reasonably continue to be used provided that it is monitored.

* Christiaensen Basin Site would be an acceptable dredged material disposal site if monitoring of the Mud Dump indicates a need for relocation.

May 1981 "Special Care Measures for Safe Disposal of Polluted Dredged Materials in the Marine Environment" submitted by the International Association of Ports and Harbors for consideration by the Ad Hoc Scientific Group, (Halifax, Canada, May 1981)

Summary:

* The ocean has a tremendous capacity for assimilating sediments without measurable ill effects. The amount of sediment that man will ever dispose in the ocean in one year is a small fraction of what has been received annually via rivers.

* Field studies indicate that there is little evidence that dredged material has caused substantial biological damage in the ocean.

* Special care measures address the methods of disposing of dredged materials, the procedures followed in the dredging and transportation of sediments and the selection of a site for disposal.

* Special care disposal measures include, but are not limited to: 1) clean material capping; 2) borrow pit disposal; 3) split-site disposal. Available evidence indicates that these methods are environmentally sound disposal options for polluted dredged material.

* Special care site selection outlines the potential use of hypersaline basins, submarine canyons, offshore islands and disposal below the zone of maximum plankton productivity.

* There are many environmental problems associated with confining dredged material on land. Among these are the deterioration of dike integrity, long duration of fluidity of the dredged material unless additional expenditures of time and money are made, loss of sediment from the containment area into the waterway, possible contamination of ground waters. The heightened competition for space has curtailed if not eliminated the use of upland areas for disposal of dredged material.

CONCLUSIONS

- * The need for dredging of ports and harbors both for enlargement and maintenance of existing channels is expected to increase in the 1980's and beyond.
- * A certain percentage of this dredged material, particularly that derived from maintenance dredging, can be expected to be polluted with Annex I substances.
- * This material must be disposed in such manner as to cause the receiving environment as little degradation as is reasonably possible.
- * By the same token, it is becoming increasingly difficult to find and use disposal sites on the land that can be considered safe and within reasonable distances from the ports and harbors.
- * Examination of the marine environment reveals that it has a high potential for assimilating dredged material without creating undue environmental risk.
- * Therefore, after thoughtful study of the problem and the delineation of possible solutions, it is concluded that if "special care" measures are used in disposal and in dumpsite selection, the disposal into the marine environment of dredged material containing Annex I substances would in many cases present no greater risk of environmental harm than the disposal of Annex II substances.
- * Accepting this, it is reasonable to consider that under these circumstances, the rationale of the Convention should allow the disposal of such dredged material at sea under a "special permit," as in the case of substances listed in Annex II.

1981 The Role of the Ocean in a Waste Management Strategy,
 A Special Report to the President and the Congress,
 National Advisory Committee on Oceans and Atmospheres
 (January, 1981).

Summary:

* National Environmental Policy Act (1970) established the procedural framework by which the United States sought to prevent or eliminate damage to the environment. The act was designed to force Federal agencies to consider the environmental impacts of their proposed activities. Five additional acts of a substantive nature were subsequently passed to address the management of society's waste disposal (Clean Air Act, Clean Water Act, Ocean Dumping Act, Safe Water Drinking Act and Resource Conservation and Recovery Act)

* The implementation of each of the substantive acts shifted the burden of receiving society's waste products to the medium that was least regulated at the moment.

* The medium-by-medium approach has lead to the promulgation of regulations which neither consider the impact on other mediums nor reflect an overall management plan for the disposal of society's waste materials.

* Disposal of dredged material physically buries benthic (bottom dwelling) organisms and creates mounds of material. The ecological effects of toxic materials are difficult to assess, however scientific evidence indicates that marine organisms are relatively unaffected by heavy metals, that benthic organisms recolonize in a very short period of time and marine food chains do not biomagnify either heavy metals (mercury excepted) or synthetic organics.

* The quantity of dredged material -- the sediment dredged from rivers, estuaries, harbors, and other waterways -- dumped into the ocean is larger than any other type of waste material. The quantity varies in relation to the number and type of dredging projects in any given year.

However, in comparison to the overall amount of sediment naturally deposited in the ocean, dredged material is a small fraction.

* The U.S. Army Corps of Engineers believes that no more than 5 percent of all dredged materials ocean dumped today fail to pass the stringent bioassay testing procedures.

* Dredged materials from maintenance dredging of ports and channels must be disposed of somewhere unless the nation is prepared to cause significant economic dislocations in its shipping and transportation industries.

* The ocean may in fact prove to be an attractive sink for some residuals after a thorough comparative study has been completed.

* The argument used by opponents of ocean disposal is that we do not know the long-term effects of every chemical constituent, or its degradation products contained in a particular waste; therefore, we should not place those materials in the ocean where they may become a burden to future generations. This philosophy is equally applicable to disposal in other media (ie: land and air)

* Where the environmental and human health risks of the waste disposal options are comparable in magnitude, then economics should play a significant role in the final decision. Even if the risk were somewhat greater for ocean disposal, significantly disproportionate costs could justify the granting of an ocean dumping permit.

Conclusions & Recommendations:

* The Federal Government must establish as a priority goal the reuse and recycling of wastes, and increase incentives to reduce the amount of toxic materials that must be disposed of by States, municipalities and private industry.

* Congress and the Executive branch must adopt an integrated approach to waste management. This requires that the EPA modify its existing medium-by-medium approach to waste disposal. Wastes should be disposed of in the manner and medium that minimizes the risk to human health and the environment, and at a price that this nation is prepared to pay.

* The EPA policy that no ocean dumping permit will be issued when any land-based alternative exists should be reversed.

* Congress should hold hearings with a view toward eliminating conflicts resulting from the implementation of the present waste management legislation, as part of the process of developing and implementing a national waste management strategy.

* The EPA should amend its regulations for disposing of dredged materials in the open ocean to be consistent with those for dumping under the Clean Water Act. Regulations for dumping in the open ocean should not be more stringent than those for dumping in internal waters. The impact of the disposition of dredged materials on the specific disposal site should be the primary consideration of the resolution.

1980

Dredged Material Disposal Management Program for the
Port of New York and New Jersey: Incremental
Implementation Plan

New York District, Corps of Engineers Mitre Corporation,
May 1980

* Recognizing the need to evaluate all available options for the disposal of dredged material from the Port of New York, the Corps of Engineers commissioned the Mitre Corporation to prepare a two volume report which screened and analyzed potential disposal options. The Corps of Engineers' 5 Year Disposal Management Program is an outgrowth of the Mitre report and is the culmination of years of study of alternatives for disposal of dredged material. The options included in this implementation program have been characterized as "feasible for large volumes of material" and "possible in special cases." All of the disposal options are being studied in detail and implemented as their initial feasibility or continued use is determined.

* Options "Feasible for Large Volumes of Material"

Subaqueous Borrow Pits - Subaqueous Borrow Pits are irregularly shaped, shallow sloped sea-floor depressions caused by sand and gravel mining. Dredged material is transported to a spot over the pit, dropped through the water column into the pit and covered with a layer of clean sand. This isolates the dredged material from the marine ecosystem.

Upland Disposal - This alternative represents a specific type of land disposal where special measures are taken to confine the dredged material. The objective of such a project is to ensure the safe disposal of all dredged material.

Ocean Disposal - Ocean disposal involves the transport of dredged material from the dredging site to a designated shallow ocean disposal site where it would be discharged directly into the marine environment.

* Disposal Options "Possible in Special Cases"

Containment Islands - This option involves the containment of dredged materials within diked areas in protected waters or harbors. With proper controls, this alternative would provide a disposal alternative for dredged material unsuitable for open water disposal.

Other Options - Beach nourishment, environment enhancement (i.e., marsh creation), sanitary landfill cover, and disposal in abandoned piers are the remaining options. They are grouped together due to their limited volumetric capacity, are site specific and must be determined as feasible on a case-by-case basis.

CONCLUSION

This time-phased implementation program recognizes the need to maintain the viability of the port and the fact that alternatives can be implemented only after in depth study. Administration of the plan is the responsibility of the New York District Corps of Engineers. An intergovernmental steering committee works with the Corps to review, comment upon and guide the overall plan. All phases of the management plan are expected to be completed in 1984.

1972 London Dumping Convention

The United States proposed legislative recommendations concerning ocean dumping to the U.N. Intergovernmental Working Group on Marine Pollution in 1971. The MPRSA provided a model that was closely followed by the London Conference. The signatory nations reached a consensus on the provisions in November 1972, and the United States ratified the Convention in 1974.

The Marine Protection, Research and Sanctuaries Act of 1972 was amended (1974) to bring it into conformance with the international treaty by 1) extending the jurisdiction of the United States to cover material dumped beyond the contiguous zone, 2) extending coverage to include oil "to the extent that such oil is taken onboard a vessel or aircraft for the purpose of dumping," and 3) requiring the Administrator to abide by the terms of the Convention when promulgating ocean dumping criteria under Sec. 102(a). The Administrator is given the latitude to establish and revise the ocean dumping criteria provided the applicable standards and criteria of the convention are considered (ie: Annex I & II).

The Convention seeks to achieve protection of the marine environment through a range of restrictions applicable to different categories of waste, depending upon the properties. Article IV(a) of the Convention prohibits the dumping of waste or other materials listed in Annex I unless the waste is either "rapidly rendered harmless" upon disposal or contains Annex I substances as other than "trace contaminants." The definition of "trace contaminants" is left to the Signatory nation via the implementation of regulations for testing and standards.

Article IV(b) permits the dumping of waste or other materials listed in Annex II, but requires a special permit and the exercise of "special care" in the disposal.

Article IV(c) authorized the dumping of all other wastes or matter, provided a prior "general permit" is obtained.

To date, the United States has progressively implemented the most stringent criteria concerning ocean dumping of dredged material. The Environmental Protection Agency is currently revising the criteria in light of scientific data which indicates that ocean disposal of dredged material is an environmentally sound option to evaluate when considering the issuance of a dredging permit.

Mr. D'AMOURS. Thank you, Mr. Mayor. I have a few questions, but before I begin my questions, I want to point out that you mentioned bringing the sludge home with you to your apartment. I have seen your apartment, and there are a lot of places there you could hide it.

You have spent a lot of time saying that you agree with what Jacques Cousteau just said. He also said that whereas we do not know much about what we are doing in the oceans, or what the assimilative capacity of the ocean is, that we do have the technology today to manage the land disposal option. Do you also agree with that?

Mayor KOCH. I do not believe, Mr. Chairman, that our ability to deal safely with contaminants, as they impact on the soil and our aquifers and our air, is enhanced over and above what we know about protecting the ocean. I think that in all cases we have a lot to learn.

Mr. D'AMOURS. So you do not agree with Mr. Cousteau on that point?

Mayor KOCH. I listened to his testimony very carefully, when he was questioned, and in his oral statement. It seemed to me, he made it very clear that there are not adequate data available to make these decisions and that the data should be collected before decisions are made.

Mr. D'AMOURS. He did at one point say that we have the technology today to contain the spread of sludge disposal plants.

Mayor KOCH. Mr. Chairman, I agree with what I heard him say on that issue. I have no problem with a system which requires a manufacturer—and he used the illustration of wood pulp, which uses mercury—to remove, for example, mercury from the disposal waste before it enters the system that brings it into the tanks from which we draw our sludge. I agree with that, and if this Congress wanted to pass a national law that required manufacturers who produce wastes containing these contaminants to use state-of-the-art technology to do that, I am supportive of that.

Mr. D'AMOURS. Is that being required today in New York?

Mayor KOCH. Let me ask the commissioner to respond to that.

Mr. MCGOUGH. Yes, very definitely, pursuant to the regulations and laws that are already on the books with respect to pretreatment.

Mr. D'AMOURS. Let me be more specific. Is the city of New York requiring that state-of-the-art technology be employed to remove the mercury and, say, the PCB's from sewage sludge? Is there such a clear requirement?

Mr. MCGOUGH. We have a code in the city of New York that is enforceable against manufacturers dumping compounds in mercury and other chemicals into our sewers.

Mr. D'AMOURS. You are not answering my question. Is there a requirement in the State of New York or in the city of New York that requires the manufacturers of the sludge or the treaters of the sludge to use state-of-the-art technology to remove mercury and PCB's?

Mr. MCGOUGH. No, there is not. The Federal Clean Water Act, as you are probably aware, and the regulations issued pursuant to it by the Environmental Protection Agency, now cover only the elec-

troplating industry in New York City. These are being implemented now and are enforceable as of July 1, 1983, when they will be enforced in New York City.

Mayor KOCH. I would support, Mr. Chairman, national legislation that requires all manufacturers producing these contaminants to apply state-of-the-art technology.

Mr. D'AMOURS. I appreciate that.

Your testimony, Ed, is couched in phrases of a clear choice between land dumping and ocean dumping, but it avoids the issue of dumping at various sites within the ocean. The Bight apex has been called one of the most polluted areas of ocean in the world by a former acting director of NOAA. Yet there are other sites—the 106-mile site and the 65-mile site. So it is not only a question of dumping on land or in the ocean. Are you suggesting then that you would not be opposed to dumping at other sites in the ocean?

Mayor KOCH. What I am saying, Mr. Chairman, is the following. It becomes a question of cost-effectiveness: what do you get by moving to the 106-mile site, which would increase our costs from \$4 million to \$27 million, plus a \$50 million capital expenditure for upgrading the boats. You get nothing, because as I understand it, analysis of the 12-mile site and the impacts of continued disposal of our sludge there indicates it does not significantly increase the degradation of that site. So shall we go out and degrade another site? It does not make any sense to me.

If it does not significantly add to the degradation of that particular site, and until we find a way to remove the contaminants and protect that site, shall we open up another site? I do not think so.

Mr. D'AMOURS. But that overlooks, does it not, that the ocean does have an assimilative capacity. If that assimilative capacity has been reached and exceeded, as I would suggest it might very well be, in the New York Bight, does not it make sense to use some other area of the ocean that still retains some assimilative capacity?

Mayor KOCH. If in fact, Mr. Chairman, there was a finding that there was a significant change ensuing as a result of continued disposal at the Bight apex, and there was independent information which was acceptable to yourselves, that might suggest a change of sites. But we see no such changes. You do not have a report before you that says there is a significant increase in despoilation by continued dumping. In fact, I understand the available evidence indicates just the contrary.

Therefore, since there is no significant change, associated with our current practices, we should not move from that site to another where we would likely cause such changes. I just do not believe that makes sense. Jacques Cousteau said that the Continental Shelf, which is where the 106-mile proposed site is, is the most fragile of ocean areas. Why would you want to start a new dump site at the most fragile of ocean sites.

Mr. D'AMOURS. But the truth is, Ed, that the reason you do not want to go to that new dump site is cost.

And that brings us to the critical issue, and that is what Jacques Cousteau mentioned earlier, and that is precisely the point that Judge Sofaer overlooked. If you look at the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, or other environ-

mental protection acts, none of these acts require that you take economic costs into play when you consider the protection of the environment, except that Judge Sofaer mandated that this tradeoff be taken into play, virtually assuring that the oceans would be used. Here is a case where the city of New York, very understandably, wants to get by with the minimal expenditure in disposal of its ocean sludge.

Jacques Cousteau said that he did not think economic costs ought to be taken into consideration. I do not know whether you agree with him on that one also; I would suggest you do not, but I wanted to find some point of departure. Would you respond to that?

Mayor KOCH. Easily. Mr. Chairman, I do not believe for one moment that this committee or any member of this committee believes that economic costs are not a consideration in any action that you mandate. Let us assume for a moment that it was not \$45 million that was involved or \$21 million for that particular move. Let us assume it was \$210 million. Let us assume it was \$2 billion. Is there no point where economic costs become involved? Shall we take our whole operating budget and deal with this? Shall we lay off cops? Obviously economic costs are involved.

Mr. D'AMOURS. Of course, but those are not the amounts of money in controversy. Judge Sofaer mandated that economic costs at all levels must be considered.

Mayor KOCH. Of course.

Mr. D'AMOURS. No other act does that.

Mayor KOCH. Mr. Chairman, I believe the key point is that Congress, when it spends its own money, or requires the expenditure of moneys by localities by mandating what we shall do—and you obviously have that right to do that, wants cost-effectiveness. You want to make effective use of resources.

All of us want a pristine environment. If I took the whole budget of the city of New York, and devoted it totally to upgrading the air, we would have terrific air and no jobs. Does anybody want that?

Mr. D'AMOURS. I am very familiar with that argument. I have heard it made many times—

Mayor KOCH. It is a valid argument.

Mr. D'AMOURS [continuing]. In the environmental debate, and I think nobody wants to exceed one way or the other.

Let me make a proposition to you. We spoke about this earlier. Would you be interested, as the mayor of New York, in some altering of the staff proposal which has been circulated, which I know you have seen, that would not perhaps totally ban dumping in the bight but only ban dumping that exceeds EPA standards, both for sewage sludge and dredge materials. It would say that only those which exceeded EPA standards would have to be transported to the further site. I think that might save considerable money for New York. Would that kind of a change interest you?

Mayor KOCH. Let me just say that it cannot be done, Mr. Chairman. After we discussed it, I asked our people. It cannot be done because there is no way, when this sludge is a runoff from our sewers, of separating the contaminants. It is quite true, as you pointed out to me, and you were correct, that of the sludge in-

volved, only 15 percent is subject to the contaminants; 85 percent is not. That is the figure you gave me.

Mr. D'AMOURS. You are very quick to accept figures that favor your position, which I understand.

Mayor KOCH. Well, I am a lawyer.

Mr. D'AMOURS. And may I suggest a very good one.

But let me say this. Am I not correct in understanding that the sludge is produced at 12 different plants in New York and that the quality of the sludge produced at those 12 different plants varies?

Mayor KOCH. It is uniform. That is to say that each of the sites during the course of the year will have contaminated sludge exceeding the levels that you referenced.

Do you want to add to that?

Mr. MCGOUGH. Yes. There are 3 plants of the 12 which do have sludges that, when they are dewatered and concentrated for composting and land application, consistently exceed U.S. Department of Agriculture limits for heavy metals, such as cadmium. However, when these sludges are left in a liquid state, and with proper dilution, they will not have an adverse biological effect on marine organisms if the sludge is disposed of at sea. Regarding land application, the sludges produced at the other plants, and it depends what the Department of Agriculture standards are, again—the standard deviation for the constituent metals, such as mercury, cadmium, and so forth, are so great that, as the mayor said, on any given day you may produce a sludge that exceeds those standards. Yes, it is true that 3 out of the 12 consistently exceed the U.S. Department of Agriculture heavy metals standards for composted sludge. The others are not consistent in exceeding those levels, but on any given day they may produce a sludge, because of what happens to enter the sewer system, that does exceed those standards for compost.

Mr. D'AMOURS. Maybe there is some way that we can distinguish between sources and sludges that exceed EPA standards and those that do not, and treat their disposal differently; is that not correct?

Mr. MCGOUGH. You could do that.

Mr. D'AMOURS. You are saying that it is correct?

Mr. MCGOUGH. You could perhaps separate the sludges with greater toxicity or metal content, particularly heavy metal content if it was based on some sort of an average, as opposed to particular days and times. However, what you would then propose is to take, I would suspect, the sludge with the heavier-metal content to another site. What you have done is collect bad material and put it in one place. As an environmentalist, I am concerned that although we have now narrowed the gap of what we have to deal with, it makes it more difficult to deal with. This is particularly true of land application of that material which is more concentrated.

Mayor KOCH. May I just add three sentences to this?

The Federal EPA examined the 106-mile site that you have made reference to, Mr. Chairman, and this is what they said:

Environmental information is lacking for determining the fate of dredged material dumped in the deep ocean and determining biological effects of dumping dredged materials.

You will never know what happened out there until it is too late; that is me, editorializing.

2. If adverse effects did occur, damage might be irreversible because of the reported extremely slow degradation process in the deep ocean;

3. It is located near Hudson Canyon, an important geological feature and possible biotic migration route.

I do not know what that means, but it sounds serious.

Mr. D'AMOURS. Ed, I am not making a case for the 106-mile site. In fact, in my question, I specifically mentioned the 65-mile site and the 106-mile site, and there are other sites.

I have terribly abused my time, and I apologize to the committee members for that. Talking to you is like eating peanuts, Ed; I cannot stop. I now recognize the ranking minority member, Mr. Pritchard.

Mr. PRITCHARD. Thank you, Mr. Chairman.

I do not know what the city is going to do without you, Ed.

Mayor KOCH. They would only gain a Governor.

Mr. PRITCHARD. I would just hate to have to follow your act as the next mayor.

You have plans to attempt to get into the category of a comprehensive special permit. You have been on a temporary one. How are you progressing on the special permit application?

Mayor KOCH. May I turn to our commissioner to respond to that.

Mr. MCGOUGH. Yes; we are in the process of preparing a special permit application. There will be two rulemaking proceedings. One will address the question of site designation for disposal of sewage sludge. Then there is the special permit application process. We are preparing to participate actively in the rulemaking on a site designation and will be applying for a special permit. As part of this process we will prepare an analysis of alternative ocean disposal sites and the land-based alternative. In other words, during this process we will assess the impacts of these alternative disposal methods. Both rulemaking proceedings will be public, with comments submitted by all interested parties.

Mr. PRITCHARD. Ed, I guess the thing that disturbs some of us is the time factor in this thing. We cannot make you do something that seems to be unreasonable, but there is a feeling that this condition may go on and on and on. The same arguments will be used 10 or 20 years from now. In your own mind, what are the timeframes we are talking about?

Mayor KOCH. I am not a scientist, and therefore I am not able to give you a timeframe. I believe that monitoring is the key here. When the results of a monitoring program indicate that degradation is significantly greater, such that it warrants removal, at that point a removal date should be imposed, but not before. That is No. 1: monitoring is key. If there is not adequate monitoring at the moment, we are happy to participate in an expanded program.

There also has to be a Federal, local, and industry effort to improve technology. I have suggested—and it is not an original suggestion—that the Federal Government should require industry to remove contaminants at the original site before they enter the wastewater treatment system where it is technologically possible to do so. You could, if you wanted, impose a special tax on the industries that use these chemicals—

Mr. PRITCHARD. A user fee type of thing?

Mayor KOCH. Yes—on industry—to be used for research and development. That makes sense to me. They have an obligation to find a way to deal with their contaminants but not to impose it on us.

Mr. D'AMOURS. Mr. Breaux?

Mr. BREAUX. Thank you, Mr. Chairman.

With regard to your comment that speaking with Mayor Koch was like eating peanuts—you can hardly stop—I would point out that apparently Playboy magazine agrees with that, too. I was reading the Playboy interview, and I find it a fascinating political document.

Ed, we are glad to have you back again.

Mayor KOCH. Thank you.

Mr. BREAUX. One of the environmental witnesses to follow you refers to New York City as “at the forefront of efforts to frustrate congressional desires to phase out the harmful sludge dumping practices.” They continue to make a point by saying that the city’s dirtier sludge right now could be deemed to have a prudent and feasible alternative in the form of composting and application to four landfill sites in the area, and they identify them. They point out further in their testimony that contractors to the New York district have identified 295 so-called nonagricultural, nonwetland barren areas, collectively comprising about 54,000 acres within a 100-mile radius of the Statue of Liberty, which might be suitable sites for the dumping of dredged materials. Perhaps your commissioners, or you, Mr. Mayor, could comment on that.

Mayor KOCH. I will comment a little bit on that.

When I was in the Congress, I remember the environmental groups, and they were all very decent people. They have a single issue. Members of Congress, who are national legislators, cannot be single-issue people. If you are not single-issue, then they will find words for you. Do you remember the expression, “The Dirty Dozen”? Do you remember that? That was supposed to terrify Members of Congress. If you did not want to be included as one of the Dirty Dozen, you had to knee jerk to every request.

It is not possible to do that. You have to have a balanced point of view. Now, as it relates to being condemned by whoever it is that will follow, I expect it. Let me put it this way. If I were giving in to them, instead of taking a balanced point of view, which is to do what is correct, there would be somebody else on the other side of the issue calling me dirty names from the other point of view. I am trying to do what is not knee jerk, but what is responsible, what is reasonable for all of the people involved.

Now, as it relates to other sites, it is our position that it makes no sense at all to dump on land carcinogens, mutagens, or teratogens, because you are simply moving the wastes from one area to another without knowing the consequences. We know some of the consequences can be to destroy the water that is used in the sinks of people around the city and the State of New York and elsewhere. We do not think that makes any sense.

Mr. BREAUX. Mr. Mayor, can you and your staff tell us what effect the proposed amendments would have on the city of New York?

Mayor KOCH. There are two things that would happen. One consequence would be an enormous increase in costs which would mean fewer cops, teachers, and all of the services that a city provides, because we would have to move our operating dollars in a fixed budget. We have to live within our budget. We have a balanced budget by law. Therefore, if you take from here and put it there, something suffers. We have put together a budget which we think is responsible, and we think we ought not to be required to go from \$4.09 million at the current site to \$27 million in operating expenses, plus the \$50 million in extra capital costs with no significant benefits. That is one effect.

Another effect is on dredged material. New York City's harbor is one of its greatest glories. With some of the rules and restrictions which would flow from the draft amendments, there will be no harbor. The soil will rise, and we will be building apartments in New York Harbor. We will not be able to dredge.

We want to develop a coal port in Staten Island. I must tell you that the people there do not want coal on Staten Island, even though it is not going to be burned there. We are going to ship it to Europe for burning, because we are the closest to Europe. We have to dredge our channel now from 45 feet to 65 feet, and we will make a lot of money, and a lot of people will go to work. It is terrific.

But I will have to stand up on Staten Island and hear the people say, We don't want it. We don't want it. Then I say, Before we do it, we are going to have an environmental impact statement; and if it shows that the quality of the air is going to be degraded, we won't do it. They say, No. We just don't want it. And I say, Well, that's not a way to run a government. We are going to get that environmental assessment and find out what the alternatives are.

I am saying the same thing applies here: Before you tell us to do something, have the information, have the criteria, have the reports. At that point if it is established that we are doing something that we should not be doing because there is a better way to do it, we would be happy to accommodate this concern.

Mr. BREAUX. Thank you, Mr. Mayor.

Mr. D'AMOURS. Mr. Forsythe?

Mr. FORSYTHE. Thank you. I yield momentarily to my colleague from Washington.

Mr. PRITCHARD. Mr. Chairman, our Congresswoman from Rhode Island, Mrs. Schneider, was tied up with a meeting with some of her constituents. She was very anxious to ask questions both of Captain Cousteau and Mayor Koch, so I would appreciate it if the record could be kept open for all members of the committee to offer questions to these people.

Mr. D'AMOURS. Without objection, it will be so ordered, and it is.

Mr. Forsythe?

Mr. CARNEY. Mr. Chairman, are we going to break for the vote, or are we going to drift out?

Mr. D'AMOURS. If the members want to stay and continue questioning, they can. It is a vote on approving the Journal. If you think your record can stand the impact of missing that vote, I would appreciate your staying. If you want to go, I certainly cannot stop you from doing that.

Mr. Forsythe?

Mr. FORSYTHE. Thank you, again, Mr. Chairman.

Thank you, Mr. Mayor, and Governor. I will stay.

Mayor, there has been a lot of talk about solving this waste disposal problem through pretreatment at industrial plants to get the bad things out of the sewage that is flowing into the plants and thereby on into the sludge. Are you aware of or have your colleagues seen any studies that have shown that where you have almost totally domestic sewage—as in the Blue Plains plant in D.C. the contaminants show up in about the same proportion as they do from a city like New York which has a heavy industrial inflow?

Mayor KOCH. I have to turn to Commissioner McGough.

Mr. MCGOUGH. Yes; that is correct. Our own studies and those of Houston and Chicago, and Bergen County, N.J., have indicated that in the cities, particularly those with combined sewer systems, that there is a certain level below which it is very difficult to go with heavy metals. The industrial load, particularly in the city of New York, of heavy metals is primarily from the electroplaters, but it is a very small load compared to the total domestic load and street runoff load for these heavy metals. That is correct. So that pretreatment would improve the system somewhat, but it would not eliminate the problem of heavy metals.

Mr. FORSYTHE. Or even other toxins?

Mr. MCGOUGH. That is correct.

Mr. FORSYTHE. In other words, the chemicals that we are using in our homes today are also a major part of the waste problem?

Mr. MCGOUGH. That is absolutely correct.

Mr. FORSYTHE. And therefore, to believe that we will solve the problem through pretreatment would be unrealistic. I am not against pretreatment, but I think we have to look at all our options.

Mr. MCGOUGH. I would agree with that statement.

Mr. FORSYTHE. Therefore, looking at the whole picture is very essential. If we do start to amend the act again, we might find we have not only left the problem unsolved but may have exacerbated it by forcing another type of disposal that may be equally harmful or even more so.

Mr. MCGOUGH. That is precisely correct.

Mr. FORSYTHE. That may be a bad thing to have said in front of this committee which is very anxious, by fiat, to address one factor of this process. But I want to get on the record that I think it is important that we look at the entire waste disposal problem, even though we may go beyond the jurisdiction of even this committee. In other words, we only have jurisdiction over a very small segment of the whole problem.

Mayor, you and I talked yesterday about the monitoring and research activities which must be carried out. You indicated that you fully support these activities.

Mayor KOCH. I do.

Mr. FORSYTHE. And that you would be willing to participate.

Mayor KOCH. Yes, sir.

Mr. FORSYTHE. How do you think such activities can best be organized to do it most effectively, so far as not only New York City but other areas across the country that are involved?

Mayor KOCH. I think, sir, the Federal Government must not forsake the obligation which it has had to date to finance these efforts. I also believe that each locality which engages in dumping ought to bear some of the cost of monitoring in the particular area of its dumpsite. At the moment I am told that the permittees' monitoring of the Apex area costs about \$300,000. New York City pays half of that. It seems to me that that could be increased, and we should pay a proportionate share.

Mr. FORSYTHE. That deals with just one area, monitoring. Obviously the research is perhaps even more important if we're to find any answers.

Mayor KOCH. It is. I believe, Mr. Forsythe, that the research and development costs associated with removal of contaminants should be borne by industry. It should not be borne by municipalities. In fact, I am now scanning my memory on this issue, but I recall that such taxes were imposed in the Ruhr Valley in Germany to cleanse the Ruhr River and were successful, and that might be looked at as a model.

Mr. FORSYTHE. What would be your reaction, for instance, to some kind of a user tax on sludge with a mandate that it be funneled back again into this research?

Mayor KOCH. I would like to distinguish between a user tax and appropriate research and development funding. Once you put it in the form of a user tax, in that language, then it becomes a revenue-producing item for revenue sake. A more acceptable approach is to develop a reasonable program to do monitoring research and development, and assess its costs among those who are doing the polluting in industry. I would support that approach.

Mr. FORSYTHE. I think we are saying the same thing.

Mayor KOCH. Yes, but I just wanted to avoid a user tax, which some people have put into the millions, as opposed to what would be appropriate for a specific monitoring program.

Mr. FORSYTHE. Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Forsythe.

Mr. Biaggi?

Mr. BIAGGI. I want to thank you, Mr. Chairman.

Ed, I believe you have made a case. Frankly, I always did. Mr. Forsythe's line of questioning obviated the need for me to pursue it.

I was looking through the testimony of the National Wildlife Federation, talking about alternate landfill sites. Let me tell you something. I have one in my district. I dare you to come up there with anything like sewage sludge. With all due respect to you, Mr. Mayor, never entertain that idea, because there will be a revolution.

Mayor KOCH. I will not go there with that suggestion unless you come with me.

Mr. BIAGGI. The point I am making is that whoever suggested landfills is not dealing in the world of reality. I think the only one left that is still open might be the one in Staten Island, and even that is bordering on full capacity. What we are looking for is alternate methods for solid waste disposal. To suggest more landfills, I do not know if those persons do so in good faith or are just not properly informed or just reaching out for an alternative. But let

me suggest that whoever recommends it should discard that immediately and proceed in some other area with a little more constructive and substantive recommendations.

Mayor KOCH. I agree.

Mr. BIAGGI. I think what you stated is a restatement of what Captain Cousteau has stated, what many of us have stated. I am going to analogize with the enzyme story that Captain Cousteau made. We do not have the research here. If we could have additional research—obviously you are supportive of it—with additional funding, research and monitoring, we can possibly develop the state of the art to the point where we can deal with it and not embark upon some esoteric undertaking with no certainty as to the outcome.

Again, I relate to Captain Cousteau's statement that you so aptly brought forward, about the Continental Shelf. I just do not understand it. People cannot be realistic. We are all concerned. They suggest taking this sludge from the New York Bight and bringing it to a most fragile area. They should be up in arms against anyone suggesting this because the devastation that could follow is immeasurable.

What I believe, frankly, is that there are people who think the ocean should be absolutely pure. I believe it. You said: In all of its pristine beauty, it should prevail; the air, the ocean, all of it. But the judge was right: There should be some accommodation of economic factors, as well as some realism. Captain Cousteau, who has committed himself over a lifetime, stated "prudent and realistic."

I think we have been prudent and realistic. I think we have led the world in the recovery of our natural resources. Considerable progress has been made, and progress is continuing to be made. But because we gave it thought and we were at that time in American history—although we know that time has passed—but we are now dealing with this issue. I know I have discussed this with you, Mr. Mayor. You would be the first to suggest we move, if the New York Bight can be proven to be one that is unreasonably degraded and certainly not to the Outer Continental Shelf, which may imperil a relatively unimpacted ecosystem.

Mine is more of a statement than a question, because I think that in your presentation and in your discussions with other members, you have addressed this issue with great equanimity.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you, Mr. Biaggi.

I would like to say that nobody is suggesting that only the 106-mile site be used. I think we should keep that in mind. There is a 65-mile site and any number of other possible sites that might be better suited.

Mr. Evans, from the State of Delaware?

Mr. EVANS. Thank you, Mr. Chairman.

Mayor Koch, I am sorry I missed your opening remarks here, but I caught you on television the other night for the Actors Guild. It was a superb performance.

As you know, Mr. Mayor, we have a difference of opinion on the dumping of harmful sewage sludge in the Atlantic Ocean. I think you have a responsibility, not only for your citizens, but when New York City dumps, you have a responsibility for what you may or

may not do to the citizens of New Jersey, to Maryland, to little States like Delaware, to our tourist industry, to our clamming industry, to our fishing industry, and all of those things that mean so much to the livelihood of people in States like ours.

I believe quite strongly that those who are dumping what might be a potentially harmful sewage sludge in the Atlantic bear the burden of proof of showing that it is not going to be harmful to others. When you start talking about cadmium and mercury and PCB's that are potentially dangerous, I think that poses a real threat.

Mr. Mayor, since you may have a different perspective now that you are running for Governor of the great State of New York, I wonder how you feel about New York State helping New York City with its sewage sludge problems? What are they doing now, and what would you do as Governor?

Mayor KOCH. Let me just say that I have the same perspective as mayor as I would as Governor, which is that I would represent my constituency. I am the mayor of the City of New York. I stand up and I fight for my city, just as you fight for your congressional constituency. Should I become the Governor of the State of New York, I would stand up and fight for the 62 counties in the same feisty way that I do the five counties that I currently represent.

As it relates to the sludge problem, which is what we are talking about, I do not believe that any of the requests that we have made of the State of New York have gone unfulfilled in this area. I may be in error, and I will look at it, but I myself do not recall ever making a request of the Governor or the State legislature in this area. So I do not think it is a problem. But whatever I would do as Governor, I would respond to New York City in the same way I would respond to Rochester, Buffalo, and Messina, N.Y.

Mr. EVANS. With a great deal of chutzpah, as they say, Mr. Mayor?

Mayor KOCH. No. Chutzpah has a special meaning. On occasion it has the connotation of feistiness.

Mr. EVANS. Generally considered to have a very positive connotation.

Mayor KOCH. On that basis, I accept it.

Mr. EVANS. You stated, Mr. Mayor, that many of the Bight's problems off New York City stem from pollution other than sewage sludge.

Mayor KOCH. Yes.

Mr. EVANS. What are you doing, for example, to stem the runoff from the city streets?

Mayor KOCH. The runoff from the city streets?

Mr. EVANS. Yes.

Mayor KOCH. Are you talking about the raw discharge?

Mr. EVANS. Yes, sir.

Mayor KOCH. Not the city streets, but the sewage that we put into the North River.

Mr. EVANS. Yes, whatever.

Mayor KOCH. OK. The sludge is what we, through our treatment facilities, produce by taking out and treating the water and what we ultimately dispose of in the ocean. The dumping of raw sewage into the North River is another cause of pollution. We are comply-

ing with a consent order entered into with the Federal courts that establishes a schedule for construction of our North River and Red Hook plants. I believe we are meeting the dates in that consent order. It involves hundreds of millions of dollars. Just let me give you the figures.

The North River plant, which is the larger one under construction, will involve spending \$283 million in 1982; in 1983, \$95 million; in 1984, \$47 million. The total cost for the termination of raw discharge into the North River will cost—and we are going to bear it, Federal/State/City, in terms of capital costs—\$426 million. It is worth it, and we are on target. The Red Hook plant construction will involve an expenditure in 1983 of \$75 million—these are rough figures; it is actually a little bit above that—and in 1984, of \$87 million. The total cost for the termination of raw discharges through the Red Hook facility will be \$163 million. We are doing a lot.

Mr. EVANS. That is a lot of figures, Mr. Mayor. It is difficult to really assess the costs in the future of what harmful dumping could be. You have stated in your opening remarks that sludge contributes a small fraction of the contaminant load in the Bight, but what is the contribution of sludge for some individual pollutants, such as PCB's?

Mayor KOCH. May I have the Commissioner respond to that, because I think it is more technical?

Mr. EVANS. Certainly.

Mr. MCGOUGH. We are not certain of what the load is on the Bight from sewage sludge of PCB's. We will examine that as part of our response to the rulemaking proceedings that are about to begin on the designation of a dumping site and in the context of our permit application.

Mr. EVANS. How much are you spending on monitoring?

Mr. MCGOUGH. The monitoring costs on the New York Bight, by the sludge dumpers, is approximately \$300,000 per year, of which the city pays one-half. That is on monitoring.

Mr. EVANS. Do you think that New York City would or could or should assume a greater share of the costs of monitoring short and long-term impacts of dumping?

Mr. MCGOUGH. I believe the mayor has said that we would be willing to pay our fair share, yes.

Mr. EVANS. Thank you, Mr. Chairman.

Mr. D'AMOURS. The gentleman from New Jersey, Mr. Hughes.

Mr. HUGHES. Thank you, Mr. Chairman.

Welcome, Mayor Koch.

Mayor KOCH. Thank you.

Mr. HUGHES. You are looking well, and you sound as good as ever. We are happy to have you.

I might tell you that your mail would be running a little higher in the nonporpoise matters today, I can assure you. Back in 1976, that was one of the major concerns, but there are a few more concerns these days.

As you know, I have been very actively involved in ocean dumping since I came to the Congress. I know you were very supportive, for which I am indebted. I suspect that if I were the mayor of New York City, I would be doing exactly the same thing you are doing,

although not as well, I am sure. I really respect you for what you are doing, and I know you are on the cutting edge of trying to balance a budget and take care of a myriad of problems, and sludge just happens to be one of them.

But we do have a great concern. I represent an area that has the second largest industry in New Jersey: Tourism. We have to depend upon clean air, clean water, and clean beaches, as you well know. It is also an area where we have a large commercial fishery industry, that depends upon clean water. The fact of the matter is that there are indications that the area is very distressed.

The New York Bight, the scientists have concluded, is a severely distressed area. Even after the Philadelphia dump site, right off Cape May, closed for the better part of a year, they found that the crabs and the other shellfish, scallops in particular, were deformed. They had viruses. The presence of bacteria was quite evident. NOAA's recent studies found that the crabs and lobsters particularly in the New York Bight area, have major abnormalities. In fact, they have managed to simulate that, by using sludge from New York City, so we know there is a very direct connection. NOAA testified last week that there was bacteria and viruses very much in evidence in the marine environment, and the question is, What has to happen before we get serious about getting our act together in the ocean?

I know that you pointed to a number of things where you agreed with Jacques Cousteau. I did not hear you, however, suggest that you agree with him on the storage of these materials. Mr. Cousteau made the point that we do not know all the answers, and we may not for many years. As we keep adding new substances to our sludge, it is becoming more and more difficult to really understand what the long-term impact is going to be. His point was that we are going to regret one of these days that we did not hold on to that material, store it, and perhaps recycle it later, when we know more about it.

Mayor KOCH. I was here when he said that.

Mr. HUGHES. Do you agree with that?

Mayor KOCH. I agree with the illustrations that he gave, which pertained to atomic energy residues and nerve gas residues. You put those into cannisters, and you have a limited amount that you can deal with. Sludge is with us every single day. So long as you have a human being with normal needs, we are going to have sludge. The fact is that it is not possible for us to store it, pending a technological development, that would allow us to treat the stored sludge.

What we are saying is, if we could put the sludge in barrels, we would do it. I said I would take it to my home. It is not possible. What we are saying is, when you store it on land, you may contaminate that land. You may contaminate the aquifers. You may contaminate the air above it. There has to be a balancing of interests, and we have concluded that there could be a greater damage from putting sludge on land than there is in continuing to put it in the bight.

Mr. HUGHES. Mayor, one of the alternatives that New York City was looking at, before they decided to move ahead and challenge the EPA in the lawsuit, was the acquiring of some land that would

provide some 7 years of storage capacity for New York City, as I recall. The big decision for New York at that time was whether or not to challenge the decision, or to go ahead, and go to bid and acquire the land for storage purposes. New York City found that to be a reasonable alternative, but once again the bottom line became one of costs.

Mayor KOCH. We did not find it to be a reasonable alternative.

Mr. HUGHES. You came in and testified at one point—I was here when one of your people testified—

Mayor KOCH. I would have the commissioner to respond to that, but we did not find that a reasonable alternative.

Mr. MCGOUGH. There was a law, and there was a deadline. In order to meet that deadline, we began planning early. Indeed, we spent over \$46 million attempting to meet that deadline. We had bid, at the time the Sofaer decision came down, over \$125 million worth of contracts which have now been canceled. We now have been challenged on \$26 million of claims. In any case, we were attempting to meet that deadline. In the course of that exercise, we developed significant concern about the land-based alternative.

Mayor KOCH. We will carry out the law. That is why we tried to meet the deadline.

Mr. MCGOUGH. It was when we found that we only had, in the city of New York, space for composting on the land for 7 years, and that EPA was unwilling to consider the prospective problems that began to surface in our research—some of the downsides of land application—that we decided to see if the Federal courts would uphold our interpretation of the law.

Mayor KOCH. Could I just add to that? You see, we are a law-abiding city. If the Congress says we have to do something, we are going to do it. It may not make sense. It may be that we will take our budget and just throw it down the sewer, but we will do whatever you mandate us to do. That does not mean we have to say that it is the sensible thing to do. If you tell us to do it, and you give us no alternatives, we will carry out your orders.

Mr. HUGHES. Mayor, you may recall, because you were in the Congress at the time, that the December 31, 1981, deadline was one that was arrived at by the EPA and New York City, and other communities who felt they could comply with that deadline. That was not created in a vacuum. You were in the Congress at the time. You may remember that the EPA developed informal regulations that set December 31, 1981, as the deadline, and we put it in writing after a series of hearings.

Mayor KOCH. If I may comment on that. You know, I often think about what I did when I was a Congressman and how foolish some of those things were. That is no reflection on Members of Congress, or me, at the time. If somebody comes in and says, "This is good for you; it will clean up the water" or "This is good for you; it will clean up the air," did I ask, "Who is going to pay for it?" I did not ask, "Who is going to pay for it?"

Did I ask, "What are the balancing of interests?" No. What did I ask? Gee, who in his right mind is going to say no to clean air or clean water. Did anybody talk about the loss of jobs in those years? They did not.

Mr. HUGHES. Ed, I would bet you that your philosophy would be much akin today to what it was back in 1976, if we were talking about Long Island Sound and not off my beaches.

Mayor KOCH. I do not think so.

Mr. HUGHES. I have a feeling that you would be hearing many more compliants than on porpoise matters.

Mayor KOCH. What I would do, frankly, is the following. It is always a balancing of interests: What do you get for the money you are spending? I think the Congress today has reached that point, just as mayors have, just as I have. There is no question that 5 or 6 years ago, I would have voted for much more expensive things, not caring about it, because I was not paying for it. When I say "I", I mean the Federal Government was not paying for it. The Federal Government was mandating expenditures by localities. Then I became the chief executive of a locality. Now I look to Mount Olympus, and I say, "What did you do to us? We don't have the money to do this."

Mr. HUGHES. That is understandable. We are talking about ocean policy, and you are talking about ocean policy, additionally, you are talking about what is best for New York. I understand that.

Mayor KOCH. No, not just New York. I think all localities have the same feeling.

Mr. HUGHES. My time is about up, but let me make another observation. You indicate in your testimony, and I know that you are being candid about it, that you do not see that we are creating any problems in the New York Bight area.

Mayor KOCH. I do not see any significant degradation.

Mr. HUGHES. As you well know, as you bring on more waste water treatment facilities, as you are going to in the next few years, the incidence of sewage sludge dumping is going to increase. We really have not moved very expeditiously in pretreatment or interception of materials at their source, as you well know. So that, as a result, when you look at the warning signs, we notice that we have major problems there. We do not understand what is taking place.

You mentioned the pinelands. That happens to be in my district. We are not dumping sewage sludge in the ocean, Ed. Very few places have the luxury of an ocean to dump in, and other places are managing to cope with these problems. We understand that you have a myriad of problems and we want to balance the interests. But the fact of the matter is that sludge dumping is cheaper. As long as it is cheaper, unfortunately that is going to be the easiest way for municipalities such as New York City.

The reason the law was put into effect in the first place was because, as the chairman said, the oceans have very little of a constituency; people do not vote out there. As a result, because they have to be protected, because they do not have a constituency, and because it is the easiest and cheapest way, it is important for us to try and provide additional incentives for cities like New York City to reduce the incidence of ocean dumping. It is as simple as that.

Cost is the bottom line. That is why you do not want to go to the 106-mile site. I hear what you are saying about the fact that it is a very sensitive area, and it is, and we are looking at what harm it

would do at the 106-mile site. But the major concern on your part is the cost involved, and we know that.

Mayor KOCH. It is not just the cost; it is the cost effectiveness. Costs in the abstract have no meaning. What is important is what do you get for your money? We are saying that you will not get anything appreciable for the extra expenditures which would be incurred by changing sites. Therefore, we do not think you should require expenditure of those extra moneys and get nothing for it.

Mr. HUGHES. There is something else that we have not talked about. Right now, dumping in the bight has become a navigational problem. We have barges out there on a very active waterway, and we have the Coast Guard and other users complaining about the fact that barges are in that bight area; they cannot really disperse the material because they cannot stay very long in the bight. That in itself is creating problems.

Mayor KOCH. Commissioner Linda Seale of the City Department of Ports and Terminals advises me that the Army Corps of Engineers says that this is not a factor.

Do you want to comment on that, Linda?

Ms. SEALE. The corps does not think there is a significant navigational problem in the apex. They believe the site can be used for another 10 to 20 years without any navigational problems.

Mr. HUGHES. Well, that is not what the agencies tell us. My time is up. I thank you. I understand your problems, and we look forward to working with you to try to develop a proper balance.

Mr. D'AMOURS. I would thank the gentleman from New Jersey.

There is one more person who wants to question you, another gentleman from New York.

Before we do that, Ms. Seale, does the Coast Guard say that also or just the Corps of Engineers?

Ms. SEALE. I have not asked the Coast Guard. I would be glad to find that out for you, sir, and submit it later.

Mr. D'AMOURS. That would be very important. I wish you would. Thank you.

The gentleman from New York, Mr. Carney?

Mr. CARNEY. Thank you very much.

Thank you, Mr. Mayor, for being here today. As you probably realize, I represent what some people refer to as the "sterile suburbs" of Long Island. I do have somewhat of a problem, and I certainly have empathy for you, too.

There are some difficult decisions that will have to be made in the next couple of months. It is going to be tough for everyone. I do have some questions I would like to ask right now, not pertaining to sludge or dredge material, but to raw sewage which for some strange reason finds its way out the North River and on the beaches of Long Island on occasion.

You said that you were going to programs now, one in the North River and one in Red Hook—

Mayor KOCH. North River being the Hudson River?

Mr. CARNEY. Right—and one in Red Hook. When those projects are completed, will that finally terminate the dumping of raw sewage in the harbors?

Mayor KOCH. Let me ask the commissioner.

Mr. MCGOUGH. From the New York side, yes.

Mr. CARNEY. From the city?

Mr. MCGOUGH. Yes. There will be some small areas for which this will not be true, but these will not be significant as compared to the total sewage flow.

Let me also state that the city has a combined sewer system. In heavy rainfall, not all of the water that enters the sewer is able to be treated by the plant, and the regulator gates open and allow it to go into the rivers and estuaries surrounding the city. That is an inescapable problem with a combined sewer system.

Mr. CARNEY. Mr. Commissioner, would you provide for the record two things: One, the points that will continue to dump the sewage; and two, the associated impact of rainwater that would be dumped raw into the river under circumstances of heavy rainfall?

Mr. MCGOUGH. I would be glad to do that.

Mr. CARNEY. Thank you. My next question, Mr. Mayor, is this. The figures you provided for us, the \$45 million versus \$3.5 million—

Mayor KOCH. That is \$45 million on land.

Mr. CARNEY. Right. My question is this. Is that pertaining solely to sludge and not to dredge material?

Mayor KOCH. I am so informed, yes.

Mr. CARNEY. Could you provide for us the cost of dredge material?

Ms. SEALE. The EPA has estimated, in its recently completed EIS, for the mud dump disposal site, that the additional costs for going to sites outside the apex, just transportation costs, would be between \$48 and \$66 million per year. These figures assume a \$0.06 per cubic yard/nautical mile cost.

That does not include the cost of upgrading a fleet to transport approximately 10 million cubic yards per year out that far. There simply are not the kind of barges and tugs that would be necessary in the harbor now to do that. So there would be capital costs associated with a new fleet, in addition to those annual operating or transportation costs.

Mr. CARNEY. Could you provide for the committee the amount of land that you could identify as being available for sewage sludge disposal and for dredge materials disposal?

Mayor KOCH. What do you mean? For land?

Mr. CARNEY. Yes, sir.

Mayor KOCH. We are not able to do that, because we do not believe that such land sites exist in the city of New York that we could use for that purpose.

Mr. CARNEY. Do you have any for dredge material, any sites for dredge material?

Ms. SEALE. I do not think the sites would be any different. It is simply a question of availability of land. The space simply is not there.

Joe, is there any reason why there would be any difference?

Mr. MCGOUGH. No. What we looked at when we were trying to meet the 1981 deadline were landfill areas, that had been abandoned and closed down, and undeveloped park land. I think the total acreage was something like 2,800 acres. This would have permitted composting on land for a 7-year timeframe, just for sludge.

However, obtaining this land was extremely difficult, and we were not able to obtain it. Whether we would ever have been able to obtain it is still a question.

Mayor KOCH. Then there is the environmental impact on the land.

Ms. SEALE. I might add that if we were required to use that land for dredge material as well as sludge, I believe it would last less than 1 year.

Mr. CARNEY. So that what you are saying is that in less than 1 year you would not have the available land necessary to get rid of dredge material?

Ms. SEALE. Right. You would have used it all up that quickly. The volumetric capacity of upland sites is limited.

Mr. CARNEY. You are doing a multimedia study. Are you aware of the fact that EPA has just announced that they are doing a multimedia study, with EPA, Food and Drug, NOAA, and I believe some participation of the Corps of Engineers?

Mr. MCGOUGH. Yes.

Mr. CARNEY. Is this a redundancy?

Mr. MCGOUGH. We are undertaking our analysis to contribute to the record on upcoming rulemaking proceedings and meet the burden of proof on the city to get an ocean dumping permit. We are hiring consultants to advise us and to help us participate in the rulemaking process. It is something like an adversary process.

Mr. CARNEY. If you say you are getting into the adversary process, is it your belief that NOAA, or EPA, or the Corps of Engineers, or Food and Drug have already determined what direction their studies are going to go in?

Mayor KOCH. No, sir. When you appear before a Government agency—and that is what we will be appearing before—we approach them like a ratemaking agency. We want to come in with our best case. That is why we will do whatever we can to prepare our own case and make our presentation and not rely on what somebody else does.

Mr. MCGOUGH. If I may add something. I have not clearly stated an important distinction in what the city and agencies will do. The agencies will be developing the methodologies and tests. What we will be doing is the actual testing. As the gentleman from Delaware said, we have the burden of demonstrating that the dumping of sewage sludge will not unreasonably degrade the area. So our efforts will not be duplicative. We will be doing actual tests—water column, sediment, and so forth—in the areas of the bight where we now dump, and in other places, to demonstrate, we hope, although the scientific evidence will lay it out, that sewage sludge does not unreasonably degrade the marine environment.

So there is a difference in function. It is not really an adversary proceeding. The agencies will focus on methods, on parameters, setting the parameters. We will focus on finding out exactly what the impact is of our sewage disposal activities.

Mr. CARNEY. But your program is basically based on ocean dumping at its present site?

Mr. MCGOUGH. No. The proceedings will address this question. They will assess the most environmentally sound place for the disposal of these wastes. We have a lot of questions to which we

simply do not have answers. That is a large part of the reason why we brought the lawsuit; not just to save money. We were preparing to meet that deadline. It was not just the money. The question was, "Are we doing the right thing?" That is how we see it. It may eventually turn out that land disposal is the most environmentally sound alternative. If that is eventually the preferable alternative then we would accept it.

Mayor KOCH. But we should not assume it until it is established.

Mr. CARNEY. Commissioner McGough, going back to the raw sewage problem, I do not recall whether you answered the question as to the timeframe when those plants would be completed.

Mr. MCGOUGH. No, I do not think we did. For North River, it will be June 1986 and for Red Hook January 1987. These are our target dates, for stemming the raw discharge of sewage.

May I make another point. The moneys that we would have to spend to meet any new deadline to get out of the ocean would be taken away from the efforts which we and other municipalities are taking to stem raw sewage discharge. Sludge dumping only accounts for, at most, 10 percent of the contaminant load on the bight. Raw sewage discharges and urban runoff accounts for the bulk of the contamination load in the bight. Even if all the sludge dumpers got out of the bight, you would still have at least 90 percent of the existing problem, if not more.

We think that it would be a mistake to divert the funds at this point away from the stemming of raw sewage discharge.

Mr. CARNEY. I agree with you, Mr. Commissioner, but I would also have to point out that as we progress, the ratio has to change, because we are now processing the raw sewage into a product known as sludge. So there will be more sludge and less raw sewage. So there is a problem there.

I would ask simply, not in a question form but in a request form, that you provide for this committee a record of the activities of New York City from 1977 to date on what you have done to try to meet the 1981 mandate. I do not want to waste too much time on that. But if you do that, I would fully appreciate that. I would like an opportunity to look at it myself.

My final question to the mayor is this: Of your 12 plants, will they all produce sludge, or are you going into any other techniques to get rid of the byproducts, that sludge that you would have to either land base or dump in the ocean?

Mayor KOCH. I would have to ask the commissioner on that.

Mr. MCGOUGH. We are trying different methods of treating the sludge, digesting it, and otherwise treating it to reduce its bulk and so forth. But these techniques will not totally eliminate sludge production, which I believe is what you are asking about.

Mr. CARNEY. The difficulty I have is this. I represent an area that under Public Law 92-500 built an enormous sewer district. The sewer district cost us almost \$1 billion. It has a long history. I am sure the mayor is familiar with the southwest sewer district.

Mayor KOCH. Everybody is familiar with that one.

Mr. CARNEY. That is correct. But with all its problems, the outcome of the southwest sewer district is one that will allow us to incinerate the sludge material and landfill it without a liner, because the ash byproduct will meet all the parameters set by the

EPA. I was wondering while you're developing these types of facilities—and I commend you for doing it—why are you not going into that type of facility which would not have the byproduct of sludge.

Mr. MCGOUGH. When we started back in 1978 to plan to meet the deadline, we examined every available alternative, including incineration, pyrolysis, land disposal of various types, and so forth. The majority of our sludge has a heavy metals problem. Our analysis indicated that incineration or pyrolysis adversely affected the air—and that the technology had not advanced far enough, given our sludges, to permit us to incinerate. We continue to assess alternatives. If a technology develops that can handle our sludges, we will certainly pursue it. But what we had found to date as the best alternative was the composting alternative, even with our serious concerns about it, and the fact that, at most, it was only a 7-year interim solution.

Mr. CARNEY. I have been notified that my time has expired, Mr. Mayor, and I would just leave you with an old Jewish prayer—

Mr. D'AMOURS. All the time of all the members have expired, and I am going to make this suggestion to the members. Every member here, Ed, you will be happy to know, has more questions. We will pose our questions very quickly and ask you to submit the answers for the record, because we have to get you out of here and we have to get out of here to get some lunch.

You have listed a great many costs the city is currently bearing in its effort to deal with its sewage and runoff problems. I wonder if you could have the people with you and your staff submit to the panel for the record a total listing of these projects and all the costs associated with them? Could you do that?

Mayor KOCH. Let me make a suggestion, Mr. Chairman. Whatever questions you have that you want to submit to us, we will respond to them.

Mr. D'AMOURS. Can you do that for the record?

Mayor KOCH. Yes. We will do every one of them, to the best of our ability.

Mr. D'AMOURS. Thank you.

Mr. EVANS.

Mr. EVANS. Yes, Mr. Chairman.

Mr. Mayor, could you give me the cost per ton of dumping sewage sludge at the 12, 60, and 106-mile sites? And in addition, have you asked the State of New York to assist in locating onland disposal sites?

Mayor KOCH. We will respond to that, sure.

Mr. D'AMOURS. Mr. Hughes.

Mr. HUGHES. Yes, Mr. Chairman.

I would like, Mayor, if you would furnish me for the record, first of all, the number of tons of toxic, organic materials, PCB's, mercury, cadmium, lead, copper and so forth, that are disposed in the ocean each year out of New York City.

Second of all, I would like to find out what contingency plans do you have in the event EPA determines that you have sludge that unreasonably degrades the environment. Specifically, what sites you have available, and how you are going to dispose of that sludge.

Third, why the EPA should not in the future, attach to any permit issued, a requirement that New York City and other municipalities bear full liability and responsibility for cleaning up the ocean if it is determined that in fact it has degraded the environment.

Mayor KOCH. We will be happy to respond to all of them.

Mr. D'AMOURS. Thank you, Mr. Hughes.

Last, I want to recognize Mr. Carney.

Mr. CARNEY. Thank you.

Mr. Mayor, you can answer yes or no. Did you not respond to the Long Island Sound dredge program that was presented by the Corps of Engineers New England District?

Mayor KOCH. I do not honestly know. Respond in what form?

Mr. CARNEY. If my memory serves me, you were for the dumping in Long Island Sound of the dredge material from the Maranock Harbor and those points.

Mayor KOCH. I honestly do not know.

Mr. CARNEY. My second question is, could you provide for the record the economic impact on New York Harbor, the Port of New York, if you would, if you were to stop dumping dredge material in the ocean? I would appreciate that.

I would like to end this hearing as we break for lunch with an old Jewish prayer, Mr. Mayor. It says, "May God bless you and keep your sludge away from my bedroom."

Mr. D'AMOURS. Ed, it was great seeing you again. Thank you for coming and for your testimony. I look forward to seeing you soon.

Mayor KOCH. Thank you.

Mr. D'AMOURS. The subcommittee stands in recess until 2 o'clock.

[Whereupon, at 12:57 p.m., the subcommittee recessed, to reconvene at 2 p.m., the same day.]

AFTERNOON SESSION

Mr. D'AMOURS. The subcommittee hearings will continue.

Our next witness is Dr. John Knauss, Chairman of the National Advisory Committee on Oceans and Atmosphere.

Dr. Knauss, thank you for coming. Please proceed.

STATEMENT OF DR. JOHN A. KNAUSS, CHAIRMAN, NATIONAL ADVISORY COMMITTEE ON OCEANS AND ATMOSPHERE

Dr. KNAUSS. Thank you, Mr. Chairman.

After this morning, I feel a bit like the cheese sandwich being brought to a banquet. It also appears that most of your members feel well fed.

I have a brief statement which, with your permission, I would like to read.

As you know, NACOA has spent considerable time reviewing waste management issues, including those relating to ocean disposal of sewage sludge. We have recently reviewed the events of the past year, since we last testified before you, and have also looked at the present status of EPA and NOAA ocean disposal programs. We appreciate this opportunity to review the situation as we see it. Our basic position has changed little, but because of events of the

past year we believe that we should reemphasize certain points to insure that our position is clear.

First, let me review the events that produced the January 1981 NACOA report, "The Role of the Oceans in a Waste Management Strategy," because we believe that in many ways the situation is very much the same today.

Looking seaward, we had learned much more about the oceans than we knew in 1972 when the Marine Protection, Research, and Sanctuaries Act, known as the Ocean Dumping Act, was originally passed. Concerns about eutrophication of the entire North Atlantic, or an ocean pollution-triggered disruption of the global oxygen balance—about which at least some scientists expressed concern in the early 1970's—had proved unfounded. The events of 1976—the fouling of Long Island beaches and the New York Bight anoxic episode—had been examined by scientists and blamed, respectively, on a malfunctioning sewer plant in Jamaica Bay, Long Island, and on untreated sewage outfall from the Hudson River. Neither of them, it seems, were really caused by ocean dumping.

Despite growing scientific evidence that showed the oceans to be considerably less fragile than many thought, a complete ban on ocean dumping was imminent, and ocean dumping research was being noticeably reduced.

Looking landward, we found a growing concern over human health hazards from land disposal of wastes. Love Canal had been in the headlines; ground water pollution was causing alarm in many parts of the country; and drinking water wells were being closed. Growing scientific evidence showed the land and freshwater systems to be more complex than expected. In reaction to this, several laws were passed—the Safe Drinking Water Act of 1974 and the Resource Conservation and Recovery Act, RCRA, of 1976—that greatly reduced land and freshwater disposal options. In addition, the Clean Air Act of 1970 led to a decrease in the number of incinerators.

NACOA was concerned that these successive acts, each a reasonable response to real environmental concerns, were creating an untenable situation. The Nation produces about 1.5 billion tons of wastes annually, and it was becoming impossible to find an acceptable disposal site anywhere for some of these wastes.

Much work needs to be done on new treatment and recycling techniques to reduce the amount and the toxicity of wastes, but it is certainly not within the bounds of present technology to eliminate waste material completely. Some wastes must be disposed of somewhere. NACOA was concerned that growing political and economic pressures associated with land disposal problems, and implementation of RCRA regulations, might create a backlash forcing renewed pressure for ocean dumping, while research on the effects of ocean dumping was being virtually eliminated.

Against this background, then, NACOA published its 1981 recommendations.

Mr. Chairman, I will not read those recommendations, but I would appreciate it if they could be put into the record at this point.

Mr. D'AMOURS. Without objection, that will be ordered.

[Material follows:]

NACOA 1981 RECOMMENDATIONS

1. NACOA recommends that the Federal Government establish as a priority goal the reuse and recycling of wastes, and increase incentives to reduce the amount of toxic materials that may be disposed of by States, municipalities, and private industry.

2. NACOA recommends that Congress and the Executive Branch adopt an integrated approach to waste management. This requires that the Environmental Protection Agency modify its existing medium-by-medium approach to waste disposal. Wastes should be disposed of in the manner and medium that minimizes the risk to human health and the environment, and at a price that this Nation is prepared to pay.

A. The EPA policy that no ocean dumping permit will be issued when any land-based alternatives exists should be reversed.

B. The 97th Congress should amend Section 301(h) of the Federal Water Pollution Control Act.

3. NACOA recommends that Congress hold hearings with a view toward eliminating the conflicts resulting from the implementation of the present waste management legislation, as part of the process of developing and implementing a national waste management strategy.

4. NACOA recommends that the Environmental Protection Agency establish broadly representative regional citizen advisory committees to advise the regional administrators in the selection of appropriate waste management options.

5. NACOA recommends that the Environmental Protection Agency amend its regulations for disposing of dredged materials in the open ocean to be consistent with those for dumping under the Clean Water Act. Regulations for dumping in the open ocean should not be more stringent than those for dumping in internal waters. The impact of the disposition of dredged materials on the specific disposal site should be the primary consideration of the regulation.

6. NACOA recommends that ocean disposal of sewage sludge either by barge or through properly designed outfalls should continue to be a disposal option under appropriate management conditions and with adequate monitoring safeguards in those areas where no unreasonable degradation of the environment results from sludge disposal.

7. NACOA recommends that ocean disposal of industrial wastes should continue at sites where evidence indicates no unreasonable environmental degradation and when human health, environmental, and economic considerations indicate this is the preferable option.

8. NACOA recommends that the Interagency Committee on Ocean Pollution Research, Development and Monitoring, established by Public Law 95-273, recognize that there is a high probability that land, deep-well, and atmospheric waste disposal activities will be reduced during the 1980's in favor of ocean waste disposal. The Federal program for ocean pollution research, development, and monitoring must emphasize research and monitoring relevant to the disposal of wastes of all kinds in various oceanic environments.

Dr. KNAUSS. I can summarize. The full set of NACOA recommendations include:

Increased incentives for reuse, recycling, and reduction of waste products.

An integrated approach to weighing different waste disposal options.

More consistent environmental criteria for disposal in different media.

Continuation of ocean disposal "under appropriate management conditions and with adequate monitoring safeguards."

Increased emphasis on ocean disposal research and monitoring.

As we look at significant events of the past year, we do see increased pressure to renew ocean dumping. Judge Sofaer's court decision has reopened the ocean dumping issue; EPA is drafting new regulations; and half a dozen municipalities are planning to submit applications for ocean dumping permits.

At the same time, EPA and NOAA programs planned for fiscal year 1983 seem inadequate to handle this renewed activity. EPA's management and research resources for ocean disposal work are level funded. NOAA's budget for supporting ocean disposal research is cut by 60 percent. Even at the fiscal year 1982 budget level, NOAA's recently published milestone charts show that, because of budget constraints, their programs could not provide research results in a timely enough fashion for many regulatory decisions, such as new EPA ocean dumping regulations, for example.

Given the current situation, NACOA has several points to make.

First, to the best of our knowledge, there has been no significant change in scientific knowledge that would cause NACOA to change its 1981 recommendations. In fact, a National Research Council symposium last June at the University of Delaware supported the view that the oceans have considerably more capacity for receiving some kinds of wastes—under controlled conditions and at carefully selected sites—than we are currently using. NACOA continues to believe that ocean dumping should be a waste disposal option, but this option must be carefully weighed against land-based and incineration alternatives.

Second, we must safeguard against indiscriminate dumping. Because ocean disposal may well be a politically and economically easy choice in the face of growing land disposal problems, any increased use of the oceans for waste disposal must be accompanied by strong and viable management and assessment programs. NACOA believes that carefully designed monitoring programs are essential so that we can be alerted to any unexpected negative impacts; and that a solid basic research effort must be in place so that we can begin to predict waste disposal effects.

Third, NACOA believes that EPA and NOAA funding plans for ocean disposal management and research programs fall short of meeting these needs. Therefore, we must look to Congress to insure that the essential management, research, and monitoring efforts are provided for.

Given the current economic climate, it may not be possible, or even desirable, for the Federal Government to be the sole source of funding for these efforts. NACOA supports the notion of payments from municipal and industrial waste dumpers to supplement Federal funds for management, monitoring, and research programs.

Finally, Mr. Chairman, let me make several comments on your staff's discussion draft of proposed amendments to the Ocean Dumping Act. Because the full text was not available for discussion at the last NACOA meeting, we have not examined the amendments in detail, but I note that several of the proposals parallel NACOA's recommendations. I think it is safe to say we support the proposal to consider ocean dumping as a waste disposal option if no prudent and feasible alternative exists. NACOA also supports the emphasis placed on continued improvement of preprocessing and recycling techniques; on careful site designation; and on continued monitoring and basic research concerning ocean disposal effects. We concur with the proposal to institute a fee system to guarantee adequate funds for the management, monitoring, and research efforts.

Mr. Chairman, that concludes my formal remarks. I would be pleased to try to answer any questions the subcommittee might have.

Mr. D'AMOURS. Thank you, Dr. Knauss.

I have several questions. In fact, I may ask you to respond to some for the record.

One general question I have is this: I noted that you were here all morning and that you listened to the testimony of our two earlier witnesses. I would be interested in hearing your comments on Mayor Koch's position that we ought not to be moving from the bight inasmuch as to do so would just be moving from a dirty area and dirtying still another clean area. What is your feeling about that?

Dr. KNAUSS. Before I answer, let me emphasize that NACOA has not taken a position on whether or not any particular site is suitable for ocean dumping. We have recommended that the ban on the dumping of sewage sludge be lifted, but we did not feel it was our position to recommend specific dumpsites. My personal opinion on the question of the New York Apex is influenced by all of the other things that are going on at present which are polluting the Apex area. The numbers that NOAA gives suggest that less than 10 percent of the pollution in the New York Bight is due to sewage sludge dumped there. Maybe it is as low as 3 or 5 percent.

Assuming those numbers are correct—and I have no reason to think they are not correct—then I am not convinced that the additional costs to which Mayor Koch referred is indeed worth the effort of going from that site to another site. I do not think the additional 5 percent pollution is worth it. There are also some arguments to keeping presently pristine areas pristine.

Mr. D'AMOURS. What about the arguments that one hears that the chemicals that are very persistent by nature—PCB's, mercury, and others—ought to be removed from the bight because of their very persistence and our desire, hopefully, to at least begin the process of cleansing the bight area. What do you think about that?

Dr. KNAUSS. Frankly, Mr. Chairman, I do not know how you are going to ever "remove" the material that is tied up in those sediments, whether it is complex organics or various heavy metals. I think they are going to be there for some time. They may be buried in time as more sediment rains down on top of them, but I do not see that they are going to go anywhere.

Again, I guess I come to the conclusion that, until such time as one attacks the primary sources of pollution in this area and solves those problems, I am not convinced personally—and again, I emphasize this is my position, not NACOA's position—that it is a cost-effective thing to do.

Mr. D'AMOURS. Are you suggesting we give up on the bight?

Dr. KNAUSS. No, sir. I am suggesting that the funds that we have available to clean up pollution be used primarily to solve the problems insofar as possible of all the other sources of pollution that are coming into the Bight from the Hudson River and elsewhere; that we spend money on, the kinds of things that Captain Cousteau was referring to in terms of recycling waste material at the industrial sites, that kind of thing; being sure that there is at least primary, and preferably secondary, sewage plants at all the other

sources; trying to solve the problem of the sewage overflow which exists in some of the older sewage systems; that kind of thing.

Given the amount of funds one has to solve pollution problems in this country today, I would think those would be of higher priority.

Mr. D'AMOURS. I appreciate that answer. Your "insofar as possible," though, perplexes me because it is possible to do something about the PCB's and mercury in cleaning the bight by stopping further sewage sludge dumping. We seem to be wanting to do whatever is possible, but refusing to do what is clearly possible. That leaves me a little bit perplexed.

I have another question, but I do not want to stop you from commenting about that, if you wish to do so.

Dr. KNAUSS. That is all right.

Mr. D'AMOURS. You have noted in your testimony that more needs to be done on research and monitoring of ocean dumping. You have supported the imposition of user fees to assure fundings for these activities. Which research and monitoring functions would you like to see specified in amendments to the act, if you can think of any?

Dr. KNAUSS. I am not sure how you specify monitoring functions within the act; maybe you can. One of my concerns with monitoring functions, as has happened a number of times before, is that a message is brought down from Congress to an agency, which says "Thou shalt monitor these kinds of things." Contracts are let, and all kinds of money is spent counting this and that. When we are through we do not really know very much more about the subject.

It is important that monitoring programs are done with a certain amount of imagination and scientific care, so that during the process we obtain the kind of evidence that all of us as scientists and concerned citizens want to have, so that we can be reasonably assured of what is going on.

The kind of monitoring programs, for example, that I have seen in southern California which Los Angeles City and Los Angeles County have established impresses me as the kind one would hope to have on a routine basis around the country where you are going to have dumping.

Mr. D'AMOURS. I have one other question, and then I am going to have to leave. I will submit some questions for the record.

You stated in your testimony that you think NOAA will not be able to provide research results in a timely fashion. If EPA and NOAA were adequately funded do you think we could get the kinds of results we need in a timely fashion?

Dr. KNAUSS. I notice when you asked Captain Cousteau, or somebody asked Captain Cousteau, that question that he said he thought a decade. I was wondering where he picked that number up. The more I thought about it, however, the more it seemed like a not unreasonable figure.

I do not know how you answer that question in any detailed, quantitative way. However, when I look back upon what we know now, or at least what we think we know now, over what we knew—

Mr. D'AMOURS. Excuse me, John. What do you consider an adequate time? You are the one who said that in your testimony. What do you consider an adequate time?

Dr. KNAUSS. I see what you are asking. EPA is going to be forced to come out with new regulations, as I understand it, within a year or year and a half. You would like to think that those regulations would be based upon adequate research findings. They are going to be based upon the best evidence one has at this time.

I do not think any of us are going to be completely satisfied that those regulations that they establish in a year or 18 months are going to be the final word. I would hope that they would be continually amended and updated as we learn more.

I guess what I am trying to say is that I would like to think that within a decade of solid research and monitoring one would do a significantly better job in amending those regulations.

Mr. D'AMOURS. John, I am going to have to excuse myself. I have to be at another meeting for a little while. Therefore, I am going to have to leave now.

I have a list of questions here which I would like to have submitted for the record. If there is no objection, I would like to submit them to you and ask you to answer for the record.

Dr. KNAUSS. I will do my best, sir.

[Material to be supplied follows:]

QUESTIONS SUBMITTED BY CONGRESSMAN D'AMOURS AND ANSWERED BY NACOA

(1) As you know, the NACOA report has been widely quoted in the last year by parties looking to expand the use of the ocean for disposing of wastes. In your view, do you feel the report has been accurately characterized or have its findings been distorted?

Since its publication in January, 1981, the NACOA report has been referenced in several documents including the June, 1981, report, "Use of the Ocean for Man's Waste," and the 1981 "National Marine Pollution Program Plan" by the Inter-agency Committee on Ocean Pollution Research, Development, and Monitoring (COPRDM). The report has been quoted in public statements such as those made during these hearings by General Gay, Ms. Hurd, and Mayor Koch. Most significantly, the report was quoted by Judge Sofaer of the Southern District of New York in his ruling in *The City of New York v. EPA*.

These documents and statements have not distorted the NACOA findings per se, but have focused attention on making use of the ocean's assimilative capacity with regard to sewage sludge. This was only one of NACOA's recommendations. NACOA wants to stress the importance of other recommendations such as the reuse and recycling incentives, the use of broadly representative regional advisory committees to advise EPA regional administrators, and the development of a comprehensive cross-media approach to waste management. This latter recommendation is particularly important, and dependent upon vital research and monitoring efforts. The administration has embraced the concept of assimilative capacity, but has reduced research and monitoring efforts in recent budget cuts. The shift to a multi-media approach, which includes use of the ocean, must be backed by marine pollution research and monitoring safeguards.

(2) As you probably know, EPA is recommending a straight reauthorization of the present law. Do you feel the current law provides clear direction of the regulation of ocean dumping, or is further clarification needed?

The MPRSA, in its present form, does not provide clear direction with respect to the regulation of ocean dumping. NACOA supports certain principles contained in the proposed amendments that could provide a measure of clarity: considering prudent and feasible alternatives prior to ocean dumping, emphasizing reuse and recycling, careful site designation, expressing the need for research and monitoring, and user fees.

Our nation is in transition from moving toward the elimination of all ocean dumping to recognizing that the ocean is one option in a multi-media approach. During this transition, responsible departments and agencies, such as EPA, the Corps of Engineers, and NOAA, should be given the latitude to develop the scientific and regulatory framework that adjusts to this new concept, as it presents a very difficult problem in waste management.

NACOA views as promising certain efforts in the administration. NOAA's Office of Marine Pollution Assessment is conducting a series of symposia through fall of this year to define unreasonable degradation. EPA is undertaking a comprehensive multi-media sludge management project, and is consolidating its marine resources programs as part of this project. These efforts, which we recommend that Congress carefully monitor, could also contribute to the clarity presently lacking in the MPRSA.

(3) You have noted in your testimony that more needs to be done on research and monitoring of ocean dumping and you have supported the imposition of user fees to assure funding for these activities. Which research or monitoring activities would you like to see specified in amendments to the Act?

The answer to this question is mainly an expression of my own views. I believe that legislation should not specify any particular research and monitoring protocols per se, but should emphasize measures that ensure adequate monitoring and assessment of the adverse consequences of waste disposal in the ocean. I do believe that legislation should encourage appropriate Federal agencies to develop long term research and monitoring programs to detect the consequences of ocean dumping. Federal agencies charged with the conduct of research and monitoring programs are best equipped to develop site specific research and monitoring concurrent with the investigation of generic problems handled through laboratory and field investigations.

(4) NOAA's 1981 draft five-year plan on ocean pollution found that: "Sufficient scientific information is not yet available to widely apply this concept (assimilative capacity) on a management basis." NOAA reemphasized this reservation when it testified before us last week. Does this finding diminish your confidence in our ability to utilize the oceans for waste management?

The five year plan does make the statement indicated, but goes on to say that: "However, waste disposal policies are changing to allow the cautious and studied use of the oceans as a waste disposal medium." I believe that a decade of systematic and imaginative research will greatly increase our understanding of the ocean's capacity. Results to date, however, show that during this time we can look at the option of doing some ocean dumping of some kinds of waste. But while doing this, the ocean must be protected through research and monitoring.

(5) Current federal regulatory measures are generally directed at individual pollutants or activities, yet marine ecosystem degradation results from the accumulated impacts of all pollution sources. Do you have any recommendations on how to deal with this problem?

I have three recommendations. First, require permit applicants to know the quantity and kinds of waste they are discharging or dumping. This provides a means to characterize wastes from various sources, which is a relatively easy matter.

Second, charge Federal agencies with determining the relative importance of these contributors by assessing the cumulative effects in a given area from all sources. This is a much more difficult endeavor, but can be accomplished through viable programs of research and monitoring that give the agency an ability to measure the effects from each permit.

Finally, institute procedures that force a choice of granting or renewing permits upon the agency, based on an assessment of adverse effects.

(6) The MPRSA is the only major environmental legislation which calls for a balancing test. Do you have any concerns that this situation might, in fact, cause an imbalance in considering alternatives?

NACOA believes that the approach taken by the MPRSA is the correct one. Somewhere, the cycle must be broken whereby each successive legislative act further prohibits disposal in a particular medium. During testimony at the present hearings, EPA has expressed the belief that it can begin to rework all of its disposal regulations to require cross-media balancing for all waste management decisions. NACOA supports this effort by EPA. Given the difficulty of orchestrating a cross-media approach to waste management through various laws by Congressional committees having varied jurisdiction, the solution would seem to lie in close Congressional oversight on Federal activities that develop comprehensive regulations.

(7) You've stated in your testimony that you do not believe that NOAA will be able to provide research results in a timely enough fashion. If NOAA and EPA were adequately funded, could they then provide the needed information in a timely enough fashion?

The statement was in reference to charted objectives and milestones in NOAA's most recent Pollution Program Plan. This plan shows activities such as the preparation of policy documents and dumpsite assessment reports arranged sequentially through fiscal year 1986. Increased funding could accelerate those processes to some

degree by allowing many of these activities to occur simultaneously. Also, increased funding could serve to accelerate the ability of these agencies to make decisions.

Most importantly, if the ocean is going to be increasingly used as a waste disposal option—and it appears likely this is so—then research and monitoring funding must be increased to keep ahead, or at least abreast, of these activities.

(8) You have identified the need for incentives for reuse and recycling of materials. Could you be more specific?

The NACOA report pointed out how imaginative efforts by municipalities and industry to reuse and recycle waste were inhibited by Federal regulations, public perceptions, and the market structure.

One incentive would be the establishment of user fees, such as is proposed in the MPRSA amendments.

Another is the metering of inputs from industrial sites, and the characterizing of waste contributions that could lead to charges on pollutants.

Finally, there could be financial support for recycling and reuse through subsidies for promising technology, and tax deferrals for recycling equipment.

MR. FORSYTHE. To follow upon the research question, we ought never to say we have found the answer. The further we go, the more we find we really do not know and should know.

It is important that we make the best possible effort and make it continuous.

DR. KNAUSS. I could not agree with you more as a scientist, sir. I am always surprised at what I think I know, and I find out a few years later I am less sure than I was.

MR. FORSYTHE. That leads into the question of the funding and fees that are addressed in the draft amendments and which were discussed by Mayor Koch this morning. The Mayor took some exception to a flat fee but thought there ought to be some way to assess the shared costs. Do you have any comment on that idea?

DR. KNAUSS. Do you mean as to who should pay the fees?

MR. FORSYTHE. Yes; should it be based on the tons of sludge or is there some other way which might be a little bit more sophisticated than saying every ton of sludge is going to pay "X"?

DR. KNAUSS. I do not have very useful ideas on this. However, let me make one possible suggestion. The ultimate hope, of course, is that we will recycle as much of this material as we possibly can. One of the ways in which you can encourage recycling at industrial sites, and others, is to establish a sufficiently high enough fee that there is encouragement to try to look at ways in which they can reduce the amount of material that they would be otherwise putting in a sewer system.

MR. FORSYTHE. As a matter of fact, I think I was the first member of this committee to propose just that kind of fee. I became less enamored of it later because it was not locked into research monitoring, which I believe would be essential if we were to go this way.

I am prepared to try to find some way to make this work in a way that wouldn't destroy those who will have to pay the fee. For instance, to assess New York City be the equivalent of the difference between the costs at the 12-mile and 106-mile sites, would be relatively ridiculous.

DR. KNAUSS. I would like to add one word to that. Coming from Rhode Island, I would hope that fees such as this would be established at the Federal level and not at the State level. It would be very easy for electroplating plants to move from Providence, R.I., to Attleboro, Mass., or vice versa, depending upon who has the

higher or more complicated fee structure. It seems to me that some kind of Federal guidelines on these things would be important, not to drive or to attract industry from one State to the other.

Mr. FORSYTHE. That is a good point.

The draft amendments include a new definition of degrade when used in the context of the marine environment. Do you believe the proposed definition will clarify the use of this term and eliminate the confusion and ambiguity often noted with regard to the term "unreasonable degradation"?

Dr. KNAUSS. I must confess that when I read the draft legislation—and I did not study it in great detail—I had great difficulty in seeing how there would be an improvement or any elimination of the confusion. It seemed to me at the first reading, and even at the second, that the problem was not going to go away.

Mr. FORSYTHE. Your testimony states that NACOA concurs with the dumping fee system proposed in the draft amendments. I guess I really asked that one, except that in the amendment I believe it states "only those dumpers receiving interim permits and for those materials found to degrade the marine environment, or for which no prudent feasible alternative exists" will be assessed the fee. Should the special fee be imposed on all dumpers?

Dr. KNAUSS. Many of us who are environmentalists and lovers of the ocean would like to see it at least as difficult to put things in the ocean as on land or in the air. One of the ways in which one can try to do something about the ocean—that common area that belongs to all of us—would be to establish some kind of fee for everybody who uses the ocean commons.

Mr. FORSYTHE. I guess I have a problem with that comment when I consider all my water and aquifer problems on land. I am beginning to feel I should be more afraid of what is happening to the aquifers than the ocean at this point in time.

Hopefully, there will be a time when we will have the perfect answer as to which is the best alternative, but certainly not today.

Can the PCB content in sludges dumped in the New York Bight be controlled?

Dr. KNAUSS. I am not competent to answer that question.

Mr. FORSYTHE. At the present time, do we have the technology to get the PCB's out of the sludge once they are in the plant?

Dr. KNAUSS. I presume one can do that sort of thing if one is willing to pay a high enough price. I just have no idea of the degree of difficulty and what it would take to do so.

Mr. FORSYTHE. Are you aware of any studies carried out in areas where sludge dumping has been discontinued which have shown that the natural ecological conditions cannot be restored within a few years' time?

Dr. KNAUSS. I am not aware of anything with respect to sludge. There have been a number of cases, I believe, that are reasonably well documented for abandoned dredge spoil areas. Although dredge spoils are not sewage sludge, some of them are reasonably contaminated. Dredge spoil areas have been studied over the years and within a decade the local ecology, at least superficially and even more than superficially, looks similar to what it was prior to its being a dumpsite. That is dredge spoils, not ocean sludge.

I do not know of any abandoned ocean sludge sites that have been studied.

Mr. FORSYTHE. Sludge sites that have been abandoned for a sufficient length of time?

Dr. KNAUSS. My staff has just informed me there is a Swedish estuary that was a sludge dump and stopped about 8 years ago. I do not know the details, but at least there is one area one could examine.

Mr. FORSYTHE. It has been abandoned?

Dr. KNAUSS. It has been abandoned.

Mr. FORSYTHE. Hopefully, we might be able to find out what has happened there.

Dr. KNAUSS. Perhaps.

Mr. FORSYTHE. Do you have any specific recommendations as to how we might increase the incentive to reduce the toxicity of our waste materials?

Dr. KNAUSS. Other than what you and I just discussed earlier about a fee structure—and, again, I am no expert in this area—it seems to me that there is nothing like a monetary stick to get people to think about other ways to solve their problems.

Mr. FORSYTHE. Or mandate that there be no more single sewage systems which carry all the runoff which apparently is causing the major problem in terms of what is going into the marine environment. I understand that it is not necessarily the sewage sludge that is coming in but runoff going into the storm drains which is the biggest pollutant factor.

Dr. KNAUSS. Yes; but when those double systems were put in back in the early 1900's that was the most modern of technology. The reason why they were established at that time was because people realized that what was getting into our local estuaries was not only from sewers, but all the runoff from the roads, and so forth. Therefore, they said they would design a sewer system that will take care of both.

I think it is also quite clear that a large amount of the material that gets into our estuaries from a city is not point source. It does not all come from the sewer system directly. For example, in our city of Providence more than 50 percent of the oil that gets into the Providence River estuary does not come via the sewer system, but comes from runoff from the roads.

Therefore, one could argue if you had a well-designed system that would take care of both of these, you would solve that. That was the original intention back at the turn of the century when they first designed dual systems. The trouble is we no longer have the capacity to handle both the runoff and the sewage. We have more roads; we have more pavements; we have more storm drains; and we have more people. We just do not have the capacity.

Mr. FORSYTHE. And far more automobiles creating the problems from our roads.

Dr. KNAUSS. That is right.

Mr. FORSYTHE. To your knowledge, has EPA given any thought to regional advisory committees or do they need new authority to do so?

Dr. KNAUSS. I brought that point up with people in EPA and got the suggestion that they would at least consider it, but I am not aware of anything substantive that has been done along this line.

Mr. FORSYTHE. Mr. Hughes?

Mr. HUGHES. Thank you, Mr. Chairman.

Thank you, Dr. Knauss. I apologize for being late.

I understand, however, in your direct statement that you do support the 1981 recommendations of NACOA?

Dr. KNAUSS. Yes; I continue to support the 1981 recommendations.

Mr. HUGHES. Were you here during Mayor Koch's testimony?

Dr. KNAUSS. Yes, sir.

Mr. HUGHES. One of the things I requested from Mayor Koch for the record was the amount of hard metals, the amount of mercury and cadmium, in particular, and PCB's that are going into the New York Bight out of New York City. Do you have that information, by chance?

Dr. KNAUSS. The only information I have is the sort of material that NOAA has collected. We do not look for that information independently.

Mr. HUGHES. Would that be relevant to any studies that you have under way?

Dr. KNAUSS. We presently have no studies under way with respect to the question of waste management, Mr. Hughes, other than the one we did last year. We have looked at it again and decided we still stand by our original recommendations. We have not made any other indepth study.

Mr. HUGHES. I understand that. My question was, Would that be relevant to your study?

Dr. KNAUSS. Yes.

Mr. HUGHES. Do you have that information, by chance?

Dr. KNAUSS. No; I do not.

Mr. HUGHES. You do not. OK.

Part of your conclusion about the New York Bight is based on the fact that only 7 to 10 percent, I think, is the figure that has been used, of the overall pollution problem in the New York Bight is attributed to sewage sludge. That is projected to increase significantly as more waste water treatment facilities come on line. Have you factored that into your conclusions?

Dr. KNAUSS. That is correct, sir. It seems to me, as we heard from New York City today, they are going to have two major systems on line here in the next few years, which will indeed decrease the amount of untreated sewage which will flow into the New York Bight area.

Mr. HUGHES. The fact of the matter is sewage sludge is going to increase. It is not going to decrease.

Dr. KNAUSS. That is right. The more secondary treatment plants we have in this country, the greater the amount of sewage sludge we will have to dispose of.

Mr. HUGHES. I agree. As I understand, basically your conclusion is that we should not phase out the New York Bight dumpsite, the 12-mile site; that at the present time it is not in your judgment, sufficiently distressed to phase that out?

Dr. KNAUSS. That is right. That is my personal view.

Mr. HUGHES. Is that a fair statement?

Dr. KNAUSS. That is a fair statement.

Mr. HUGHES. At what point scientifically do we reach saturation? What is it we can measure objectively that will occur before you would change your recommendation? What will we be looking for? What will have occurred scientifically that will change your conclusion about the continuation of the New York Bight as a dump-site?

Dr. KNAUSS. I would think several things would certainly influence my opinion, Mr. Hughes. One would be when the amount of material being put into the New York Bight by sewage sludge is an appreciable percentage of the total amount of material that was coming into the New York Bight from all sources. At that point, we must look very hard at the New York Bight and decide what is the current effect on the local ecology, on the fisheries, and so forth; and then decide whether or not the sewage sludge itself is indeed causing sufficient damage to the environment that one should think about moving it.

There are people who believe that sewage sludge in itself, even though it is only 5, 7, or 10 percent of the material—because it gets to the bottom quickly and stays there; ties up heavy metals in the sand grains; is less available for ingestion by animals; reduces oxygen demand; and so forth—that it may be the New York Bight will look a lot better if, relatively, the same amount of material was in the former sewage sludge than is in the raw sewage that now comes out.

I am saying that, once we get to the point of cleaning up the rest of the sources of the New York Bight we should look very carefully at the effect of the disposing material in the New York Bight, and decide whether to go further offshore to put sewage sludge somewhere else—maybe 65, 106, or disperse it—or whether to concentrate it. I do not think we have the information now to predict what that will be.

Mr. HUGHES. You are almost saying that what we should do, is wait to see what the damage is and then we will know at that point we have gone too far. Is that what you are saying?

Dr. KNAUSS. I hope I did not say that. I did not mean to say that.

Mr. HUGHES. It seems to me that is the conclusion with which you end up. In the first place, you are not suggesting that sewage sludge does not contribute to the overall distressed condition of the New York Bight?

Dr. KNAUSS. I am not suggesting that at all.

Mr. HUGHES. You are not suggesting we know everything we should know about the long-term impact?

Dr. KNAUSS. I am not suggesting that, either; no, sir.

Mr. HUGHES. You are not suggesting that perhaps our whole research effort might be misdirected along the way, and that is one of the reasons why we know so little about the long-term impact?

Dr. KNAUSS. I am not saying our research effort has been misdirected, but I would agree with you that it seems to me perhaps we have looked at too few things.

Mr. HUGHES. Let me just read something to you.

Research to date has shown minimal long-term detrimental effects from ocean waste disposal. This suggests that either the ocean is the best medium for the dis-

posal of certain wastes or that the effects of ocean waste on human health and environment are more subtle than supposed. A third possibility is that past research on the effects of waste ocean disposal has been inadequate or misdirected.

Do you agree with that?

Dr. KNAUSS. That was in our report, sir.

Mr. HUGHES. It sure was, January 1981.

Dr. KNAUSS. I think I wrote that statement, as a matter of fact.

Mr. HUGHES. Then you would have to agree with it, I would think.

Dr. KNAUSS. Yes, I do.

Mr. HUGHES. I know my time is probably up. However, I have difficulty with your conclusion because it seems to me what you are saying is that,

Well, we have not gotten to the point where we have saturated the New York Bight even though most scientists agree that it is severely distressed. Let's give it some more time, and let's see what the impact has been on raw sewage. We may discover in the interim that the combination of raw sewage and sewage sludge has created tremendous problems, and we will know what to do at that time once we continue our studies.

Therefore, I think the ultimate conclusion is that we may end up at the end of the block at a deadend alley and find out that we have done irreparable harm, but then it is too late, isn't it?

Dr. KNAUSS. I do not think we will find we have done irreparable harm, sir.

Mr. HUGHES. I have a lot of people who are concerned about the fact that significant quantities of cadmium and mercury found around these dumpsites. And in shellfish living in areas I have a big seafood industry in my district and they are scared to death that sometime there might be a connection made between some of the dumping that is taking place and some of the viruses that might be discovered in seafood sold over the counter in my region. Is it too late once that occurs?

Dr. KNAUSS. It certainly is true that every time something like this happens it will have a significant—

Mr. HUGHES. I can just see on a busy, summer, holiday weekend somebody picking up the fact that there is a direct connection between the dumping of mercury, cadmium, PCB's, or what have you, and the contamination of seafood that people are eating in my region. It would just destroy our industry.

Thank you, Mr. Chairman.

Mr. FORSYTHE. Thank you, John. We will be submitting more questions to you for a response in the record. Thank you very much.

The next witness is Mr. Kenneth S. Kamlet of the National Wildlife Federation.

STATEMENT OF KENNETH S. KAMLET, DIRECTOR, POLLUTION AND TOXIC SUBSTANCES DIVISION, NATIONAL WILDLIFE FEDERATION

Mr. KAMLET. Thank you, Mr. Forsythe.

I would like to preface my comments with an observation about the testimony this morning and the testimony we have just heard.

It seems to me that an area in which there is pretty much total consensus among all of the witnesses from whom you have heard

thus far is on the ocean dumping fees, user fees of one kind or another, as well as the concept of prudent and feasible alternatives. Although the witnesses this morning used the term "prudent and realistic alternatives," I think the thrust is pretty much the same. I do not think there was any objection voiced, either, to the proposed prohibition against the use of unstudied ocean dumpsites. I think that these points that have emerged from the testimony thus far are worth emphasizing.

I would like to highlight three key issues affected by the draft amendments which could be termed "the major ocean dumping issues of the 1980's."

The first of these is sewage sludge, about which we have heard a great deal. The legislative history of the 1977 amendments to the ocean dumping law clearly indicates, I think, that Congress intended that whether ocean-dumped sewage sludges unreasonably degraded the marine environment should be determined strictly on the basis of anticipated harm to the marine environment. The London Dumping Convention, which is binding on the United States, likewise, prohibits the approval of ocean dumping for waste, including sewage sludge, which contains certain specified blacklist constituents such as mercury compounds, PCB's, and oil and grease as other than "trace contaminants."

I might note with respect to mercury and PCB's that it has been estimated that up to 30 percent of the PCB inputs to the New York Bight are contributed by ocean-dumped sewage sludge in relation to other sources, and the corresponding numbers for mercury are on the order of 50 percent. Although it may be true that overall only 7 to 10 percent of the inputs to the bight may be attributed to sludge, in the case of mercury and PCB's, in particular, those inputs are considerably greater.

However, a 1981 Federal district court decision, which the administration steadfastly, and I might say enthusiastically, refused to appeal, held that sludge could be determined to be "unreasonably degrading" only if a balancing analysis demonstrated that the harms of ocean dumping outweighed the incremental costs and impacts of land-based alternatives. It is noteworthy that neither party in that litigation raised, and the court did not consider, the requirements of the London Dumping Convention.

Moreover, in rejecting the arguments and analyses of several members of this committee who sought to persuade her that the court decision should be appealed, EPA Administrator Gorsuch cryptically noted that "concerns regarding the convention do not provide a basis for appeal" because Judge Sofaer's opinion "did not address the London Dumping Convention." That was precisely why an appeal was needed.

The only explanation offered was that the court decision "does not tie the agency's hands with regard to the convention and leaves EPA with ample authority to assure that our legal obligations in this area are fulfilled." In other words, EPA wanted the flexibility to construe its obligations under the convention in its own fashion without the benefit or burden of judicial review. One can hope, based on this position, that EPA will not object to the proposal to amend the act to incorporate the convention's prohibition against materials containing blacklist constituents as other than trace con-

taminants. Such an amendment would serve, consistent with Ms. Gorsuch's desire, to enhance EPA's authority to assure that its legal obligations in this area are fulfilled.

The draft amendments take a logical and moderate middle ground approach between that of the court in the New York City case and that of EPA's current ocean dumping regulations and criteria. The approach laid down by the court would require harm to the ocean, no matter how severe or how inappropriate, to be uniformly and invariably balanced against the incremental cost and impacts of land-based alternatives before the dumping could be barred.

EPA's regulations would invariably preclude dumping on the basis of either excessive environmental effects or availability of land-based alternatives. The draft amendments, on the other hand, would recognize, I think quite appropriately, gradations of harm to the marine environment. The most harmful material could not be dumped at all. The most innocuous could be readily dumped. For material between these extremes, the magnitude of anticipated harm would be balanced against the availability of prudent and feasible alternatives. This strikes us as an eminently reasonable approach to take.

There are those who argue that the "prudent and feasible alternative" test that would be established under the draft amendment would require would-be dumpers to resort to extravagantly more costly land-based alternatives in preference to ocean dumping. This is a gross mischaracterization of the letter and intent of the draft amendments. The "prudent and feasible" rubric was not pulled out of thin air. It has a long and respectable history as a central feature of the Department of Transportation Act where it applies to highways routed through public parks and wildlife refuges.

The same common property attributes that made it necessary to protect public parks against preferential use in highway routing apply equally strongly to the ocean. In both cases, but for at least marginally stronger Federal protection, highway developers would always choose to go put roads through parks rather than residential or commercial neighborhoods, and waste disposers would always prefer to dump wastes in the ocean rather than in somebody's proverbial "backyard."

As the courts have recognized in construing the "prudent and feasible alternative" concept, while cost considerations certainly deserve a prominent place in the analysis, the public interest in parks—or, in this case, in the ocean—was to be regarded as paramount. An engineeringly feasible alternative could, therefore, not be lightly dismissed simply on the basis that other alternatives were more expensive. On the other hand, developers were not expected to incur "extraordinary" cost increments as the price of safeguarding parkland resources. This approach, I might add, is little different from that currently embodied in EPA's ocean dumping regulations.

I would like to note with respect to the New York City situation, about which we have heard a great deal this morning, that the sludge which New York City ocean dumps is generated by 12 separate sewage treatment plants that are scattered throughout the city. As the city's environmental protection administrator noted

during the question period, there are at least three identifiable treatment plants that are significantly more heavily industrialized and generate distinctly more heavily contaminated sewage sludges than the rest.

Back in 1978, consultants to New York City proposed a series of short- and long-term alternatives to ocean dumping that would have permitted the city to comply with the 1981 phaseout requirement. The plan, developed by Camp, Dresser, and McKee—CDM—contemplated onetime application of composted sewage sludge at 16 landfill and parkland sites. The plan was never implemented, in large part because of public opposition to placing sludge on parkland.

It is important to recognize, however, that several of the city's treatment plants and treatment systems are much more heavily industrialized than the rest and generate far more heavily contaminated sludges, so that it seems entirely conceivable that under the draft amendments we are talking about the city's dirtier sludges could be deemed to have a prudent and feasible alternative in the form of composting and application to the four landfill sites identified in the CDM report without having to resort to any of the more controversial parkland sites. These four landfills by themselves would supply at least 1,084 available acres or more than 42 percent of the total acreage earmarked in the original 16 sites identified by Camp, Dresser, and McKee.

I might note at this point, in response to the concerns expressed by Mr. Biaggi this morning about possible use of the Pelham Bay landfill for this purpose, what we are talking about here is the one-shot application of composted sewage sludge mixed with soil to the landfill as a means of stabilizing it and to assist in the prevention of leachate escape from a landfill. This landfill, the Freshkills landfill, and a variety of other landfills are significant pollution sources themselves which generate a great deal of leachate. The application of sludge in a controlled manner of the sort that is being discussed would actually improve the environmental stability and quality of these areas. In fact, I am informed that representatives of the New York City Department of Sanitation within the past few days have been exploring the possibility of utilizing sewage sludge as a capping material on the Freshkills landfill in New York City.

The second major issue I would like to address is the designation of ocean dumpsites. The ocean dumping law authorizes the EPA Administrator to designate recommended sites for dumping, but only after consideration of environmental evaluation criteria under the act. The London Dumping Convention allows dumping permits to be issued "only after prior studies of the characteristics of the dumping site." Determining a site's suitability for dumping and its compatibility with particular waste proposed to be deposited there is no more than a matter of simple prudence and common sense. Yet, it has been honored, thus far, far more in the breach than in the observance.

In 1977, EPA blanketly designated as interim-approved some 140 unstudied ocean dumpsites around the country, giving itself 3 years to complete the site study process. Three years later, with only a small handful of sites studied, EPA blanketly extended the interim

designations of virtually all of the original sites with a few others thrown in for good measure.

A lawsuit that we filed in February of 1980 led to a court-approved settlement agreement, later embodied in an EPA regulation, requiring completion of site designation studies and supporting site designation and environmental impact statements in accordance with a specified compliance schedule for the 22 most actively used ocean dumpsites.

Despite EPA representations to this committee last spring and to House and Senate appropriations committees that it needed more ocean dumping funding to permit compliance with the NWF court order, once the funding was obtained, EPA scaled down its site designation plans. Considerable slippage has already occurred in the site study schedules to which EPA is legally obliged to adhere. As of last May, the site designation work for only 1 of the 22 sites covered in the settlement agreement was proceeding on schedule. With respect to the other 21 sites, the estimated dates for final designation were anywhere from 4 months to 16 months behind schedule. There has undoubtedly been further slippage since last May.

All told, EPA's site study and designation program has yielded only 11 sites out of 144, a meager 7.6 percent that have been formally studied and designated by EPA. In the meantime, the dumping proceeds unabated at five or six dozen dumpsites each year. In short, little has changed in connection with dumpsite designation since the advent of the ocean dumping law except that EPA is now operating in violation of an act of Congress, an international treaty, a court order, and its own regulations.

In our view, the only thing that will give EPA the incentive to take its site study and designation responsibilities seriously is a firm statutory prohibition against continued dumping at any site that has not been formally studied and designated. We, therefore, enthusiastically support the draft site designation amendment as a much-needed reaffirmation of existing mandates of the ocean dumping law and the Ocean Dumping Convention.

Finally, the third major issue is dredge spoils. Dredged material accounts for 90 percent of all U.S. ocean dumping and implicates a like percentage of interim-approved ocean dumpsites. A small but significant percentage of dredged material, particularly in heavily utilized and industrialized port areas, is significantly contaminated with persistent toxic chemicals, sewage, and microorganisms. Despite what may seem a significant potential for conflict between the London Dumping Convention, which absolutely prohibits dumping of wastes, including dredge materials, when they contain certain black-listed constituents as other than trace contaminants, and the needs of navigational dredging, in only two instances in the entire 10-year history of implementation of the act has permission to ocean dump dredge material been withheld even temporarily on the basis of excessive contamination.

The thrust and intent of the proposals involving the dredged material provisions of section 103 in the draft amendments, as we understand them, is to retain both the structure and the existing parallelism between the environmental effects evaluations of dredged and nondredged waste. Degrading and even unreasonably degrading dredged material could continue to be approved for ocean

dumping when the Secretary of the Army certifies that there are no prudent and feasible alternatives.

On the other hand, dredge material which contains black-listed constituents as other than trace contaminants could not be ocean dumped, as is true under present London Dumping Convention requirements. No waiver could be obtained from this prohibition. Similarly, the prohibition against dumping in unstudied and undesignated dumpsites would and should unwaivably extend to dredged material dumpsites. We wholeheartedly support the thrust and intent of these amendments.

In conclusion, as long as society and our political leaders permit ocean dumping to be regarded as the path of least cost and resistance, it will continue to proliferate. Just as bulldozing a road through a public park costs less than going around it, ocean dumping is almost always a coastal facility's least expensive means of getting rid of waste. If only the wastes being dumped were treated as resources to be recovered rather than as waste to be disposed of, then perhaps economics might dictate a different and more sensible result.

The draft amendments being considered today are a much-needed step in the right direction. We urge every member of this committee to support these amendments so that another generation of children does not have to ask with regard to a polluted ocean, "Why did you let them do it?"

Thank you.

[The statement of Mr. Kamlet follows:]



NATIONAL WILDLIFE FEDERATION

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STATEMENT OF KENNETH S. KAMLET, ON BEHALF OF THE NATIONAL WILDLIFE FEDERATION, AT HEARINGS ON DRAFT AMENDMENTS TO THE OCEAN DUMPING LAW, BEFORE THE SUBCOMMITTEE ON OCEANOGRAPHY AND THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT OF THE HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, MARCH 23, 1982

Messrs. Chairmen and Members of the Subcommittees:

I am Kenneth S. Kamlet, Director of the National Wildlife Federation's Pollution and Toxic Substances Division. It is a pleasure to appear once again before these subcommittees on behalf of the National Wildlife Federation and its 4.6 million members and supporters (and our 53 state and territorial affiliates).

As we approach the ten-year anniversary (on April 23rd) of the effective date of the Ocean Dumping Law, it is entirely appropriate that this Committee consider, as you are doing, the state of the coastal ocean off the shores of the United States, how well the Ocean Dumping Law has worked, and whether any changes or refinements are needed in the structure and approach of this landmark law.

After briefly surveying where we are in achieving the marine protection goals of the Ocean Dumping Law, I will highlight what I perceive to be the major ocean dumping issues of the 1980's and how well the draft amendments address these issues. Finally, I will offer some suggestions on how the draft amendments can be improved and will identify some additional changes in the

Ocean Dumping Law which may further assist in achieving Congressional objectives for the program.

The 1970's: A Decade of Progress--and Setbacks

Looking back on the first decade of ocean dumping controls, the track record of successes and failures can be summed up as followed:

1. The New York Bight, and particularly the New York Bight "Apex"--the coastal ocean off the shores of New Jersey and Long Island, continues to be one of the most degraded coastal environments in the world. Fin rot, gill erosion, skin tumors, parasitic infestations, microbial infections, chemical contamination, and developmental abnormalities are rampant in the fish and shellfish unfortunate enough to inhabit this cesspool of human and industrial effluvia. Ocean dumping is certainly an important contributor to these problems. However, although the ocean dumping of sewage sludge has taken most of the blame in the news media for this sorry state of affairs, the fact of the matter is that other waste materials bear an equal or greater share of the blame. Contaminated dredge spoils, dumped at the so-called "Mud Dump" Site in the Apex, contribute a large proportion of the highly toxic PCBs, carcinogenic polynuclear aromatic hydrocarbons, and toxic heavy metals present in the Bight. Riverine inputs from the Hudson and Raritan Rivers; fall-out of contaminants from the air; flow of contaminated runoff from surrounding shoreland; direct discharges from outfall pipes; and spills and releases of oil and other chemicals, all contribute to the sorry condition of the Bight.

2. Although a large number of sewage sludge ocean-dumpers have been persuaded to terminate this practice since the advent of the ocean dumping law, most have been very small communities. Overall, the level of ocean-dumped sewage sludge has increased by more than one-third--from 4.8 million tons to 7.3 million tons--between 1973 and 1980. Dumping information is not yet available for 1981, but the figures will almost certainly show a continuation of the trend of steadily-increasing quantities of ocean-dumped sewage sludge. The 1981 phase-out deadline on harmful sewage sludge ocean dumping, enacted by Congress in 1977, has had little impact on the pattern of ocean dumping, with the notable exceptions that the cities of Philadelphia and Camden successfully implemented land-based alternatives nearly two years ago.

3. Despite statutory and treaty restrictions on allowing ocean dumping at sites which have not been formally studied and designated for this purpose, only 11 of the 144 ocean dumpsites given blanket interim-approved status have gone through the study and designation process. In the meantime, ocean dumping freely continues at 50 to 70 of these unstudied sites each year.

4. The ocean dumping of dredged material--the product of river and harbor maintenance and deepening--continues unabated, with massive increases likely if a number of proposed port development projects come to fruition. While the vast majority of this dredged material is relatively innocuous sand, clay, and silt, a small, but important fraction of the material is

highly contaminated with the chemicals, sewage, oil and grease, and microorganisms which can be found in abundance in most of our urban-industrial rivers and harbors. Although this contaminated material can pose significant hazards to sea life and human health--and although ocean dumping of dredged material accounts for 90% of all ocean dumping and implicates 90% of all ocean dumpsites--few if any instances can be found of permission to ocean dump having ever been denied (or even significantly delayed) for even the most toxic dredge spoils in the entire 10-year period of statutory controls on ocean dumping.

5. EPA is in the process of drafting weakening revisions to its nationwide ocean dumping regulations, which would turn the clock back at least 6 years on the effective regulation of ocean dumping.

6. Concurrently, the Administration has proposed to reduce NOAA's marine pollution research budget by nearly \$7 million, virtually cutting in half already modest FY '82 funding levels. This reflects the "proposed phase-out of NOAA's research on waste disposal in the marine environment." At a time when EPA is seeking to scrap its reliance on predictive screening to prevent harmful wastes from getting into the ocean, in favor of heavy reliance on after-the-fact monitoring of material allowed into the ocean much more freely, it seems disingenuous in the extreme to so significantly reduce the federal capability to research and monitor the short-term impacts of ocean dumping.

7. On the plus side, ocean dumping of harmful industrial wastes has been significantly reduced, although growing quantities of less harmful industrial wastes have been ocean-dumped since 1978.

8. At-sea incineration of highly toxic chlorinated organic wastes has come under strict government regulation and monitoring, by virtue of the Ocean Dumping Law and the London Dumping Convention.

9. Scientifically sound and environmentally protective bioassay and bioaccumulation testing procedures have been developed, although significant abuses have occurred in their use.

Major Ocean Dumping Issues of the 1980's

1. SEWAGE SLUDGE

Background:

In 1977, Congress amended the Ocean Dumping Law to prohibit the ocean dumping of sewage sludge which "unreasonably degrades" the marine environment after 1981. The Legislative History of this amendment clearly indicates that Congress intended that "unreasonable degradation" for this purpose be determined strictly on the basis of anticipated harm to the marine environment. The London Dumping Convention, whose standards and criteria are binding on the United States (see, §102(a) of the MPRSA, as amended in 1976), likewise prohibits the approval of ocean dumping for wastes, including sewage sludge, which contain specified "black list" constituents (i.e., mercury and cadmium compounds, organohalogens, and oil and grease) as other than "trace contaminants."

However, a 1981 Federal district court decision (New York City v. EPA), which the Administration steadfastly refused to

appeal, held that sludge could be determined to be "unreasonably degrading" only if a balancing analysis demonstrated that the harms of ocean dumping outweighed the incremental costs and impacts of land-based alternatives. It is noteworthy that neither party raised and the court did not consider the requirements of the London Dumping Convention ("LDC").

As an interesting footnote to the LDC issue, it is worth noting that following a meeting of several Members of this Committee (led by Chairman D'Amours) with EPA Administrator Gorsuch, at which Ms. Gorsuch was urged to reconsider her decision to not appeal the New York City judgment, detailed written arguments were prepared by the subcommittee staff and conveyed to Ms. Gorsuch by Chairman D'Amours (by letter dated December 7, 1981). That letter documented in detail the bases for seeking Court of Appeals resolution of unaddressed LDC issues, among others. Administrator Gorsuch's December 28th response, rejecting the pleas to take an appeal, cryptically noted that the "concerns regarding the Convention do not provide a basis for appeal" because Judge Sofaer's opinion "did not address the London Dumping Convention" (which was precisely why an appeal was needed). The only explanation offered for this circular logic was that the court decision, having not addressed the Convention issue, "does not tie the Agency's hands with regard to the Convention and leaves EPA with ample authority to assure that our legal obligations in this area are fulfilled." In other words, EPA wants the "flexibility" to construe its obligations under the Convention in its own fashion

without the benefit of judicial review. One can only hope that, based upon this position, EPA will not object to the proposal to amend the Ocean Dumping Law to incorporate within the body of the Act the Convention's prohibition against dumping materials containing "black list" (Annex I) constituents as other than "trace contaminants." Such an amendment would serve only to enhance EPA's "authority to assure that [its] legal obligations in this area are fulfilled."

Effect of the Draft Amendments:

The draft amendments would refine the current statutory approach, by creating four categories of material proposed for ocean dumping:

1) Material which does not degrade the marine environment, which can be freely ocean-dumped.

2) Material which degrades but lacks "prudent and feasible" alternatives, which can be ocean-dumped under "interim permits" and somewhat more restrictive dumping conditions.

3) Material which "unreasonably degrades" the marine environment, and, therefore, cannot be ocean-dumped, because it both degrades the ocean and has recourse to "prudent and feasible" disposal (or reuse) alternatives.

4) Material, which because of its high content of highly toxic and persistent toxic chemicals, is absolutely prohibited from being ocean-dumped (such material is currently subject to similar prohibitions under the LDC).

In so doing, the draft amendments, in our view, take a logical and moderate middle-ground approach somewhere in between

that of the court in the New York City case and that of EPA's current ocean dumping regulations and criteria (which mirror the intent of the 1977 sludge phase-out amendment). The approach laid down by the court would require harm to the ocean--no matter how severe or inappropriate--to be uniformly and invariably balanced against the incremental costs and impacts of land-based alternatives. EPA's regulations would invariably preclude dumping on the basis of either excessive environmental effects or availability of land-based alternatives. The draft amendments, on the other hand, would recognize gradations of harm to the marine environment. The most harmful material could not be dumped at all; the most innocuous could be readily dumped. For material between these extremes, the magnitude of anticipated harm would be balanced against the availability of "prudent and feasible" alternatives. This strikes us as an eminently reasonable approach to take.

There are those who argue that the "prudent and feasible alternative" test that would be established under the draft amendments would require would-be ocean dumpers to resort to extravagantly more costly land-based alternatives in preference to ocean dumping. This is a gross mischaracterization of the letter and intent of the draft amendments. The "prudent and feasible" rubric was not pulled out of thin air. It has a long and respectable history as a central feature of the Department of Transportation Act (49 U.S.C. §1653 and 23 U.S.C. §138) where it applies to highways routed through public parks and

wildlife refuges. The same common property attributes that made it necessary to protect public parks against preferential use in highway routing, apply equally strongly to the ocean. In both cases, but for at least marginally stronger Federal protection, highway developers would always choose to go put roads through parks rather than residential or commercial neighborhoods, and waste disposers would always prefer to dump wastes in the ocean rather than in somebody's proverbial "backyard." As the courts have recognized, from the Supreme Court on down, in construing the "prudent and feasible" alternative concept, while cost considerations certainly deserved a prominent place in the analysis, the public interest in parks (or in this case, in the ocean) was to be regarded as paramount. An engineering feasible alternative could, therefore, not be lightly dismissed simply on the basis that other alternatives were more expensive. On the other hand, developers were not expected to incur "extraordinary" cost increments as the price of safeguarding parkland resources. See, e.g., Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402 (1971).

The draft bill, similarly, makes clear that an alternative is to be regarded as "prudent and feasible" only if it is available at "reasonable cost and energy expenditures" which, however, need not be "competitive with the costs of ocean dumping." (§4(2), p. 9). This approach is little different from that currently embodied in EPA's ocean dumping regulations (§227.16(b)). These regulations specify that alternatives to ocean dumping must

be regarded as "practicable" "when they are available at reasonable incremental cost and energy expenditures, which need not be competitive with the costs of ocean dumping"

Note on the New York City Situation

New York City, which has been at the forefront of efforts to frustrate Congressional desires to phase-out harmful sludge dumping practices, will doubtless oppose much, if not all, of the draft amendments. We would simply point out with respect to New York City that ocean dumping of its sewage sludge need not be an all-or-nothing proposition. The sludge which New York City ocean-dumps is generated by 12 separate sewage treatment plants, scattered throughout the City. In 1978, these plants in aggregate were producing a total of some 1,500 dry tons of sludge per week. At that time, consultants to New York City (i.e., the engineering firm of Camp, Dresser & McKee) proposed short- and long-term alternatives to ocean dumping, which would have permitted the City to comply with the 1981 phase-out requirement. The CDM plan contemplated (1) dewatering the sludge at two locations-- one at the Owls Head plant, and the other at either the Hunts Point plant or the Bowery Bay plant; (2) composting of the sludge cake produced at these plants at College Park, and at the Freshkills landfill and South Shore incinerator sites; and (3) one-time application of the compost at 16 landfill and parkland sites (with a total available acreage of 2,800 acres) at a loading rate of about 500 tons per acre (this would provide about 8 inches of compost, which would be mixed with about two parts of existing topsoil to enrich the topsoil and to provide structural integrity).

The plan was never implemented, in part because of public opposition to placing sewage sludge on parkland, and in part because of the ultimately successful legal action initiated by New York City to overturn the ban on ocean dumping.

It is important to recognize, however (both in this context and in connection with proposals to relocate New York City's sludge dumping from its present 12-Mile Dumpsite to Deepwater Dumpsite 106 or to an immediate 65-Mile area) that New York City's 12 sewage treatment systems generate distinctly different sludges. Several of these systems (e.g., Newtown Creek and Bowery Bay) are much more heavily industrialized than the rest and generate far more heavily contaminated sludges. It seems entirely conceivable that, under the draft amendments to the Ocean Dumping Law, the City's dirtier sludges could be deemed to have a prudent and feasible alternative in the form of composting and application to the four landfill sites identified in the CDM report (i.e., Pelham Bay Landfill in the Bronx; Fountain Avenue Landfill and Pennsylvania Avenue Landfill in Queens; and Fresh Kills Industrial Park in Staten Island), without having to resort to any of the more controversial parkland sites. These four landfills by themselves would supply at least 1,184 available acres. The cleaner sludges, to the extent they could qualify as non-"degrading," might well be able to be readily ocean-dumped. Even if they did not qualify as non-degrading, it might still be possible to ocean-dump them under an "interim" permit on the basis of their lesser harm to the ocean and the diminished prudence of applying them to more sensitive and controversial parkland sites. (Even among the parkland sites identified, 4 sites, accounting for 500 available acres, engendered little, if any, public protest.)

2. OCEAN DUMPSITE DESIGNATION

Background:

Section 102(c) of the Ocean Dumping Law authorizes the EPA Administrator to designate recommended sites for dumping, but only after consideration of the environmental effects criteria established pursuant to section 102(a). Article IV(2) of the London Dumping Convention allows dumping permits to 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..." Determining a site's suitability for dumping and its compatibility with particular wastes proposed to be deposited there is a matter of simple prudence and common sense. Yet, it has been honored far more in the breach than in the observance.

In 1977, EPA blanketly designated as "interim approved" without prior study some 140 historically utilized ocean dumpsites, giving itself 3 years to complete the site study process (40 C.F.R. §228.12(a), 42 Fed. Reg. 2484-87, January 11, 1977). Three years later, with only a small handful of sites studied, EPA blanketly extended the interim-approved status of a few dozen sites for another three years and of a much larger number of additional sites into the indefinite future (beyond three years) (45 Fed. Reg. 3053-55, January 16, 1980). An NWF lawsuit filed in February 1980 led to a court-approved settlement agreement (NWF v. Costle II, Civ. No. 80-0405, Stipulation of Settlement and Dismissal, D.D.C. September 25, 1980), later embodied in a Federal Register notice (i.e., a regulation) (45 Fed. Reg. 81042-44, December 9, 1980), requiring completion of site designation studies (and supporting site designation environmental impact statements) in accordance with a

specified compliance schedule for the 22 most actively used ocean dumpsites (accounting for up to 90 percent of U.S. ocean dumping).

Despite EPA representations to this Committee last Spring, and to House and Senate Appropriations Committees, that it needed more ocean dumping funding to permit compliance with the NWF court order, once the funding was obtained, EPA scaled down its site designation plans.

Considerable slippage has already occurred in the site study schedule to which EPA is legally obliged to adhere. As of last May, the site designation work for only one of the 22 sites covered in the settlement agreement was proceeding on schedule. For the other 21 sites, the estimated dates for final designation were anywhere from 4 months to 16 months behind schedule. There has undoubtedly been further slippage since last May. For example, the draft site designation EIS for the "Mud Dumpsite" (for dredged material) in the New York Bight, which under the settlement agreement was to be completed in December, 1980 (and, even under EPA's May, 1981, revised schedule, by last October), was not issued until this February--14 months late.

All told, EPA's site study and designation program which (supposedly) began in earnest in January of 1977--over five years ago--has yielded only 11 sites out of 144 (a meager 7.6%) that have been formally studied and designated by EPA. In the meantime, the dumping proceeds unabated--at five or six dozen ocean dumpsites each year (many of which change from year to year).

In short, little has changed in connection with dumpsite designation since the advent of the Ocean Dumping Law--except that EPA is now operating in violation of an Act of Congress, an international treaty, a court order, and its own regulations.

In our view, the only thing that will give EPA the incentive to take its site study and designation responsibilities seriously, is a firm statutory prohibition against continued dumping at any site that has not been formally studied and designated (perhaps following a no more than 2- to 3-year transition period).

Effect of the Draft Amendments:

The draft amendments would amend section 102(c) of the Act to limit dumping to formally designated sites and to prohibit designation of any site until an analysis has been undertaken and completed of "the environmental effects which will likely result from the dumping". (§ 4(3), p. 9).

We enthusiastically support this site designation amendment as a much-needed reaffirmation of the existing mandates of the Ocean Dumping Law and the London Dumping Convention. (The Subcommittees and Committee may wish, however, to consider providing a 2- to 3-year phase-in period for completion of ongoing site study and designation work to avoid the dislocation that might well result from the shock of an abrupt ban on dumping at 92 percent of the ocean dumpsites utilized around the country). Some minor wording changes in the language of the site designation amendment are suggested later in this statement.

3. DREDGE SPOILS

Background:

Dredged material, the product of navigational dredging, accounts for 90 percent of all U.S. ocean dumping and implicates a like percentage of all interim-approved ocean dumpsites. Although largely composed of sand, clay, and silt, a small but significant percentage of dredged material (probably in the range of 10-25%), particularly in heavily

utilized and industrialized port areas, is significantly contaminated with persistent toxic chemicals, sewage, and microorganisms.

The Ocean Dumping Law currently allows dredged material to be ocean-dumped, notwithstanding unreasonable degradation to the marine environment, if the Secretary of the Army certifies that there is an overriding need based on the interests of commerce and navigation to proceed with the dumping (provided the EPA Administrator does not find that "unacceptable adverse impacts" on specified fish and shellfish resources will occur). However, in cases where dredged material contains certain "black-listed" (Annex I) constituents (mercury and cadmium compounds, organohalogens, and oil and grease) as other than "trace contaminants", the London Dumping Convention permits no waiver of the environmental effects criteria and the prohibition on dumping is (virtually) absolute.

Despite what might seem a significant potential for conflict between requirements and the needs of navigational dredging, in only two instances in the entire 10-year history of implementation of the Ocean Dumping Law has permission to ocean-dump dredged material been withheld, even temporarily, on the basis of excessive contamination.

Effect of the Draft Amendments:

The proposed modifications to the dredged material provisions of section 103 are awkwardly and confusingly worded. However, as I understand the thrust and intent of the proposals they would retain both the structure of the existing section and the present parallelism between the environmental effects evaluations of dredged and non-dredged wastes. "Degrading" and even "unreasonably degrading" dredged material

could continue to be approved for ocean dumping, where the Secretary of the Army certifies that there are no "prudent and feasible" alternatives to the dumping of "degrading" material. On the other hand, dredged material which contains "blacklisted" (Annex I) constituents as other than "trace contaminants" (as determined on the basis of appropriate chemical and toxicological testing) could not be ocean-dumped (as is true under present LDC requirements), and no waiver could be obtained from this prohibition. Similarly, the prohibition against dumping at unstudied and undesignated dumpsites would and should un-waivably extend to dredged material dumpsites.

We wholeheartedly support the thrust and intent of these amendments (although a number of wording changes are necessary to accurately convey the intentions of the draftsmen).

The amendments would, in addition, affect the "Mud Dump Site" in the New York Bight, at which dredged material from New York Harbor and associated navigation channels is ocean-dumped, by prohibiting after 1985 further dredged material dumping in the New York Bight Apex. This would necessitate relocation of dredged material dumping to a yet-to-be designated new site 10 or more miles further offshore. Two factors may serve to partially mitigate the seemingly harsh implications of this prohibition. First, the mounding of dredged material at the Mud Dump (the accumulation of many decades of dumping) has prompted serious discussion of the need to move the site to avoid interference with navigation in the shipping channel in which the Mud Dump is located. (On the other hand, perhaps another 10 years of capacity could be squeezed out of this site by shifting the dumping within it to a less heavily utilized portion of the site). Second, the New York District

of the Corps has, to its credit, embarked upon an "Incremental Implementation Plan" for management of dredged material emanating from the New York Harbor area. This plan calls for the detailed exploration and implementation of an array of dredged material management options (including but not limited to ocean dumping) on a sequential basis between February 1980 and May 1985. Among the options to be pursued are: deposition and capping of material in "subaqueous borrow pits" in New York Bay; consignment to upland disposal sites; use for construction of offshore containment islands; and a number of "special case" options, including use as sanitary landfill cover, for beach nourishment, for habitat enhancement, etc. It is, therefore, at least theoretically possible that a number of non-ocean dumping alternatives will be available for at least some proportion of the dredged material which is currently dumped at the Mud Dumpsite, before the advent of the proposed post-1985 ban on dumping in the Bight Apex.

It is worth noting--particularly in light of the prevailing view that alternatives to ocean dumping of dredged material are very limited to non-existent (especially in densely populated areas)--that contractors to the New York District have identified 295 so-called (non-agricultural, non-wetland) "barren" areas, collectively comprising about 54,000 acres, within a 100-mile radius of the Statue of Liberty, which might be suitable containment sites for New York Harbor dredged material. Eleven of these sites have been evaluated in depth. It would take only a few of these sites to accommodate all of the contaminated dredge spoil produced in the New York Harbor area for many years. The point is that, if alternatives exist for the New York City area, they are not likely to be unavailable anywhere.

4. OTHER ISSUES ADDRESSED BY THE DRAFT AMENDMENTS: Expanded Statement of "Findings and Policies" (§2, p. 2)

We especially support the addition of findings relating to: the resource value of many ocean-dumped materials; the lack of adequate studies of many ocean dumpsites; and the need for a comprehensive research and monitoring plan to ensure the reasonable use of the ocean for waste disposal.

Expanded Coverage of Dumping by U. S. Agencies and Instrumentalities (§4(2), p. 6, lines 9 and 10).

We support the broadening of MPRSA coverage to encompass dumping by agencies and instrumentalities of the U.S., whether or not the material was transported from U. S. shores "for the purpose of dumping". This change is needed to bring under regulation the casual dumping (in peace-time) of jet fuel and other materials by naval vessels and by aircraft, simply because it is considered more costly or more trouble to off-load these materials upon return to the home port or base. Unlike the situation for private vessels, no link between the dumping and transportation of a material from a U. S. port need be established in order for the U. S. to assert regulatory jurisdiction over dumping by a public vessel operating in international waters. The public status of the vessel and the involvement of a U. S. agency or instrumentality furnish an ample "jurisdictional nexus" for U. S. regulatory control. (The language and location of this provision could be improved, however).

Prohibition Against Dumping Known or Suspected Carcinogens, Mitagens, and and Teratogens (§4(1), p. 4).

We support incorporation in the statute of a tight restriction on dumping carcinogens (and like compounds) similar to that presently contained in §227.6 of EPA's Ocean Dumping Regulations. It may well be, however, that a total ban on dumping such compounds--as the draft amendments would mandate--(regardless of how low their levels may be in an ocean-dumped waste) goes too far. It might be more appropriate to include this paragraph within proposed paragraph (E) (p. 5, lines 3-18), so

that only carcinogens, etc. present as other than "trace contaminants" would be prohibited from being dumped.

Addition of New Evaluation Factors to §102(a) (§4(l), p. 7).

We strongly endorse the addition of evaluation factors requiring consideration of: dumping impacts on the composition and vulnerability of exposed biological communities; and the cumulative effects of a given dumping proposal in conjunction with other sources of contamination of the dumping area.

Addition of Specific Site Study and Monitoring Requirements (§4(3), pp. 9-11).

The incorporation of these provisions is highly desirable. (Several wording changes would be helpful, however).

Processing Fees and Special Fees (§6(l), p. 14, lines 11-23).

Internalizing the costs is highly desirable and long overdue. (It should be made clear, however, that the proceeds from collecting these fees should not revert to General Revenues, but should be earmarked to defray the costs on which they were based).

Moratorium on Dumping of Radioactive Wastes (§8(d), p. 18).

We support the notion that authorization to ocean dump radioactive wastes--suspended in the U. S. since at least 1970--should be withheld for a sufficient period to ensure that such wastes can satisfy the "findings" and "policies" of the MPRSA, and to permit a comprehensive review of the radioactive waste ocean disposal plans of the Navy and the Department of Energy.

Amendments to Title II

(a) Specifying some of the components of the long-range research and monitoring program under §202(a) is desirable. However, it is not clear that NOAA is best suited to develop a methodology for comparing the costs and benefits of ocean dumping with those of available alternatives.

(b) It is not clear that NOAA is best equipped to develop techniques and guidelines for integrating "social and economic factors" affecting ocean dumping into Federal decisionmaking processes. The intent of this provision is unclear, as well.

(c) The concept of regional "long-term materials disposal management plans" is a commendable one. However, assuring that meaningful and properly focussed plans are developed, and then ensuring that they are integrated into decisionmaking across a wide array of waste management programs, are tasks of staggering proportions (which are not adequately addressed).

5. SUGGESTED IMPROVEMENTS AND ADDITIONS

Findings

p. 2, line 18: add "and resource" after "potential commercial" to make clear that many ocean-dumped materials have resource value, whether or not they have "commercial" value in the strict sense.

Policy

p. 3, line 10: add "and enhance" following "to restore", to make clear that Congress seeks to both restore and enhance areas degraded by dumping. The goal should be both rehabilitation and, where possible, realization of an area's full environment potential. An example might be use of otherwise ocean-dumped dredged material for habitat enhancement purposes.

p. 3, line 13: revise to read "to encourage the removal and recycling of degrading contaminants..."

Degradation

p. 4, line 2: Revise to read..."to have a measurable adverse effect..." (to make clear that trivial impacts, not distinguishable from background conditions, are not a criterion of "degradation".)

p. 4, lines 5-6: Revise to read—"to impede any reasonable or customary use of the marine environment".

Dumping Permit Program

pp. 4-5: The prohibitions of paragraphs (B) through (F) might be best incorporated in section 101 (where "prohibited acts" are dealt with currently). This would make clear that applicability of these prohibitions to all of Title I, without the need for repetitive references within sections 102 and 103. Paragraph (A), which is intended simply to indicate that dredged material is regulated under section 103 rather than 102, is confusing as drafted, and could be deleted entirely if the proposed relocation is adopted.

p. 5, lines 6-10: Persistent floatable materials; dealt with in this paragraph, are of far lesser environmental significance than the persistent toxic materials dealt with in the remainder of the subsection. Although derived from the LDC, this paragraph probably need not be singled out in the Act for prohibition.

p. 5, lines 4-5: Change "contain more than trace amounts of" to "contain, as other than trace contaminants...". This is necessary to conform to the "words-of-art" utilized in the LDC and in EPA's regulations.

p. 6, lines 14-15: Delete "or", in line 14. This is a significant typographical error. This change is necessary to properly reflect the intent that, for dumping by "an agency or instrumentality of the United States", transportation from the U.S. is sufficient to make an ocean dumping permit necessary. (For dumping by private parties, it is necessary to have transported the material "for the purpose of dumping it into ocean waters"). Actually, it would be preferable to deal with jurisdictional matters of this sort in § 101(a), with this provision simply cross-referencing that subsection.

p. 6, lines 10-21: Revise to read as follows: "The Administrator may, after notice and opportunity for public hearings and after consultation with the Adminis-

trator of NOAA, issue permits for the transportation and dumping of material as described in section 101(a), and subject to the prohibitions of section 102(a) (1) [as amended], if the Administrator determines that.--" (It seems unnecessary to reference the penalties section, §105, but it is important to make clear that the prohibitions of proposed §102(a) (1), which derive from the London Dumping Convention, are absolute and are not subject to the "prudent and feasible alternative" test.

Section 101(a) should be amended to add a new paragraph (3) encompassing the dumping of material transported by a public vessel or aircraft of the United States, or by an agency or instrumentality of the United States [without regard to whether it was transported from a U.S. port or for the purpose of ocean dumping]. Subsections 2(c) and 102(a) should be revised to cross-reference §101(a).

This series of amendments is necessary to plug the loophole in the Ocean Dumping Law which allows hazardous oily wastes (including surplus jet fuel) to be ocean dumped with impunity by Naval vessels and others. Documentation of this problem has been furnished to the Oceanography Subcommittee Staff.

p. 7, line 25; p. 8, line 1: This paragraph (D) is awkwardly worded. Revise to read: "The persistence and permanence of the effects of the dumping, and the potential for bioaccumulation of contaminants".

p. 8, line 15: Change "ecosystem, such as those important for the foodchain", to "ecosystem, including the human foodchain".

p. 8, lines 16-18: Revise paragraph (H) to read as follows--"The cumulative effect of such dumping on human health and the marine environment when considered in conjunction with existing and projected pollutant success in the vicinity of the dumpsite".

p. 9, line 1: Change "or" to "and", to read "feasible and prudent".

p. 9, line 23: Retain the "sites and times" language of the existing statute.

line 26: Delete "under this subsection", which is superfluous.

line 27: Change "an analysis" to "a detailed analysis".

line 28: Insert, between "the" and "environmental"—"characteristics of the site and its suitability for dumping and of the" (The intent of these studies is primarily to assess site suitability).

line 29: Insert after "dumping" and before the period, "at the site".

Change the clause "undertaking such an analysis of each site" to "conducting such site designation studies".

line 30: Change "take into consideration" to "apply", and "set" to "established".

p. 10, line 1: Change "forth in" to "pursuant to" and change "investigate" to "evaluate".

line 2: Change "wastes" to "materials".

line 3: Change "for dumping" to "to be dumped".

line 4: Delete "waters at the".

line 6: Change "normal" to "balanced, indigenous".

line 13: Change "which" to "of"; delete "at the site will...".

line 14: Change "have with respect to" to "on".

line 15: Delete this line.

line 16: Delete this line; insert "in and around the site".

p. 10, line 20: Change "Secretary" to "Administrator".

lines 17-22: Revise to read—"Site designations shall be effective for a period of six consecutive years. The designation may be renewed for additional 6-year periods, but only following completion by the Administrator of a supplemental analysis of the environmental effects required to be evaluated under paragraph (1) of this subsection".

line 23: Change "continuously" to "periodically".

line 24: Delete "the"; "of materials"; and "designated"; insert "designated" between "each" and "site"; insert a comma after "site".

line 25: Delete "by him under paragraph (1),".

p. 11, line 3: Insert "determines", after "Administrator".

line 4: Delete "the monitoring of such estimate" and "determines"; insert at the beginning of the line, "this estimate or such monitoring,".

line 5: Delete: "the"; "of materials"; and "degrade,"; insert, after "will", "cause or contribute to".

line 6: Delete "or aggravate the"; the comma after "of"; and "at"; insert "in or" at the end of the line.

line 7: Insert "around" at the beginning of the line; change "may" to "shall".

line 9: Change "at" to "to"; insert, after "times", "and conditions".

line 10: Insert "site" before "designation"; delete the rest of the line.

line 11: Delete the word "site".

p. 12, lines 6-9: Revise to read as follows—"(1) In making the determination required by subsection (a), the Secretary shall apply the criteria, established by the Administrator, pursuant to section 102(a)." (It is no longer necessary to reference "those criteria...relating to the effects of dumping").

line 14: Insert after "need for", the words "and the availability of prudent and feasible alternatives to the dumping".

p. 12, line 25; page 13, lines 1-7: Revise the draft amendment to Section 103(d) to read as follows—"If, subject to the prohibitions of sections 101(c) and 102(c), the Secretary finds that, in the disposition of dredged material, there is no prudent and feasible alternative to dumping at a site or under conditions that would result in noncompliance with the criteria established pursuant to section 102(a), he shall so certify and request a waiver from the Administrator..., etc." This change is necessary to integrate the "prudent and feasible alternative" approach into section 103, and to make clear that the prohibitions against dumping "blacklisted" substances as other than trace contaminants, and against dumping at undesignated sites, apply to dredged material and cannot be waived under the London Dumping Convention.

p. 14, lines 18-23: Revise to read— "The special fee shall be sufficient to

cover the costs of the environmental analysis and review, and the alternatives evaluation, specified under subsection (c) (2) of this section, plus an appropriate amount to be applied toward the costs of site designation and monitoring pursuant to section 102(c) (3) and title II."

p. 15, lines 13-25; page 16, lines 1-9: This subparagraph can be made more succinct (and more consistent with the Department of Transportation Act's two-pronged test) by revising it to read as follows--"(B) The Administrator, after taking into account the results of the analysis and reviews required under section 102(c), shall require interim permittees to take all possible steps to ensure that the transportation and dumping of material will be conducted in a manner that minimizes adverse effects on the health, environmental, and resource values enumerated in section 102(a)."

p. 16, line 17: Add, after "recycling", the words "or beneficially utilizing."

Suggestions for Additional Fine-Tuning Amendments

1. Clarification of the definition of "high-level" radioactive waste--Revise the first sentence of section 102(a) to insert, following the words "high-level radioactive waste", the parenthetical phrase: "(including seabed emplacement thereof)." This is necessary to clearly refute the contention of at least one Federal agency that burying something in the seabed for disposal purposes is not ocean dumping.

2. The Ocean Dumping Law should be amended to make the toxic substances limitations established by EPA pursuant to section 307 of the Federal Clean Water Act (P.L. 92-500) applicable to ocean dumping under the Ocean Dumping Law. This is necessary to eliminate any incentive for waste disposers to transfer discharges which cannot lawfully be made into inland waters to the ocean, merely because of the lack of parallel requirements.

3. Revise the definition of "dumping in section 3(f) of the Act to clarify what is current Corps practice, namely that carriage of dredged material by pipeline (pipeline dredges) to an ocean dumping site is "dumping" subject to the Ocean Dumping Law (rather than to the Clean Water Act).

4. Congress should reassert and clarify its intent under section 107(c) that the Coast Guard's responsibility to "prevent...unlawful dumping" extends to other Federal agencies and that the Coast Guard is not free to allow (as is provided in a Memorandum of Understanding between the Coast Guard and the Corps) the Corps of Engineers to monitor its own dumping.

5. Define "emergencies" of the sort that would justify waiver or relaxation of normal public notice or environmental evaluation procedures as "a situation which would result in an unacceptable hazard to life if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process the application under required procedures." Approval of emergency ocean dumping should also be explicitly predicated on each of the following: (1) a determination that the emergency admits of no feasible solution other than ocean dumping under relaxed procedures; (2) a determination that there is every probability that the damage consequent upon such dumping would be less than would otherwise occur; (3) a requirement that public notice and environmental evaluation requirements be followed to the fullest extent practicable; and (4) where Annex I constituents may be present (under the London Dumping Convention), a requirement of advance Department of State consultation with the Intergovernmental Maritime Consultative Organization (IMCO) and with the Governments of Canada and Mexico to the extent either of the latter is "likely to be affected" by the proposed dumping. Dumping without a permit should be sanctioned only where unavoidably necessary to safeguard human life at sea. In the case of the Corps of Engineers, approval of emergency dumping should be required to come from the Chief of Engineers, in consultation with the Secretary of the Army. In the case of EPA, approval of the Administrator is necessary.

Mr. D'AMOURS. Thank you, Mr. Kamlet.

I noticed that you also were here this morning throughout the Koch testimony. I would like to give you the same opportunity I gave to Dr. Knauss to respond to Mayor Koch's contention that it makes better sense to continue incrementally polluting an already polluted area than it does to move to a pristine area, the area of course in question being the Bight Apex. What are your comments on that?

Mr. KAMLET. I would like to say first that the 106-mile site can certainly not be regarded as a pristine area. It receives industrial waste, toxic industrial waste, which is being dumped right now and has been for a number of years. It is true there has not been long-sustained dumping of sewage sludge at the 106 site. There was a brief period during which the city of Camden dumped sludge at that site. Certainly one could not regard it as a pristine area. The 65-mile site could better meet that description inasmuch as there is not any dumping currently going on at that site.

It is a significant concern. I have mixed feelings about the desirability of shifting sludge dumping from the 12-mile site to the 65-mile area because I think that the ocean is the wrong place to put most of that sewage sludge or a large part of it, whether it is at the 12-mile site or any other site.

With respect to the New York City situation, a middle-ground approach that makes more sense than simply moving it all to 65 miles or 106 miles would entail isolating those sludges that come from the most industrialized sewage treatment systems in the city, and there are at least three of them by the Commissioner's acknowledgement this morning, and requiring those to be placed on land at landfill sites that I have identified in my testimony which would be available as an interim measure for 5 to 7 years, and then ultimately handling these sludges through an incineration technique or some other longer-term means of dealing with them.

The balance of that New York City sludge, the less industrialized, less contaminated material, I perhaps would just as soon prefer to see continue to be dumped at the 12-mile site in that already degraded area than have the entire sludge moved further out. The economics of that may not be all that unfavorable.

Mr. D'AMOURS. That is very interesting. I made such a suggestion to Mayor Koch earlier today. His response was, although as I recall it was not shared by the gentleman who accompanied him, that he thought the material generated by all 12 sites was uniform. Would you disagree with that, then?

Mr. KAMLET. I would agree with the New York City Environmental Protection Commissioner who indicated that there are at least three treatment systems that do generate distinctly more heavily contaminated sludges. The point the mayor was making was that, even for the less contaminated systems, there are occasions in which the sludges become heavily contaminated.

Mr. D'AMOURS. What would you do with the more highly contaminated sludge?

Mr. KAMLET. There are four landfill sites that would provide about 1,200 acres of available capacity to accommodate the sludge which could receive sludge on a one-shot only basis and accommodate it for a 5-to-7-year period. These were sites identified by a con-

tractor, a consulting engineering firm retained by New York City back in 1978. These sites continue to be available. It makes a lot more sense in my view to put the dirty sludges there and stabilize landfills in the process, than to continue to put them in the ocean at any of the ocean dumpsites that are being discussed.

Mr. D'AMOURS. Do you agree with Captain Cousteau that we do have the technology today to restrict and contain land-dumped sludge?

Mr. KAMLET. Yes, absolutely. I could not make the statement as unequivocally if we were talking about hazardous waste of a variety of kinds. However, the experience with land application of sewage sludge is sufficiently extensive in the United States and elsewhere in the world that I can say categorically that we do have the technology in a controlled land application situation to insure that sludge can be safely applied to land with minimal environmental consequences. That is a view, I might add, that has been shared by four scientists from Cornell University in rebutting a statement by two of their colleagues which applied solely to agricultural land application. There are many nonagricultural applications of sewage sludge that not only are environmentally sound, but are beneficial in terms of impact on the environment.

Mr. D'AMOURS. This Cornell study to which you are referring, I take it, is the one that was referred to in the exchange between Mr. Forsythe and Mayor Koch's assistant? Is that the study to which you are referring?

Mr. KAMLET. There was an earlier press release by two Cornell School of Agriculture researchers. I think those representatives may have been at hearings here last spring. It was a rebuttal to that press release communicated by four other scientists at Cornell which appeared as a letter to the editor in the newsletter of the Water Pollution Control Federation and in Sludge Newsletter. I have a copy here in front of me. I would be happy to submit it for the record if you wish.

Mr. D'AMOURS. Without objection, it will be entered into the record at this point.

[Material to be supplied follows:]

Letter to the Editor

Sludge on Land

In the November 1981 issue of *HIGHLIGHTS*, we noted with chagrin the story, "Cornell Study Says Sludge Too Toxic for Land Use." This story obviously was taken from an August 8, 1981, news release entitled, "Cornell Studies Show Sludge Too Toxic for Land Use." This news release and the position represents the personal opinion of Donald J. Lisk, professor of vegetable crops at Cornell University. Cornell has no policy on recommended sludge disposal practices and has never recommended incineration as the safest method of sludge disposal.

We are concerned with the news release because we do not share the opinion expressed and feel that the position is largely unjustified. In general, we agree with the position formally established by the U.S. Department of Agriculture, the U.S. Food and Drug Administration, and the U.S. Environmental Protection Agency that it is safe to use certain sludges in agriculture. We further feel that the land application of sludges can represent the most cost-effective means available for controlling this kind of pollution in many locations. We feel that the growing base of scientific information supports the controlled use of land as a sludge management alternative.

The costs of incineration, both in capital investment and energy, are unacceptable for many communities, particularly smaller communities. We hope that our colleagues will continue to consider land application as a viable alternative for the utilization and disposal of sludge.

William J. Jewell
Lewis M. Naylor
Raymond C. Loehr
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Cornell University
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Page 9

SLANTS & TRENDS

* * *

GROUP OF CORNELL UNIVERSITY RESEARCHERS, in a letter to *SLUDGE* last week, joined the growing list of vocal opponents to the controversial views of Cornell toxicologist Donald Lisk, who claims that sludges of all types are for the most part too toxic for any form of land application (*SLUDGE*, Oct. 28, 1981, p. 169). "We are concerned," wrote William Jewell, Lewis Naylor, Raymond Loehr and Richard Dick, "because we do not share the opinion expressed (by Lisk) and feel that the position is largely unjustified... Cornell University has no policy on recommended sludge disposal practices and has never recommended incineration as the safest method of sludge disposal." The four researchers agree, in general, with the position established in the policy and guidance package addressing application of sludge to cropland developed by EPA, Department of Agriculture and the Food and Drug Administration (*SLUDGE*, Jan. 22, 1981, p. 10). "We further feel," they wrote, "that the land application of sludges can represent the most cost-effective means available for controlling this kind of pollution in many locations. We feel that the growing base of specific information supports the controlled use of land application of sludge as a management alternative."

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Page 8-A

EPA must stand firm on ocean-dumping deadline

Under orders of the Congress, ocean disposal of sewage sludge must end by Dec. 31, 11 years after passage of the Federal Marine Protection, Research and Sanctuaries Act. The deadline was set after scientific studies proved that years of dumping sludge had contaminated surrounding ocean water, seabed and aquatic life with toxic pollutants such as oil, metals, PCBs and other substances. The long-range effects of that are not entirely known, but are perilous.

Philadelphia, New York, Camden and several northern New Jersey municipalities that barged their sewage sludge to sea fought the deadlines imposed by the U.S. Environmental Protection Agency. After granting the cities additional time to find suitable land-based sludge disposal methods, the EPA adopted a get-tough policy to force the cities to halt ocean-dumping. In April 1977, the EPA fined Philadelphia \$225,000 and set a strict timetable for alternative sludge disposal.

Despite Philadelphia's opposition to the EPA's actions, the city ended ocean-dumping a year before the 1981 deadline and, in fact, has put the sludge to beneficial uses on land, including reclamation of barren strip-mined land, and soil supplements in the city and on home lawns and gardens. Camden halted its ocean-dumping in 1978 and now uses its sludge for composting material.

The city of New York and the northern New Jersey municipalities still are dumping their sludge in the ocean. The EPA currently is reviewing its deadline for New York to halt that disposal practice, following a lawsuit brought by the city which still is pending in the courts. That leaves the six municipalities, which have asked the federal court in Newark to invalidate portions of the EPA's ocean-dumping rules in order that they can continue ocean disposal.

One of the most noteworthy aspects

of the lawsuit is the apparent shift in thinking on the part of the EPA under the Reagan administration. EPA officials have expressed a willingness to allow New York and the New Jersey communities to continue dumping if they barge the sludge further offshore. The waste materials are now dumped 12 miles out in the New York Bight, a shallow body of water off northern New Jersey that is considered to be the most degraded coastal area in the country.

The National Wildlife Federation and its affiliate, the New Jersey State Federation of Sportsmen's Clubs, have gone to court to defend the federal ocean-dumping regulations as applied to the New Jersey communities. According to a lawyer for the wildlife organization, "if we hadn't gotten involved in this lawsuit, there would be no one arguing on behalf of the oceans."

The New Jersey municipalities claim the alternatives to ocean disposal of sludge are unsatisfactory — an argument raised in the past by Philadelphia and Camden. That argument proved fallacious in the 1970s, even when technology was not as far along as it is today. The experience of Philadelphia and Camden, plus the technical advances in the intervening years, render it even more meaningless.

EPA's lack of enthusiasm for enforcing the Marine Protection, Research and Sanctuaries Act is a cause of alarm. Scientific research in the past decade has indicated that perhaps the threat of ocean dumping of toxic materials, including sewage sludge, may not pose as serious an immediate threat to the world's environment as was feared when the act was passed. But even the most optimistic scientist cannot predict what the long-term effects will be. There are proven methods of disposing of the materials on land. Ocean dumping of sludge must be halted.

Mr. D'AMOURS. My time has expired. Mr. Forsythe?

Mr. FORSYTHE. Thank you, Mr. Chairman.

Thank you, Ken, for your testimony.

This is a question actually which John Breaux, who could not be here, wanted to ask you. This morning Mayor Koch disputed that portion of your testimony which he had apparently read regarding the availability of 295 barren areas comprising 54,000 acres within 100 miles of the Statue of Liberty which might be suitable for the disposal of New York Harbor dredged material. Mr. Kamlet, do you stand by the figures in your testimony or do you have any comments on what Mr. Koch said?

Mr. KAMLET. Yes to both. The figures that I was citing were figures that were generated by contractors to the New York District of the Corps of Engineers, the Mitre Corp., I believe, specifically. These are sites that they have identified in a series of two reports that they prepared for the Corps. Of the 200-some-odd sites that they evaluated, they subsequently looked at 11 of them in detail. Of the 11, they were only able to reject 1 of the 11 as probably inappropriate for dredge material disposal.

Yes, I stand by those numbers. I think they are accurate. It is noteworthy that the Commissioner of the New York City Department of Ports and Terminals stated that, as far as she was concerned, there was no difference in terms of sites that were suitable for dredged material disposal and sites that could accommodate sewage sludge. Therefore, I gather from that that these sites might be available for sewage sludge application as well.

Mr. FORSYTHE. I think I may disagree with your last statement regarding finding sites available for sewage application. Maybe they are there. Maybe they might be suitable under certain circumstances. However, as I understand it, finding a place on land for the disposal of sewage sludge is getting to be very, very difficult. Some local ordinances and local pressures bring about all kinds of problems which are very difficult to overcome. Then when it comes to a very sensitive aquifer, I have even greater problems. You heard me talk about that this morning.

Mr. KAMLET. Yes, sir. I might say, Mr. Forsythe, that in none of these sites are the groundwater conditions such that that would be a problem. That was one of the screening criteria utilized in identifying these sites, so that none of these areas that I alluded to would be ones with a high water table close to the surface.

Mr. FORSYTHE. First, we will have some additional questions which we would like to have you answer for the record instead of trying to get them all in this afternoon.

Do you favor balancing human health and environmental impacts of ocean dumping against the human health and environmental impacts of land-based disposal methods as currently required under the Ocean Dumping Act and under the Sofaer decision?

Mr. KAMLET. As I have indicated, Mr. Forsythe, I think there are a lot of problems with the Sofaer decision, not the least of which was the fact that the decision did not reflect at all the considerable relevance of the London Dumping Convention's requirements on the regulatory situation. Under the London Dumping Convention, not only is EPA, the United States as a government, not required

to balance harms to land against those to the ocean, but it is not permitted to do so in that strict, formal sense.

Nevertheless, I think the draft amendments that we have before us do strike a reasonable balance between the approach in the Sofaer decision and the approach in EPA's current regulations in mandating consideration of the availability of prudent and feasible alternatives. It makes it marginally more difficult to utilize the ocean for waste disposal than under a simple balancing kind of approach, but I think that sort of approach is called for and is appropriate in the case of the ocean because, unlike the land, it lacks the protections of private property and marketplace mechanisms.

Mr. FORSYTHE. In your comments on the draft amendments to title II you indicate that NOAA may not be the appropriate agency to conduct some of the already newly assigned tasks. What agency would be better suited to do this work?

Mr. KAMLET. I am not sure any agency within the current administration would be particularly well suited to it, but I suppose it does fall most directly in EPA's purview of the array of existing Federal agencies.

Mr. FORSYTHE. Later testimony will be given concerning the problem associated with finding and using land alternatives due to strong public pressures. Do you have any comments as to how municipalities can deal with this problem?

Mr. KAMLET. The problem of public opposition to siting waste disposal facilities in their backyard is a very serious problem. We recognize that it is a problem.

On the other hand, we believe that responsible governmental officials really need to make their decisions about selection of waste disposal sites on the basis of the overall environmental and public health merits. I think a lot of the problem arose because of situations such as Love Canal which have given land disposal a bad name.

The answer to the problem is to deal with the public in a more forthright, open way from the very outset; attempt to bring community leaders into the process from the earliest planning stages; and do everything possible to resolve legitimate concerns that are expressed. If after a full and open public review process it appears that a proposed site still makes the most sense from an environmental and public health protection standpoint, then I think it is the responsibility of the officials involved to adopt use of the site. There inevitably is going to be resistance to sites located in people's neighborhoods, but the alternative is to go to the ocean in every instance because that happens not to be anyone's backyard.

Mr. FORSYTHE. Thank you. My time has expired.

Mr. D'AMOURS. Mr. Hughes, do you have any questions?

Mr. HUGHES. Yes. Thank you, Mr. Chairman.

Thank you, Mr. Kamlet.

I have some concern over the bottom line, which is of course support of the draft recommendations for structural changes in the law. I am curious because you echo my sentiments at the bottom of page 14 when you say, "In short, not much has changed with respect to dumpsite designation since the advent of the ocean dumping law, except that EPA is now operating in violation of an act of Congress, an international treaty, a court order, and its own regu-

lations." I suppose you could have added "acts of God," and that would probably just cover the waterfront.

What makes you think that if we change the law that we are going to get an executive agency in this administration to carry out the new law? I thought that the December 31, 1981 deadline was pretty clear cut. I did not think it was ambiguous. Yet, we find it was very severely undercut. How do you deal with an administration that will not carry out the law?

Mr. KAMLET. I think I can respond to that. The statement that I made in the testimony referred specifically to the problem of designation of ocean dumpsites. It seemed to me that there, rather than simply specifying a deadline which, if passed, would simply have to be extended or would be extended de facto, if you instead said that the availability of these sites for continued use for ocean dumping would automatically expire as of a certain date if these sites were not previously studied, I think that would have a rather different effect.

One effect it would have would be to cause those in whose self-interest continued availability of those sites was—you would have them clamoring to EPA and the other agencies involved to get on with studying those sites so that use of those sites would not be closed off to them at the expiration of the specified deadline. It would be a self-executing deadline rather than the sort that we have had in the law in the past. That is the critical difference. That is the only sort of approach that has a chance of working.

Mr. HUGHES. It seems to me that there would be ways to circumvent that. The basic problem that this committee has is that we have different philosophies and different approaches in dealing with this issue. You can talk about the Sofaer decision and the EPA's refusal to appeal the decision, but the fact of the matter is that the administration does not want to carry out the intent of the law. The law was rather clear in what was intended. We took EPA's criteria and we tried to put it in concrete. We tried to phase out what EPA had established back in 1977 as harmful ocean dumping. EPA is going to have the wherewithal even with the changes that are proposed, which you embrace, to be able to circumvent that as a matter of policy.

Mr. KAMLET. Certainly there is no absolutely foolproof way to prevent an intransigent agency from continuing to be intransigent.

Mr. HUGHES. Except perhaps to challenge them in the courts.

Mr. KAMLET. Even that is a matter of leading a horse to water and not being able to make him drink. There are very few instances of Federal judges holding agency administrators in contempt of court and throwing them in jail. That certainly is an option. We are seriously considering and most likely will pursue contempt of court proceedings against the EPA administrator with respect to their blatant disregard of the settlement agreement in our site designation lawsuit. Maybe that will do some good.

It seems to us that we are bound to pursue every option—administrative, judicial, and legislative—to try to bring this problem under control. I think the legislative option is certainly at least as important as each of the others. The thrust and intent of the draft amendments is very commendable and we support it.

Mr. HUGHES. I think it is important to challenge the EPA legislatively and otherwise, but I am not going to fool myself into believing that because we embarrass administration officials here before this committee that that is going to be sufficient pressure, nor do I believe that if the EPA will not be responsive to us with regard to one law that they would not do the same thing with any law that we would enact. I do believe, however, that as a general rule, attorneys in the Justice Department do not like to be reversed and reprimanded. That, to me, appears to be the most viable of all the alternatives we have. I am not saying that we should not approach it from every angle we can and try to address it legislatively, but I think we are kidding ourselves if we think the administration would not find ways to circumvent the policies that we have established under new law.

Mr. KAMLET. There is a higher authority than—

Mr. HUGHES. Yes, but it is going to be a number of years before they reach that higher authority.

Mr. KAMLET. There is a higher authority than the administration, the Congress, or any other established part of the system, and that is the people of this country. I am seeing increasing evidence that the public is starting to reach the point that they are not willing to tolerate any more the environmental abuses that are being perpetuated by this administration.

We have incident after incident in the New York Bight of people in private vessels seeking to interfere with dumping operations. We do not condone that type of activity, but the fact is it is going on. It is going on not only on the part of environmental groups, but on the part of fishermen, fishing interests. In connection with proposals to test dump dredged materials in borras pits in New York Harbor, we are aware—and these incidents were publicized, I believe—of fishing vessels accompanying the Corps of Engineers vessels and the NOAA research vessels out to the site of that disposal to doublecheck what was going on there and to express their concern with that dumping operation. That is happening more and more.

I think the weight of public sentiment and reaction against abuse of the ocean is going to continue to mount. Maybe that is a message the administration will hear even if they do not listen to what this committee does or what past Congresses have done and do not take court orders terribly seriously. That is the sort of voice that none of us can ignore.

Mr. HUGHES. That is true. I share your hope. They say where there is life there is hope eternal.

Let me ask you this: What is the status of any other matters arising out of ocean dumping that might be before the courts of appeal in the country? There was a decision of the Federal District Court of New Jersey that I believe is up on appeal.

Mr. KAMLET. I think you may be referring to the lawsuits by six New Jersey municipalities against EPA raising many of the same issues that were addressed and decided in the *New York City* case.

Those cases, to my knowledge, have not yet been decided at the district court level, although the judge recently has ordered a status hearing to take place on those six lawsuits for a date in May. I do not recall the precise date. However, the indications are

that the judge has begun to lose patience with the pace of negotiations in those lawsuits. I have a feeling that things are going to crystalize in those cases and reach a resolution very shortly.

Mr. HUGHES. Is the National Wildlife Federation a party to those suits?

Mr. KAMLET. We have filed friend-of-the-court briefs in each of those cases. We are currently preparing papers in support of a formal motion to intervene in those lawsuits.

Mr. HUGHES. What is your understanding of the status of any new regulations developed by the EPA that promulgated pursuant to the *Sofaer* decision which might be challengeable?

Mr. KAMLET. I believe the latest draft of those regulations came out in early February. The original timetable for issuing proposed revised regulations in the Federal Register was early April, but the indications I have are that that date has slipped somewhat. It may not be until late spring or even summer before proposed revisions find their way into the Federal Register. However, those are actively going on. They contain a number of provisions that would significantly relax many of the more significant ocean protections that are contained in the existing ocean dumping regulations.

Mr. HUGHES. Thank you.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Mr. Evans, do you have any questions?

Mr. EVANS. Thank you, Mr. Chairman.

Mr. Kamlet, thank you for being here. I am sorry I was on the floor speaking on a bill and could not be here for your testimony.

This morning, as you know, we heard from Mayor Ed Koch of New York City, who might have a different perspective now that he is running for Governor. He said in his original testimony that sewage sludge contributes only a small percentage of the contaminant load in the New York Bight. I asked what contribution sewage sludge made to the individual pollutants such as PCB's, for example. I just wonder if you might comment on that same question.

Mr. KAMLET. I would be delighted to comment on it. I believe the response by the New York City Environmental Commissioner to your question was that we do not know. There are numbers that have been suggested for the loadings of PCB's and other contaminants by sewage sludge in relation to other sources. Those numbers indicate that sewage sludge contributes on the order of 30 percent of the PCB's that enter the bight. In the case of mercury, about 50 percent of the material that enters the bight is attributable to sludge. Therefore, while it may be true that in terms of the wide array of contaminants that are introduced only 7 to 10 percent may be associated with the sludge, there clearly are certain specific contaminants such as PCB's and mercury which are contributed by sludge in very significant quantities.

Mr. EVANS. Thank you, Mr. Kamlet.

Second, Mayor Koch implied that, even with all the pollutants going into the New York Bight, there is really little impact on fish and other marine organisms. I would just like to have your comment on the same question.

Mr. KAMLET. Of course; it is hard to directly pin the impacts to sewage sludge as opposed to other sources of contamination of the

bight, but it certainly is true—and NOAA has acknowledged as much—that the New York Bight, and particularly the New York Bight apex, is one of the most severely degraded coastal environments in the entire world.

The sorts of things that are quite common in the bight apex are fin rot, gill erosion, skin tumors, parasitic infestation of the gills of fish that are present in the bight, Chromosome breakage, damaged embryonic development, has been observed in mackerel embryos in the vicinity of dumpsites within the bight apex.

Measurements that have been made of levels of uptake not only of PCB's and heavy metals, but also of carcinogenic polynuclear aromatic hydrocarbons [PAH] have found significant, and to me very disturbing, concentrations of PCB's and PAH's in just about every fish and shellfish tissue sampled within the bight apex. I, for one, would have great qualms about eating seafood that came anywhere from that area.

Mr. EVANS. That was one of the reasons for the law that we established here in 1977 and reconfirmed again in 1980. However, the Administrator of the Environmental Protection Agency questioned our intent. I think she was wrong. Being one of the authors, I should know what we meant. The record clearly indicated that we meant that there would be a specific deadline.

We hear over and over again, Mr. Kamlet, that it is more dangerous to keep sewage sludge on land than it is to dump it in the ocean. I am not a scientist; I am a generalist. However, it seems to me that it is a lot easier to contain toxic substances on land than it would be to have them out there in the ocean in the currents and subject to the vagaries of Mother Nature. Could you give me your comment?

Mr. KAMLET. I would be happy to do so. You are a very perceptive generalist, I might suggest. I think that is right. As Captain Cousteau indicated, the thing that one wants to guard against, whether you are talking about waste disposal on land or in the ocean, is to prevent contamination of the water. If you dispose of material in the ocean, you know that it is inevitable that you are going to contaminate the water because that is where you are purposely putting the material.

On land, on the other hand, there are management techniques that are available to prevent the ground water or surrounding surface waters from being contaminated in the first place. Even if you err and problems do arise, the opportunity to intervene and correct those problems is far greater on land than it is in the ocean.

Mr. EVANS. Once you have dumped in the ocean, it seems to me that what you have done is irretrievable, irreparable, or certainly could be. Captain Cousteau was with us this morning and was talking about the checks that we are writing now that we are drafting on someone else's account, a future generation. I believe we must preserve some of the things that we have on this Earth for future generations.

How do you feel about New York State helping New York City find an onland disposal site? Do you know?

Mr. KAMLET. I just do not know.

Mr. EVANS. I asked at the end of the hearing of Mayor Koch that same question, and he is going to respond in writing to that question.

Mr. KAMLET. I do know that the State of New York does contribute some share of sewage treatment construction grant funds to New York City, on the order of 12 or 12.5 percent, as I recall. Some of that construction grants money, of course, can be used to fund alternatives for managing sewage sludge. However, beyond that, I am not aware of specific involvement on the part of New York State.

Mr. EVANS. Mr. Kamlet, thank you very much for being here this afternoon.

Mr. KAMLET. I appreciate the opportunity.

Mr. EVANS. Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you.

Just 1 minute, Ken. I have one more question.

Fred Harper of the Conference of Coastal Agencies is going to be testifying in a little bit. He says in his testimony that there is a consensus within the scientific community that the environmental problems encountered in ocean disposal are no more significant than those encountered in utilization of sludge on land, and often considerably less.

He also says that the marine scientific community generally agrees that while cadmium is a potentially severe problem in land-based disposal methods such as incineration or spreading, it is considerably less a problem in the oceans because of the ocean's ability to lock up cadmium permanently in ocean sediments.

What are your reactions to that testimony?

Mr. KAMLET. Let me react first with a general observation and then a bit more specifically. The general observation I would make is that it seems to me, and I think as an abstract matter most scientists would agree with this proposition, that where you are dealing with persistent toxic contaminants the disposal approach or the management approach that makes the most sense is isolation and containment to the maximum extent possible. On the other hand, where you are dealing with a readily biodegradable or innocuous material, it makes sense to try to disperse the material and facilitate biodegradation of that material. Cadmium and other heavy metals are persistent toxic materials. They are elemental forms of matter. You cannot break them down to any lesser unit.

On that basis, a waste management strategy that emphasizes containment makes a great deal more sense than one that promotes dispersal. As between the ocean and the land, the ocean is the quintessential dispersal medium whereas the land, imperfect though it may sometimes be, is the best containment medium that we have. Obviously one needs to be cautious in connection with this, but my money is on the land in terms of the ability to safely contain the contaminants associated with sewage sludge.

Mr. D'AMOURS. The testimony I cited, though, refers to a consensus within the scientific community. Are you aware of any such consensus?

Mr. KAMLET. I am certainly not aware of any consensus to the effect that impacts on the ocean are less in connection with cadmium or anything else than they are on the land. To the contrary,

you have organisms in the marine environment like shellfish that are noteworthy in terms of being able to bioaccumulate heavy metals and other contaminants from minute concentrations in the surrounding water to levels hundreds of thousandsfold, and sometimes millionsfold, beyond their levels in the surrounding environment. There is the potential for food chain magnification on land, but I don't think there are any bioaccumulators that exist in the land environment that can match that capability on the part of shellfish.

Mr. D'AMOURS. Thank you, Ken.

Are there any further questions?

[No response.]

We appreciate your testimony. You have performed a real service for this subcommittee. We thank you for it and look forward to hearing from you again and often.

Mr. KAMLET. Thank you very much.

Mr. D'AMOURS. The next witness is Michael Garabedian who is assistant national conservation representative of the Sierra Club of New York.

Mr. Garabedian, you may proceed whenever you are ready.

STATEMENT OF MICHAEL GARABEDIAN, ASSISTANT NATIONAL CONSERVATION REPRESENTATIVE, SIERRA CLUB

Mr. GARABEDIAN. Thank you, Mr. Chairman.

I am Michael Garabedian, the assistant national conservation representative of the national organization of the Sierra Club located in New York. On behalf of the 280,000 members of our organization, I wish to thank you for providing us with this opportunity to testify.

We want to thank the two subcommittees that have called today's hearings for their diligent efforts over the years to put an end to harmful ocean dumping and to get the facts on the record. Without your work, we would be in a much worst predicament nationwide than we are today.

My testimony today will discuss our nationwide goals for ocean dumping legislation. But, first, because of today's testimony by Mayor Koch, and because our office represents the Sierra Club in New York, I feel it necessary for comment on the New York City situation.

Future generations will look at the sludge dumping actions of the city of New York with the same distaste and disdain with which we today regard the sanitary habits of towns of medieval Europe in which people threw their personal and household refuse into the street in front of their homes. This disdain will be enhanced by the knowledge that sludge is today a useful and therefore wasted resource.

But, New York's actions are worse than those towns that merely despoiled their own doorsteps. New York's continued dumping despoils the marine environment for all living creatures and pollutes the waters of those people who are New York's neighbors.

How can pride in the city survive knowledge that off the shores of New York we have created a 28.5 mile-long contaminated area of fecal coliform bacteria smelling of hydrogen sulfide gas? And

that the city is one of the major PCB dispersers? And that when heavy rains come, New York's sewage is washed raw into the water? And when New York staunchly defends its isolated position as an ocean dumper of sludge—about 40 percent of the Nation's sludge is deposited in landfills, 20 percent is applied to agricultural lands, 25 percent is incinerated, and only 15 percent is discharged into the oceans from barges and pipelines?

The judiciary has now joined the ranks of those who, in the face of undisputed evidence of severe degradation and stress, take an ecologically and morally unacceptable stand in favor of dumping sludge into the bight apex. Judge Abraham Sofaer has apparently written off the degraded areas of the bight. He refers to it as "an area so polluted that discernible [sic] improvement in conditions might not be achieved for many years to come" and "an area of ocean that appears to be beyond immediate reclamation."

When we seriously degrade a land area, we seek to stop our activities that have created the problem. We try to reclaim it and we act with alarm. But we act irrationally and illogically when we find we have injured this area of ocean. Too many people have a ho-hum attitude. This is particularly true in the case of the foot-dragging, recalcitrant officials of New York City. The city's practices result in delay, distortion of facts, and the continued ocean dumping of sludge, thereby seriously damaging plants and animals of the Bight and putting toxins such as PCB's into the food chain.

I want to depart from my prepared testimony to point out that the testimony we heard this morning of the mayor and from the city indicates that the thrust they are contemplating at this time, the thrust of their action, is to assess, to monitor and survey the results of ocean dumping. I am concerned about the kind of results we will get from this sort of survey.

Within the same written statement submitted by the city today it says that the composting merely stabilizes the sludge. It refers to its reducing the volume of sludge and making it more aesthetically acceptable. They left out one key fact: Composting eliminates pathogens.

Now I will go back to my prepared statement.

With regard to the national implication of the bill, the bill that has been drafted by the committee is excellent in its scope and intent. We agree that all sludge dumping into the bight must be stopped immediately. It is incorrect for the city to say, in the face of a mass of scientific data, that no significant impact will be caused by continued dumping at the existing site. It is undisputed that the ocean disposal of sewage sludge has severe, adverse environmental impacts on the New York Bight.

Attempts to hide this fact by stating that sludge dumping is but part of the cause of this effect misses the point—the effect is due to the cumulative impact of pollution in the bight including sludge. These impacts pose a danger to human health, welfare, the marine environment, ecological systems, and economic potentialities. They include depression of oxygen available to the benthic community, microbial pollution at dumpsites, and introduction of toxic chemicals into both ecological systems and the food chain.

And, arguments that sewage sludge is less significant a factor than waste water discharges and raw sewage are not relevant to

the issue at hand—sewage sludge is an additional, significant, and, perhaps most important, growing source of contaminants and of oxygen depression.

Testimony attesting to these facts was submitted by the Sierra Club to the subcommittees on June 4 of last year. I understand that the printed record of the 1981 hearing that contains our testimony will soon be in print, so we will not repeat it or submit it here.

A particularly poignant example of the great impact of sludge is that of PCB's. Nearly one-fourth of the PCB's entering the bight come from sewage sludge dumping. No better example exists to refute those who argue that sludge does not contribute significantly to the bight. I believe the fact that sludge contributes 50 percent of the mercury to the bight has been mentioned. The most recent source I noticed on this was NOAA's testimony to this committee last year stating these figures of 25 and 50 percent.

Elimination of the toxin's in sewage sludge will not, of itself, make ocean disposal of sludge acceptable since sludge will continue to pose the potential for depressing bight oxygen and adding microbial pollution to the bight. Thus, a comparison with land-based alternatives after industrial pretreatment does not lead us to conclude that ocean disposal will become a safe, reliable disposal method once pretreatment is in effect.

It is critical to understand that sewage sludge will be a growing problem and an increasingly important contributor to bight pollution in the years ahead if ocean disposal is not curtailed. In 1978, 5.386 million wet tons of sewage sludge were dumped into New York's Bight. The figure rose to approximately 7 million tons in 1980 and is rising still further.

As more sewage treatment plants that employ full secondary treatment are completed, the volume of sewage sludge generated will continue to increase. According to NOAA, by the year 2000 sewage treatment plants in the region will generate 52,000 tons of sewage sludge per day. If past trends continue, over 13 million wet tons of sewage sludge will be dumped in the bight by the year 2000.

Unfortunately, the bill draft does not unequivocally ban all dumping of sewage sludge into all ocean waters. It is unconscionable that we are putting any sludge into an environment where it is harmful in many cases and when we do not know its effects in others. There are no appropriate ocean sites for sludge, not the Apex, not the 106-mile site, not a 60-mile location. As reported in the EPA's Environmental Impact Statement on the Ocean Dumping of Sewage Sludge in the New York Bight, the hearing officer of the Toms River hearing in 1977 recounted the following reasons why sludge dumping at the chemical wastes site would be environmentally unacceptable:

The preponderance of informed scientific opinion urges extreme caution in dumping wastes in the deep ocean, particularly wastes containing solid materials, because of the many unknowns about this part of the environment. There is a strong feeling among marine scientists that it would be possible to start long-range trends which would be undetectable until it was too late to take corrective measures.

Specific concerns with the dumping of sewage sludge in the deep ocean are the possible persistence of pathogens for long periods of time, the accumulation of biodegradable materials which could ultimately float up undecayed to contaminate seas

and beaches, the development of anaerobic deep sea environments, and the damage to deep sea organisms which are used to extremely stable conditions.

Based on this informed scientific opinion, it is concluded that dumping of sewage sludge at the 106-mile site (the chemical wastes site) has a potential for irreversible, long-range, and therefore unreasonable degradation of the marine environment, and that the use of this site for this purpose would be contrary to the intent of the act (the MPRSA) and the Convention (the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter).

It is also unfortunate that the dumping of sludge in the ocean is of no direct use to us. However, there is a need for sludge which can be applied to the land. Our agricultural soils are losing productivity due to cropping patterns and erosion. Fertilizer prices are skyrocketing due to rising energy costs; ammonia, the chief source of nitrogen, is primarily manufactured from natural gas.

Our testimony last year documented requests by five New York State agricultural communities for New York City sludge. Strip mined, developed, and other lands where the soil has been removed also can be reclaimed using sludge. Although sludge is not a waste product by any means, we cannot accept the opposite proposition that sludge dumping is safe and acceptable, although we would not go as far as Mayor Koch did before these committees in 1979 when he suggested in response to a question that sludge was invented by God.

The city of New York has a pretreatment program that is being initiated right now; at least the study is being initiated. I am very concerned about the honorable mayor's comments this morning that they would support industrial source reduction efforts if the Federal Government mandated—and, if I am not mistaken, he said "funded" it. I am concerned because this kind of statement could very well pull the rug out from under the pretreatment program the city is attempting to initiate.

I am talking a lot about the city of New York. This is not a New York issue alone. It is a national issue. Cities, municipalities in virtually every State have successfully undertaken pretreatment programs that reduce heavy metals and other toxicants to safe levels.

The test is not, as the New York commissioner stated this morning, to eliminate heavy metals. The test is to reduce them to safe and acceptable levels.

Some examples of the kinds of studies that have been done: A study in Chicago funded by the National Science Foundation found that cadmium usually does not exceed 3 parts per million in residential sewage, and is usually 1 to 2 parts per million.

In a town in Pennsylvania which not too long ago had 1,000 parts per million of cadmium, it is now down to less than 15 parts per million. Philadelphia is perhaps an excellent example. In the early 1970's they had 200 parts per million of cadmium. By 1975, it was 105 parts per million. They cut it in half, and today it is less than 25 parts per million. That was at their northeast plant. At their southwest plant they cut from 35 parts per million in 1975 to less than 15 parts per million.

Washington, D.C., had a cadmium content of 15 to 20 parts per million, which is now reduced to 8 to 10 parts per million.

Regarding New York City there has been discussion of the different plants. One sewage treatment plant has an output in its sludge

of about 7 parts per million. Another is 200 parts per million. In answer to a question this morning, the commissioner—

Mr. D'AMOURS. Excuse me, Mr. Garabedian. I have to interrupt you at this point.

Inasmuch as you are no longer following your statement, I do not know how much more you have to go. However, we have a very serious problem which just arose. A series of 5-minute votes is being ordered. There are eight 5-minute votes which the members now have to go and make. That will take about 1 hour.

This, of course, is addressed most particularly to Mr. Harper, who came all the way across the country to testify today. I suppose there are two alternatives. I can come back, and I hope the other committee members can, at about 4:45 to complete your testimony, to question you, and to listen to Mr. Harper and ask direct questions of him, if you want to do that.

The only other possible alternative I can imagine, would be to come in and testify on Friday, when there will be other testimony taken on the same subject and where we could pick up exactly where we are now. You would be put on first, in front of the witnesses who are scheduled to go on at 10 o'clock Friday morning.

I am perfectly happy to come back here at 4:45. It is your convenience that I am concerned for at the moment, the convenience of both you, Mr. Garabedian, and Mr. Harper.

Would you want to make a quick decision on that?

Mr. GARABEDIAN. Would you like me to confer with Mr. Harper? Is that the suggestion?

Mr. D'AMOURS. All you have to do is tell me whether you want to come back at 4:45, or whether you want to come in and lead off Friday morning.

Mr. GARABEDIAN. Mr. Chairman, either sounds acceptable—to answer questions at 5 or to come back Friday. I can finish my statement in about 3 minutes.

Mr. D'AMOURS. There is not even time for that. We have to be going within a very few minutes.

Mr. Harper?

Mr. HARPER. I would like to finish it today, sir.

Mr. D'AMOURS. The subcommittee stands in recess. We will be back here, hopefully, at 4:45, maybe a bit later, depending on how much time is wasted between votes.

[Recess taken.]

Mr. D'AMOURS. Mr. Garabedian, thank you for your patience. Unfortunately Mr. Harper could not stay. That might have allowed us to change the scene and avoid this. I do thank you for staying. We will hear from him next Friday.

Mr. GARABEDIAN. Thank you, Mr. Chairman.

Mr. D'AMOURS. I believe you had some of your testimony yet to deliver.

Mr. GARABEDIAN. That is correct.

Mr. D'AMOURS. OK. Why don't you conclude, please?

Mr. GARABEDIAN. Thank you.

To sum up our message about sewage sludge dumping, the best way I can do it is to give our conclusion. That is that when a municipality, or other agency handling sewage sludge wants to clean

up by pretreatment, they can and it works. There are examples of it across the country.

Regarding dredge spoil disposal, we support the provisions of the current law requiring analysis of the dredge material before dumping and that prohibit dumping unless it is shown through bioassay and bioaccumulation testing that the spoils are safe for ocean disposal. Substances that do not pass the tests should not be dumped into the ocean.

The Sierra Club will be submitting for the record a list of the uses (see letter on p. 351) to which we believe a dumping fee should be put. As I read the draft bill, it suggests a dumping fee that would be oriented mainly toward paying the cost of the specific dumping operation.

The suggestions we will submit have to do with expanding the purposes beyond the particular dumping operation to include such things as EPA research into new processes for reducing toxic contamination, including the development of new less polluting processes; research into methods of municipal pretreatment and tertiary treatment; cleanup projects such as PCB dredging; assistance to industry for pretreatment and source reduction; planning funds for establishing land application programs; and land application sitings, including money for land through purchase or condemnation; and packages of mitigation measures.

Regarding radioactive wastes, those dumpsites already located must be carefully evaluated before any further dumping is allowed. We support the moratorium, though it should be total and indefinite, excepting only dumping of wastes for limited research purposes that are determined to be safe and proper by an independent group, such as the National Academy of Sciences. The moratorium should only be lifted when conditions specified by Congress are met.

For instance, it is clear that we have no practical basis of knowledge to conclude that radioactive waste dumping is safe. Careful scientific studies at the Atlantic disposal site and past U.S. dumping sites might possibly yield criteria on which dumping could be based and specified by Congress. Of course, the reductions in NOAA's budget are particularly inappropriate at this time, both regarding radioactive waste and any other kind of dumping. In short, we feel that nothing short of a clear congressional statement will stop this dumping.

Thank you, Mr. Chairman.

[Material follows:]

Aptil 29, 1982



Sierra Club

NEIL B. GOLDSTEIN
National Conservation
Representative

The Honorable Norman E. D'Amours
Committee Chairman on Subcommittee on Oceanography
U. S. House of Representatives
Washington, D.C. 20515

Dear Chairman D'Amours:

Regarding your inquiry about the costs of pretreatment programs made to me at the March 23, 1982 hearing of the Subcommittees (page 177, line 4338), I am enclosing (1) a copy of a portion of the pretreatment regulation regulatory assessment report (pages 4-16 to 4-24) which is addressed to overall costs. I have been told that the appendix to this report may contain detailed case study costs; (2) copies of a portion of the Pretreatment Resource Reader by the Association of Metropolitan Sewerage Agencies, pages 96 to 110, on capitol and administrative costs which contains specific cost estimates and user charge options, even though it concludes by assuming that the municipalities will have to assume all administrative costs; and (3) part of the East Bay Municipal Utility District analysis relating to setting equitable pretreatment charges.

Our suggestions for dump site specific and ocean territory area costs which should be covered by assessed dumping fees are as follows (see page 174, line 4253 of the transcript):

- analytic procedures by the Army Corps and the EPA including bioassay and bioaccumulation testing
- ocean research and monitoring
- EPA research into new processes for reducing toxic contamination, including development of new, less polluting processes
- research into methods of municipal pretreatment and tertiary treatment
- clean up projects such as PCB dredging
- assistance to industry for pretreatment and source reduction
- planning funds for establishing land application programs
- land application siting, including money for land through purchase or condemnation and amenities packages of mitigation measures
- regional and dumpsite management programs.

Sincerely,

Michael Garabedian

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NATIONAL HEADQUARTERS
San Francisco, California

ASSESSMENT OF THE IMPACTS
OF INDUSTRIAL DISCHARGES
ON PUBLICLY OWNED TREATMENT WORKS

FINAL REPORT

November 20, 1981

This document has been prepared pursuant to
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U.S. Environmental Protection Agency
Office of Water Enforcement
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Washington, D.C.

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4.4 ENVIRONMENTAL EFFECTS OF THE OPTIONS

This section describes the environmental effects of the options. As discussed in Chapter 2, the results for the 2000 POTWs are currently based on modeling the impacts of the options on 1839 POTWs. The remaining 161 POTWs were not included because all of the available information showed that they either had no industrial contribution or that they discharged into other POTWs. Thus, the results for the 1839 POTWs should reasonably represent the total impacts.

This section focuses on the impact of the options on the pass-through of pollutants and the resulting effects on water quality as measured by exceedances.

4.4.1 Bypasses, Interference and Upsets

The impact of the options on reducing the number or severity of bypasses and upsets has not been quantified in the model. Chapter 3 provided a detailed discussion of the prevalence of these problems and their significance. All of the options, except for guidance, ensures that these problems are dealt with because they all include the basic 403 program.

4.4.2 Removal of Pollutants

The environmental effects that have been quantified include: pounds of toxic organics and toxic metals removed, percent reduction of toxic pollutants in POTW effluent, and the percent reduction of toxic contaminants in effluent sludge. These estimates are shown in Table 4-2. Available in Chapter 3 are additional data on incremental consumption of water quality criteria and a comparison of BAT removals with POTW efficiencies.

TABLE 4-2

IMPACT OF THE OPTIONS ON ENVIRONMENTAL RESIDUALS

| OPTION | POTWs AFFECTED | ANNUAL TONS REMOVED | | PERCENT IMPROVEMENT IN POTW EFFLUENT | | PERCENT IMPROVEMENT IN POTW SLUDGE |
|---|-------------------|---------------------|---------------|--|------------|---|
| | | ORGANICS | METALS | ORGANICS | METALS | |
| 1.a Existing Program | 1839 | 36,435 | 25,820 | 70% | 63% | 56% |
| 1.b. 1.a. with waiver | 846} | 16,760 | 11,877 | < 70% | < 63% | <56 |
| 2.a Existing Program, Reduced Scope | 1839 | 3934 x 1,810 | 18,733 | 20% | 46 | 28 |
| 2.b. 2.a. with waiver | 846} | x | 8,617 | 0 <20% | <46 | <28 |
| 3.a. Tech-Based Limits for POTW | 1839 | 36,435 | 25,820 | 70 | 63 | 56 |
| 3.b. 3.a. with waiver | 846} | 16,760 | 11,877 | <70 | <63 | <56 |
| 4. Water Quality Limits for POTW | 846} | 16,760 N/A | 11,877 N/A | <70 N/A | <63 N/A | <56 N/A |
| 5. Local Program for Documented Problems | 846}} | <16,760 | <11,877 | <70 | <63 | <56 |
| 6. Guidance Only | 1839 | 0-36,435 | 0-25,820 | 0-70 | 0-63 | 0-56 |

N/A Not Available

} Assuming no ambient concentration of toxic pollutants.

}} Only includes those options that have water quality problems.
Does not include those POTWs that have upset or bypass problems, but no chronic water problem.

The numbers of POTWs affected strongly influences the volumes of pollutants removed and the total cost of treatment. Where the application of the option does not depend on water quality conditions, then all 1839 of the POTWs are affected. If requirements only apply where there are water quality problems, then the number of POTWs affected is reduced to the model estimate of 846. These estimates are based on the numbers of exceedances as discussed in more detail in Chapter 3 and later in this section.

All of the uniform national programs have the largest impacts on reducing the volume of pollutants discharged into waterbodies. This is primarily because the requirements apply to more POTWs than do the other options. Option 2 (categorical pretreatment standards for metal finishers only) has a relatively significant impact on the reduction of toxic metal discharges as well as an reducing toxic organic discharges. The uniform, national programs also significantly improve (on a percentage basis) the quality of the POTW effluent discharge and the quality of the sludge.

While the options significantly affect the volume of the pass-through of toxic pollutants, the importance of these reductions depends on the resulting impacts to water quality. In the following subsection, the immediate impacts to water quality have been analyzed using exceedances as an indicator. However, there can be important water quality impacts even where there are no immediate exceedances because the reduction in pollutant discharge can lower ambient pollutant levels, facilitating the attainment of water quality objectives downstream. In addition, exceedances are thresholds, and (as discussed later in this chapter) there can be benefits associated with reducing pollution even where there are no exceedances or where exceedances persist in spite of controls.

4.4.3 Effectiveness In Reducing Water Quality Violations

As discussed in Chapter 2, an exceedance is a rough indicator of the possibility that there may be a water quality violation for a pollutant. The

baseline analysis indicates that there could be 846 POTWs currently that have at least one exceedance. The estimate of 846 is low because it does not take into account ambient levels of toxics in the receiving water or the contribution to water quality degradation due to upsets or bypass at the POTW. In addition, the normalizing assumptions used in modeling industrial discharge loadings and POTW removal efficiencies also tend to minimize the estimate of water quality exceedances.

Table 4-3 shows the reduction in the number of exceedances due to the application of each of the options. About 61 exceedances are eliminated by most of the options, except for Option 2 (the existing program with categorical standards for metal finishing only) where 50 exceedances are eliminated. It is not known how effective Option 4 (water quality-based limits for POTWs) would be. At least 61 violations would be eliminated through this option; however, there are limits to the extent that exceedances can be reduced through more stringent controls on industry because in many cases non-industrial sources are significant contributors. Since the federal back-up for Option 5 is the application of categorical pretreatment standards, it is assumed that municipalities will reduce at least 61 of the exceedances (as in Option 1).

Sensitivity analysis was performed for a broad range of factors, such as changes in ambient conditions and federal water quality criteria. Even under sensitivity analysis, the ability of the options to reduce the number of exceedances remained stable, indicating that where water quality problems exist they are generally severe.

4.5 COST, COST-EFFECTIVENESS AND BENEFITS

This section first summarizes the cost of the options to industry and to POTWs and then examines the cost-effectiveness of the options. The benefits that are obtained from eliminating exceedances are also discussed. It was not practical to include analysis of economic impacts (such as industrial plant closures) in this report because of data limitations.

TABLE 4-3

EFFECTIVENESS OF THE OPTIONS IN REDUCING EXCEEDANCES)
 (Based on a total of 1,839 POTWs)

| <u>OPTION</u> | <u>INITIAL}} EXCEEDANCES</u> | <u>EXCEEDANCES ELIMINATED</u> | <u>EXCEEDANCES REMAINING</u> |
|---|----------------------------------|-----------------------------------|----------------------------------|
| 1.a Existing Program | 846 | 61 | 785 |
| 1.b. 1.a. with waiver | 846 | 61 | 785 |
| 2.a Existing Program, Reduced Scope | 846 | 50 | 796 |
| 2.b. 2.a. with waiver | 846 | 50 | 796 |
| 3.a. Tech-Based Limits for POTW | 846 | 61 | 785 |
| 3.b. 3.a. with waiver | 846 | 61 | 785 |
| 4. Water Quality Limits for POTW | 846 | >61 | <785 |
| 5. Local Program for Documented Problems | 846 | <61 | >>785 |
| 6. <u>Guidance Only</u> | 846 | 0-846 | |

-) An exceedance is defined to be when a POTW causes at least one water quality criteria to be surpassed. POTWs causing more than one criteria to be exceeded are still counted only once.
-)) It is assumed that there is no ambient concentration of toxic pollutants. If there is an ambient concentration of toxic pollutants, then the number of initial exceedences will be higher. For example, if other sources of pollution account for 50% of the aquatic lifewater of quality criteria, then the initial exceedences would increase from 846 (46%) to 1048 (57%). See Table 3-1.
- { Assumed to be limited to the effectiveness of the federal back-up (Option 1a). However, the actual effectiveness could be as high as for Option 4 depending on the steps taken by the POTWs.

4.5.1 Cost

Table 4-4 shows the total annual compliance cost to industry as a result of each option. The industrial cost is divided into two components: the additional cost of pretreatment and the cost of disposing of the additional hazardous waste that is generated. The total cost depends significantly on the number of POTWs affected by each option. Excluding the Guidance Option, the total annual cost ranges from about 0.5 billion dollars for categorical standards for metal finishers including water quality waivers to about 1.9 billion dollars for the existing program.

The total municipal cost contains two components: the program development cost (a one-time cost) and the annual cost of operating the program. Sludge disposal costs for the POTWs are not affected by the improvement in sludge quality because municipal sludges are not now subject to federal regulations that require more costly disposal. If there were sludge criteria that resulted in more expensive disposal, then some of the options could lower the POTW cost (and possibly the net total cost for both POTWs and industry), potentially significantly affecting the relative cost-effectiveness of the options.

4.5.2 Cost-Effectiveness

Some observations about the cost-effectiveness of the options can be made based on two series of assumptions regarding the effectiveness of the options:

- First, each of the options (other than Option 6, guidance only) includes the general provisions of the 403 program that provide for addressing problems of upsets, bypass, and passthrough. If it can be assumed that each of the eight options is equally effective in implementing these provisions, then these nonquantified environmental benefits are not a factor in differentiating among the options.
- Second, the most relevant environmental difference between the options that can be measured is their effectiveness in reducing exceedances. Use of this measure involves two assumptions: 1) that the benefits of reducing

TABLE 4-4

TOTAL COST OF THE OPTIONS FOR POTWS AND INDUSTRY
(Millions of 1981 dollars)
(Based on a total of 1,839 POTWs)

| OPTION | POTW COST | | ANNUAL INDUSTRY COST | | TOTAL ANNUAL COST |
|--|-------------|--------|----------------------|--------|-------------------|
| | DEVELOPMENT | ANNUAL | PRE-TREATMENT | SLUDGE | |
| 1.a Existing Program | 35-91 | 51-101 | 1,292 | 485 | 1,829-1,878 |
| 1.b. 1.a. with waiver | 16-55 | 23-46 | 594 | 223 | 841-864* |
| 2.a Existing Program, Reduced Scope | 35-91 | 51-101 | 725 | 252 | 1,027-1,077 |
| 2.b. 2.a. with waiver | 16-55 | 23-46 | 334 | 116 | 472-495* |
| 3.a. Tech-Based Limits for POTW | 35-91 | 51-101 | <1,292 | <485 | <1,829-1,878 |
| 3.b. 3.a. with waiver | 16-55 | 23-46 | <594 | <223 | <841-864* |
| 4. Water Quality Limits for POTW | 16-55 | 23-46 | >594 | >223 | >841-864* |
| 5. Local Program for Documented Problems# | 16-55 | 23-46 | <594 | <223 | <841-864* |
| 6. Guidance Only## | 0-55 | 0-46 | 0-594 | 0-223 | 0-864* |

Assumed to be limited to the cost of the federal backup. Actually, the costs could be higher depending on the local programs.

The extent of local action in the absence of a federal backup is not known. While the range reflects a maximum cost equivalent to the existing program with waivers (1.b.), the cost could be higher depending on local action.

* Assumes no ambient toxic pollutant levels.

pollution discharges where there are no water quality problems are insignificant and 2) that the benefits of reducing pollution discharges even where there are water quality problems are insignificant unless the exceedance is eliminated.

Under these assumptions, the most cost-effective option would be the option with the lowest cost per exceedance eliminated. Thus, those options that require uniform action irrespective of local conditions (untargeted options) are likely to be less cost-effective than those options that take local conditions into account (targeted options). This conclusion is most apparent for Option 1a (the existing program) which requires about one half of the POTWs to implement categorical standards even though they have no exceedances; the result is that it costs twice as much as Option 1b (the existing program with waivers) to have the same effect on exceedances. The cost per exceedance eliminated for all of the options based on categorical standards is shown below.

COST PER EXCEEDANCE ELIMINATED FOR CATEGORICAL STANDARDS
(Millions of Dollars)

| | <u>ALL INDUSTRIES</u> | <u>METAL FINISHING ONLY</u> |
|--------------------|-----------------------|-----------------------------|
| UNTARGETED | 30 - 31 | 20.5 - 21.5 |
| TARGETED (WAIVERS) | 13.8 - 14.2 | 9.4 - 9.9 |

On this basis, Option 2a, categorical standards for metal finishing only with water quality waivers appears to be most cost-effective of the options that rely on categorical standards.

It is not possible in this report to analyze the cost-per-exceedance of the water quality-based options because it is not known how many exceedances would be eliminated or what the total cost would be. Presumably, however, the costs would be in line with the benefits because the States would always have the option of downgrading the designated stream use if the costs outweighed the benefits of attaining water quality standards.

The costs per exceedance eliminated for categorical standards may appear to be high because the costs of all of the POTWs affected have been loaded onto the smaller number of POTWs where exceedances are actually eliminated. This is illustrated in Table 4-5A which allocates the total costs for each option into three categories: cases where there are no exceedances in the first place, cases where there are exceedances but they are not eliminated and cases where exceedances are eliminated. As shown in the table, the actual mean cost per exceedance eliminated is about 5 million dollars, and the median cost is 350,000 dollars. Table 4-5B shows the effect that ambient levels of toxics can have on the elimination exceedances and on the incidence of cost across the three categories. For an ambient level of 50%, the number of initial exceedances would increase to 57% from 46% and the number of exceedances eliminated would increase to about 80 from 61. The importance of reducing POTW toxic discharges increases as the ambient levels come down to the aquatic water quality criteria.

Tables 4-5 A and B raise three important questions: 1) to what extent should costs be borne in cases where there are no immediate water quality problems, 2) to what extent should costs be borne in cases where there are immediate water quality problems, but where the problems persist in spite of control measures and 3) is it worth the cost to eliminate the exceedances at all? These questions are discussed in the following section on benefits.

4.6 LOCAL BENEFITS OF PRETREATMENT

This report monetizes some benefits of the pretreatment program. Analysis was first limited to recreation benefits, which past studies have indicated are most important. Because it was not clear how to relate degrees of recreation activity to ambient toxics levels, the analysis was next limited to cases in which all exceedances of federal water quality criteria for toxics were eliminated by control options. The basic assumption is that eliminating exceedances makes valuable recreation uses feasible. Finally, analysis was limited to a

Pretreatment Resource Reader

A Compendium of Experience and Practical
Knowledge for the Establishment of Local Programs

By
ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES



Supported by a Grant from the



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CHAPTER 5

ASSESSING ADMINISTRATIVE AND FINANCIAL NEEDS

INTRODUCTION

Pretreatment is not new for most publicly owned treatment works operators, be they major metropolitan areas or small rural villages. Most entities have had some type of ordinance, if only general prohibitions, such as pH controls, for many years. Many of these regulations arose from obvious problems such as collapsed sewers due to damage from industrial discharges, treatment plant upsets, or in a few tragic cases, the actual death of sewer workers.

In most cases, the need for minimum regulations of these types was readily apparent to both the publicly owned treatment works policy body and to most responsible users of the system. The application and extent of the present Federally mandated pretreatment requirements, however, go well beyond that which is immediately obvious, and therefore may not be readily palatable to either the POTW policy body or the local industries. In this case, we are dealing with many exotic materials in barely measurable quantities, the effect of which on the POTW and environment is not as immediately apparent as a collapsed sewer or a major wastewater plant upset.

Despite these problems, many agencies have already developed industrial source control programs, and many others are beginning to do so. Of primary concern to POTWs engaged in this process are the associated costs of the program. This chapter attempts to assist POTWs in this regard by focusing on anticipated program development and administration costs as well as on possible cost recovery methods that can be used by local agencies to pay for their programs on an ongoing basis.

LOCAL PRETREATMENT PROGRAM DEVELOPMENT COSTS

Local pretreatment program development costs will vary from POTW to POTW depending on such factors as previous efforts, facility size, and the number and type of industries tied into the municipal system. In addition, these costs will be affected by the extent to which EPA will require sampling and analysis for priority pollutants. Regardless of these cost variables, POTWs should anticipate significant capital expenditures as they develop a local pretreatment capability in accordance with legislative mandates and accompanying administrative requirements. With some limitations, however, these costs will be offset by the availability of 75% Federal construction grant funding, and POTWs are advised to review EPA's September 23, 1980, Municipal Pretreatment Program Guidance Package for detailed information regarding pretreatment grant application procedures and eligible costs for the development of an approvable municipal pretreatment program.

As a first step in assessing POTW start-up costs, POTWs should look at the overall functional responsibilities which they must meet for a pretreatment program. In a large POTW, many of these functions would be met by an entire division or department. In a small POTW, the same people might fulfill several of these responsibilities. The important factor is that each of the following responsibilities be addressed: sampling and industrial review; lab analyses, technical and engineering assistance; legal assistance; adjudication; and overall administration. Special equipment requirements fall into the areas of field sampling of industrial wastes and subsequent laboratory analyses.

Sampling and Industrial Review

While the present Federal Pretreatment Regulations are based to a large extent on self-monitoring, there appears to be movement away from extensive self-monitoring on the part of the industries. At a minimum, it is essential that each of the "significant" industries in a POTW service area be sampled twice a year. Problem or recalcitrant industries require substantially more effort to locate and define the problem and develop a case for enforcement.

In any event, the provision of a field crew or crews is an essential part of POTW Pretreatment Program. Depending upon the nature of the activities to be performed by these people, their qualifications can vary. The people performing the field sampling and industrial review should be of sufficient qualification and training to be able to do an in-plant review of major process lines, discuss the processes and sampling techniques with plant management, install and maintain the sampling equipment, and retrieve the samples. A two-person crew is generally adequate for most sampling situations. It is desirable that at least one member of the crew have substantial field experience and advance education at the community college or college level.

It is estimated that approximately four (4) to eight (8) crew hours are required to contact a moderately complex industry, obtain information on its plant processing, flow characteristics, etc., and to actually install and maintain the monitoring equipment. More complex plants or enforcement problems would greatly magnify the time required.

After an industrial plant has been thoroughly reviewed, sampling routine and locations established, and compliance achieved, a two-person crew should be able to handle between 150 to 200 moderately complex industries with a twice a year sampling frequency. The cost for such personnel would vary, depending upon the wage scales in the area, but it is not unreasonable to assume that salaries in the range of \$13,000 to \$20,000, depending upon qualifications, experience, and responsibility are appropriate. Figure 5-1 summarizes the equipment necessary to outfit one (1) two-person industrial waste sampling crew. The prices indicated will vary from one area of the country to another, but these are reasonably representative of the costs that are involved.

As can be seen, the equipment needed for one POTW industrial waste Pretreatment sampling and review crew will require approximately \$24,950. Present Construction Grant Guidelines indicate that most of this equipment

FIGURE 5-1

TYPICAL EQUIPMENT FOR POTW
PRETREATMENT VAN (TWO-PERSON CREW)

| <u>Equipment</u> | <u>Purchase Price</u> |
|--------------------------------|-----------------------|
| - Van w/2 way radio | \$ 9,000 |
| - Gas Detector | 450 |
| - 2-Self cont. breathing units | 1,500 |
| - 4 portable samplers & bottle | 8,200 |
| - Portable pH meter | 800 |
| - 2-flow meters | 2,000 |
| - Flumes & Weirs | 1,600 |
| - Velocity meter | 600 |
| - Misc. Safety equipment | 400 |
| - Misc. Personnel equipment | 200 |
| - Misc. Tools & equipment | <u>200</u> |
| TOTAL | \$24,950 |

cost, with the possible exception of the vehicle, should be eligible for 75% Construction Grant funding if needed for POTW Pretreatment Program development. This is not totally consistent with other guidelines in the Construction Grants program, however, in which special purpose vehicles integral to the operation of a Federally funded treatment works are grant eligible on a one-time basis. Certainly, vehicles used in a POTW sampling program are an integral and necessary part of a Federally funded treatment works.

Lab Analyses

It can be safely assumed that nearly all POTWs have some laboratory capability in order to meet the needs of plant operation and NPDES reporting. Initiation of a POTW Pretreatment Program in accordance with U.S. EPA regulations will generally necessitate the addition of laboratory equipment and personnel. In addition, it may require the acquisition of additional laboratory space. The laboratory equipment required for a municipal wastewater treatment plant is generally standard. If there is a significant amount of industrial waste received by the facility, specialized equipment may be necessary.

Probably the most significant instrument for the determination of metals in water is the atomic absorption spectrophotometer (A.A.). There are more than thirty elements that can be analyzed by atomic absorption. According to the EPA publication titled Handbook for Analytical Quality Control in Water & Wastewater Laboratories, an experienced analyst can perform 150 analyses per day when no preliminary treatment of the sample is necessary. This number drops down to 60-80 per day when the metals analysis is performed following preliminary treatment of the samples. Consequently, if each sample were to be analyzed for 20 elements, the number of samples analyzed daily would be in the range of from three to seven. Figure 5-2 indicates that the cost of a good A.A. is in the order of \$50,000. Supplies for the A.A. are approximately \$3,000 per year. The cost of a qualified operator is assumed to range from \$16,000 to \$22,000 per year.

The normal methods for measuring organics in wastewater (BOD, TOC, and COD) do not provide any information on the molecular structure and quantity of a particular organic molecule. In order for a POTW to adequately administer an EPA approved pretreatment program, such capability will probably be necessary.

For these type of analyses, EPA recommends the use of a Gas chromatograph-Mass Spectrometer (GC-MS). Figure 5-2 indicates that a moderately sized GC-MS meeting EPA protocols costs approximately \$120,000. Accessories and glassware cost approximately \$5,000, and a year's supply of chemicals can be assumed to cost approximately \$15,000. Based on four samples per day and 200 productive workdays, a GC-MS of the type noted above could handle approximately 800 samples per year. On each sample, as many as 120 compounds can be measured. Since the number may increase in the future, the computer associated with the GC-MS system has the capability to identify literally thousands of compounds.

It is assumed that an individual to operate a GC-MS would be compensated between \$18,000 and \$26,000 per year. In addition, at least two lab technicians in the \$10,000 to \$14,000 class would be needed to support the additional workload capable of being handled by the equipment.

As can be seen in Figure 5-2, the equipment requirements total approximately \$193,500. This equipment should be eligible for 75% Construction Grant funding if normal grant requirements are met. In addition, the cost of constructing any additionally required laboratory space should also be eligible for 75% Federal funding.

Technical & Engineering Assistance

Because of the complex nature of the Federal Regulations and the technical nature of the industries to be regulated, strong technical and engineering input into the POTW pretreatment program is necessary. In a relatively small POTW operation, this need could be met to a large degree by a manager of the POTW program if he has a strong technical background. In a larger operation, specialized individuals could work full time in the POTW Program. In other cases, technical input could be made from a central engineering pool. The important fact is that it be available.

The most significant reason for this is that a fair number of pretreatment cases may ultimately end up in litigation. Such litigation will be costly and may ultimately include the POTW, the State, EPA, the industry, and perhaps even a trade association or environmental group. It is, therefore, essential that the POTW program be on a firm technical base. Thus, additional technical input is especially critical if field crews of high school level education are utilized.

In addition, technical input is necessary to provide for review of facilities which industries propose to install in order to meet their pretreatment needs. While the regulations do not require POTWs to "approve" plans for pretreatment facilities, certainly some review is necessary to establish that industries are complying with their milestones and schedules. Such review also can be used to provide positive public relations with industry, particularly smaller ones, who may be proposing to install equipment which will not meet the job. Such approval should not guarantee that the facilities will meet the pretreatment standards, but rather indicate general conformance and include the stipulation that, if standards are not met, additional facilities will be needed. Attempting to assign a general cost to this element of the program is extremely difficult, since it largely depends upon the POTW structure and the going rate for engineers within the area.

Legal Assistance

Because of the complex legal nature of the POTW pretreatment program, attempting to administer it without adequate legal assistance would be a serious mistake. The form of such legal assistance and its magnitude will, of course, vary from POTW to POTW.

In the case of large POTWs, the fulltime efforts of one or more members of the legal staff may be required ultimately in permit formulation,

FIGURE 5-2

ADDITIONAL LABORATORY EQUIPMENT

FOR

POTW PRETREATMENT PROGRAM

| <u>EQUIPMENT</u> | <u>PURCHASE PRICE</u> |
|---|-----------------------|
| - Atomic Absorption Spectrophotometer (A.A.) | \$ 50,000 |
| - Supplies for A.A. | 3,000 |
| - Gas Chromatograph - Mass Spectrometer (GC-MS) | 120,000 |
| - Accessories and Glassware for GC-MS | 5,000 |
| - Chemicals | <u>15,000</u> |
| TOTAL | \$193,000 |

hearings, and litigation. In smaller agencies, part-time efforts of the City Law Director, Village Solicitor, or County Prosecutor will suffice. In some cases, outside counsel may be needed. Costs of legal services vary widely, depending on whether inhouse or outside counsel is utilized and upon the level of experience of the legal staff available.

Adjudication

Unfortunately, the implementation of a POTW pretreatment program will not always be rosey. Disputes will arise between the POTW and the industry over interpretations and regulations. While every effort should be made to resolve these matters at the staff level, there will be the need for conflict resolution. Litigation should be the last resort due to the cost and time involved and the negative public relations impact.

Most sewer use codes provide for some type of due process procedure when a violation or dispute evolves. Its exact nature, of course, varies from POTW to POTW. In some cases, it may call for a hearing before a Commissioner or Utilities Director. In other cases, it might call for a hearing before the governing body of the sewerage agency or a sub-committee of the governing body. Other agencies have used the "hearing examiner" approach. Whatever approach is called for, a couple of cautions appear to be in order. First of all, it is essential that the person hearing the violation or dispute not be the person directly responsible for the pretreatment program. Such a person's objectivity would certainly be questioned. The other caution would be to be certain that the person or persons chosen to hear cases have sufficient time to hear the issues in a timely fashion. If a large number of cases are expected, there may be little practical choice but to go the hearing examiner route.

Overall Administration

A POTW Pretreatment Program will require a significant amount of program administration. Record keeping, report preparation, review, and submittals will require the full time services of one or more high quality clerical individuals. In addition, an overall Program Manager is essential. Which of the functions outlined above would actually be under his administration, of course, varies from POTW to POTW. In all probability, he would not be directly responsible for legal functions. In a large POTW, administration would be a full time effort.

In addition to the day-to-day direction by a competent Program Manager, particularly in the initial stages of the program, involvement by the Agency head is critical. A successful pretreatment program necessitates a good public relations effort and the establishment of firm groundwork with the local industrial associations and Chamber of Commerce.

Summary

The information presented in this section indicates that the actual capital costs relating to necessary monitoring, analysis, and laboratory equipment are significant. Assuming a POTW requires two field crews with two completely outfitted vans as well as one A.A. and one GC-MS, its total equipment cost would amount to \$243,000.

POTWs will also have start-up costs associated with conducting an industrial survey, reviewing legal authority, evaluating possible revenue sources, determining technical information necessary to support local ordinances and standards, designing a monitoring enforcement program, and meeting public participation requirements. In Figure 5-3, cost estimates for accomplishing these tasks are presented for the Metropolitan St. Louis Sewer District, the Sanitary District of Rockford, and the Green Bay Metropolitan Sewerage District.

If you consider their anticipated start-up costs and add to those costs the equipment requirements noted above, their total costs for pretreatment program development may range from \$300,000 for a moderately sized city such as Rockford to well over \$500,000 for a city the size of St. Louis. It is also important to take into account that these agencies are, in effect, simply fine-tuning their existing industrial control programs to meet Federal requirements, with the result that agencies starting a pretreatment effort can anticipate even higher start-up costs.

LOCAL PRETREATMENT PROGRAM ADMINISTRATION COSTS

Even more significant than program start-up costs are the projected annual costs that POTWs should anticipate for administering their programs. In contrast to development costs, which are cushioned by 75% Federal funding, municipal agencies will have to bear these ongoing administrative expenses on their own. This will include the high costs associated with maintaining field crews and a satisfactory laboratory capability. In addition, this will mean ensuring adequate technical, engineering, and legal assistance; providing an effective mechanism for the adjudication of disputes with industrial users; and overall administrative expenses, including the costs associated with record keeping and the preparation, review, and submission of required reports.

Figures 5-4 through 5-6 illustrate the magnitude of projected annual pretreatment expenditures. Figure 5-4, for example, projects the annual cost for each field crew when equipment life, maintenance, and personnel costs are calculated. As indicated, the bulk of the crew equipment will need replacement within five (5) years and such replacement is not eligible for grant funding. Hence, while the local share of outfitting an industrial waste pretreatment crew is approximately \$13,000, its annual operating costs amount to over \$55,000.

Figure 5-5 indicates a similar analysis for the additional laboratory equipment required. Again, it must be emphasized that these are incremental costs and assume an existing laboratory which requires no physical modifications. While the local cost of acquisition is approximately \$45,000, the true annual cost is over \$110,000. While these numbers will vary significantly from POTW to POTW, it must be realized that the program set-up cost is minimal in comparison to the annual operating cost.

For illustrative purposes, Figure 5-6 shows a hypothetical cost work-up of a POTW with 300 to 400 significant industries. These numbers are offered to generate thought and discussion and should not be cased in granite. However, a total annual cost of \$380,000 does not seem unreasonable.

FIGURE 5-3

ESTIMATED POTW PRETREATMENT PROGRAM DEVELOPMENT COSTS
EXCLUSIVE OF EQUIPMENT AND FACILITY NEEDS

| TASK | Estimated Costs | | |
|--|------------------------------------|---|-----------------------------------|
| | Metro. St. Louis Sewer District | Sanitary District of Rockford ³ | Green Bay Met. Sewerage Distr. |
| 1. Identification and Survey of Industrial Users | \$84,300 ¹ | \$26,000 | \$39,912 |
| 2. Review of Legal Authority | 9,000 | 14,000 | 21,964 |
| 3. Evaluation and Selection of Revenue Source | 10,000 ² | 5,500 | 4,789 |
| 4. Determination of Technical Information | 50,000 | 5,000 | 6,795 |
| 5. Design of Monitoring Enforcement Program | 158,000 | 4,300 | 98,157 |
| 6. Public Participation | 39,000 | 2,000 | 13,751 |
| | \$350,300 | \$56,800 | \$185,368 |

¹Identification previously done at District Expense.

²Part of user charge system evaluation presently underway.

³Extensive program development work has already been accomplished.

| EQUIPMENT | ANNUAL COST PER 2 PERSONS | | ESTIMATED LIFE | ANNUAL COST |
|----------------------------------|---------------------------|-------------------|----------------|-----------------|
| | PURCHASE PRICE | ANNUAL O & M | | |
| - Van w/2 way radio | \$ 9,000 | \$2,000 | 5 Yrs. | \$ 3,800 |
| - Gas Detector | 450 | 100 | 5 Yrs. | 190 |
| - 2-Self Cont. Breathing Units | 1,500 | 60 | 10 Yrs. | 210 |
| - 4-Portable Samplers & Bottles | 8,200 | 400 | 5 Yrs. | 2,040 |
| - Portable pH Meter | 800 | 100 | 5 Yrs. | 260 |
| - 2-Flow meters | 2,000 | 100 | 5 Yrs. | 500 |
| - Flumes & Weirs | 1,600 | 0 | 20 Yrs. | 80 |
| - Velocity Meter | 600 | 20 | 5 Yrs. | 140 |
| - Misc. Safety Equipment | 400 | Replace as Needed | 200 | 200 |
| - Misc. Personnel Equipment | 200 | Replace as Needed | 200 | 200 |
| - Misc. Tools & Equipment | 200 | Replace as Needed | 200 | 200 |
| Total Equipment = | \$24,950 | \$2,780 | | \$ 7,820 |
| Field Personnel | \$16,000/yr. x 2 x 1.5 = | | | \$48,000 |
| Total Annual Cost per Field Crew | | | | <u>\$55,820</u> |

FIGURE 5-5
ADDITIONAL ANNUAL LABORATORY COST

| FOR | | POTW PRETREATMENT PROGRAM | | |
|---|-----------------------|---------------------------|-----------------------|--------------------|
| <u>EQUIPMENT</u> | <u>PURCHASE PRICE</u> | <u>ANNUAL O & M</u> | <u>ESTIMATED LIFE</u> | <u>ANNUAL COST</u> |
| - Atomic Absorption Spectrophotometer (A.A.) | \$ 50,000 | \$ 1,000 | 10 Yrs. | \$ 6,000 |
| - Supplies for A.A. | 3,000 | 3,000 | 1 Yr. | 3,000 |
| - Gas Chromatograph Mass Spectrometer (GC-MS) | 120,000 | 3,500 | 10 Yrs. | 15,500 |
| - Accessories and Glassware for GC-MS | 5,000 | 5,000 | 1 Yr. | 5,000 |
| - Chemicals | 15,000 | 15,000 | 1 Yr. | 15,000 |
| TOTAL EQUIPMENT = | <u>\$193,000</u> | <u>\$21,000</u> | | <u>\$ 44,500</u> |
| + 1 A.A. Operator = | \$ 20,000/yr. x 1.5 | | | \$ 30,000 |
| + 1 GC-MS Operator = | \$ 24,000/yr. x 1.5 | | | \$ 36,000 |
| TOTAL ADDITIONAL ANNUAL COST | | | | <u>\$110,500</u> |

FIGURE 5-6

HYPOTHETICAL POTW PRETREATMENT PROGRAM
ANNUAL COST

| <u>FUNCTION</u> | <u>ANNUAL COST</u> |
|---------------------------------------|--------------------|
| - Sampling Vans & Equipment (2) | \$ 15,640 |
| - Sampling Crews | |
| 4 people x 16,000 x 1.5 | 96,000 |
| - Additional Lab Equipment & Supplies | 44,500 |
| - Additional Lab Personnel | |
| 1 A.A. Operator x 20,000 x 1.5 | 30,000 |
| 1 GC-MS Operator x 24,000 x 1.5 | 36,000 |
| 2 Technicians x 12,000 x 1.5 | 36,000 |
| - Technical & Engineering Assistance | |
| 1 person x 26,000 x 1.5 | 39,000 |
| - Legal Assistance | |
| 1 person x 26,000 x 1.5 | 19,500 |
| - Administration | |
| 1 Manager x 30,000 x 1.5 | 45,000 |
| 1 Clerk x 12,000 x 1.5 | <u>18,000</u> |
| TOTAL ANNUAL COST | \$379,640 |

COST RECOVERY METHODS

As can be seen, the annual cost of a POTW Pretreatment Program can amount to a substantial sum of money. At this point in time, there appears to be some ambiguity on what EPA regulations may or may not permit as a cost recovery system. A strong case can be made, however, for several different cost recovery methods, depending upon the characteristics of the POTW's users and its user charge system. The POTW should be able to utilize whatever system is equitable and publicly acceptable. The following possible POTW Pretreatment Cost Recovery Methods are offered for consideration.

Charge All Users

This is the simplest method of cost recovery, particularly if an ad valorem tax user charge system is utilized. Cost accounting and records keeping are greatly simplified.

A broad justification can be made that all users of the system benefit from an effective POTW Pretreatment Program. Assuming that no extensive additional sampling or enforcement is required against any particular industry, broad equity can be claimed. If, however, problems develop with some industries which require extensive monitoring and enforcement, then inequities will result.

Charge All Industrial Users

A stronger case can be made that only industry should pay for a POTW Pretreatment Program. The question then must be asked should industry as stipulated in the SIC Codes included in the Federal Regulations bear the burden or only those with industrial discharge.

Charging only industry under an ad valorem tax system is more complicated since some type of industrial special charge would be required. Under a water use based user charge system, the charge-back system would be greatly simplified. As in the "Charge All Users" scenario, inequities result if some industry requires special monitoring or enforcement.

Charge Significant Industrial Users

Under this system, only those industries which actually have discharges would be charged. The break-point is obviously controlled by the final turn that the Federal Regulations take in terms of industries and pollutants to be covered. The "significant" break-point should track with that ultimately defined by U.S. EPA.

Again, this system presents more complexity to an ad valorem system since some type of special charge would be needed. A water consumption based or sewer discharge based user charge system should be able to readily accommodate such a cost recovery system.

Charge Base Cost to All Users with Incremental Cost to Problem Industrial Users

This system of cost recovery has the merits of the "Charge All Users" scenario in terms of ease of administration under an ad valorem system,

with the added advantage of making problem dischargers pay the cost for extensive monitoring or enforcement activities.

Under this system, great care would have to be taken in establishing the threshold level of POTW activity which results in an industry being labeled "problem." Further, extreme care in cost accounting would be necessary to be certain that charges levied can be substantiated in court, if necessary.

This system should be capable of ready administration under either a water consumption base or sewage flow use charge system.

Charge Base Cost to All Industrial Users with Incremental Cost to "Problem" Industrial Users

On the surface, this system appears to provide for maximum equity since only industry pays and "problem" industries pay for additional work generated on their behalf. As in the previous scenario, care must be taken in defining the "threshold" after which an industry is labeled a problem. Close cost accounting is also necessary.

For a water consumption based or sewage flow based user charge system, administration should be accomplished with little difficulty. For an ad valorem system, additional administration and billing would be required.

Other Combinations

After reviewing the above, it is apparent that other combinations can come to mind based on the particular POTW's circumstances. The above are offered not as the "only" methods, but rather to stimulate thought on other alternatives.

CONCLUSION

While POTW Pretreatment Program development costs are significant, their grant eligibility makes them more palatable to municipal agencies. Development costs, however, are quickly dwarfed by annual operating costs which municipal agencies must bear without the benefit of Federal largesse. As with inflation and other demands for public dollars, these costs will become more difficult to justify, let alone obtain, with the result being that the maintenance of high quality POTW pretreatment programs may be more difficult to achieve. This will be particularly the case where environmental benefits are not readily apparent and the economic impact on local industry is severe.

POTW Pretreatment Programs will require a substantial amount of hardware and trained personnel. The amount of sophisticated laboratory hardware required by POTWs will depend on the extent to which they will have to perform priority pollutant analyses. The number of significant industries, the extent of industrial self-monitoring, and the number of enforcement actions will greatly impact both the hardware and personnel categories and hence operating costs of POTW Pretreatment Programs. Legal costs may also be substantial.

Several methods of funding a POTW Pretreatment Program are possible. The exact method should be determined by the statutes governing the POTW since institutional methods vary widely across the country.

AMSA CASE STUDY ANALYSIS

A PRETREATMENT PROGRAM FOR INDUSTRIAL SOURCE CONTROL

IN THE

SAN FRANCISCO AREA

FEBRUARY 1979

to adopt effluent limits for its industrial dischargers that eliminated the specter of discrimination could arise if limits are based on a discharger's size. Other advantages to the East Bay sampling program are discussed in the section below on developing pretreatment rate structures.

Although much of the sampling work carried out for this pretreatment program was conducted by the POTW staff, East Bay also developed a questionnaire that large customers could use in characterizing their own wastes. Such a questionnaire program could be a useful addition to any local pretreatment effort in two ways. First, the questionnaire has enormous educational value for the industrial customer. In areas where no previous source control or enforcement program was in effect, industries subject to pretreatment generally know very little about their wastewater. Going through the process of answering such a questionnaire enables dischargers to discover the exact nature of their effluents, as well as to directly experience the types of problems and difficulties that are encountered by a POTW when it obtains a representative sample of industrial wastewater. Industrial customers agreeing to complete a questionnaire are generally easier to talk to about the need for controls, since they can better understand the potential impact of an uncontrolled discharge on both a POTW and its receiving waters.

A second benefit of carrying through the questionnaire program relates to fair allocation of the overall costs of sampling. East Bay pretreatment program directors felt that part of the total cost of a sampling program should be borne by the customers regulated. They reasoned that it was fair for larger customers to determine the most satisfactory and economical methods of sampling and testing their own wastes. Such an approach is completely within the general philosophy of pollution control legislation that users pay the costs of their pollution-causing activities. How did industrial customers respond? The questionnaire was sent to approximately 150 of the largest East Bay users; although answering the questionnaire was not legally required, approximately 90 industries returned completed forms to the District.

Setting Equitable Pretreatment Charges

Since the development of a pretreatment program coincided with East Bay's move to secondary treatment, an analysis of the District's capital and operating expenses to determine the costs of treatment for different parameters for wastewater strength was undertaken at the same time. The general revenue system used by the District draws from tax collection and service charges. Pretreatment bills are calculated on the basis of a unit rate calculated for each parameter, multiplied by the number of units discharged, as indicated in an industrial user's pretreatment program permit.

A short description of the rationale behind East Bay's general revenue program is in order here. The service charges provide the District with the money needed to offset the capital costs of existing facilities and the ongoing operation and maintenance costs that can be directly attributed to users to the sewer system. Approximately 50 percent of the total capital expenses and 96 percent of the O&M costs are paid for through the service charge collected. Ad valorem taxes are used to pay for those capital costs that can be attributed to

future growth within the system and to infiltration and inflow from unidentifiable sources. Such tax revenues offset 47 percent of the total capital requirements and four percent of the operational expenses; the four percent representing the portion of plant operations attributed to infiltration and inflow. In developing this system, East Bay reasoned that using the ad valorem tax base was the proper way to charge for services that benefit property and that treatment for infiltration and inflow, and additional capacity for future use were the two aspects of a POTW's operations that benefited the community generally.

Pretreatment charges were based on the results of East Bay's sampling program. The sampling showed that customers could be assigned a waste strength based on their business category. Once the survey was completed, the 20,000 non-residential customers of the District were divided into the 87 classification groups created. Data from the survey was then used to assign a strength to each pollutant in each business class. For an individual discharger, meter readings and sampling data were used to calculate the total amount of pollutants and the volume of discharge. Unit rates were calculated for each parameter based on East Bay's knowledge of the amount of each parameter accounted for in the overall system, and the cost to the District of handling each parameter. Using the BCC system, East Bay pretreatment officials calculated the separate contributions of each user in each category, and then determined the limits to place on such users directly from the POTW's discharge requirements or effluent limitations.

Once unit rates were calculated for each parameter within each BCC class, a list of charges was adopted for each individual class. Such charges were rounded to the nearest five cents. Designers of the pretreatment system decided that the five cent increment represented the degree of accuracy that they could achieve with charges based on volume and quality, given the spread of each user's wastewater strength within a business classification group. East Bay officials tested the accuracy of this general procedure by comparing the mass emission for each parameter computed for all categories with the respective amounts of pollutant entering the treatment plant. Data collected during this verification process proved the validity of assigning the strength to each individual class of user. Further, the sampling procedure used by the District in its general survey showed that wastewater strength was independent of wastewater volume, as mentioned previously.

Issuing Effective Permits and Credits

The strength of East Bay's pretreatment program rests on its permit system. That system involves issuing specific sets of effluent limitations to industrial dischargers within each of the BCC classes established, based on the POTW's own limitations as set forth in East Bay's NPDES permit. Certain permits are issued automatically to "critical industries" specified in the District's wastewater control ordinance. A critical industry classification includes all manufacturing and processing industries and industries discharging other than sanitary wastewater.

In addition to a set of mandatory permits, East Bay also issues two types of optional permits. The first type is available for customers classified into

Mr. D'AMOURS. Thank you very much, Mr. Garabedian.

Do I understand your position to be essentially that you do not think we ought to be dumping any sewage sludge into the oceans? Is that basically your position?

Mr. GARABEDIAN. That is our position.

Mr. D'AMOURS. I did not say any sewage sludge that degrades. Is it any sewage sludge, whether or not it can be shown to degrade the ocean environment?

Mr. GARABEDIAN. That is correct. There are several key reasons which I attempted to outline.

Mr. D'AMOURS. Why would you object to the dumping of sewage sludge which does not degrade the environment?

Mr. GARABEDIAN. There are site-specific issues and general considerations. The site-specific one would be, for instance, the New York Bight which is overstressed. It would not make sense to be stressing it with even additional nutrients. We all agree it would not do any good there.

Mr. D'AMOURS. What harm would additional nutrients do?

Mr. GARABEDIAN. We are talking an overstressed environment there. There certainly is no need for the additional nutrients. We simply would be adding an additional load which would put a stress on oxygen availability. That is an example of oxygen stress.

When it comes to the question, say, of moving from the New York Bight or any other overstressed location to open ocean areas, it does not make sense to us to dump the dredge disposal when it has ready uses on land. In fact, it is clear to us that, through pretreatment, sludge toxins can be eliminated. That, to us, is not a reason to dump in the ocean.

Mr. D'AMOURS. Even Jacques Cousteau, for instance, would say that the dumping of clean sludge, so to speak, with nutrient value is beneficial and has a beneficent effect.

Mr. GARABEDIAN. He is saying that is true in some situations. That is his statement.

Mr. D'AMOURS. Would you object to even that dumping?

Mr. GARABEDIAN. Mr. Chairman, I would answer your question this way: Personally, if the law were to specify that before sewage sludge could be dumped in the ocean there had to be a pretreatment program in effect, I would say that would be a sound way to go. It would be sound because, first, it would eliminate toxics from the ocean; and, second, because I would be surprised if, once the toxics were eliminated, there would be any resistance to using it for land applications.

Mr. D'AMOURS. You just said a few minutes ago that pretreatment works. We have the technology and it works, and, therefore, we could solve all of our problems by pretreating all of our sludge. Do you have any studies on the relative cost and the ability of municipalities such as New York and others to absorb this cost?

Mr. GARABEDIAN. Mr. Chairman, I do not have any cost figures with me, though I would be delighted to submit them for the record. (See letter on p. 351.)

The point is that it is working in other cities. Philadelphia is a prime example. We are concerned that, if New York is allowed to continue with its sludge dumping, if there are no demands made on it or pressure put on it to cease, other cities which have in recent

years stopped their ocean dumping will join New York and others in wanting once again to dump their sludge.

Mr. D'AMOURS. I share that concern. Of course, I was as upset by the *Sofaer* decision as you undoubtedly were, for that very reason.

However, is it not true that Philadelphia does dispose some untreated sludge on land?

Mr. GARABEDIAN. Mr. Chairman, I do not know the answer to that question. However, it is certainly feasible to dispose on land untreated sludge in the proper sites where it can be contained properly. If Philadelphia did that, I would not be surprised.

Mr. D'AMOURS. You agree with Captain Cousteau that we do have the technology at certain specific sites to properly contain sludge runoff and the like?

Mr. GARABEDIAN. Yes, sir.

Mr. D'AMOURS. Thank you very much, Mr. Garabedian. I appreciate your patience in waiting for us to return. I regret that we could not accommodate you before the vote, which we might have done had we been aware of Mr. Harper's situation.

Mr. GARABEDIAN. It is quite acceptable.

Mr. D'AMOURS. Your testimony has been very helpful. We will look forward to your continued participation as this legislation evolves.

Mr. GARABEDIAN. Thank you, Mr. Chairman.

May I make a final comment?

Mr. D'AMOURS. Certainly you may.

Mr. GARABEDIAN. Thank you.

The question of the economics of all this has been brought up today by the city. The final point I would like to make has to do with our concern about the economics. The Sierra Club certainly is on the record as being concerned about our economy.

The priorities for spending, especially in relation to sewage sludge, seem to be a real issue that was brought up here today. We simply have to question whether it makes sense to spend more money on studies, assessments, inventories, and so forth, when it relates to sewage sludge when we have the data in. We would much prefer to see the money directed toward actual solutions and not more studies.

Mr. D'AMOURS. Thank you very much.

This subcommittee is adjourned.

[Whereupon, at 5:27 p.m., the hearing recessed, to reconvene Friday, March 26, 1982.]



REAUTHORIZATION OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT, TITLES I AND II

FRIDAY, MARCH 26, 1982

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY AND SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, D.C.

The subcommittees met, pursuant to notice, at 10:10 a.m., in room 1334, Longworth House Office Building, Hon. John B. Breaux (chairman of the Subcommittee on Fisheries and Wildlife Conservation and the Environment) presiding.

Present: Representatives Breaux, Hughes, Forsythe, Pritchard, Evans, Carney, and Schneider.

Staff present: Howard Gaines, Darrell Brown, Mary Pat Barrett, Jeff Curtis, Dale Brown, and Barbara Wyman.

Mr. BREAUX. The subcommittee will please be in order.

This is the third and the last day of hearings on the Marine Protection, Research and Sanctuaries Act, better known as the Ocean Dumping Act.

Thus far we have heard testimony from the agencies which regulate and conduct research on ocean dumping, environmental groups, marine scientists, and representatives of municipalities.

Today we will hear from the American Association of Port Authorities and additional environmental, scientific, and municipal groups.

I have been involved in this issue for a long time and it has always been my view that we must have a balanced, comprehensive approach to protecting the oceans and dealing with society's wastes.

We must consider all options, including ocean and land-based disposal, recycling, and incineration to insure that we minimize the risks to human health, welfare, and the environment.

I share the concerns of those who fear that an "out of sight, out of mind" philosophy may indiscriminately jeopardize the marine environment, simply because ocean dumping is often the cheapest disposal alternative as well as being the most politically expedient.

However, I believe that the current Ocean Dumping Act provides the basic framework necessary to provide a balancing of disposal options and ultimately the selection of the mode of disposal which best protects man and his environment.

I also believe that we must insure that adequate support is provided for research and monitoring so that we can upgrade our ability to predict the effect of ocean waste disposal and so that we can be alerted to any unexpected negative impacts which may occur.

I point out for the record that we have two subcommittees who share joint jurisdiction over the Ocean Dumping Act in this Congress, the Oceanography Subcommittee, chaired by Congressman Norm D'Amours, and, of course the Fisheries and Wildlife Conservation and the Environment Subcommittee, which I chair.

We are sharing jurisdiction and I will be handling the hearings today and would ask if anyone has any comments.

Mr. Forsythe?

Mr. FORSYTHE. Again, as you have pointed out, Mr. Chairman, I think it is important that we carefully look at the options which are available to us and recognize that we do not have the answers to all the problems that we face. I welcome the witnesses that are here today and who I think will contribute to the knowledge of the committee before we mark up the legislation.

Thank you for holding this hearing, Mr. Chairman.

Mr. BREAU. Any other comments?

The gentleman from New York.

Mr. CARNEY. I would like to request that the statement of the Honorable Peter Fox Cohalan, county executive of Suffolk County, be submitted for the record. He is fogged in at the Long Island Airport. He was to testify before the committee and he passes on his disappointment to the committee.

It is my understanding he is still attempting to get here, but flying out of that airport on a weekly basis tells me he is not going to get here.

I would like to ask unanimous consent and request that it be printed in the record.

Mr. BREAU. Without objection, the statement of the gentleman will be made part of the record.

[The statement of Mr. Cohalan follows:]

PREPARED STATEMENT OF PETER F. COHALAN, COUNTY EXECUTIVE, SUFFOLK COUNTY,
NEW YORK

Mr. Chairman and members of the subcommittees, it is my great privilege to have been invited here today to testify on the proposed reauthorization and amendment of the Marine Protection, Research and Sanctuaries Act. I was encouraged to learn that a joint subcommittee hearing had been called on this important legislation, and that you had asked representatives from local government to testify. This is an important issue to Long Island, as we are surrounded by water and a large part of our economy is marine oriented.

Suffolk county lies at the eastern extreme of Long Island, which lies to the east of New York City. The county encompasses 929 square miles, and in 1980 had a population exceeding 1.2 million. The western end of the county is highly developed and industrialized; the eastern end is comprised primarily of farmland and is a key tourism center for New York State. To the south and east of Long Island lies the Atlantic Ocean, to the north Long Island Sound, and to the west the East River, which separates us from Manhattan.

The imprint of the New York metropolitan region is clearly evident in the water quality that exists along the south shore of Long Island. Water quality generally improves as distance increases from areas with high population density; it also improves as distance increases from areas where tidal flushing action is poor and incapable of rapidly diluting pollutants. Suffolk County is fortunate in that the most serious water quality problems in the New York metropolitan region are located in the apex of the New York Bight; and that many miles of Long Island coastline are

still adjacent to marine waters of high quality. Complacency, however, is not in order. Given the magnitude and variety of pollutants deposited in the New York Bight, and the associated potential ecological and economic disruptions such dumping may cause, the degradation of water quality in the New York Bight poses a severe threat to both the commercial fishing industry and the tourism/outdoor recreation related economy of Suffolk County.

Commercial fishery landings data from 1880 to the present time indicate that over 100 species of fish, shellfish, and crustaceans have been landed by New York marine commercial fishermen. In fact, the Suffolk County hamlet of Blue Point lent its name to the renowned Blue Point Oyster from Great South Bay, which is now almost extinct in that body of water.

For the most part, New York State's commercial fishing industry is based in Suffolk County. In 1981, 28.2 million pounds of fish and shellfish with a value of \$39.3 million were landed in Suffolk. This harvest amounted to 78 percent by weight and 87 percent by value of all marine fishery products landed in New York State in 1981. The fishing industry has a considerable impact upon both the local and state economies, the local impact has been estimated at about \$100 million and the impact on the State as a whole at \$160 million in 1981. These figures do not reflect the additional impact of retail seafood sales.

As stated previously, the county's tourism and recreation oriented industry is also, to a large part, dependent upon both the perception and reality of clean beaches and marine waters of high quality. The island's south shore oceanfront beaches are world renowned. Marine parks and recreation facilities, such as Jones Beach, attract tourists from both the United States and abroad. We cannot let this \$2.5 billion industry be threatened by continued ocean dumping in the New York Bight.

In June 1976, Long Island's south shore beaches were inundated by large amounts of floatables, litter and debris. Local and State officials found it necessary to close many ocean beaches to swimming, because of a feared potential health threat. As a result, there was a severe disruption to Long Island's tourism/outdoor recreation related economy. Over only an 18-day period, there was an estimated loss of \$25 million to local recreation-oriented businesses.

The floatables were dispersed over an area of 7,500 square nautical miles in the New York Bight, mostly to the south and west of Long Island. This debris was driven ashore by southerly winds. The type and source of floatables included: trash, plastic and rubber objects; grease from wastewater and combined outfall discharges; street litter from bays and minor estuaries; sewage; garbage; and oil wastes from oil spills, commercial ships, and recreational boats; charred wood from pier fires; solid waste originating from landfill sites; and oil and grease from industrial waste. It is believed that increased river runoff from the Hudson River, and intense persistent southerly winds, combined to cause the transport of the large and continued supply of floatables to Long Island's beaches in 1976. Even though many people have stated that these two factors, excess runoff and prolonged southerly winds, do not frequently occur together, even once was too often for the residents of Long Island.

High nutrient loadings have also caused extensive algal blooms in the New York Bight. Such conditions result in extremely low levels of dissolved oxygen and high levels of hydrogen sulfide in bottom waters, with the subsequent mortality of bottom-dwelling shellfish and finfish species. During the massive fish kill of 1976, which occurred almost simultaneously with the pollution of our beaches that year, dissolved oxygen levels were extremely low in an area 100 miles long by 40 miles wide. Commercial fishing activity, especially for surf clams, was severely impacted.

Dumping in the bight must be brought under control. Until this occurs, the public will be faced with the possibility of sporadic beach closures and economic hardship. With the above considerations in mind, I am here today to support the reauthorization and amendment of the Ocean Dumping Act. As stated in the proposed changes to the act, prudent and feasible alternatives to ocean dumping must be explored. The ocean should be used as a dump site only as a last resort. It is my belief that the least cost approach to waste disposal is often not the best approach. Therefore the proposed amendments to the act, dealing with the expanded evaluation of dumping based upon whether the dumping will degrade the marine environment, and the requirement that prudent and feasible alternatives to ocean dumping be considered, should be implemented.

I also support the proposed amendment that would phase out all dumping in the New York Bight apex; specifically, the ban on dredge spoil disposal by the end of 1985, and the ban on the disposal of all other material by December 31, 1982.

The Federal Environmental Protection Agency [EPA] moved to prohibit all ocean dumping of sludge; however, New York City successfully challenged this dumping ban in court, and the Environmental Protection Agency did not appeal the ruling.

EPA now has under active consideration a change in the New York dumping site from 12 miles to 106 miles. Suffolk is on record, and will testify at any hearings held by the EPA, that we support dumping at the new proposed 106 mile location, not at the current twelve-mile site in the apex. Dumping at the 106 mile site would cost New York City \$18 million, as opposed to the current \$3 million to dump at the twelve-mile site; it would cost Nassau County \$3.7 million, as opposed to the \$650,000 to dump at the twelve-mile site. I believe these additional costs are minimal, when compared to the potential economic loss to the tourism and fishing industries in the region if dumping continues and expanded contamination of the ocean occurs in the New York Bight area. In a poll my office conducted last year, on continued sludge dumping in the bight, the ten elected town supervisors in Suffolk County also indicated that they were opposed to continued dumping.

It is my firm belief that continued dumping in the New York Bight will have a severe future impact upon Suffolk County. Dumping in this critical area will continue to have adverse effects upon the marine environment and there is great potential for future economic repercussions to Long Island. Therefore, I wish to urge that your two subcommittees proceed in a positive fashion on the proposed amendments. I do not want to come before you 3 years hence to tell you that the fishing industry on Long Island went the way of the Blue Point oyster.

Mr. BREAUX. We would like to welcome our first panel representing the American Association of Port Authorities, Mr. J. Ron Brinson, president of the association; Col. Herbert Haar, Associate Port Director, Port of New Orleans, accompanied by Joseph LeBlanc, counsel to the committee.

We are pleased to have you as the first panel this morning and are looking forward to receiving your testimony, particularly Mr. Haar.

Good to see you again this morning.

Mr. HAAR. Good to see you, Mr. Chairman.

STATEMENT OF J. RON BRINSON, PRESIDENT, THE AMERICAN ASSOCIATION OF PORT AUTHORITIES; HERBERT R. HAAR, JR., ASSOCIATE PORT DIRECTOR, PORT OF NEW ORLEANS, CHAIRMAN, SPECIAL DREDGING COMMITTEE, ENVIRONMENTAL PLANNING AND ENGINEERING TASK FORCE, THE AMERICAN ASSOCIATION OF PORT AUTHORITIES; JOSEPH E. LeBLANC, JR., MILLING, BENSON, WOODWARD, HILLYER, PIERSON & MILLER

Mr. BRINSON. I am Ron Brinson, president of the American Association of Port Authorities.

As you know, our association is a professional management and trade association comprising 135 public port agencies in the United States, Canada, and throughout Latin America.

Virtually all public port agencies in the United States are members of AAPA. Our system of local or State ports is, for all practical purposes, the national seaport system for the United States. We think it is important that our ports be perceived accordingly.

I am here today with Herbert Haar, Associate Port Director, Port of New Orleans, who serves as chairman of our dredging committee, and Joseph E. LeBlanc, Jr., counsel to the dredging committee.

The issues which are pertinent to the committees' attention this morning, Mr. Chairman, have been very thoroughly analyzed and evaluated in recent weeks by Mr. Haar's committee. We are very pleased to have this opportunity to share our findings and positions with this committee.

Our association is deeply concerned about the problems created by the regulation of ocean dumping. Many of our coastal ports rely

to some extent on the ocean disposal of dredged material. For many ports, such as New York, it is crucial to operational survival.

In 1978 we counted 16 major ports, plus the navigation channels at the entrance to the Mississippi and Columbia River systems, required dredging and ocean disposal of dredged material by the Corps of Engineers.

As one example of the importance of ocean disposal of dredged material to ports and the national economy, we should look at the situation in the lower Mississippi River.

Maintenance of the deep draft navigation channels in 1978 at the Mississippi River/Gulf outlet accounted for 6.1 million cubic yards of dredged material disposed of in the ocean.

Waterborne commerce in the stretch of the river from Baton Rouge to below New Orleans, a distance of slightly more than 100 miles, totaled 540.5 million tons in 1977, making this the largest port area in the world.

Rotterdam and New York, by comparison, had waterborne commerce of about 300 million tons and 180 million tons respectively.

Ocean disposal of dredged material is the only feasible method to keep this vital shipping area of the lower Mississippi River open.

The 5-year dredged material research program completed in 1978 by the Corps of Engineers provided information on the environmental impacts of dredging and disposal operations.

One conclusion reached was that the environmental impacts of most disposal operations, especially open water ones, are not as severe as has been generally believed.

For each dredging project the corps must consider all likely alternatives to the disposal of dredged material by ocean dumping. In most instances, however, there is no environmentally and economically suitable substitute for ocean disposal.

Periodic maintenance dredging of our shipping channels is essential for operations at our seaports. And efficient port operations are unquestionably essential to the orderly flow of foreign commerce in terms of the national interest.

General planning for needed development and expansion of navigational channels has become almost impossible.

Our seaports are responding to the changing face of the world's maritime fleet. Technological advancements in ships dictate that port facilities must change, too.

I can assure you, Mr. Chairman, that U.S. ports are anticipating these needs to develop and to expand by planning for projects which are, by any measure, expensive.

A recent study by the U.S. Maritime Administration shows: one, U.S. ports spent \$5 billion on new and modernized pier and wharf facilities from 1946 through 1978 and some \$3.4 billion will be spent by ports for cargo-handling facilities from 1979 through 1983.

These commitments have been and are being made in a spirit of serving the national interest and with an assurance that the Federal Government will, in a timely manner, fulfill its responsibilities to provide navigable channels.

At a time when the importance of our seaports is being underscored by the necessity to increase exports and by the consideration of national defense mobilization, we find that a pall of uncertainty

hangs over the Federal Government's commitment to navigation channels.

To say that this uncertainty is playing hob with the operations and planning at our seaports is an understatement. What must not be understated or underestimated are the dimensions of this problem in terms of affecting the best interests of our Nation.

As we face these problems, Mr. Chairman, we are thankful for your leadership and the active involvement of this committee in addressing the issues which affect the U.S. seaport industry in many vital ways.

Thank you.

Mr. BRINSON. With that I would like to turn our testimony over to Colonel Haar.

Mr. BREAUX. Colonel Haar, good to see you and good to have your testimony.

STATEMENT OF HERBERT R. HAAR, JR.

Mr. HAAR. Mr. Chairman, and members of the subcommittee, my name is Herbert Haar, Jr., Associate Port Director of the Port of New Orleans and I serve as chairman of the Special Dredging Committee, Environmental Planning and Engineering Task Force of the American Association of Port Authorities.

I would like to express again the appreciation of the AAPA and the Special Dredging Committee which I chair for the opportunity to appear before your group here today to express the views of the AAPA upon amendments which have been proposed to the Marine Protection, Research, and Sanctuaries Act of 1972 and to bring to the attention of the subcommittee much needed changes which AAPA member ports feel should be made in this act.

The AAPA has submitted for the record a prepared statement which describes the specific AAPA concerns with the amendments being proposed and suggests alternative changes in the act which would satisfy these concerns. In this testimony I will simply highlight the matters covered in our prepared statement.

AAPA ports are faced with a continuing need to dispose of dredged material. This need arises from periodic maintenance dredging operations and from needed harbor and channel improvements which are essential to the continued operation of our ports.

Most of our coastal ports rely to some extent on ocean disposal of dredged material. For many ports, such as the Port of New York, such disposal is crucial to operational survival.

These dredging needs can also be expected to increase—especially in view of the many current proposals for the deepening of major channels to 55 feet to accommodate the deep draft vessels which will handle the expanding coal export trade which is expected during the rest of this century.

The past experience of AAPA ports with the ocean dumping program for dredged material has been fraught with difficulty. It has been characterized by inconsistent policies among Federal agencies, unnecessary and unreasonable testing requirements and permit conditions, and the ever-present spectre of permit denial on the basis of narrow, and often unsupported, environmental concerns which take no account of competing "public interests."

Changes in the ocean dumping program are urgently required.

It is against this background that the AAPA has read with alarm the text of certain "Discussion Drafts" of proposed amendments to the act which are under consideration by the subcommittees.

Changes are proposed that would threaten the virtual shutdown of ocean disposal of dredged material for many ports, with devastating impact upon the national, regional, and local economies which these port operations serve.

The amendments of concern to the AAPA include those which propose:

One, a policy allowing "no degradation" of ocean waters. Such a policy is unrealistic and unnecessary, and would establish a bias against ocean dumping that is unsupported by recent scientific evidence and experience.

Two, criteria for permit decision and site designation which do not take proper account of all relevant factors affecting the "public interest" including such vital port concerns as the need for ocean dumping, and the economic, commercial, and governmental considerations associated with such dumping.

Such an approach fails to recognize and properly weigh the interests of all sectors of the "public" in contrast to the limited views of mission-oriented, environmental interest groups.

Three, a requirement for "final" site designation before any ocean dumping may be allowed. At a time of budget and manpower cutbacks within the Federal agencies involved, such a provision is unreasonable and unrealistic, and could effectively halt much needed dredging operations.

Four, permit conditions which would impose costly "special fees" and affirmative research obligations upon ports as permit applicants. Such conditions would tax many ports to the point of threatening continued operations.

Five, incorporation of prohibitions of the London Dumping Convention without needed clarification of the relationship between convention requirements and the provisions of the act.

In its prepared statement the AAPA offers alternative language of amendment which would avoid the many problems presented by these proposed changes and respond to port concerns in a fashion that would continue to assure the protection of the marine environment, a goal that ports, no less than other interests, value so highly.

The AAPA recommendations may be summarized as follows:

One, continue the present policy of prohibiting only unreasonable degradation of the marine environment and base this determination upon a consideration of all factors affecting the "public interest."

Two, provide that the determination of "unreasonable degradation" shall include consideration of the "criteria" to be established under section 102, which are to be applied to dredged material permits under section 103; and further provide that these criteria shall include all factors affecting the "public interest" including the need for proposed dredging and dumping operations and the costs and economic and governmental conditions associated with such operations.

Three, provide for consideration of ocean disposal of dredged material on an equal basis with all other methods of disposal and require utilization of alternative means or locations of disposal only where there will be significant adverse impacts from the ocean disposal, the alternative will result in lesser impacts and the alternatives can be utilized at reasonable cost and energy expenditures.

Four, provide that the determination of whether annex I substances are present in dredged material as other than "trace amounts" shall be based upon the presence of the prohibited substances in quantities and concentrations that will not be "rapidly rendered harmless" upon disposal and that, notwithstanding the use of "special care" measures in dumping or site designation, will cause "unreasonable degradation" of the marine environment; this determination should not be based solely on chemical and toxicological testing.

Five, provide that the action of the Administrator or the Secretary in issuing a permit under section 102(a) or section 103(a) or in issuing a waiver of compliance under section 103[d] shall satisfy the standards and criteria binding upon the United States under the convention, including its annexes.

This would avoid reassertion of past claims that the convention can prohibit the Administrator from granting a waiver of compliance for dredged material, even where all requirements of the Act are satisfied.

Six, qualify the requirement for final site designation to provide for interim use of a site where the Federal agencies involved fail to complete site designation studies in time for needed port operations to be carried out.

Seven, qualify permit conditions that would impose costly "special fees" and research obligations upon ports to take into account the "public" status of most ports and the funding limitations inherent in that "public" status.

Each of the above recommendations is addressed in greater detail in the AAPA's prepared statement. We invite the subcommittee's earnest consideration of these proposals.

Mr. Chairman, in a final note I might mention that I have been working as chairman of the International Association of Ports and Harbors' dredging task force and Mr. LeBlanc and I have attended as observers the last two annual meetings of the London Dumping Convention and the last meeting of the ad hoc scientific group, the investigative arm of that group, at the invitation of the London Dumping Convention to present with a noted oceanographer, Dr. W. E. Pequegnat, assistance on special care measures that can be used in the disposal of certain problem dredge material at sea, and this has been favorably received by the London Dumping Convention and we have been invited again to the next meeting of the ad hoc scientific group in Paris in September to present further data that Dr. Pequegnat is preparing on this subject.

So there has been a lot of accomplishment in this area that I would like to make the committee aware of and we would be happy to supply for the record any of this data that you might desire.

This completes my statement. Thank you very much.

[The prepared statement follows:]

PREPARED STATEMENT OF THE AMERICAN ASSOCIATION OF PORT AUTHORITIES

INTRODUCTION

This statement is presented to the Subcommittee on Oceanography and the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the House Merchant Marine and Fisheries Committee (the "Subcommittee") by the American Association of Port Authorities ("AAPA") to express deep and vital concerns which AAPA member ports have in the permit program for the ocean dumping of dredged material under Sec. 103 of the Marine Protection Research and Sanctuaries Act of 1972 (the "MPRSA"), 33 U.S.C. § 1413.

AAPA ports are faced with a continuing need to dispose of dredged material derived from needed maintenance dredging activities and necessary harbor and channel improvements. Most of our coastal ports rely to some extent on ocean disposal. For many ports, such as the Port of New York, such disposal is crucial to operational survival. These dredging needs can also be expected to increase—particularly in view of current proposals and plans for the deepening of major channels to 55 feet to accommodate the deep draft vessels necessary for this country to take advantage of the burgeoning coal export trade during the remainder of this century.

The past experience of AAPA member ports with the ocean dumping program for dredged material has been fraught with difficulty. It has been characterized by inconsistent policies among Federal agencies, unnecessary and unreasonable testing requirements and permit conditions, and the ever-present spectre of permit denial on the basis of narrow (and often unsupported) environmental concerns which take no account of competing "public interests". Changes in the ocean dumping program are urgently required.

It is against this background that the AAPA has read with alarm the text of certain "Discussion Drafts" of proposed amendments to the MPRSA which are under consideration by this Subcommittee.¹ The changes proposed in these drafts would, singly and collectively, threaten the virtual shutdown of ocean disposal of dredged material for many ports—with devastating impact upon the National, regional, and local economies which these port operations serve. The amendments of concern to the AAPA include those which propose:

(1) a policy allowing "no degradation" of ocean waters—such a policy is unrealistic and unnecessary, and would establish a bias against ocean dumping that is unsupported by recent scientific evidence and experience.

(2) criteria for permit decisions and site designations which do not take proper account of all relevant factors affecting the "public interest" (including such vital port concerns as the need for ocean dumping, and the economic, commercial, and governmental considerations associated with such dumping)—such an approach fails to recognize and properly weigh the interests of all sectors of the "public", in contrast to the limited views of mission-oriented environmental interest groups.

(3) a requirement for "final" site designation before any ocean dumping may be allowed—at a time of budget and manpower cutbacks within the Federal agencies involved, such a provision is unreasonable and unrealistic, and could effectively halt much needed dredging operations.

(4) permit conditions which would impose costly "special fees" and affirmative research obligations upon ports as permit applicants—such conditions would tax many ports to the point of threatening continued operations.

(5) incorporation of prohibitions of the London Dumping Convention without needed clarification of the relationship between Convention requirements and the provisions of the MPRSA.

In the following sections of this Statement, the AAPA sets forth the basis for each of the concerns described above and offers alternative language of amendment to avoid the many problems which these proposed changes would impose upon AAPA member ports.

A. DEGRADATION OF MARINE ENVIRONMENT

The approach taken in the Discussion Draft (Sec. 102(a)(2)), pp. 6-7, and Sec. 103(a), pp. 11-12 is to prohibit all ocean dumping that will "degrade" the marine environment unless there exists no prudent and feasible alternative means or locations of disposal. Sec. 3(m) (pp. 3-4) defines "degrade" as having any "adverse effect" on human health, welfare, or amenities, or on the marine environment, eco-

¹ In this statement, the AAPA will refer to provisions of concern as they appear in the "Discussion Draft of Feb. 25, 1982" (hereinafter "Discussion Draft").

logical systems, or economic potentialities; as preventing any reasonable or customary use of the marine environment from being made; or to adversely affect an area of ocean waters to the extent that it cannot naturally restore itself, after dumping is terminated, to the environmental, ecological, esthetic (sic) and economic posture existing before dumping in the area was authorized under this Act.

The effect of these provisions would be to effectively prohibit all ocean dumping of dredged material for many ports. The AAPA urges that this approach of allowing "no deregulation" be abandoned.

The present provisions of the MPRSA prohibit only "unreasonable degradation" (Sec. 102(a), 103(a), 4(d)). This standard should be retained. Whether or not, in a given case, adverse effects from ocean dumping of dredged material should be allowed is necessarily a "balancing" process, involving a consideration of all factors—pro and con—relating to the proposed dredging and disposal operation. In the case of the MPRSA, this "balancing" process should include consideration of the criteria to be established under Sec. 102 (which are to be applied to dredged material under Sec. 103), including a consideration of all factors affecting the "public interest."² The need for such a "balancing" has recently been affirmed by the United States District Court for the Southern District of New York in *City of New York v. EPA*, 15 ERC 1965 (S.D.N.Y. 1981). Maintaining the focus upon "unreasonable degradation" would also be consistent with the approach taken in the Ocean Discharge Criteria established pursuant to Sec. 403(c) of the Clean Water Act (3 USC § 1343(c)). 40 CFR Part 125, 45 Fed. Reg. 65942 et seq., October 3, 1980. This "balancing" process is not satisfied by a prohibition of any degradation (whether unreasonable or not) whenever there is any "feasible and prudent alternative" (as defined in Sec. 102(a)(4), pp. 8-9) to ocean dumping.³

Three additional changes are also needed in the concept of "degradation" in the Discussion Draft. The first is that "degradation" should not include all adverse effects, but should be limited to "significant" adverse effects. This would reflect real world concerns and would be consistent with the approach taken in the Ocean Discharge Criteria established under Sec. 403(c). 40 CFR § 125.121(e)(1), 45 Fed. Reg. 65953. Secondly, degradation should not include all instances where the dump site cannot naturally restore itself after the dumping is terminated. By the very nature of things, many dumping activities will cause some permanent change and prevent full natural restoration of the dump site. While this is a fact that may be taken into account in site designation or in the balancing process to determine "unreasonable degradation," it should not be used to prohibit issuance of an ocean dumping permit, per se. Third, "degradation" should not be broadly defined to include the prevention of any reasonable or customary use of the marine environment from being made.⁴ Such a provision would entail recognition of (and deference to) rights of use of other persons, as opposed to effects upon the intrinsic marine environment itself. Such considerations should be taken into account, if at all, only in the determination of "unreasonable degradation"—a balancing process involving consideration of the Sec. 102(a) criteria and including all factors affecting the "public interest".

The concept of "unreasonable degradation" could be incorporated into the Discussion Draft by substituting that term in place of "degradation" in Sec. 102(a)(2) and Sec. 103(a), and by deleting the proposed definition of "degrade" (Sec. 3(m), p. 3) and substituting in lieu thereof the following definition of "unreasonably degrade"⁵:

(m) "Unreasonably degrade", when used in the context of this Title, means that the dumping will have the following effects: (1) a significant and unacceptable adverse effect on human health, welfare, or amenities; or (2) a significant and unac-

² In part B(1) of this statement, the AAPA proposes appropriate amendment of section 102 (or alternatively amendment of sec. 103) to require a consideration of all "public interest" factors.

³ Section 7 of the Discussion Draft ("Miscellaneous Amendments"), p. 16, would define "unreasonably degrade" in this manner.

In the balancing process proposed by the AAPA, the existence of "feasible and prudent alternatives" (as proposed to be defined by the AAPA in part B(2), *infra*) would be a factor to consider as part of the section 102 criteria in determining "unreasonable degradation" and the "public interest."

⁴ Any provision of this nature would necessarily require some limitation as to the "significance" of the past use. It should also include such historical uses as past utilization of the area as a disposal site for dredged material.

⁵ The concept of "unreasonable degradation" might also be implemented through use of the definition of "unreasonably degrade" in Section 7 of the Discussion Draft ("miscellaneous amendments"), provided the "criteria" to be applied in determining whether a "feasible and prudent alternative" exists are changed as suggested by the AAPA in part B(2) of this statement.

ceptable adverse effect on marine environment, ecological systems, or economic potentialities, and, after a consideration of the criteria established pursuant to Sec. 102(a)(3), the Administrator or the Secretary, as the case may be, concludes that the dumping would not, on balance, be in the public interest."

Reliance upon the concept of "unreasonable degradation" is also necessary to avoid the overt bias against ocean dumping proposed in the Discussion Draft. This bias is evident in the prohibition against dumping if there is any alternative which offers an equal or lesser adverse impact (regardless of comparative considerations of "costs"), or if there is any alternative which is cost-effective and energy efficient (without any consideration of relative adverse impacts). This bias, in the case of dredged material, wholly ignores the data and experience developed over the past several years which indicate that the effects of ocean disposal upon the marine environment are not nearly as adverse as had originally been believed. This has prompted a recent call for a "holistic" approach to waste management, under which ocean dumping would receive equal consideration with all other means of disposal as part of an overall waste management strategy. This was the recommendation of the Special Report to the President and the Congress presented by the National Advisory Committee on Oceans and Atmosphere [NACOA] (January 1981)⁶, entitled "The Role of the Ocean in a Waste Management Strategy". It was also the conclusion reached in a recent study prepared by Dr. Robert M. Engler, United States Army Corps of Engineers, Waterways Experiment Station, Environmental Laboratory, Vicksburg, Mississippi, entitled "Impacts Associated with the Discharge of Dredged Material: Management Approaches"; and in the paper recently prepared by Dr. Willis E. Pequegnat, as special consultant to the International Association of Ports and Harbors (the IAPH), entitled "Special Care Methods in the Disposal of Polluted Dredged Material." Dr. Pequegnat's paper was presented by the IAPH to the Ad Hoc Scientific Group of the London Dumping Convention (the "Convention") (to which the United States is signatory) and has received favorable comment and approval, on a test basis, by both the Scientific Group and the Contracting Parties at the Sixth Consultative Meeting held in London, England, during October 1981.

On the basis of these recent data, the EPA has also announced its intention to commence additional rulemaking to revise and amend the current Sec. 102 criteria to reflect recent advances in knowledge concerning the effects of ocean dumping.⁷ This developing experience with ocean dumping of dredged material, and the emerging scientific consensus for equal consideration of dumping at sea, should be recognized—not ignored—in these reauthorization proceedings.

B. THE CRITERIA APPLIED IN EVALUATING DREDGED MATERIAL PERMITS

(1) *The Evaluation Criteria of Section 102(a)(3).*—Under Sec. 102(a)(3) of the Discussion Draft, the Administrator is required to establish and apply criteria for reviewing and evaluating applications for permits under Sec. 102, including (but not limited to) his consideration of the factors specified in Sec. 102(a)(3)(A)–(D). Under Sec. 103(a), the Secretary is required to apply these criteria in evaluating dredged material permits. It is on the basis of these criteria that the Administrator, or the Secretary, as the case may be, is to determine whether "degradation" of the marine environment will occur from the proposed dumping. These criteria are also to be taken into account by the Administrator in his analysis of environmental effects in connection with designation of sites for ocean dumping. (Sec. 102(c)(1), pp. 9–10).

In connection with the AAPA's recommendation that amendments to the MPRSA continue to focus upon "unreasonable degradation" (based upon a balancing process utilizing the Sec. 102 criteria), the AAPA urges that the provisions of Sec. 102(a)(3) relating to the criteria be changed to require a consideration of all factors effecting the "public interest" as the basis for determining whether "unreasonable degradation" will occur and for dumpsite designation. Such a change is necessary in the Discussion Draft because Sec. 102(a)(3) would rely solely upon "environmental" concerns in making these determinations.⁸

⁶ This Special Report was prepared and submitted in response to NACOA's legislative mandate, Public Law 95-63, to undertake a continuing review, on a selective basis, of national ocean policy, coastal zone management, and the status of the marine and atmospheric science and service programs of the United States.

⁷ Environment Reporter [BNA], Current Developments, May 30, 1980 (p. 146) and January 23, 1981 (p. 1809).

⁸ The Discussion Draft quite openly proposes to delete "the need for the proposed dumping" from the current provisions of Sec. 102(a)(A), as one of the factors to be considered in the criteria.

A similar change is also necessary in the current wording of Sec. 102(a). The present criteria established by the EPA under Sec. 102 (40 C.F.R. Part 227, 44 Fed. Reg. 2462 et. seq., January 11, 1977) base the crucial determination of "acceptability" of dredged material for ocean dumping entirely upon environmental factors, i.e., whether the results of laboratory bioassay and bioaccumulation testing indicate a "potential" for "significant undesirable effects". (40 C.F.R. § 227.6, 42 Fed. Reg. 2477-2478). The past experience of ports under this standard highlights its unreasonableness and the need to amend Sec. 102(a) to require a consideration of all "public interest" factors in the issuance of dredged material permits.⁹

To rely upon environmental concerns to the exclusion of all other public interest factors is inherently unsound and falls far short of the duty to consider the interests and welfare of the public as a whole. The determination of whether adverse effects from dumping may be "significant", or whether "degradation" should be considered "unreasonable", is necessarily a value judgment which requires consideration of all relevant factors—not just environmental concerns, but social, political, and economic needs and conditions as well. This consideration is especially necessary in the case of ports because of the "public" status of most ports and the "public interests" which ports serve.

Strong policy reasons also militate against any provision which would prohibit proposed ocean disposal of dredged material irrespective of the overall "public interest". To ignore such considerations would, in effect, grant to the agencies involved the absolute right to determine and define the public interest—in advance and in every case—solely on the basis of narrow, environmental concerns.

Reliance upon environmental concerns alone also ignores the need—rooted in the requirement of due process of law—that an opportunity be afforded a permit applicant to demonstrate that issuance of a permit, even considering the anticipated "adverse effects", would be appropriate and serve the "public interest" in a given case. As the Court pointed out in *WAIT Radio v. FCC*, 418 F.2d 1153, 1157-1158 (D.C. Cir., 1969):

" . . . That an agency may discharge its responsibilities by promulgating rules of general application which, in the overall perspective, establish the 'public interest' for a broad range of situations, does not relieve it of an obligation to seek out the 'public interest' in particular, individualized cases. . . . A general rule, deemed valid because its overall objectives are in the public interest, may not be in the 'public interest' [in other cases] . . ."

See also, *Southwest Pennsylvania Cable T.V., Inc. v. FCC*, 514 F.2d 1343, 1347 (D.C. Cir. 1975); and *Community Service, Inc. v. United States*, 418 F.2d 709, 712 (D.C. Cir. 1969). The need to allow an "exception" or "departure" from any general prohibition against "degradation" when circumstances (e.g., the "public interest") warrant it is a necessary adjunct of the permit process. *United States v. Allegheny-Ludlum Steel Corporation*, 406 U.S. 742, 755, 32 L.Ed. 2d 453, 464; and *EPA v. National Crushed Stone Association*, 101 S. Ct. 295, 301 (1980), citing *E. I. Dupont de Nemours and Co. v. Train*, 430 U.S. 112, 128, 51 L.Ed. 204, 217 (1977).

There is a strong need to amend the MPRSA to require a consideration of all factors affecting the "public interest" in determining the "acceptability" of a proposed ocean disposal of dredged material. In the case of the MPRSA, this change could be accomplished in either of two ways.

First, Sec. 102(a) could be amended by striking out the provision that provides: " * * * The Administrator shall establish and apply criteria for evaluating such permit applications, and, in establishing or revising such criteria, shall consider, but not be limited in his consideration to, the following: * * *" and by substituting in lieu thereof the following provision (new language italicized):

" * * * The Administrator shall establish and apply criteria for reviewing and evaluating such permit applications, *which criteria shall determine the acceptability of the proposed dumping based upon a consideration of all factors affecting the public interest, including but not limited to the following: * * **"

The above amendment would require the criteria established by the Administrator to base the permit decision upon a consideration of all public interest concerns, including the listed statutory factors. This would preclude the use of any one concern—e.g., environmental concerns—as the sole basis for determining "acceptabil-

⁹ The shortcomings of attempting to rely solely upon laboratory test results as a basis for permit decisions were described in great detail by the AAPA in previous testimony before the Committee on Merchant Marine and Fisheries, Mar. 14, 1980, in the consideration of H.R. 6361 ("A Bill to Amend the Marine Protection Research and Sanctuaries Act of 1972 in Order to Suspend Temporarily the Use of Bioaccumulation and Biomagnification Testing in the Applications Relating to Ocean Dumping of Dredged Material, and for Other Purposes").

ity". It would also allow for continued consideration of all relevant environmental concerns as "factors" to be taken into account in the overall assessment of "acceptability".

A second means of amendment would be to leave the Sec. 102 criteria unchanged insofar as they relate to material other than dredged material and to amend Sec. 103(b) to delete the requirement that the Corps apply the Sec. 102 criteria in the evaluation of dredged material. Instead, the Corps would independently consider the statutory factors listed in Sec. 102(a) (A)-(I), along with all other public interest factors relevant to the determination. This would establish a separate procedure for the evaluation of dredged material. This change could be accomplished by striking out the provision of Sec. 103(b) that provides:

"In making the determination required by subsection (a), the Secretary shall apply those criteria, established pursuant to section 102(a) of this title, relating to the effects of the dumping * * *" and by substituting in lieu thereof the following provision (new language italicized):

"In making the determination required by subsection (a), the Secretary shall *consider the factors specified in section 102(a) (A)-(I) of this title, along with all other factors affecting the public interest * * **"

This change would also require conforming amendments to Sec. 103(c) and 103(d) to delete the reference to "compliance (and non-compliance) with the criteria" and to refer instead to the "Administrator's objection to the determination of the Secretary under subsection (a)" and to refer to a "waiver of objection" rather than to a "waiver of compliance."

The two changes described above would also properly require a further amendment to Sec. 103(d) to require appropriate consideration of all public interest factors by the Administrator in making any determination to deny a request for a "waiver" submitted by the Corps. It would require amendment of Sec. 103(d) to include the following italicized language:

"(d) * * * 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, shellfish beds, wildlife, fisheries (including spawning and breeding areas), or recreational areas, *and that such effect is dominant over other factors affecting the public interest, he shall grant the waiver.*"

In connection with any listing of factors to be included in the Sec. 102 "criteria," the AAPA also urges the Subcommittee to retain the current consideration (in Sec. 102(a)(A)) of "the need for the proposed dumping," and to require consideration of (i) the costs, and economic, commercial, and governmental impacts and conditions, associated with the proposed dumping, (ii) mitigative measures (e.g., "special care" measures) which may be utilized in the dumping, and (iii) the existence of "feasible and prudent alternatives" to the dumping (as proposed to be defined by the AAPA in Part B(2) of this Statement).

(2) *The "Prudent and Feasible Alternative" Criteria of Sec. 102(a)(4).*—Sec. 102(a)(4), pp. 8-9, of the Discussion Draft establishes "criteria" to be applied in determining whether a "feasible and prudent alternative" to ocean dumping exists in connection with the permit decisions to be made under Sec. 102(a)(B) and Sec. 103(a)(2). The criteria provide that such an alternative exists where the probable adverse impact of alternative locations or methods of disposal " * * * is less than or equal to the impact of the dumping" (presumably without any consideration of comparative "costs"), or where an alternative location or method of disposal can be utilized " * * * at reasonable cost and energy expenditures" (presumably without regard to comparative impacts). The fact that ocean dumping may cost less, or be less difficult to implement, is not a reason, in itself, for determining that alternative means are neither prudent nor feasible.

The AAPA vigorously objects to this biased treatment of ocean dumping insofar as it applies to dredged material. Such a bias is unwarranted and is squarely at odds with the developing scientific evidence as to the effects of ocean disposal, and the emerging scientific consensus that ocean dumping should be considered on an equal basis with other means of disposal. See Part A, supra.

There is no justification for requiring use of alternative means of disposal solely on the basis of comparative impacts without regard to cost, or solely on the basis of "reasonable cost and energy expenditures" without regard to comparative impacts. A "rule of reason" is required which will take into account, and properly balance, both comparative impacts and costs. This is the approach taken in the Ocean Water Act (40 CFR § 125.121(d), 45 Fed. Reg. 65953 and 659546).

In the case of the Discussion Draft, this result could be achieved by changing Sec. 102(a)(4)(A) and (B) to provide that a "feasible and prudent alternative" exists only when (i) the ocean dumping of dredged material will have significant adverse im-

pacts upon the marine environment, (ii) the alternative means of disposal will have a lesser adverse impact than ocean dumping, and (iii) the alternative means of disposal can be utilized at a reasonable cost and energy expenditure. A statement of these criteria in the conjunctive is essential to a standard of "reasonableness".

(3) *The "Trace Contaminants" Problem of Sec. 102 (a)(1)*.—Sec. 102(a)(1), pp.4-5, prohibits dumping of any materials which, on the basis of chemical and toxicological testing, are found to contain more than "trace amounts" of certain designated substances which are listed in Annex I to the London Dumping Convention. It is unclear whether this "trace amounts" provision is intended to apply to dredged material, since there is no mention of Sec. 102(a)(1) in Sec. 103. If it is intended to apply, the AAPA submits that changes are required in the provision for a number of reasons.

(a) Use of the term "trace amounts", without providing a definition of the term, will only invite controversy and litigation. If the experience of the past has taught anything at all, it is that use of this undefined term will present recurring permit delays and threats of permit denial based upon the asserting that more than "trace amounts" of the specified substances are present.

(b) The proposed language would also base the determination of "trace amounts" solely on "chemical and toxicological testing." In view of the absolute prohibition where more than "trace amounts" are found, such a critical determination should not be based solely on numerical test results, but should be made in the context of the entire permit application and should be related to the presence of Annex I substances in such quantities as to cause "unreasonable degradation." Indeed, if the material to be dumped contains Annex I substances but nevertheless will not cause "unreasonable degradation", then there is no sound reason for prohibiting the dumping at all.

The difficulty in relying upon test procedures alone in making the "trace amounts" determination was described in great detail by the AAPA in testimony before the Committee on March 14, 1980, in hearings upon H.R. 6361. See Part A, p. 13 note 9, supra. In that testimony, the AAPA pointed out that neither the London Dumping Convention nor its Annexes require the use of any specified test procedure in making this determination. Most other countries utilize an overall "risk assessment" based on all relevant data and information, much the same as the "unreasonable degradation" determination recommended by the AAPA.

(c) Because the reference to "trace amounts" is derived from the Convention, some parties—notably the National Wildlife Federation (the "NWF")— may assert (as the NWF has asserted in the past) that when the results of testing indicate more than "trace amounts" of "Annex I substances", the Convention prohibits the granting of a permit independently of the MPRSA and, more importantly, prohibits the Administrator from granting, upon request of the Secretary, a waiver of compliance with the criteria under Sec. 103(d). This "asserted conflict"¹⁰ between the Convention and Sec. 103(d) of the MPRSA can be avoided by providing that the "trace amounts" determination will be made as part of the overall determination of "unreasonable degradation"—a form of the risk assessment used by other Contracting Parties to the Convention. The AAPA also urges that any doubt as to the availability of a waiver under Sec. 103(d) be removed by providing that the "trace amounts" prohibition is " * * * subject to the provisions of Sec. 103(d)."

(d) The AAPA also submits that any "trace amounts" prohibition should contain an exclusion where Annex I substances are "rapidly rendered harmless" by physical, chemical, or biological processes in the sea, or where, through the use of "special care" measures in disposal, polluted dredged material can be dumped without "unreasonable degradation" of the marine environment. Both exclusions apply under the Convention.¹¹

The concerns expressed in (a)-(d) above could be satisfied by adding the following definition of "trace amounts" to Sec. 102(a)(1)(E) of the Discussion Draft (p. 5):

¹⁰ In the previous testimony of the AAPA before the Committee on March 14, 1980, the AAPA demonstrated that there is, in fact, no conflict between the waiver provisions of section 103(d) and the convention. See AAPA Prepared Statement, pp. 42-46. Moreover, to the extent that a conflict were to exist, the MPRSA would clearly prevail since it is later in date than the convention. *Chew Heong v. U.S.*, 112 U.S. 536 550, 28 L. Ed. 770 774 (1884); *Chae Chan Ping v. U.S.* (the *Chinese Exclusion case*), 130 U.S. 581, 600-601, 32 L.Ed. 1068; and *Reid v. Covert*, 354 U.S. 1, 18, 1 L.Ed.2d 1148, 1164 (1957).

¹¹ The "rapidly rendered harmless" exclusion is provided in paragraph 8 of Annex I to the Convention. The use of "special care" measures in the dumping of Annex I substances was approved by the Ad Hoc Scientific Group and by Contracting Parties, on a test basis, at the Sixth Consultative Meeting. See Part A, supra.

"Subject to the provisions of Sec. 103(d), 'trace amounts' when used in the context of this section means the presence of constituents in the material to be dumped in quantities and concentrations that will not be rapidly rendered harmless upon disposal and that, notwithstanding the use of 'special care' measures in dumping or site designation, will cause 'unreasonable degradation' of the marine environment"

C. Final Site Designation and Permit Conditions.—Sec. 102(c)(1), pp. 9–10, of the Discussion Draft provides for the Administrator's designation of sites for ocean dumping. Sec. 103(b)(3), p. 12, further provides that a dredged material permit may be granted only at a site designated by the Administrator under Sec. 102(c)(1). Under Sec. 8(c), pp. 12–18, this final designation requirement also applies to present dumpsites that have only interim designation.

Under Sec. 102(c)(1), no site designation may be made until the Administrator "undertakes and completes" an analysis of the environmental effects which will likely result from the dumping. Sec. 102(c)(3) further requires the Administrator to "continuously monitor" the effects of dumping at designated sites, a burden which Sec. 104(b)(3), p. 14, proposes to impose upon the permit applicant in the form of a "special fee" to carry out these activities.

The AAPA submits that these site designation requirements are unreasonable and should be changed for a number of reasons.

First, to prohibit ocean dumping until final site designation, with no provision for interim use of a site prior to completion of site studies, may work an unintended hardship upon affected ports in the event that the Administrator is not able to complete final site designation in time for needed port dredging activities to be carried out. This concern, the AAPA submits, is a very real one, since these site designation requirements are proposed at a time of massive budget and manpower restrictions on the part of the various Federal agencies involved. Coupled with these restraints is the likelihood of a significant increase in dredging activity, especially in connection with the many proposals for the deepening of major channels to 55 feet to accommodate increased coal shipments in the future. The cumulative effect of these factors is to make the proposed site designation requirements wholly unrealistic.

The requirement for "completion" of analysis of environmental impacts at the site may also raise an issue as to when a site study is "complete". Some may insist that site studies are never "complete". This could result in interminable delays in site designations, to the detriment and hardship of affected ports. This concern might be remedied by providing that "completeness" shall be determined by the Administrator; or by establishing fixed deadlines for the completion of site designations, with provision for interim use of a site by affected ports if the Administrator is not able to complete the site designations in a timely manner.

The imposition of "continuous monitoring" costs in the form of a "special fee" will also seriously impact ports. Because of the "public" nature of most ports, and the funding limitations inherent in their status as "public bodies", the unqualified imposition of such additional costs would be unreasonable and, in many cases, might well prevent the orderly conduct of needed port operations. The proposal for such additional costs is also particularly ill-timed, when the current Administration is seeking to impose "cost sharing" upon ports for new construction and operation and maintenance dredging activities. Ports can not afford the imposition of still further charges for environmental fees and monitoring. Again, if experience is to be a teacher, the lesson to be learned is that requirements for environmental studies very frequently are urged and argued to the point of requiring virtual "blank checks" for compliance—a requirement with which AAPA member ports simply cannot live.

If a continuous monitoring requirement is to be imposed upon ports as a "special fee", provision should be made that the amount and appropriateness of such a fee shall be determined in each case by the Administrator, after a consideration of all relevant factors relating to the effect of such fee upon the affected port and its operations.

Sec. 104(c)(2) of the Discussion Draft, p. 15, would require, as a condition to an interim permit (i.e., a permit for dumping which will cause "degradation" of the marine environment but for which there is not "prudent and feasible alternative"), that to the maximum extent practicable the permittee ensure that reasonable and accustomed use of the marine environment will continue and that the site will be able to restore itself to its environmental, ecological, esthetic [sic] and economic posture in effect before the dumping commences. The AAPA has previously urged that such provisions be deleted from the concept of "degradation" under the MPRSA. (See Part A, supra). Such requirements would impose significantly greater costs upon affected ports for purposes which go beyond protection of the marine environment from "unreasonable degradation" and seek to enforce a policy of "no degrada-

tion." For reasons previously stated herein, such a policy is unwarranted and unreasonable, and is unsupported by the experience with ocean dumping to date.

Much the same is true for the proposed requirement of Sec. 104(c)(2)(C), p. 16, that the permittee take affirmative steps to develop alternatives to ocean dumping, or plans for reducing or eliminating contaminants in the dredged material or for recycling of the material. Such requirements establish a bias against ocean dumping that is unsupported by recent experience, and would impose added costs upon ports which would go far beyond protection of the marine environment from "unreasonable degradation."

The restriction of final site designations to 6 years (Sec. 102(c)(2), p. 10), and the limitation of interim permits to 12 months (Sec. 102(c)(2)(A), p. 15), will also seriously impact needed port operations. Ports will not have the assurance of long term usage necessary to allow capital investments in maintenance dredging equipment.

D. Compliance with the London Dumping Convention.—In Part B above (in the discussion of the "trace amounts" issue), the AAPA pointed out the past assertion by the National Wildlife Federation that the London Dumping Convention imposes independent requirements relating to ocean dumping which override the provisions of the MPRSA. The NWF has asserted that where substances listed in Annex I of the Convention are present as other than "trace contaminants"—a determination which, under our domestic criteria, is presently made solely on the basis of laboratory tests not used by other countries—the Convention not only prohibits the disposal at sea, but also prohibits the grant of a "waiver of compliance" under Sec. 103(d).

This assertion is wrong. The Convention is not self-executing. It requires enabling legislation on the part of Contracting Parties. In the case of the United States, the enabling legislation is the MPRSA. Sec. 103(d) of this enabling legislation provides, in appropriate circumstances, for the grant of a "waiver" of compliance for the ocean dumping of dredged material. The Convention has no independent force and effect which would override Sec. 103(d).

In this Statement, the AAPA urges the Subcommittee to recognize this role of the MPRSA in implementing the Convention and to avoid any assertion of conflict between the two by deleting the provision of Sec. 102(a) that provides:

"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"; and by inserting in lieu thereof the following provision: "The action of the Administrator or the Secretary, as the case may be, in issuing a permit under Sec. 102(a) or Sec. 103(a) of this Title, or in issuing a waiver of compliance under Sec. 103(d) of this Title, shall satisfy the standards and criteria binding upon the United States under the Convention, including its Annexes."

CONCLUSION

In this Statement, the AAPA has described numerous respects in which amendments to the MPRSA proposed in the Discussion Draft would have a devastating impact upon AAPA member ports. In order to avoid such effects, and with a view to implementing much needed changes in the MPRSA, the AAPA has recommended specific amendments which would accommodate and satisfy major port concerns. The need for these changes has never been more urgent. No less than our National interest and world position is at stake. The AAPA asks the Subcommittee to give its serious consideration to the recommendations presented herein.

Mr. BREAUX. Thank you, Colonel Haar and Mr. Brinson, for your presentations.

I take it, Mr. Brinson, when you start off in your testimony you mentioned the corps study that was done, the 5-year dredge material research program, something I need to be more aware of myself as to what it really concluded.

You say that one of the conclusions reached during the corps 5 years of dredged material research was that the environmental impacts of most disposal operations, especially open water ones, are not as severe as had been generally believed. What are some of the other conclusions that might have been drawn from that study?

Mr. BRINSON. We don't mean to oversimplify the conclusions of this very detailed work, Mr. Chairman, but I think on the bottom

line what this study showed was that properly managed dredge disposal does not have to be an environmentally harmful function.

Mr. BREUX. I think that is clear. If you are dredging and disposing of nontoxic dredge material you don't have a problem. If, on the other hand, you are picking up dredge material that has toxins in it, you can create a large number of problems.

Mr. BRINSON. We have a written summary of those findings and our observations on them. We would be happy to provide them to the committee.

Mr. BREUX. I would like to have the summary for my personal review and we can make it part of the record.

[The information follows:]

SYNTHESIS OF RESEARCH RESULTS—DREDGED MATERIAL RESEARCH PROGRAM,
DECEMBER 1978

At the beginning of this decade, the concern over the environmental impacts of dredging to maintain navigable waterways and harbors and the disposal of the dredged material reached the stage where Federal legislation was necessary. However, it was recognized that the technical base on which the initial legislation was based was inadequate—existing information was limited to site-specific studies that permitted only inferences that the open-water disposal of polluted dredged sediments presumably must be harmful to the environment. It was in this context that the need for a comprehensive nationwide research program was recognized and authorized by Congress (Public Law 91-611).

Responding to this need for more basic information on all types of dredged material disposal and possible alternatives to existing methods, the Corps of Engineers undertook the Dredged Material Research Program (DMRP) via the Waterways Experiment Station in Vicksburg, Mississippi. Initiated in 1973, the DMRP was accomplished in the planned 5-year time frame at a cost of \$32.8 million. Highly interdisciplinary in nature, it was a tightly managed, basically contracted (70 percent of total research funds), extensively coordinated effort involving more than 250 individual studies. These consisted of a planned and phased mixture of conceptual, laboratory, and field studies in association with routine Corps projects designed to understand the processes and mechanisms involved in environmental impacts. To an extent not possible previously, this generic approach was intended to permit the development of much-needed methods for predicting effects before a project is carried out or a permit issued under regulatory functions.

The DMRP was designed to be as broadly applicable as possible on a national basis with no major type of dredging activity or region or environmental setting excluded. It thus resulted in methods of evaluating the physical, chemical, and biological impacts of a variety of disposal alternatives—in water, on land, or in wetland areas—and produced tested, viable, cost-effective methods and guidelines for reducing the impacts of conventional disposal alternatives. At the same time, it demonstrated the viability and limits of feasibility of new disposal alternatives, including the productive use of dredged material as a natural resource.

Before summarizing the more significant findings of the DMRP, it is important to note that extensive efforts were taken to ensure effective information dissemination and technology transfer. In addition to a wide variety of publications designed to meet the varying requirements of different audiences, the technical staff that managed the DMRP repeatedly briefed Corps and non-Corps personnel at all levels throughout the nation and participated in several interagency coordinating and planning committees. Of greater significance were the efforts to incorporate research results into Corps regulations and operating procedures and into the criteria and guidelines developed for regulatory programs. In the latter case, both the Section 103 (Public Law 92-532) and 404 (Public Law 92-500) programs for ocean and inland water protection have profited from results of the DMRP and will continue to do as efforts progress to prepare technical implementation manuals for both programs.

To those concerned with national or regional planning and policy formulation, there are two extremely important fundamental conclusions that can be drawn from the DMRP. The first is that there is no single disposal alternative that presumptively is suitable for a region or a group of projects. Correspondingly, there is no single disposal alternative that presumptively results in impacts of such nature

that it can be categorically dismissed from consideration. Put in different terms, there is no inherent effect or characteristic of an alternative that rules it out of consideration from a technical standpoint prior to specific on site evaluation. This holds true for open-water disposal, confirmed upland disposal, habitat development, or any other alternative.

Specific on-site evaluations mean that each project must be considered on a case-by-case basis. It is not technically sound, for example, to make the general statements that ocean disposal must be phased out or that all material in the Great Lakes classified as polluted must be confined behind dikes. To do this would be contrary to research results that have indicated that there can be situations where there is greater probability of adverse environmental impacts from confined disposal than from open-water disposal. Yet, in other situations such as when certain types of contaminants are present, confined disposal may provide the greatest amount of environmental protection.

Implications of this conclusion from a management point of view are fully recognized. Case-by-case evaluations are time consuming and expensive and may seriously complicate advanced planning and funding requests. Nevertheless, from a technical point of view, situations can be envisioned where tens of millions of dollars may have been or could be spent for alternatives that contribute to adverse environmental effects rather than reduce them.

The second basic conclusion is that environmental considerations are acting more strongly than possibly any force to necessitate long-range regional planning as a lasting, effective solution to disposal problems. No longer can disposal alternatives be planned independently for each dredging operation for multiple projects in a given area. While each project may require a different specific solution, the interrelationships must be evaluated from a holistic perspective and thought given to when particular disposal alternatives may have to be replaced with others as conditions change. Regional disposal management plans not only offer greater opportunities for environmental protection ultimately at reduced project cost, but also meet with greater public acceptance once they are agreed upon.

Considering first the specific findings with regard to the effects of open-water disposal, the physical effects—the logical and easily predicted physical effects—are with few exceptions more important than chemical or biological effects. Physical effects include the smothering of a clam bed, the disruption of a flow pattern, a change in salinity, or a similar effect. These possible consequences of disposal operations are persistent, often irreversible, and compounding. However, they are infrequent and can be avoided with the judicious application of evaluative procedures available under guidance for the Section 404 and 103 programs. More intense evaluations of physical impacts traditionally have relied on physical hydraulic models, but the DMRP developed mathematical models that can also be used for certain needed predictions. Specifically, a partially verified and tested math model is now available to predict the short-term fate or dispersion of barge and hopper dredge dumped material as well as pipeline dredged material in ocean, estuarine, lake, and river environments. An unverified sediment transport model for the long-term and ultimate fate of these deposits is now available.

Contrary to much public, scientific, and governmental opinion, the deep ocean, when analyzed in a detailed objective fashion, is not everywhere a fragile environment totally unacceptable for dredged material disposal. A significant contract study concluded that, should the economic and technological aspects be favorable, extensive deep ocean areas are more environmentally acceptable for disposal than are some highly productive continental shelf areas, especially for contaminated materials.

Turning to inland and coastal areas, the DMRP achieved definitive results that soundly substantiate that most widely held fears over the short-term release of contaminants to disposal site waters are unfounded. As long as the geochemical environment is not basically changed, most contaminants are not released from the sediment particles to the water. However, in contrast, upland disposal often does result in a change in the geochemical environment that can lead to contaminant release. Some nutrients such as ammonium and manganese and iron are released in open-water disposal, but in most cases enough mixing is present to rapidly dilute these to harmless concentrations. Situations where toxic effects could occur would most likely be where pipeline dredges are discharging large volumes of material into very shallow estuarine waters.

The difficult problem of the effects of turbidity or suspended sediment particles on both water quality and aquatic organisms was addressed with significant results. It was found that, except in unusually environmentally sensitive areas such as coral reefs, turbidity is primarily a matter of aesthetic impact rather than biological

impact. It is, of course, often advisable to schedule dredging and disposal operations to avoid disrupting spawning activities and fish migrations. However, studies showed that most adult organisms can tolerate turbidity levels and durations far in excess of what dredging and disposal operations produce. These studies, conducted in the laboratory and verified in the field, involved a variety of marine, estuarine, and freshwater organisms.

With regard to benthic or bottom-dwelling organisms, their resiliency, once beyond the larval stage, was demonstrated. Disposal sites can be and are rapidly recolonized by the establishment of new populations, by migration of organisms from adjacent unaffected areas, and by survival of the organisms buried. Colonization by opportunistic species can occur within weeks and by the original species within months. When the type of dredged material disposed at a site is of the same grain-size distribution as the natural bottom (e.g., sand deposited on sand or silt on silt), survival of existing organisms is maximized. Conversely, a mismatch of sediment type can be quite detrimental. The condition that could be most injurious to benthic organisms is when the disposal operations, primarily hydraulic pipeline operations, produce a fluid mud or "fluff" layer that is a difficult and alien environment for many organisms.

It was shown that certain aquatic organisms will uptake chemical contaminants from dredged material. However, the patterns of uptake were found to be unpredictably erratic and there were no clear trends.

Different types of organisms will uptake different quantities of contaminants such as heavy metals depending on an apparent variety of environmental and biological factors. The complexity of this process and the low level of predictive capability have been controlling factors in the decisions that bioassays must be an integral part of the evaluative criteria used in implementing the Section 404 and 103 programs. It is fully realized that bioassay tests are expensive and time consuming, but the state-of-the-art allows no effective alternative for determining how organisms will be affected by contaminated dredged material.

Determining the effects of open-water disposal has been somewhat like trying to strengthen a chain. Once the weakest link is found and strengthened, attention is necessarily then directed to the next weakest link. Major DMRP field studies of open-water disposal sites strengthened several links. They verified several major laboratory findings and showed that short-term impacts are quite brief and are not of major environmental significance. These indeed can occur, but are certainly going to be the exception rather than the rule. In addition, studies have called attention to situations where open-water disposal has even had beneficial environmental effects and have identified operational procedures that can be used to reduce impacts without new technology or major cost increases.

The next weakest link in the strengthened chain involves long-term biological impacts. Certain selected field test sites will be monitored for 3 years beyond the end of the DMRP to provide some much-needed information on this subject; however, many answers still will not be forthcoming. Among these will be ones relating to chronic or sublethal effects of very long-term exposure of benthic organisms to contaminated material and effects on reproduction.

Thus far, mention has been made primarily of assessing the effects of open-water disposal and very little about controlling or mitigating effects when they occur. This aspect was not overlooked, and even when an effect was found to be an unlikely event, it was presumed there could be instances where control or regulation would be advisable for one reason or another. A good example is turbidity. Even though adverse biological effects are highly unlikely, there may be reasons why excess turbidity should be minimized. One study called attention to how simple equipment maintenance and efficient operation can reduce turbidity and another extensively evaluated and developed guidelines of using silt curtains or "diapers," pointing out when they can be effective and when they will only mask the problem and not alleviate it. For example, silt curtains are ineffective where currents exceed 1 knot and will be both ineffective and uncontrollable under moderate wave conditions.

The DMRP included considerations of dredging equipment development in very few cases as this was largely beyond its scope. However, because of the peculiar nature of the problem of turbidity, a concept was developed for the submerged discharge of material from a hydraulic pipeline dredge through a specially designed underwater diffuser. Model tests of the diffuser showed it has excellent potential for reducing turbidity as well as for reducing the extent of the potentially harmful fluid mud layer that so often develops.

On a related subject, various studies considered the feasibility of treating contaminated dredged material to reduce the impact of disposal operations. Because of the large volumes and variable nature of the material involved and the very low con-

centrations of contaminants, most conventional treatment processes are infeasible, particularly when considered for use in the dredging operation itself. Some processes are feasible for confined disposal facilities and are discussed later. However, with regard to open-water disposal, only in-line oxygenation to reduce the dissolved oxygen sag accompanying disposal of certain kinds of material being moved by a pipeline dredge appears operationally and economically practical. The use of flocculents to reduce turbidity in an open-water disposal situation is not effective or practical in most situations.

No studies directly addressed the issue of hopper dredge overflow as this is not a disposal problem per se. Nevertheless, program results do shed some light on this matter since turbidity from overflow is no different from that resulting from other dredging-related causes. In many, in not most, cases, this practice should result in no significant impact; however, there is an element of risk involved since the fine-grained materials overflowed are the ones that contain the relatively highest contaminant loads. The negative public image of this practice is widespread and there can be situations where aesthetic impacts are more important than biological impacts. A study of foreign dredging practices and technology showed that there is a simple and inexpensive technique developed in Japan that shows promise for significantly reducing the amount of surface turbidity associated with hopper dredge overflow.

Confined or diked containment of dredged material as a conventional alternative was also extensively investigated. Confining contaminated material on land or in shallow water next to land can be an environmentally sound and preferred alternative, but not inherently better than open-water disposal for several reasons. There are technical reasons why confined disposal could be less effective in protecting water quality or organisms. These include the change in the geochemical environment that could lead to an enhanced release of contaminants and the difficulty in retaining the finer grained particles in environmental settings where they are likely to have greater impact when released (e.g., wetlands or small streams). Also, it should not be overlooked that confined facilities are expensive, of finite life, and result in a permanent change in the physical landscape, often in conflict with land-use and management plans.

Irrespective of the alternative decision, if a confined disposal area is to be constructed, it must be designed, built, and operated in such a way as to achieve maximum effective capacity and satisfactory effluent quality. Unfortunately, historically, neither of these basic objectives has been met by most of the facilities that have been built. These objectives are by no means mutually incompatible and the reasons they have not been met involve lack of technical knowledge as well as policy and institutional factors such as cost, funding sources, and diffused construction and management responsibilities.

The DMRP developed and issued in report and manual form a variety of guidance and information that should largely alleviate the technical knowledge limitation. No longer is it necessary to rely primarily on "rules of thumb" and personal experience. Specific guidelines were prepared for designing containment areas with appropriate storage capacities, surface areas, and shapes; designing and building dikes; designing and placing inflow pipes and weirs; selecting equipment for operating in disposal areas; landscaping containment areas; and controlling problems such as mosquito breeding and noxious odors.

If a confined disposal site is to be effective from an environmental protection standpoint, it must be efficient in retaining a high percentage of the finer soil particles, for it is the clays and silts that carry the contaminants. These are admittedly the materials most difficult to retain in an area, but if they can be, the effluents should be essentially nontoxic except for occasional situations where nutrient levels and oxygen depletion may be excessive.

The guidance mentioned above contains specific information on how disposal site retention times can be maximized; however, there are cases where sites are simply incapable of providing adequate retention. Addressing these situations, studies found that coagulants and flocculents can be quite effective for effluent treatment, and treatment system design and operation guidelines were developed based on actual field tests. Studies also considered the principles involved in the land treatment of wastewater and concluded from a limited field test that the regulated discharge of disposal area effluents through a natural marsh can be effective in removing nutrients.

With time, the soil physicochemical environment in a confined disposal site can become appreciably different from that of sediments before dredging or sediments deposited in open water. The upland drained situation can lead to an oxidizing acidic environment that was shown in laboratory studies to be conducive to the

leaching of contaminants, particularly heavy metals. Whether or not the leachate will contaminate groundwater will depend on the absorptive capacity of the natural soil, which is normally quite high. A far more serious and more probable impact can occur when saline sediments are placed in a freshwater upland environment. Salt will leach from most dredged material and whether or not it will contaminate groundwater must be carefully evaluated on a case-by-case basis.

In terms of time, effort, and cost, the most expensive aspect of confined dredged material disposal can be the land acquisition. The DMRP included studies aimed at alleviating or lessening this problem. These dealt with methods to increase the storage capacity of existing sites and-or concepts for making existing sites reusable.

Field tests proved that it is possible to dewater even some of the more difficult types of dredged material so that disposal sites can store more sediment and less water. A side benefit of this dewatering is improved engineering characteristics of the densified material. Through field investigations and tests, surface trenching with an available surplus Marine Corps vehicle called the Riverine Utility Craft proved to be cheap and effective in providing natural drainage. Whereas more complex and even exotic dewatering methods such as underdrainage systems and electro-osmotic dewatering may be feasible where the cost can be justified, here is a case where the cheaper technique, relying heavily on nature, was shown to be generally the most effective.

Dredged material, particularly dewatered dredged material, has value for landfilling or in construction. Every cubic yard that can be removed from a containment area and used, donated, or sold offsite for any purpose is a cubic yard of new storage capacity gained. In conjunction with the Corps Districts, concepts were developed for disposal area reuse for both existing and planned disposal sites. Numerous possibilities exist for separating and handling materials in a site, and actual field situations have demonstrated that uses within the site for purposes such as haul road construction and dike raising are too often overlooked as completely viable concepts.

Dredged material is also a substance that can be used to create or improve wildlife habitats—examples of this already exist in nearly all parts of the country. However, it is known that the past occurrences were primarily accidental rather than planned. Realizing that even the most productive habitats sometimes can be out of place within an ecosystem, the DMRP concentrated on understanding the natural processes and developing guidelines on exactly what should be done, where and when, and what are the relevant considerations in all phases from site selection to follow-up management.

Certain basic studies were concerned with wetland plant productivity from two points of view. Knowing the relative productivity of a species is one factor in selecting those suitable for planting at a habitat development project. It is also one factor in the extremely difficult problem of determining the value of a wetland being evaluated as a disposal site. Studies showed, for example, that the ability of at least one species to recover from burial beneath dredged material up to 9 inches thick is greater than expected. This information will be helpful in selecting areas and methods of disposal should a wetland area have to be used for disposal.

Considerable attention was given to the uptake of chemical contaminants by marsh plants as an obvious concern in decisions on developing marsh habitat using dredged material. Uptake was found to occur in different ways and at different rates in most plant species, but the amounts of contaminants involved were not so large as to cause major concern. The question of how much uptake is too much was not resolved and is not likely to be anytime soon; however, evaluations of uptake should be made with an awareness of the natural functioning of a wetland system as a contaminant processor. The end product sought by the research was a test that can be used to predict the pattern of uptake from a particular type of material. To this end, it was largely, but not entirely, successful since certain contaminants have proven difficult to predict as far as behavior is concerned.

Marsh creation using dredged material is now a proven, viable alternative that can be designed and implemented as reliably as any other alternative. Also, certain misconceptions about this alternative were firmly dispelled. In particular, it can be easily demonstrated that marsh development does not necessarily eventually preclude the disposal of material from subsequent maintenance dredging projects. There are examples where phased marsh development, with or without other disposal alternatives, has been planned in such a way as to accommodate maintenance dredging for periods of 50 years or more.

While marsh development is a field-tested and proven alternative, it is not a simple one and it is often not cheap. However, costwise, it is definitely competitive with other alternatives and cheaper than some. Marsh development is not unusually difficult from an engineering point of view, but it is difficult operationally in rela-

tive rather than absolute terms. By this, it is meant that no new equipment or technology is needed. But rather dredgers are sometimes required to perform unfamiliar operations according to unusual time and accuracy specifications. The operations can be done, but they will require close coordination and cooperation.

As indicated earlier, marsh development is not a satisfactory alternative for all locations, but there is no major geographic region where it is not desirable and possible somewhere. Marshes can be developed in the Great Lakes area and along inland river systems as well as in all coastal areas. The only known environmental conditions in which it is probably not practical are ones with high tidal ranges and strong waves and/or currents. Otherwise, depending on local conditions, marshes can be developed in a variety of shapes and sizes, with different plant species and planting techniques, and with or without retaining dikes. Specific guidance was prepared for each of these considerations and is supplemented by decision methodologies useful in selecting sites and particular habitat development goals.

In some respects, the development of upland habitats, either on new disposal sites or by reclaiming old sites, is a technology more advanced and more tested than marsh habitat development. Upland habitat includes such situations as food and cover for mammals and nesting, resting, or feeding areas for waterfowl. Most of these require only the application of existing agronomic and wildlife management practices. But availability is useless without awareness, so this information was compiled and synthesized for widespread distribution. Upland habitat development can be relatively inexpensive and is not difficult, and there are hundreds of disposal sites that could be improved environmentally and meet with greater public acceptance if improved in this way.

Small islands created by dredged material disposal in inland waterways and coastal bays and estuaries are a special type of upland habitat development. Several regional surveys showed that many of the more 2000 of these islands have become extremely valuable wildlife habitat. In fact, maintenance of the U.S. population of several colonial nesting birds such as sea gulls, terns, and herons is dependent upon islands of this type.

Thus, island development obviously can be an environmentally beneficial disposal alternative and one that has large public acceptance. The DMRP provided guidance on how islands can be designed and managed to be of greatest value to certain target species and how the natural evolution of the islands can be controlled for maximum wildlife benefit. However, there are problems, both real and imagined. In the former category are the conflicting concerns and needs of the wildlife interests and the fisheries interests who often have opposing views on the need for islands versus open water. This type of problem can only be resolved on a case-by-case basis. In the latter category is the widespread belief that once an island is created and inhabited by desirable wildlife, it can never again be used as a disposal site. This is not true! In fact, studies showed that unless natural vegetational successional patterns are occasionally interrupted, the islands will lose their wildlife value. The most practical way of providing the needed interruption is by depositing a new layer of material. Specific guidance includes management techniques on how continued disposal can be phased with optimum wildlife use. Once again, the key is a sound management plan.

While research focused primarily on wetland and upland habitats, aquatic or submerged habitats were also included. A literature review and a small field test were accomplished, but these concluded only that it is a promising but unproven disposal alternative. It was demonstrated that seagrasses can be transplanted to a disposal site; however, much additional information will be needed before the basic requirements for establishing a successful seagrass meadow are recognized and understood.

The fourth major part of the DMRP was the development and testing of concepts for nonwildlife-oriented beneficial or productive uses of either dredged material itself or disposal sites. Perhaps more than in any other alternative, successful use of the material or the sites as a natural resource requires favorable and often fortuitous circumstances, but these do occur. Nontechnical factors outweigh technical ones more as a rule than as an exception and requirements for coordination in land-use planning are extraordinary. Since many of the concepts are new and unusual, there is also the requirement for the Corps or some other group to take the initiative in promoting the ideas and getting people to think about them. Indeed the DMRP was a positive factor itself in advertising concepts and moderating apprehension by pointing out where others have applied and concepts successfully.

Many products such as aggregate and bricks have been made using dredged material, sometimes successfully, and the potential for new concepts is limited only by the breadth of one's imagination. However, success will be difficult in view of the quality and undependability of the supply of the raw material, the requirements for

capital investment, and especially the need for favorable market conditions. The only concept with apparent potential for at least regional application that was field-tested as part of the DMRP was the use of conventional disposal sites for the mariculture of shrimp. This was proven technically feasible and has caught the attention of some private entrepreneurs who feel the potential market outweighs the risk. In this and similar concepts, the advantages is that a landowner is more likely to favorably consider the use of his land as a disposal site if he can derive some benefit from it rather than relegate it solely to a form of waste disposal. In mariculture, the disposal site forms the required impoundment and the organic-rich dredged material is a periodically renewed source of food for the organisms.

Opportunities for the productive use of dredged material increase appreciably as one moves inland from navigable waterways. As a consequence, a study considered multiple aspects of modes of long-distance transport of dredged material and produced a method to use in determining the feasibility and cost of various transport systems for individual projects. If dredged material can be moved economically over distances of tens of miles, some of the disposal opportunities that emerge include improvement of agricultural soils, use of dredged material in solid waste management, the filling of abandoned pits and quarries, and strip mine reclamation. Reports were prepared on multiple aspects of each of these possibilities, documenting requirements and discussing case histories as well as setting forth specific concepts options.

As would be expected, concerns over the effects of using chemically contaminated materials dominate the list of relevant considerations; however, so far these have not proven to be limiting. One should never lose sight of the fact that much dredged material is not contaminated, nor should one overlook the real dangers of placing saline dredged material in freshwater areas.

Considering productive uses of dredged material, the obvious value of the land created when a disposal site reaches capacity was not overlooked. Most disposal sites filled with fine-grained materials from maintenance dredging are not suitable for industrial or commercial development from a foundation engineering point of view, but they can be ideally suited for recreational development. While it is not the present policy of the Corps to expand its role in recreation to include navigation projects, there is a need for recreational facilities in this context and many non-Federal groups are interested. One study pointed out the issues related to such use of disposal sites, including funding availability, maintenance responsibility, and guarantees of public land use. Another analyzed case histories in an attempt to find out why certain productive land uses have succeeded and others have failed. These include but are not limited to recreational uses. Other studies evaluated laws and regulations at all levels impacting on land uses and determined the land values and associated benefits created by disposal sites. The end products are guidelines on how the Corps or other groups can achieve or promote the productive subsequent uses of disposal sites both for the inherent benefit of doing so and the probability of being able to acquire new sites more easily.

In summary, the DMRP contributed considerable new information that is being and can be used in all aspects of dredging project design and implementation, including project planning, engineering design, environmental impact assessment, project scheduling and operations, and permit evaluation. In other instances, it only affirmed what had been previously held by many, but it has done so in such a way as to reduce remaining doubt and enhance more widespread acceptance. In both cases, the result has been greatly increased opportunity for economically necessary waterways and harbors maintenance and development to proceed in harmony with appropriate levels of environmental protection and even enhancement in some cases.

Mr. BREAUX. Colonel Haar, you make a statement and you cover I think quite adequately some of your concerns with the key draft that is before the committee, that has not yet been introduced, but it is a working draft that Congressman D'Amours has put together with others, and I get the impression that if you had your druthers you would rather continue operating under the present legislation.

Mr. HAAR. We think some changes are also needed in the present legislation, Mr. Chairman, and we would like to recommend those, and I think our statement takes that into consideration also.

Mr. BREAUX. Given a choice of working on the staff draft and trying to improve it or just having a continuation of the present law, which would be your preference?

Mr. HAAR. You are saying we would have a choice of just one or the other? I couldn't have improvements in the present?

If I am given a choice of just the two, I think we prefer to continue with what we have.

Mr. BREAUX. From this member's individual standpoint, I have yet to be convinced that some serious and substantial changes in the current law need to be made. As we rush to completion of this Congress with all the other things that we have going, I think that one of the options these two committees are going to have, particularly with the words I am getting back from the Senate, is not to act on this legislation.

I am asking the question if that is one of the options. Would you prefer spending time trying to improve this one or to let this one go for the time being?

Mr. HAAR. If the practical considerations as you have outlined are such as they are, then I think that we would opt to go with the present legislation rather than what has been proposed here as amended.

Mr. BREAUX. Discuss for a little bit concerns that you and the association indeed has with the standard that is used in the discussion draft to prohibit all ocean dumping that will degrade the marine environment unless there exists a prudent and feasible alternative.

I guess I think any dredging material is going to have an effect, and that is an impossible standard to meet.

Mr. HAAR. I will let Mr. LeBlanc get into some of the details on that.

Mr. LEBLANC. The basic problem we have with the approach taken in the discussion draft is that it would prohibit any degradation unless there is no feasible and prudent alternative as defined in the discussion draft.

Some of the problems that we have relate to definitions, with the definition of the term degrade. It would encompass any adverse effect.

We think that is too broad. It should encompass significant adverse effects. We have serious concerns about including within the definition of degrade any interference with customary uses of the sea in the area of the dump site. This we feel in some cases could go beyond protection of the intrinsic marine environment and could get into deferring to or recognizing rights of use of third parties, individuals, and that sort of thing.

We have a concern about any consideration of customary uses not also including the historical use of a dump site for ocean dumping purposes. In any consideration we feel that would be relevant.

We are concerned about including in the definition of degrade any instance where there will be a permanent change in the dump site by the dumping.

Ocean dumping of dredged material may result in a change in the dump site.

When we turn to the criteria to be utilized to determine whether a feasible and prudent alternative exists, we feel that a bias

against ocean dumping is established by providing that such an alternative exists whenever an alternative means of disposal will have equal or lesser impacts than ocean disposal.

If we would treat the reference to equal, we would require that the alternative means of disposal at least have lesser impacts and that the impacts be in terms of significant impacts, not any degradation as previously defined in the discussion draft.

In the criteria for feasible and prudent alternative, on the one hand you have the alternative and on the other hand you will have a feasible and prudent alternative if the alternative can be undertaken at a reasonable energy and cost expenditure.

We think that the statement of these criteria should be in the conjunctive and that an alternative should be feasible and prudent and have to be considered only where in the context of significant adverse impacts it will have less adverse effects than ocean dumping and where the use of the alternative can indeed be accomplished at a reasonable cost and energy expenditure.

Both factors should be stated in the conjunctive.

In our paper our preference would be to retain the concept of unreasonable degradation, to have the ultimate basis for the permit decision be on where lies the public interest and to have the determination of unreasonable degradation and the public interest be determined after a consideration of all public interest factors.

But if the approach in the discussion draft were to be followed, we feel it would require appropriate changes in the definition of degrade and in the criteria for determining feasible and prudent alternatives as set forth in the statement.

Mr. BREAUX. If ocean disposal was not an alternative that could be considered for the Port of New Orleans, where would you go to look for a disposal site?

Mr. HAAR. I really have no alternative disposal site because we have an area that is highly developed. There is not—the yardage that is involved is very, very large. As you know, the last port of the Mississippi River involved Plaquemines Parish which on one side is a complete wetland for the lower part and on the right descending back there is a developed area with business, industry, and homes, and the whole river is developed, and we really have no alternative.

Mr. BREAUX. Most of that area in fact would be surrounded by wetland areas and the chances of you dumping dredged material from the Mississippi as fill, I will tell you right now, are slim to none.

Mr. HAAR. That's correct.

Mr. BREAUX. You are not going to get any support from Congress to enable you to use dredge material as fill in wetlands. It is just out of the question.

Mr. HAAR. That's correct. So we really have no other feasible alternative.

I might also point out that the tonnage that Mr. Brinson alluded to has a value of \$41 billion a year that moves in that lower stretch of the river from Baton Rouge to the gulf and that 2 billion bushels of grain, some 80 million tons of grain, move in that lower stretch of the river every year.

Some 43 percent of the Nation's total grain exports are going out the lower river. And there is now a tremendous development of approximately \$1 billion worth of new coal terminal expansions or new coal terminals being built that will have a capability of exporting over 100 million tons of coal in the mideighties, so the Nation has a vital economic stake in the continued viability of this lower Mississippi River, and it is very essential that nothing be done to impede or delay the movement of that waterborne commerce which is so much in the national interest and our balance of payments.

Mr. BREAUX. Mr. Forsythe?

Mr. FORSYTHE. Thank you, Mr. Chairman, and I thank the panel for its testimony.

I think I will only ask one question.

Mr. Brinson, you may have to get this information for us, but I think it is important. Which ports would be affected by an immediate ban on the use of dump sites which have not received final designation?

Mr. BRINSON. We would have to provide that for you. I would think that the lower Mississippi River would be No. 1. Perhaps New York would be impacted to some extent.

Mr. FORSYTHE. I think it would be important to have information because, as has been pointed out during our hearings, the alternatives just aren't available in some cases.

Mr. BRINSON. I might just elaborate on that. We know that a number of our ports now depend on ocean dumping as a principal means of disposal of dredged spoils. I think as time goes on, though, that ocean dumping is going to be more and more the alternative.

Land site filling is, of course, problematic under any conditions. We are going to have to continue dredging our navigation system in this country, and we simply have no choice. And so as time goes on the land available sites will become fewer and fewer and more of our ports will be looking at ocean dumping as the alternative.

Mr. FORSYTHE. I would also point out, as the chairman did, that the filling of wetlands is a major problem when it comes to the whole marine environment. The production of so much of our marine resources comes from coastal wetlands and we have lost a number of acres already. An issue about which we should be very, very severe is any further incursion into the wetlands of this Nation.

Thank you all very much for your testimony.

Mr. HAAR. Mr. Chairman, could I add one or two small points?

Mr. BREAUX. Certainly.

Mr. HAAR. I alluded to the paper we had prepared by Dr. Pequegnat from Texas A&M University, a noted world oceanographer for the London Dumping Convention, which was well received by that convention and which we are elaborating on.

I have a copy here which I would be happy to submit for the record that shows how special care methods can be used to dispose of problem dredge materials in the ocean and to do it safely.

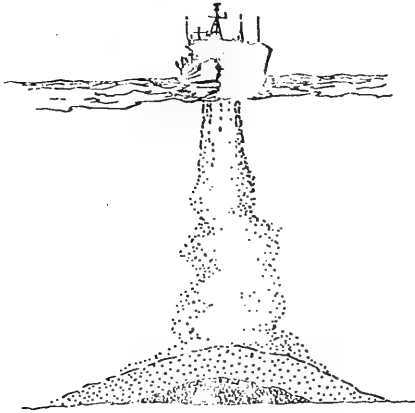
Mr. BREAUX. We would like to have a copy of it. It would be helpful for the staff and the members.

[The document follows:]

A SUBMISSION ON

SPECIAL CARE MEASURES FOR SAFE DISPOSAL
OF POLLUTED DREDGED MATERIAL
IN THE MARINE ENVIRONMENT

By the International Association of Ports and Harbors



FOR CONSIDERATION OF THE AD HOC SCIENTIFIC GROUP
IN REGARD TO AGENDA ITEM #10

MAY 1981 MEETING

HALIFAX, CANADA

SUMMARYGENERAL

Structured in this submission is the basic premise that ways must be found to permit ports and harbors to continue the dredging of new and existing waterways to assist in achieving safe passage of vessels of commerce. Anticipating that some of this dredged material will contain Annex I substances and being aware that public and economic pressures against use of some present-day types of land environments will increase, this paper evaluates the probabilities that when such dredged materials are disposed in the marine environment by "special care" measures no undue environmental risks are engendered.

OBJECTIVES

This paper has several objectives but the overriding ones are (1) to document that large volumes of material must be dredged and disposed economically by major ports and harbors if they are to continue functioning effectively, (2) to present evidence that the marine environment is increasingly a more appropriate receptacle for dredged material than the terrestrial environment, (3) to demonstrate that with the use of "special care" measures in disposal and dump-site selection, the dumping of dredged material containing Annex I substances would in many cases present no greater environmental harm than the disposal of Annex II substances, (4) to suggest and describe some "special care" measures, and (5) to invite the Scientific Group to take note of these matters and to recommend that Contracting Parties achieve a solution by taking appropriate action.

VOLUMES OF DREDGED MATERIAL

It is estimated that member nations of IAPH must dredge millions of cubic yards of sediment from their ports and harbors each year to keep them safely open to ships of commerce whose cargoes are vital to the maintenance of healthy economies. There is every expectation that the need to dredge present volumes will continue long into the future. If even a fraction of

present plans to deepen and widen channels in major harbors are realized the amount of dredged material produced annually will increase substantially.

RECEIVING ENVIRONMENTS - LAND VS. SEA

Although in recent years sponsors of dredging projects have made much use of land sites for disposal purposes, the environmental, economic, and sociologic problems associated with such use are increasing. The spread of population to coastal areas has usurped land that was once available for disposal adjacent to the ports. Equally important such population shifts have usurped agricultural land, covering it with homes, airports, parks, and the like. On a worldwide basis shortage of food has become an increasingly critical issue for man.

FOOD PRODUCING POTENTIAL - LAND VS. SEA

The plant biomass of the sea is about 15,000 times smaller than that of the land. And, more important, is the observation that the oceans with about three times the area of the land produce only about one-third as much biomass per year as do terrestrial plant communities. Moreover, the oceans produce no more than 1.5 percent of the world's food supply. There is every likelihood that this percentage will decrease, for the world's population is increasing while the yield of food from the sea has leveled off. In 1978 world landings of ocean products totaled 72.4 million metric tons. This was down from the record 74.7 million metric tons reported for 1976.

OCEAN DISPOSAL APPEARS TO BE A GOOD SOLUTION

The ocean has a tremendous capacity for assimilating sediments without measurable ill effects. The amount of sediment that man will ever have to dispose in the ocean in a year is a small fraction of what it has been receiving annually via rivers. In the United States the Mississippi River discharges in a normal year about one million cubic yards of sediment per day. Yet one of the most productive U.S. fisheries is located in the area of this discharge. It is important that we now give consideration to the ocean values that we shall be able to protect by using "special care".

THE VALUES TO BE PROTECTED

The ultimate concerns associated with impacts of the dredging-disposal process are the direct and indirect effects on biological communities and the ecosystems of which they are a part. Of the major living parts of the ecosystem, viz., plankton, nekton, and benthos; it is the latter that are most likely to be impacted by dredged material disposal. It is anticipated that the "special care" measures of disposal mentioned in this paper will tend to isolate benthic organisms from the more serious impacts of dredged material disposal.

Consideration is also given to the role that "special care" measures can play in protecting the interests of those people whose living and/or recreation are dependent upon a viable sea. It must be realized that IAPH is an arm of the people and as such that it has vital economic concerns. Nevertheless, by "special care" measures it seeks to solve its dredging problem while protecting the relevant interests of society.

ANNEXES I AND II: THE BASIS FOR CLASSIFICATION

The Convention seeks to protect the marine environment by applying dumping restrictions to wastes having particular properties. Article IV (a) of the Convention prohibits the dumping of a waste listed in Annex I unless it is rapidly rendered harmless upon disposal or contains this waste as only a trace contaminant. The issue of concern to IAPH is that Annex I might be construed to categorically prohibit the ocean dumping of dredged material containing Annex I substances even though the dredging may be essential and there are no practicable alternative means.

IAPH submits that consideration should be given to whether, through use of "special care" measures, the dredged material containing Annex I substances may be safely disposed at sea, as in the case of substances permitted to be dumped under Annex II. The focus of this consideration is on "techniques" in dumping, rather than upon the "intrinsic properties" of the material to be dumped.

It is reasoned that consideration of the eligibility for dumping of dredged material containing Annex I substances could be handled on a case-by-case basis, particularly if there is appropriate assurance that, through the use of "special care" measures, the substance may be safely disposed in the marine environment.

WORKING DEFINITIONS OF ANNEX I AND II PARAMETERS

The three Annex I properties of being toxic, of being susceptible to bioaccumulation, and of being persistent or refractory to degradation in the environment are legitimate concerns; however, we have come to learn more and more about the fate of pollutants in the marine environment from field studies and there is little hard evidence that dredged material has caused substantial biological damage in the ocean.

Toxic. To state that a constituent of any material is toxic is equivalent to saying that it is poisonous and capable of causing death. But to indicate that a given toxicant is present in dredged material is not tantamount to admitting that it will be available to the organism or, if it is, that the organism will suffer acute or chronic impacts. Several chemical characteristics common to many dredged materials, such as adsorption on clay, complexing with organic matter, or reducing conditions may favor immobilization of the toxicant. Also, organisms have many adaptations to their chemical environment; two of these are (1) to remove the toxicant from its metabolic streams by sequestering it in one or more storage depots, or (2) degradation or transformation of the molecule into an innocuous substance and into residues which are eliminated in a process of depuration. "Special care" measures of disposal can augment environmental sequestering of toxicants.

Bioaccumulation. Bioaccumulation refers to those processes by means of which organisms take up chemicals from the physicochemical environment and incorporate them into some or all of their tissues. The concern with this process is that the organism will accumulate levels of toxicants well above those in the ambient environment so that it will become a hazard to predatory animals, including man.

Evidence is that many marine organisms accumulate most toxicants primarily from the water column or interstitial water. Many toxicants once disposed in dredged material are not readily available in either medium. "Special care" measures of disposal can enhance immobilization of, say, toxic metals to a high degree.

Persistence. As used in environmental management, persistence refers to the property of toxic substances to resist degradation by the activity of such organisms as bacteria or fungi or by natural physicochemical factors for substantial periods of time. Obviously, metals and metal compounds may be very persistent. But many of these are immobilized by conditions of dredged material disposal. Among organics, the organochlorines, are quite persistent. But contrary to a still commonly held view they will not remain permanently in the marine environment. Even the PCBs are amenable to biodegradation, albeit for some with high chlorine numbers the process is very slow. The best procedure, then, is to sequester them removed from the biota either permanently or for long periods of time by one or another "special care" disposal methods.

SOME ECOLOGICAL CONDITIONS THAT SUPPORT OCEAN DUMPING OF POLLUTED DREDGED MATERIALS

Taking conditions affecting the immobilization of mercury, cadmium, and chlorinated hydrocarbons in dredged material one finds several factors that work equally well on all three. For example, mercury is immobilized (absorbed) in sediments by clays (especially montmorillonites), as are cadmium and DDT; humic materials and other organics are important immobilizers; sequestering is enhanced generally by reducing conditions and a pH near neutral. Most of these conditions are met in ordinary disposal of dredged material (in the mound) in the open ocean, but "special care" measures can enhance the effects.

NATURE AND APPLICATION OF SPECIAL CARE MEASURES

Obviously special care measures will apply to methods of disposing of

dredged material or to procedures to be followed in the dredging and transport of bottom sediments or to decisions in selecting the location and other characteristics of dumpsites.

SPECIAL CARE MEASURES OF DISPOSAL

CLEAN MATERIAL CAPPING

In clean material capping (CMC) relatively large volumes of polluted dredged material are emplaced and then covered with a reasonably thick blanket of clean material. Available evidence indicates that CMC is an environmentally sound method by which to dispose of polluted dredged material.

BORROW PIT DISPOSAL: ANOTHER CMC TECHNIQUE

Another innovative approach to capping operations utilizes existing submarine borrow pits which have been made during sand mining. These pits are generally anoxic. The process involves dumping the polluted material into the pit and capping it flush with the ambient bottom with adjacent clean material. This process will actually enhance the benthic environment by removal of more or less abiotic pockets.

SPLIT-SITE DISPOSAL

Where huge volumes of dredged material are to be generated by major improvements to a port or harbor, it may be environmentally sound to utilize a disposal site that has a half dozen or so release zones. If both polluted and unpolluted material are to be generated in the improvement project, the polluted sites should be dredged first and dumped ad seriatum at the half dozen release zones. By careful management, this should permit downstream organisms in particular to depurate many of the toxicants without reaching heavy body burdens. Later, as the work on the project proceeds to new work, where the sediments are likely to be clean, each release zone can be capped.

SPECIAL CARE DISPOSAL AREAS AND SITES

RATIONALE FOR DEEP OCEAN DISPOSAL

Special consideration is given to deep ocean disposal as a "special care" measure. The arguments in favor of this proposal are numerous but some of the more cogent are that (1) there will be an amelioration of effects during a long transit in the water column, there being large areas and immense volumes of water to dilute materials, (2) there is a marked reduction of animal biomass in offshore waters as compared with onshore waters, (3) there are no commercial fisheries below depths of 800-1000m (and probably never will be), and (4) the deep ocean basins, of all places, have been receiving large amounts of sediment since their creation.

HYPERHALINE BASINS

Anoxic hypersaline basins exist on the outer continental shelf and upper continental slope of the northern Gulf of Mexico and elsewhere. The largest basin so far studied is about one-third full of brine that is 8.6 times as salty as the normal seawater overlying the basin. It is thought that sufficient seawater dissolution of the associated salt dome to completely fill the basin with brine will take at least 30,000 years.

The basins are devoid of life except for simple bacteria whose utilization of organic matter produces methane, ammonia, and hydrogen and keeps the dissolved oxygen content of the brine at zero.

SUBMARINE CANYONS

Submarine canyons are sea-floor valleys that generally begin as notches in the continental shelf from which they cut as troughs into the continental slope and terminate in fans of sediment. They are viewed by some marine scientists as being ideal locations for disposal of polluted dredged material, primarily because the floors of active canyons support very little life.

It should be pointed out that submarine canyons of one type or another occur throughout much of the world ocean. Some of these may not be appropriate for disposal because of the fact that they are migration routes for finfish or shellfish.

CREATION OF OFFSHORE ISLANDS TO SEQUESTER VERY CONTAMINATED MATERIAL

It is envisaged that in appropriate places and with careful planning artificial islands can be created in offshore waters that will sequester dangerous pollutants away from the marine ecosystem and important groundwater supplies. This would be done by creating an island shell with central pits into which the pollutants could be pumped and the partially filled pit capped with clean material. Later the pit cover could be left barren or planted to appropriate vegetation to encourage development of habitat for sea birds.

DISPOSAL BELOW THE ZONE OF MAXIMUM PLANKTON PRODUCTIVITY

In areas where disposal of dredged material must be carried out during periods of maximum phytoplankton production, it should be possible to ameliorate impacts by shunting dredged material below the zone of maximum production. As noted earlier, the lower part of this zone in temperate regions is no deeper than 15 or so meters. It may be feasible to pipe material for that depth from a sea-going barge.

SPECIAL CARE DREDGING MEASURES

PUMPING FROM HOPPER DREDGES TO SEA-GOING BARGE

When hopper dredges are used more environmental concern is expressed over the dredging than the disposal process. This is due to the great amount of fine material released as the hoppers are overfilled in order to obtain as much sediment per shipload as possible. The turbid slurry that overruns the weirs often creates a massive turbid plume. Moreover, it is this fine material to which many pollutants are attached. And in some instances the

oxic conditions free the metals where their environmental activity is increased.

A possible solution to this problem which has more than one environmental advantage is to employ sea-going barges for transport. In many instances the hopper dredge is not only the dredger but the transporter of the material to the dumpsite. During this period of transport it is out of action, thus prolonging the dredging operation. A possible solution, which has been used successfully, would be to pump the hopper material directly into a sea-going barge without the overfill. The small decrease in sediment carried per load would very likely be compensated for by virtue of keeping the dredger on the dredging job 24 hours a day.

Moreover, these barges could be equipped to either shunt material below the zone of maximum phytoplankton production or to pump very polluted material into pits on artificial islands.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- 1) The need for dredging of ports and harbors both for enlargement and maintenance of existing channels is expected to increase in the 1980s and beyond.
- 2) A certain percentage of this dredged material, particularly that derived from maintenance dredging, can be expected to be polluted with Annex I substances.
- 3) This material must be disposed in such manner as to cause the receiving environment as little degradation as is reasonably possible.
- 4) By the same token, it is becoming increasingly difficult to find and use disposal sites on the land that can be considered safe and within reasonable distances from ports and harbors.

- 5) Examination of the marine environment reveals that it has a high potential for assimilating dredged material without creating undue environmental risk.
- 6) Therefore, after thoughtful study of the problem and the delineation of possible solutions, it is concluded that if "special care" measures are used in disposal and in dumpsite selection, the disposal into the marine environment of dredged material containing Annex I substances would in many cases present no greater risk of environmental harm than the disposal of Annex II substances.
- 7) Accepting this, it is reasonable to consider that under these circumstances, the rationale of the Convention should allow the disposal of such dredged material at sea under a "special permit," as in the case of substances listed in Annex II.

RECOMMENDATION

Finally, and most importantly, the IAPH invites the Scientific Group to take note of the matters set forth in this submission and to recommend to Contracting Parties at the Sixth Consultative Meeting a Resolution or Guideline (e.g., a new paragraph 3.2 in the classification criteria LDC IV/12/3, Annex 2) to provide, viz.:

"Wastes which contain substances listed in Annex I but which, in appropriate cases, may be safely disposed in the marine environment if special care is used in the disposal, may be dumped under a special permit, in the same manner as substances classified to Annex II."

INTRODUCTIONBACKGROUND FOR SUBMISSION

This paper has been prepared and is submitted by the International Association of Ports and Harbors (the "IAPH") in connection with the Fifth Meeting of the Ad Hoc Scientific Group on Dumping (the "Scientific Group"), a working group of the London Dumping Convention (the "Convention"). The IAPH is an international association comprised of ports in 73 countries which has been granted observership status at Consultative Meetings of Contracting Parties to the Convention. LDC II/2.

This submission addresses technical issues relating to the ocean dumping of dredged material which were raised by the IAPH at the Fifth Consultative Meeting of the Contracting Parties to the Convention in London, England on 22-26 September 1980. The IAPH expressed serious concern about a possible construction of the Convention that would categorically prohibit the ocean disposal of dredged material which may contain substances listed in Annex I to the Convention, even in cases where there may be no practicable alternative means of disposal.

The IAPH emphasized the vital national and international interests which IAPH member ports serve for their respective States. The IAPH also stressed the need for periodic dredging to assure the maintenance of sufficient channel depth to accommodate waterborne commerce and trade. Without this work, efficient port operations cannot continue, and the closure of affected ports could occur--with drastic, and perhaps irreparable, impacts upon affected States and the exercise of their sovereignty.

The IAPH invited Contracting Parties to consider whether further study or action might be appropriate, or necessary, to address the need for ocean disposal of dredged material under such circumstances.

The IAPH presentation at the Fifth Consultative Meeting included certain scientific aspects of the dredged material issue. In the Prepared Remarks

of Herbert R. Haar, Jr., the head of the IAPH delegation,*/ the IAPH invited Contracting Parties to consider whether, even if dredged material might otherwise be subject to the prohibition of Annex I, there may nevertheless be circumstances under which the dredged material may be safely disposed of in the marine environment if "special care" is taken in the disposal. This is the manner in which Annex II substances are treated under the Convention. They may be disposed of at sea under a "special permit".

CALL FOR STUDY BY THE SCIENTIFIC GROUP

A majority of delegations agreed that the technical matters raised by the IAPH should be considered by the Scientific Group at its next intersessional meeting in light of information to be supplied by the IAPH on possible measures to reduce the environmental impact of the disposal of dredged material at sea. LDC V/12/10.4. These technical matters are scheduled for consideration as Agenda Item 10 on the Provisional Agenda for the Fifth Meeting of the Scientific Group to be held at the Bedford Institute of Oceanography, Dartmouth/Halifax, Nova Scotia, Canada, from Monday, 4 May to Friday, 8 May, 1981. LDC/SG. V/1 (5 December 1980).

FOCUS OF THE PRESENT PAPER

This submission will discuss technical aspects of "special care" measures which may be used in the ocean disposal of polluted dredged material and will assess, from a scientific perspective, their potential effectiveness in minimizing adverse environmental impacts associated with the dumping. The submission will consider Annexes I and II of the Convention, and the dilemma facing affected States if Annex I is applied to categorically prohibit the ocean dumping of dredged material when there may be no other

**/ Mr. Haar is a member of the Ad Hoc Committee on Dredging of the IAPH; Chairman, Ad Hoc Dredging Committee of the American Association of Port Authorities, and Associate Port Director of New Orleans, USA.*

feasible alternative means of disposal. The submission will then survey the extent to which, through the use of particular "special care" measures in dumping, dredged material containing Annex I substances may be safely disposed in the marine environment to the same extent as substances permitted to be dumped under Annex II.*/

Bearing in mind Contracting Parties' recognition that, scientifically, conclusive proof as to harmlessness is impossible, and that studies and tests can only provide evidence for judging whether the environmental risk is acceptable or not [LDC IV/12, Annex 5 (Appendix II, Introduction)], this submission addresses the extent to which the use of "special care" measures will provide data sufficient to demonstrate that the environmental risk is "acceptable".

**/ The emphasis of this consideration is upon the "special care" measures themselves. Whether any one or more of these measures would be economically feasible or practicable in a given case would necessarily have to be determined by ports and affected States under the facts and circumstances of that case.*

THE NEED FOR CONSIDERATION OF "SPECIAL CARE" MEASURESVOLUMES OF DREDGED MATERIAL

It is estimated that member nations of IAPH must dredge millions of cubic yards of sediment from their ports and harbors each year in order to keep them safely open to ships of commerce whose cargoes are vital to the maintenance of healthy economies. For example, according to a study by Arthur D. Little, Inc. (1974) the U.S. Army Corps of Engineers was expected to dredge on the order of 450 million cu yd annually for the years 1974 and 1976. Of the total volume, some 315 million cu yd, or about 70 percent, would be generated by maintenance dredging activities in existing waterways, and about 140 million cu yd, or 30 percent, would result from so-called "new work" dredging. These figures may be taken as generally typical of Corps' annual maintenance and new work dredging operations during the 1970s. Significant year-to-year differences in dredging operations are accounted for by variations in new work quantities. According to the U. S. Environmental Protection Agency (1976), the volumes of dredged material discharged in the ocean annually are on the order of 90 to 100 million cu yd. Thus, of the about 450 million cu yd projected annual dredging only about 20 to 22 percent is presently disposed in the ocean.

Estimating from extant plans for harbor deepening and expansion known to the IAPH, there is every likelihood that the volumes of dredged material to be disposed by one means or another and in one place or another will increase in the future. Plans to modify ports and harbors to safely accommodate deep-draft vessels carrying coal, grain, petroleum, and liquid natural gas will necessitate the dredging of millions of cu yd of new material. It is inevitable, therefore, that the need for maintenance dredging will also increase. There can be little doubt, then, that maintenance dredging will continue.

Although it is not expected that environmental regulations will be ignored, Pequegnat et al. (1978) have stated in regard to the need for dredging

ports and harbors:

"The United States of America and many other countries must continue to dredge new and existing waterways to assist in achieving safe passage for vessels of commerce. This will be done, not only because the export and import cargoes are vital to maintenance of sound and growing economies, but also because accidental spillage of some cargoes due to poorly maintained channels could have far more profound effects than dredging on marine ecological systems and, thus, on the welfare of the peoples of the world."

Thus, we are confronted with three important facts

- (a) dredging of ports and harbors must and will continue in the 1980s and beyond,
- (b) the volumes of dredged material to be utilized or disposed will certainly increase, and
- (c) the numbers and kinds of acceptable places in which to dispose of this mounting volume of dredged material will just as certainly decrease, especially on the land.

There can be no doubt, then, that problems associated with the disposal of dredged material will persist for years to come. Therefore, it is the disposal aspect of the dredging/disposal problem and the justifications for recommending increasing use of the marine system as the receiving environment that will orchestrate the principal theme of this paper. We shall examine the extent to which some amelioration of environmental impacts can be achieved by careful management of the dredging plan and process as well as of the disposal process.

At this point let us examine some geographic, demographic, oceanographic, and ecologic facts which demonstrate that the ocean can and will very likely have to assimilate substantial amounts of dredged material derived from ports and harbors over the globe, provided the dredging/disposal process is

carefully managed especially when some Annex I and Annex II contaminants are present in more than trace amounts.

RECEIVING ENVIRONMENTS - LAND VS. SEA

There are three major categories of disposal environments for dredged material removed from saline waters:

- (a) the land or upland areas,
- (b) the estuarine/continental shelf complex, and
- (c) the offshore deep ocean

In recent years sponsors of dredging projects have made much use of land sites for disposal purposes. Boyd et al. (1972) believed that this trend arose in part because of concern over open-water disposal of contaminated sediments in traditional ways. There are, however, many environmental problems associated with confining dredged material on land (Meccia, 1975). Among these are the deterioration of dike integrity, long duration of fluidity of the dredged material unless additional expenditures of time and money are made, loss of sediment from the containment area into the waterway, possible contamination of ground waters, and quite frequently there are both sight and smell indignities -- not to mention health hazards in some areas as a result of breeding of mosquitoes. Clearly there are other even more critical problems associated with land disposal in the 1980s and beyond. One of these is becoming more apparent with each passing month; it is the lack of appropriate and available space for disposal on land of sediments derived from major ports and harbors. In the USA, for example, areas such as the Gulf coast that once had no such problem are now faced with it as the influx of people has seen intensive utilization of upland areas for industry, housing and services, and recreation. This has resulted in acceleration of the usurpation of agricultural land for non-productive uses. Certainly the heightened competition for space has curtailed if not eliminated the use of upland areas for disposal of dredged material.

True, it is still possible to modify the land/sea interface in producing marshes or sea-grass beds, but this, too is not a permanent solution.

This usurpation of productive agricultural land is more serious than is generally understood. Let no one think that the areas needed for land disposal are or would be small. Mallory and Meccia (1975) estimate for the USA alone that no less than 7000 acres of new land would be required each year for the containment of material generated from maintenance dredging of marine channels by the Corps of Engineers alone. The situation becomes even more startling when we learn that

- (a) in the period from 1880 to 1952 tilled land the world over classified as "good" declined from 85% to 41% of the total, and
- (b) Borgstrom (1969) found that in the USA alone over 2 million acres of rural land are turned over every year to urban development, airports, highways, flood control measures, parks and wildlife refuges.

What these figures portend for the curve of world food production with the passage of time is not hard to visualize - an asymptote and then a downturn. If we add to this situation the inevitable increase of the world's population, estimated to soar to at least six billion by the year 2000 with about 85 percent of the population living in Asia and Africa, the downturn is not far off. Obviously it can be pushed farther into the future if usurpation of tilled land for unnecessary purposes is curtailed. In many instances the placing of marine-derived sediments on land is one such unnecessary act of usurpation.

FOOD PRODUCING POTENTIAL - LAND VS. SEA

To document the reality of the need to preserve the land for the production of food, let us compare some vital statistics of the land and sea. Those who look to the seas as a solution to the world's food problem will be disappointed.

Plant Biomass on Land and in the Sea. Rodin et al. (1975) estimate that the total weight of plant tissue (biomass) present on the land is 2.4×10^{12} metric tons, dry weight. The total plant biomass in the world ocean amounts to 1.7×10^8 metric tons, which is about 15,000 times smaller than that of the land. Perhaps a better gauge of the relative importance of land and sea to the problem at hand is the rate of plant production.

Plant Production of the Land and of the Sea. Primary production refers to the rate of production of organic matter through the photosynthesis of plants. Bogorov (1959) estimates that the total primary production of the land is 1.72×10^{11} metric tons per year, whereas that of the sea averages 5.8×10^{10} metric tons per year. Hence, the oceans with roughly three times the area of the land account for only one-third as much primary production as do terrestrial plant communities. What this adds up to, however, is the relative capacities of these two ecosystems to produce human food. The sea is a poor second.

Food Producing Capacities of Land and Sea. The marine 71 percent of the earth's surface produces no more than 1.5 percent of the world's food supply, although it does contribute between 8 and 10 percent of the protein consumed by humans. Part of the reason for this disparity is the deficient protein level in the diet of the majority of humans. It is doubtful that the ocean's contribution to human food supplies will increase much in the future. In fact it may well decline. In 1978 world landings of ocean products totaled 72.4 million metric tons, which was down from the record 74.7 million metric tons reported for 1976. The important point to note in regard to attempts to increase the food derived from the sea is that 99 percent of it comes from nearshore (the estuarine/shelf complex) and only 1 percent from the deep offshore waters. The reason that the offshore region yields so little (in the form of shark, tunas, and some squids) is not because of the lack of exploitation but because it just is not there. The other discouraging fact is that most of the world catch is taken in waters less than 200m deep and it is estimated that commercial catches will at their deepest be no more than a 1000m. Compare this with the fact that

about half of the earth's surface is covered by ocean water 2000 or more meters deep.

It would seem that a good case can be made for disposing of dredged material of many types in the open ocean. Let us now examine why the ocean is so capable of assimilating dredged material and then we shall discuss what values are to be protected by using special care in the dredging/disposal process.

OCEAN DISPOSAL APPEARS TO BE A GOOD SOLUTION

On the basis of the above considerations, it is evident that the ocean can be a better receiving environment for dredged material than the land. Certainly the ocean has a tremendous capacity for assimilating sediments without measurable ill effects. It has been receiving sediments from rivers for millenia. The amount of sediment that man will ever have to dispose in the ocean in a given year is but a small fraction of what it has been receiving annually via rivers. For instance, Holeman (1968) estimates a world annual river runoff of sediment of 18 billion metric tons. About 40 percent of this is being carried by about a dozen major rivers, of which the largest by far is the Yellow River of China (Table 1). It may have come as a matter of surprise that the Mississippi River transports on average some 0.3 billion metric tons of sediment to and beyond its delta each year. This amount approximates the total of material produced in one year by maintenance dredging in the entire USA. It is remarkable, therefore, that between 20-25 percent of the total fish tonnage landed annually in the USA comes from the region around the Mississippi Delta where Shepard (1960) estimated much of the above sediment drops to the bottom. In view of this, it is difficult to believe that well-managed disposal of dredged material will seriously impact the marine environment. Even so, it is important that we give consideration to the ocean values that we shall be able to protect from serious impacts by using extraordinary care in disposing of some dredged material.

TABLE 1
Suspended Sediment Discharge to Ocean by Some Major Rivers

| River | Location | Annual Sediment Discharge (10 ⁹ short tons) | Percentage of World Total |
|-------------|---------------|--|---------------------------------|
| Yellow | China | 2.08 | 10.0 |
| Ganges | India | 1.60 | 8.0 |
| Bramaputra | East Pakistan | .80 | 4.0 |
| Yangtze | China | .55 | 2.7 |
| Indus | West Pakistan | .48 | 2.4 |
| Amazon | Brazil | .40 | 2.0 |
| Mississippi | USA | .34 | 1.7 |
| Irrarvaddy | Burma | .33 | 1.7 |
| Mekong | Thailand | .19 | .8 |
| Colorado | USA | .15 | .7 |
| Red | North Vietnam | <u>.14</u> | <u>.6</u> |
| | Total | 7.06 | 34.6 |

Source. From Stanley and Swift (1976).

THE VALUES TO BE PROTECTED

MARINE ECOLOGICAL SYSTEMS

Components of An Ecosystem

As was pointed out by Boyd et al. (1972), the ultimate concerns associated with impacts of the dredging-disposal process are the direct and indirect effects on biological communities. It should be added, however, that these community changes have the potential for impacting the welfare of man.

All ecosystems are major functional organizations involving both living and non-living components. The living components include the various groups of plants and animals that make up the biological communities. The non-living components are the atmosphere above the water, the water column, and the sea floor that collectively comprise the environments of the living systems. The living and non-living components of ecosystems are bound together through the dynamic exchange and recycling of chemical material and energy, and the patterns of such exchange are determined largely by the controlling factors of the physical and chemical environments.

Non-Living Components

The atmosphere above the ocean water is of primary importance because water mass movement is induced largely by the frictional force of winds passing over the water surface. Wind-driven currents play a major role in the horizontal spread of organisms and of any materials discharged at sea. The atmosphere is also an important source of oxygen that dissolves in the water and sustains life even at great depths.

The water column itself provides the conditions of light, temperature, salinity, nutrient concentrations, density, and pressure to which the organisms must adjust if they are to survive in a given area. The seasonal progression of the sun determines that greater amounts of heat and light will be received by the surface waters during late spring, summer and early fall than during the remaining seasons, when the sun is more directly over the southern hemisphere. Much of the sunlight striking the sea surface is

reflected back into the atmosphere, and that which does penetrate the sea surface is rapidly absorbed by water molecules and by smaller suspended particles. For these reasons, sunlight is attenuated in seawater as a logarithmic function of depth. Phytoplankton growth is limited by the quantity of light available for photosynthesis, and phytoplankton generally cannot carry on photosynthesis when the light level is less than one percent of the surface value. Therefore, the depth (Figure 1) of the euphotic zone (i.e., the upper layer of the sea where light is sufficient to support photosynthesis) tends to be greater in the open ocean than in the more turbid coastal waters, greater in summer than in winter, and greater in tropical latitudes than in temperate or polar latitudes.

The floor of the sea is called the benthic area. For present purposes it is considered to include the water column for a few meters above the bottom, the bottom surface itself, and the bottom muds to a depth of about one meter. The benthic area is the ultimate resting place of all particulate material that sinks down through the water column. This includes the river-borne sediments, fecal pellets, the organic and inorganic remains of all plants and animals of the water column, and all non-floating debris of civilization that is dumped at sea. The bottom itself is a habitat for a very large variety of microbial and animal species. Through chemical action and through mechanical activities such as burrowing and pumping, these organisms stir and change the sediments and bring to the surface materials once buried to a meter's depth.

Living Components

The living components of the marine ecosystem include the plankton, nekton, neuston, and benthos.

Plankton. The plankton of the sea includes the mostly microscopic plants and animals, which possess limited powers of locomotion and which are, thus, at the mercy of the water currents. Marine plankton is divided into two main groups: the phytoplankton, or plant plankton, and the zooplankton, or animal plankton. Each of these plays distinct functional

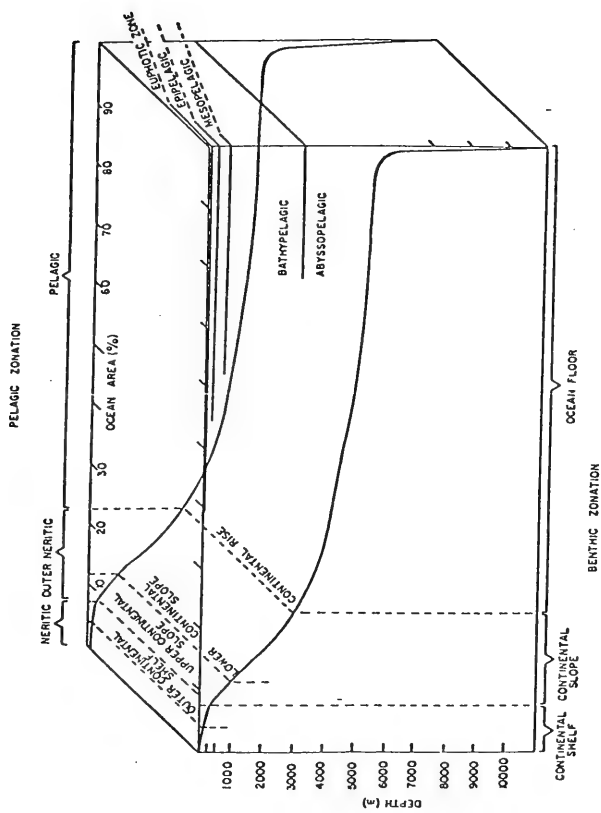


Figure 1. Diagrammatic section of the marine environment showing zonation.

roles in the economy of marine ecosystems:

(a) phytoplankton includes the single-celled organisms, diatoms, dinoflagellates, and others of lesser abundance (Figure 2). These are the producers of organic matter in the sea (comparable to grass and trees on land) upon which all the animals ultimately depend. Since light is required to support photosynthesis, the phytoplankton is restricted to the depths of penetration of sunlight. However, in temperate seas the major amount of photosynthesis occurs from just beneath the sea surface to depths no more than 15 meters, but this will depend upon turbidity of the surface waters. Phytoplankton is limited not only by light, but also by available nutrients, of which phosphorus and nitrogen are the two chief components. These elements may become available in the surface waters through river runoff from land, through excretion and recycling of materials in the euphotic zone, through the rising of nutrient-laden waters from deeper layers, and the disposal of various human wastes. Both the upwelling of nutrient-rich waters and the disposal of sewage may cause immense phytoplankton blooms.

The quantity of organic matter produced by the phytoplankton is referred to as primary production, and the rate of production is called primary productivity. When the latter is high one will soon find a large zooplankton population feeding on the phytoplankton.

(b) zooplankton of the sea is subdivided into the holoplankton that spend their entire lives as plankton, and the meroplankton in which only the larval stages are planktonic, the adult becoming an active fish or a bottom-dwelling animal. The meroplankton is much more abundant over the continental shelf than in deep oceanic waters. The ability to produce planktonic larvae permits many benthic species to achieve wide distribution throughout the ocean and to rapidly colonize new areas as appropriate environmental conditions become available.

The zooplankton is very diverse in its composition, and it includes representatives of nearly every major kind of marine animal (Figure 3). Small crustaceans generally predominate, and these include such forms as copepods,

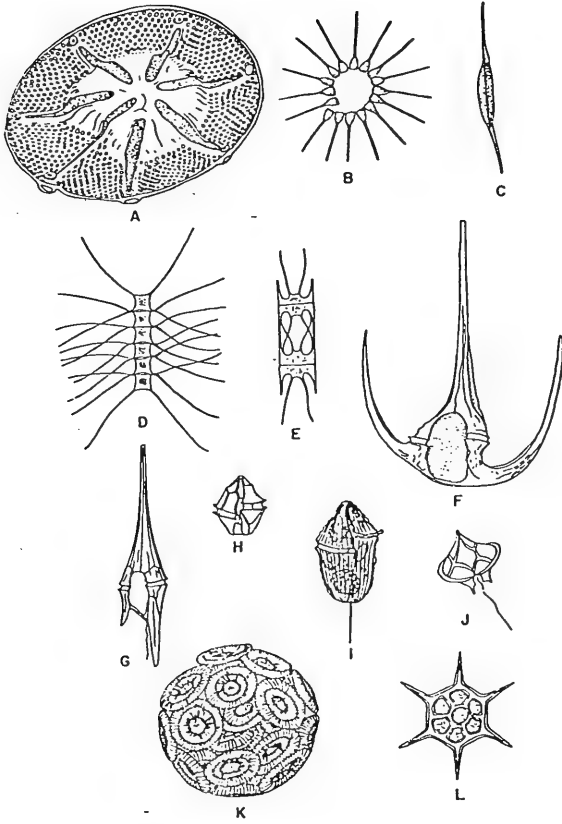


Figure 2. Examples of marine phytoplankton organisms. A, D, E - Centric diatoms; B, C - Pennate diatoms; F-J - Dinoflagellates; K - Coccolithophorid; L - Silicoflagellate.

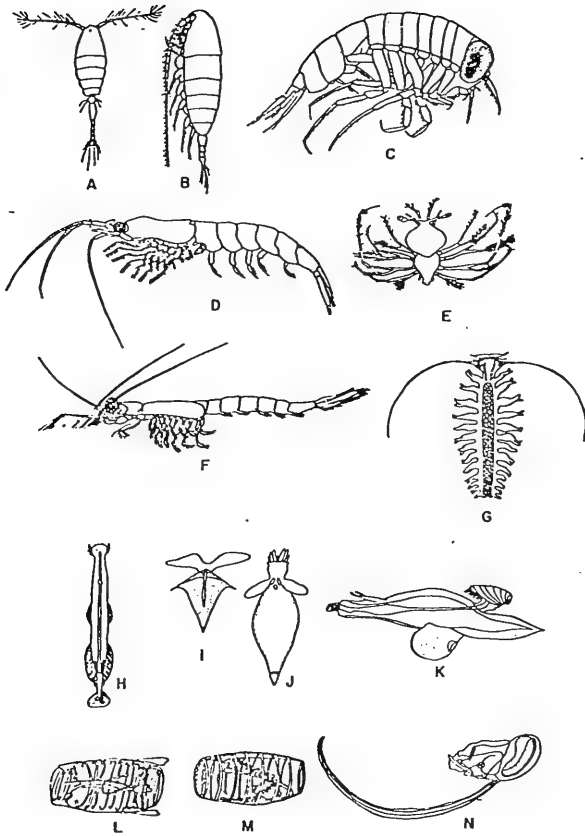


Figure 3. Examples of marine zooplankton organisms. A. Cyclopoid copepods; B. Calanoid copepod; C. Amphipod; D. Euphausiid shrimp; E. Phyllosoma (lobster) larva; F. Mysid shrimp; G. Pelagic polychaete worm; H. Chaetognath (arrow worm); I, J. Pteropod mollusks; K. Heteropod mollusk; L. Salp; M. Doliolid; N. Larvacean.

amphipods, mysids, and euphausiids, as well as the larvae of shrimps, crabs, and lobsters. Although most abundant in the surface and near-surface waters, the zooplankton is found at all depths of the sea. From the standpoint of vertical zonation the zooplankton may be classified as epipelagic (0-200m), mesopelagic (200-700m), or bathypelagic (700m and more), as shown in Figure 3. Many of the epipelagic species exhibit regular patterns of daily vertical migration in the water column, being nearer the surface at night and deeper during the daylight hours.

Nekton. Nekton includes those free-swimming animals of the sea that are larger than plankton and that have more powerful swimming abilities. They are able to move independently and may roam from one water mass to another. Included are all marine mammals and most fishes, cephalopod mollusks (especially the squids), and certain larger swimming crustaceans (Figure 4). As in the case of the plankton, the nekton is most abundant in the near-surface waters, but it may be encountered at any depth. Nekton organisms display a variety of feeding types. For example, the great blue whale (the largest mammal) and the whale shark (the largest fish) feed on zooplankton, the menhaden and sardine feed on phytoplankton, others prey upon nektonic species, and still others consume organic detritus (the dead and decaying organic matter that constantly rains down from the surface layers of the sea).

Some of the most important commercial and recreational finfish belong to the nekton. Among these are tunas of all kinds, salmon, menhaden, herring, anchovies, sailfish, marlin and many others.

Benthos. Benthos includes all the organisms intimately associated with the bottom. Some species live within the bottom sediments (infauna). Others live upon the bottom surface or in the near-bottom portion of the water column (epifauna). Finfish that swim in the water column but are wholly dependent upon bottom material for food (called demersal fish) are also included in the benthos. Some benthos burrow (e.g. worms), others are attached to the substrate (barnacles), still others crawl upon the surface (dungeness crab).

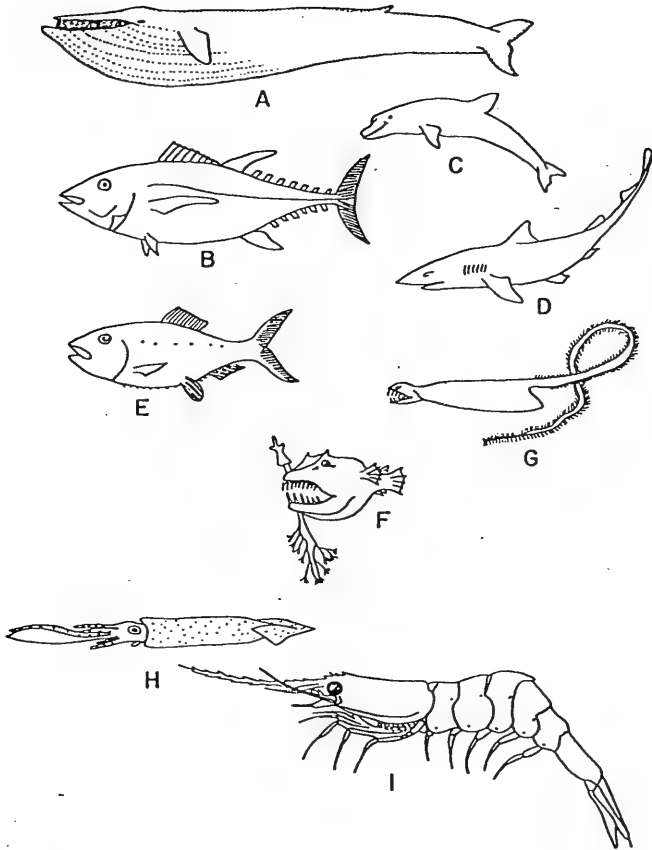


Figure 4. Examples of marine nekton organisms. A. Blue whale; B. Tuna; C. Dolphin; D. Shark; E. Menhaden; F. Angler fish; G. Viper fish; H. Squid; I. Caridean shrimp.

(a) phytobenthos includes plants associated with the bottom such as seagrasses and attached marine algae (kelps and seaweeds). These are most abundant in the shallow marginal areas of the sea and its estuaries. In estuaries the phytobenthos provides nursery areas for shrimp, crabs, and many finfish that as adults live on the continental shelf.

(b) zoobenthos includes representatives of nearly every major group in the animal kingdom (Figure 5). Especially important are the protozoans, various groups of marine worms, mollusks, crustaceans, and starfish and their relatives. Demersal fishes (bottom-feeding fishes) that live upon or just above the bottom are very important components of the benthos. Commercially important demersal fishes and benthic shellfishes are

- | | |
|---------------|-----------------|
| 1. Cod | 9. Halibut |
| 2. Haddock | 10. Sablefish |
| 3. Hake | 11. King crab |
| 4. Butterfish | 12. Tanner crab |
| 5. Pollock | 13. Shrimp |
| 6. Sole | 14. Prawns |
| 7. Flounder | 15. Red crab |
| 8. Plaice | 16. Blue crab |

Bacteria are also common and a very important part of the benthos. They break down various organic compounds, some of which are toxic to higher organisms, and recycle metals and nutrients.

Studies have revealed that benthic organisms are far more abundant in shallow waters than they are in deeper areas. Standing crops in the nearshore waters may reach a kilogram or more per square meter of bottom surface area, whereas in the abyssal zone the living matter may constitute only a gram or less per square meter of bottom.

Matter and Energy Transfers in Marine Ecosystems

Ecosystems exist by repeated cycling and recycling of chemical elements from the environment through various steps of the living systems and back to the environment. By means of photosynthesis and other mechanisms the

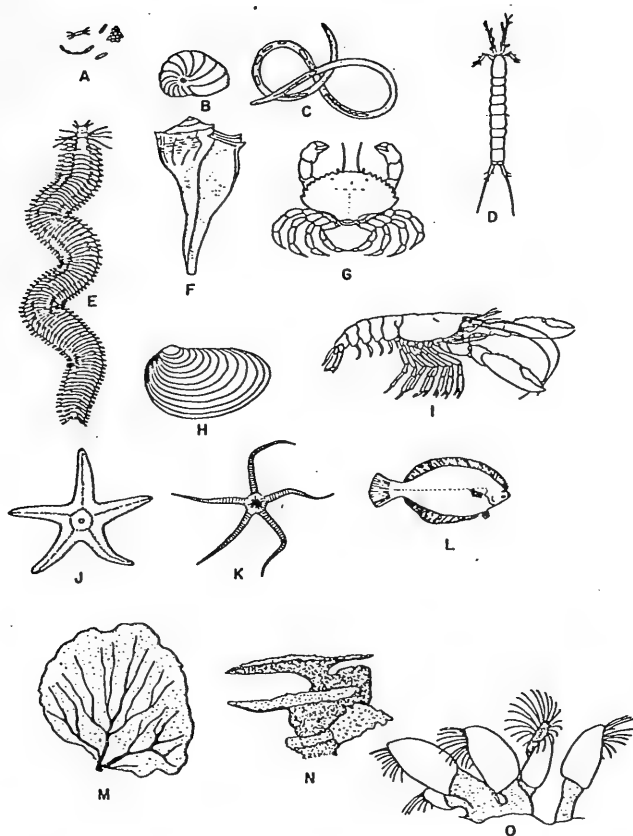


Figure 5. Examples of marine benthic organisms. Micro- and Meio- infauna (A. Bacteria, B. Foraminifera, C. Nematode worm, D. Harpacticoid copepod); Soft bottom epifauna (E. Polychaete worm, F. Gastropod mollusk, G. Brachyuran crab, H. Bivalve mollusk, I. Lobster, J. Starfish, K. Serpent star, L. Flatfish); Hard bottom epifauna (M. Sea fan, N. Stony coral, O. Stalked barnacles).

plants of the sea take up carbon, hydrogen, oxygen, nitrogen, and the various salts and metals required by the living plants. Once these materials become incorporated as organic compounds (carbohydrates, proteins, fats) into phytoplankton cells, they become available to the animals of the sea that graze upon phytoplankton.

Within the lighted euphotic zone the phytoplankton organisms are consumed by smaller zooplankton organisms, and through a series of eat-and-be-eaten steps the chemical materials are eventually transferred to the largest predatory carnivores (Figure 6). Taken together, these steps form the links of the food chain of the euphotic zone. Some of the phytoplankton sink to lower levels, but very little of it reaches depths below 200 meters before being eaten. This is one very great difference between land and sea ecosystems. Whereas most of the primary production of the sea is eaten directly, on land only a small percentage is eaten by herbivores. If this were not the case, we would not have trees, lawns and gardens, much of the production of which is recycled by fungi and bacteria rather than by herbivores.

In order for the chemical elements to move through the food webs of the sea, there must be power, and this power is derived from the sun. In the process of photosynthesis, phytoplankton cells convert certain wavelengths of solar radiation to chemical energy stored in the cell body as carbohydrates, fats, and proteins. These materials are passed around the living system through the food chains and webs. When plants or animals require energy to support their metabolic activities, growth, and reproduction, they oxidize some of the stored chemicals and release the energy for biological work. According to the second law of thermodynamics, no energy transformation is 100 percent efficient. Some of the energy becomes available for useful work, but the remainder is lost, primarily as heat. The ratio of work output to fuel consumed is a measure of efficiency. Most biological systems are approximately 10 percent efficient, which means that 90 percent of the energy is lost at each step in the food chain. This high rate of energy loss effectively limits the marine food chains to no more (usually less) than six links.

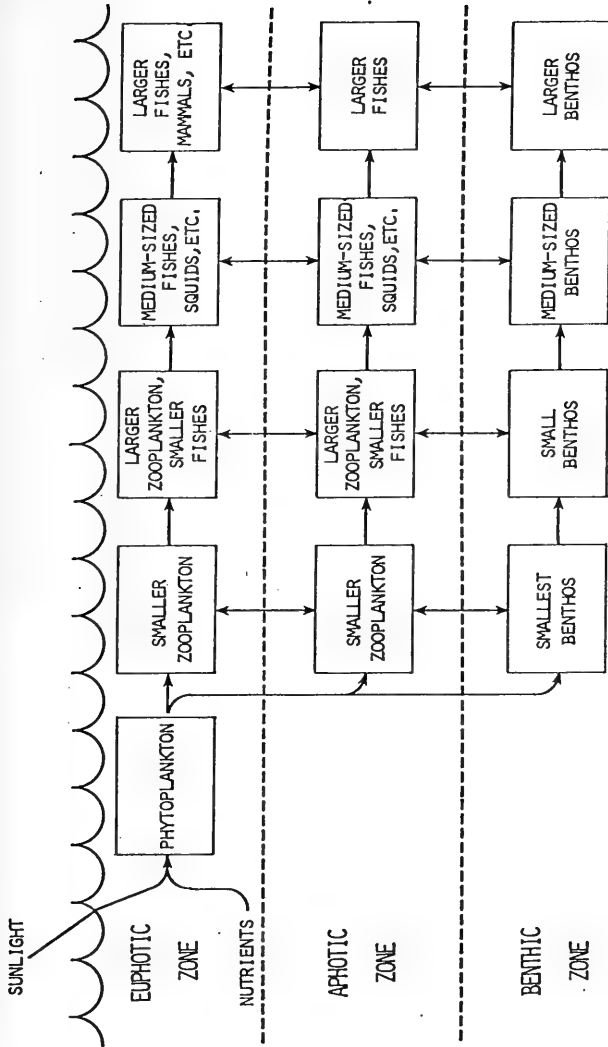


Figure 6 . Diagrammatic representation of the food chains of the sea.

Any factor, such as chronic turbidity that limits the availability of nutrients or light will be reflected in a reduced production of phytoplankton. If this basic food supply is reduced, starvation occurs at various points higher up in the food chain, and the quantity and diversity of marine animals that can survive in the area becomes correspondingly restricted.

Ecosystems Under Stress

All life on this planet is adapted to survive under the particular set of environmental conditions within which it normally lives and to which it has become genetically and evolutionarily adjusted through eons of time. Marked deviation of an environmental factor from the normal may place a burden upon the biological system, a condition referred to as stress. Biological response to stress takes many forms, and it occurs at all levels of biological organizations. Mild stress or stress of short duration may produce little permanent biological effect, but severe stress or stress of long duration inevitably takes a significant biological toll. Plankton populations are known to exhibit changes in species composition under mild stress (Mosser et al. 1970), and to be locally wiped out by severe stress. However, due to the dilution capacity of large volumes of seawater, the movement and mixing capacities of turbulent diffusion and water currents, and the widespread distribution of most plankton species, permanent damage to plankton populations by dredging stress agents appears remote.

Most nektonic species are sufficiently mobile that they may avoid areas of severe stress if it can be sensed as being dangerous. Unfortunately this is not always the case. Subtle stress agents, such as heavy metals, which become concentrated up food chains, may not induce avoidance reactions, and these could, in sufficient concentrations, damage the nektonic populations.

Benthic environments, however, cannot provide for dilution and transport. Many benthic species are of somewhat limited distribution, and most are relatively immobile. Hence, widespread and long-term damage to benthic

systems is a definite possibility, although even here the damage is not likely to be permanent unless whole species are eliminated.

All the effects of stress agents noted above are likely to be most severe in semi-enclosed bodies of water and in areas with low flushing rates. The special care measures of disposal discussed below are intended to prevent substantive damage to any aspect of the biotic components of the marine ecosystem.

SOCIAL AND ECONOMIC VALUES

Although one could quite properly take up fisheries as a part of the above marine ecosystem, there is good reason to lend special concern to these activities for they are at once both sociologic and economic. Few would long argue that fisherfolk the world over do not stand somewhat apart as unique sociological entities. The trade that they ply has had some stormy political implications from the Herring Wars in the North Sea during the 18th century to the protective adjustments required of the trade by creation of the Exclusive Economic Zone in the 20th century. Their protectionist stance engenders often extreme sensitivity to any environmental change. Certainly their interests are to be protected.

But we must not overlook the equally important uses of the sea for national and international trade and commerce which is so vital to the very existence of States and to the broader range of interests which they must protect. These practical concerns are certainly recognized in the Convention in Contracting Parties' agreement to use the best practicable means to prevent pollution of the sea (Art. I) according to their economic capabilities (Art. II), and in their desire to prevent interference with legitimate uses of the sea (Art. I).

It must be realized, therefore, that the IAPH is itself an arm of the people with economic concerns that must be met without excessive costs. And it should be appreciated that there is no attempt on the part of IAPH to solve its problems by creating equally difficult problems for others. Rather, "special care" measures will be designed to achieve protection of all relevant interests of society.

ANNEXES I AND II: THE BASIS FOR CLASSIFICATIONCLASSIFICATION BY CATEGORIZATION

The Convention seeks to achieve protection of the marine environment through a range of restrictions applicable to different categories of waste, depending upon their properties. Article IV(a) of the Convention prohibits the dumping of waste or other matter listed in Annex I unless the waste is either "rapidly rendered harmless" upon disposal or contains Annex I substances as "trace contaminants." Article IV(b) permits the dumping of waste or other matter listed in Annex II, but requires a special permit and the exercise of "special care" in the disposal. Article IV(c) authorized the dumping of all other wastes or matter, provided a prior "general permit" is obtained.

The issue of concern to the IAPH--and the further study of which has been directed by Contracting Parties--arises under Annex I. The concern is that Annex I might be construed to categorically prohibit the ocean dumping of dredged material containing Annex I substances even though the dredging may be essential and there may be not other practicable alternative means or methods of disposal.

Paragraphs 8 and 9 of Annex I provide exceptions to the Annex I prohibition where Annex I substances are "rapidly rendered harmless" (para. 8), or are present as "trace contaminants" (para. 9).^{*/} But where the exceptions do not apply, the IAPH submits that consideration should be given to whether, through use of "special care" measures, the dredged material may never

^{*/} *At the Third Consultative Meeting, Contracting Parties adopted "Interim Guidelines for the Implementation of Paragraphs 8 and 9 of Annex I to the London Dumping Convention", LDC III/12, Annex 6. Paragraphs B(4) and (5) of the Interim Guidelines define the basis for evaluating "harmlessness" and "trace contaminants".*

theless be safely disposed at sea, as in the case of substances permitted to be dumped under Annex II. The focus of this consideration is on "techniques" in dumping, rather than upon the "intrinsic properties" of the material to be dumped.*/

This use of "special care" is the basis for classifying substances to Annexes I or II. The "General Guidelines for Classification of Substances to Annexes I and II to the London Dumping Convention"-- which were approved by Contracting Parties at the Fifth Consultative Meeting. LDV V/WP. 5/Add. 1, para. 3.2.1, Annex--classify substances to Annex I if they are "... simultaneously toxic, persistent and bioaccumulative." Annex II substances are similarly defined as "... those which exhibit one or more of the properties of toxicity, persistence of bioaccumulation, but which may be safely disposed of in the marine environment if special care is used in the disposal." (Emphasis added) Under these classification criteria, an Annex II substance can have all of the Annex I properties of toxicity, persistence, and bioaccumulation. It is nevertheless classified to Annex II, rather than to Annex I, because it may be "safely disposed in the marine environment if special care is used in the disposal." The focus of the classification is upon "special care" and "safe disposal", and not upon the properties of toxicity, persistence, and bioaccumulation, per se.

SCIENTIFIC BASIS FOR APPLICATION OF CRITERIA

Although the classification of substances to Annexes I or II has been on a categorical basis, scientifically the criteria can equally be applied on a

*/ Under the Interim Guidelines certain of the "special care" measures considered in this submission may also be relevant in determining "harmlessness" and "trace contaminants". Paragraph 5 of Appendix I provides that "in applying the results of tests to predict the environmental impact of the proposed disposal, the method of disposal and the dilution of the waste that would result after dumping should be considered..."

"case-by-case" basis.*/ If it can be demonstrated that dredged material containing Annex I substances may be safely disposed through the use of "special care" measures, then under the classification criteria it should be treated as under Annex II, and not Annex I, and should be allowed to be dumped under a special permit. This flexibility in applying the criteria appears evident in Contracting Parties' recognition that the criteria should not be applied "rigidly" and that "... a degree of judgment is involved in applying these criteria, e.g., toxicity, bioaccumulation and persistence, for assigning materials to the Annexes,..." LDC IV/12/3, Annex 2, and LDC V/WP. 5/Add. 1, para. 4.6.

Such case-by-case application of the classification criteria also finds support in the recent consideration and approval by Contracting Parties of "A Procedure and Methods of Approach for Preparing and Maintaining a List of Hazardous Substances." This list is intended to serve as a basis for inclusion of substances into Annexes I or II. LDC V/WP. 5 Add. 1, para. 4.7, Annex 3, and LDC V/4, Annex 3. In the report of the last meeting of the Scientific Group some delegations noted that "... in the process of reviewing new scientific information in regard to substances already in Annexes I or II, in theory it might also be possible that certain specific compounds could be withdrawn from the Annexes in the light of new scientific information or increased experience. The group noted that changes in the status of substances presently in Annexes I or II could be handled procedurally by Consultative Meetings in the same manner as followed in the development of the list of hazardous substances." LDC V/4, para. 2.3.5.

*/ *This is the approach taken in the Interim Guidelines for determining "harmlessness" and "trace contaminants" under paragraphs 8 and 9.*

This same reasoning should also allow a case-by-case review of dredged material containing Annex I substances in light of "special care" measures which may allow the safe disposal of the material at sea. When this can be done, the rationale of the listing criteria should permit the dumping under a special permit, as in the case of substances classified to Annex II.

In the succeeding sections of this submission, detailed consideration will be given to a number of innovative "special care" measures which should be of particular benefit in the safe disposal of dredged material at sea.

WORKING DEFINITIONS OF ANNEX I AND II PARAMETERS

The three Annex I properties of being toxic, of being susceptible to bioaccumulation, and of being persistent or refractory to degradation in the environment are legitimate concerns; however, we have come to learn more and more about the fate of pollutants in the marine environment from field studies and there is little hard evidence that dredged material has caused substantial biological damage in the ocean. It is our position, therefore, that the special care disposal measures that we address in this submission for disposal of dredged material containing Annex I substances will secure continued protection of the marine environment.

Toxic. To state that a constituent of any material is toxic is equivalent to saying that it is poisonous and capable of causing death. The degree of toxicity depends upon several factors, including

- (a) The particular element or compound involved.
- (b) The amount of the element or compound.
- (c) The presence of other metals or substances with which it is synergistic or will complex.
- (d) The kind of organisms exposed to the toxicant.

(e) The life stage of the organism.

Other factors will determine the availability of the toxicant to exert its effects upon the organism. For instance, much of the dredged material removed during harbor and channel maintenance dredging is high in organic matter and clay and is both biologically and chemically active. It is usually devoid of oxygen, may contain appreciable sulfide, and is near neutral pH. These sediment conditions favor effective immobilization of many pollutants. For example, organic matter and especially sulfide can effectively immobilize mercury and lead, especially in a reducing and near neutral pH condition. These conditions are usually found when dredged material is disposed in a low-energy hydraulic regime, and is favored by mounding or placement in a low-energy depression and capped with clean material (see Special Care Disposal Measures in this report). It should be noted then that some laboratory tests, of the availability of, say, metals when a dredged material is disposed in the ocean are not an accurate measure of field effects.

The difference between acute vs. chronic toxicity is generally, but not always, attributable to the amount of toxicant present within the organism. Acute responses of organisms are relatively easy to observe, whereas chronic responses are not. Acute responses generally involve dysfunction of a vital process, such as respiration or heart function. Chronic responses on the other hand more likely will affect the reproductive capacity or fecundity of the organism.

Fortunately, all organisms have the ability to accommodate to the intake of a wide range of toxicants. They achieve this accommodation by sequestering the toxicant in their storage tissues or by a process of detoxification and depurative elimination carried out by the liver, lungs, kidneys or, in some cases, the skin. This process of depuration is time-dependent. Hence amelioration of impacts of even highly polluted dredged material can be achieved by reducing the frequency of dumping and the amount dumped on each occasion (see section on Multiple Capping and Depuration in this report).

Bioaccumulation. Bioaccumulation refers to those processes by means of which organisms take up chemicals from the physico-chemical environment and incorporate them into some or all of their tissues. It is a very normal set of processes without which life would not be possible.

The environmental concern with bioaccumulation is related to the uptake of toxicants and their effects upon the consuming organism or upon the organism that consumes it. Unfortunately the early concern with bioaccumulation was based largely upon one compound, namely DDT, which is somewhat unique in its ecological characteristics. Simply because an organism takes up a toxic compound and assimilates it does not mean that it will suffer debilitation. For example, in the bodies of vertebrate animals DDT is stored in adipose or fat tissue depots. Here it has little or no effect on the organism. The amount of DDT stored in an organism's tissues then will depend upon the amount of fat it possesses and this, as we well know, is related to season. If and when it is released from the fat depots some of it is detoxified by liver and, in some cases, kidney cells. A third factor that protects organisms from the effects of toxicants is the development of immunity. Thus, it is rarely the case that an organism will accumulate a given toxicant until it becomes lethal. Rather the organisms will establish a dynamic equilibrium wherein the toxicant is assimilated and eliminated at the same rate as its uptake (Mitchell, 1966; Stanford Research Institute, 1963).

In this event one must consider the effect that such an organism will have when it is prey for a predator, including man. Here again this is a complicated issue. But in general one can say that man has a remarkable ability to detoxify his foods. In addition, there is ample evidence to show that most of the chlorinated hydrocarbons, when fed regularly at a given concentration in the diet, will reach an equilibrium in the fat. Man has suffered from the uptake of chemicals such as organochlorines primarily when he has been exposed to massive doses over substantial periods of time-conditions that were once common in certain kinds of chemical manufacturing plants. It is very unlikely that dredged material would cause toxic conditions in an organism that when eaten by man would cause untoward

symptoms. Note for example, some marine food organism for man such as mussels and oysters have natural proclivities to store relatively high levels of metals in some of their tissues. Mussels normally store relatively high levels of cadmium and oysters store high concentrations of copper. Neither appears to suffer nor does man upon consuming them.

The subject of whether or not marine organisms take up significant quantities of many toxicants, such as cadmium or PCBs, from marine sediments is complex and subject to debate but present indications are that the main route of entrance is via water. Again, it is the purpose of the special care measures of disposal submitted here to sequester toxic materials away from interstitial waters in the sediment bed.

Persistence. As used in environmental management, persistence refers to the property of toxic substances to resist degradation by the activity of such organisms as bacteria or fungi or by natural physico-chemical factors for substantial periods of time. In other words, the material by remaining intact persists in its original toxic state. For the most part persistence is concerned with compounds, not elements, and with organics, not with inorganics. Certainly it is the chlorinated hydrocarbons that are of principal concern.

There is no doubt that the chlorinated hydrocarbons, including such insecticides as DDT, endrin, aldrin, and other chlorinated compounds such as the PCBs, are relatively persistent when released into the marine environment. Nevertheless, there is a common misconception that once these compounds get into water or sediments they will remain there forever. This, of course, is not so. Persistence is a time-related function which is of significance only in a comparative sense. All components of the marine ecosystem are dynamic, which means that residues of chlorinated hydrocarbons are removed from (1) aquatic environments by codistillation, metabolism, etc., (2) from sediments by microbiological activities and chemical degradation, and (3) from organisms by various metabolic processes in liver and/or kidney cells (Buescher et al., 1964; Bridges, 1961).

Data tabulated below show the loss of insecticides from water containing mosquito larvae by codistillation:

| <u>Insecticide</u> | <u>Original Conc.</u> <u>ppm</u> | <u>% Codistilled After</u> <u>20 hours at 26.5°C</u> |
|--------------------|-------------------------------------|---|
| aldrin | .024 | 93 |
| dieldrin | .024 | 55 |
| heptachlor | .21 | 91 |
| heptachlor epoxide | .25 | 42 |
| p,p'-DDT | .0056 | 30 |
| chlordane | .20 | 70 |
| lindane | .023 | 30 |

Source: Buescher et al., 1964.

Bridges (1961) found that endrin accidentally sprayed on a pond in Colorado to a level of 40ppb was gone from the water in a month, from the sediment in 3 months, from the vegetation in 2 months, and from the fish in 4 months.

DDT is considered to be one of the most persistent pesticides in the environment. Two of its major metabolites are DDE and DDD. Of these two, DDE is the compound most frequently encountered in environmental sediment samples. In soils and sediments DDT is slowly converted to DDE under aerobic conditions by fungi, molds, and bacteria. All of the cyclodiene insecticides including aldrin, chlordane, endrin, dieldrin, and heptachlor are generally held to be persistent in the environment. But all can be metabolized by various microorganisms.

Even though some toxic, synthetic, organic compounds may be refractory to biologic degradation for long periods of time, there are other ways that these compounds are sequestered when combined in marine sediments. Many such compounds are bound to organic matter and clay particles in marine

sediments in such ways as to be unavailable to any but microorganisms. It is the objective of special care measures of disposal to increase the conditions within the sediment mass that will promote continued sequestering.

SOME ECOLOGICAL CONDITIONS THAT SUPPORT OCEAN DUMPING OF POLLUTED DREDGED MATERIALS

SEQUESTRATION OF POLLUTANTS

In general the dumping of dredged material in the marine environment creates conditions in the mound that induce immobilization of toxic metals and many organic compounds. This is particularly true when the dredged material contains substantial amounts of fine particles and is enriched by naturally occurring organic matter (Gambrell et al., 1977). Also, it should be noted that several physicochemical conditions that immobilize pollutants of interest to the present discussion are augmented by some "special care" disposal measures discussed hereinafter. First, however, it may be helpful to examine the sequestering effect that these physicochemical conditions have on particular pollutants.

SELECTED POLLUTANTS

Mercury

Uptake and accumulation accompanying mercury contamination have been documented for pelagic and benthic organisms. It appears, however, that this uptake by aquatic organisms is predominantly from water rather than bioaccumulation in food webs (Gambrell, et al., 1978). Fortunately elutriate tests on a number of sediments have shown that very few release mercury in significant amounts (Brannon et al., 1978).

The following physicochemical conditions can effectively immobilize mercury in sediments: (1) humic materials, (2) sulfide, (3) clays, especially montmorillonites, (4) reducing conditions, and (5) pH around 7.0. Many of these conditions are met in ordinary disposal of dredged material in the

open ocean, but "special care" measures enhance the effects of these conditions on sequestering of mercury and mercury compounds and some, such as capping, will preclude contact of benthos with the polluted material. It should be mentioned also that hydrous iron oxide, prevalent in some sediments, scavenges dissolved mercury in the water column.

Methyl mercury is, of course, highly toxic, but in Japan where, as is well known, mercury contamination in some sediments has been a problem, methyl mercury was found to enter benthos from water and not from sediments (Fujiki, Hirota, and Yamaguchi, 1977).

Both capping of mounded dredged material and that disposed in borrow pits (these are special care measures mentioned in this report hereinafter) should be desirable disposal methods with low potential for adverse environmental effects.

Cadmium

Although cadmium is a highly toxic metal the disposal of cadmium-polluted sediments in the marine environment poses relatively low risks to the pelagic environment within or adjacent to the dumpsite (Gambrell et al., 1978). Moreover, even though it appears that benthic organisms can accumulate cadmium from some contaminated bottom sediments, it is espoused here that the physicochemical conditions that accompany some "special care" disposal methods will effectively sequester the metal from these organisms (Chen et al., 1976). Cadmium is immobilized by (a) reducing conditions, in which it is bound as insoluble organic and sulfide forms, and (b) by alkaline pH. High concentration of sulfides and/or organic material in reducing bottom sediments will precipitate and complex cadmium in immobile forms with little or no diffusion of soluble cadmium to the overlying waters. Some or all of these conditions will be met by "special care" disposal methods.

Chlorinated Hydrocarbons

The chlorinated hydrocarbons of principal concern in dredged material are

such pesticides as DDT and its derivatives, and polychlorinated biphenyls (PCBs). It is still problematical as to whether or not pelagic and benthic organisms can acquire significant body burdens of chlorinated hydrocarbons from polluted sediments. Even when they do, most benthic organisms do not exhibit acute symptoms of toxicity. As a result, concern is expressed as to the potential for elicitation of chronic responses and bioaccumulation. Clearly these matters are again the reason why "special measures" of disposal can be so effective in minimizing potential harm to the environment while providing time for biodegradation of these compounds.

It should be noted that Burks and Engler (1978) demonstrated that chlorinated hydrocarbons are normally very strongly bound to particulates in sediment-water systems. It is in this state that micro-organisms may act to degrade many of these compounds. This activity in regard to DDT and related species is well known, but less well known is the fact that PCBs are also degraded by sediment-living bacteria and fungi. It is reported, however, that the rates are inversely proportional to chlorine number but only very slowly above four (Wong and Kaiser, 1975, Ahmed and Focht, 1973). Thus, because of the long-term stability of many chlorinated hydrocarbons in sediments any problems will be associated with gradual release and subsequent accumulation by organisms. In quiescent offshore waters, say, 30 meters or more depth, release directly from contaminated sediments to the water column should present low environmental risk. Even this low risk factor could be reduced further by mounding the polluted material and then capping it with clean material having considerable clay and organic matter in it. Again, "special care" measures can ameliorate the impact of these compounds by sequestering them in isolation from benthic organisms and providing time for biodegradation. Covering polluted dredged material with cleaner sediment from the same project to accomplish this sequestering has also been advocated by Rhoads et al. (1978) and Gambrell et al. (1978).

NATURE AND APPLICATION OF SPECIAL CARE MEASURESRELATIONSHIP TO DECISION PROCESS

The concept of special care measures applies to three phases of the dredging/disposal process, viz.,

- (1) To methods of disposing of dredged material in the marine ecosystem.
- (2) To procedures to be followed in the dredging and transport of bottom sediments.
- (3) To decisions involved in selecting the location and other characteristics of dumpsites.

Obviously there can also be particular combinations of items 1 and 3 above.

SPECIAL CARE MEASURES OF DISPOSAL

CLEAN MATERIAL CAPPING

Description of the Technique

In clean material capping (CMC) relatively large volumes of polluted dredged material are emplaced and then covered with a reasonably thick (no less than one meter) blanket of unpolluted or clean sediment. The technique's rationale argues that the "cap" will prevent transport of the polluted material and that it will also be thick enough to accommodate the needs of burrowing benthos. Hence they will not drill into the polluted core, which action could permit pollutants to reach the sediment/water interface through the process of bioturbation.

Examples of the Application of CMC

A recent capping operation (in 1979) was carried out by the New England Division of the U.S. Army Corps of Engineers. The specific source of polluted sediment containing various industrial pollutants was Stamford Harbor, Connecticut; the clean capping silts and sands were dredged from New Haven Harbor (Morton, 1980a). Some 38,000 cu m of polluted material was capped with about 76,000 cu m of clean material. Extreme shoaling required that both harbors be dredged in 1979 to insure safe passage of commercial traffic to oil and other terminals in those cities. The fate of this material is being monitored on a regular basis by precision bathymetric surveys. It was still in place, as of late 1980, although the originally irregular surface of the cap has been smoothed by the passage of storm waves.

In 1980 a million cu yd of PCB enriched dredged material from the New York/New Jersey area was placed in the Mud Dump in the New York Bight and capped in November with two million cu yd of harbor mouth material. The results are being monitored (pers. communication, Dr. Dennis Suszkowski, Corps of Engineers, New York District, Feb. 1981), by precision bathymetry, translocation of dumped sediment, and field bioassay using live mussel (Mytilus edulis) held at the site.

In Norwalk Harbor, Connecticut a pit was dredged alongside the channel in which a spill of naphthalene and nitrobenzene and other toxic chemicals had occurred. After placement of the 1500 cu m of polluted material in the pit, some 20,000 cu m clean material was to be applied (Morton, 1980b).

Environmental Soundness

Available evidence indicates that CMC is held to be an environmentally sound method by which to safely dispose of polluted dredged material in moderate depths where precision dumping around a taut-wire buoy can be accomplished. If deep-water disposal sites are to be used, dredging should be done only with a clamshell and dumping will require locating the exact

release zone by means of a bottom pinger.

Usefulness of CMC

Many of the major harbors of the world require dredging of material that in some cases is contaminated with industrial wastes or products, including heavy metals, pesticides, and PCBs (Morton, 1980b). The continental shelf is deemed the best disposal area for this technique because of

- (a) the generally large amounts to be dredged
- (b) the usual lack of suitable upland or shoreline disposal sites near these harbors, and
- (c) the higher cost of transport of polluted plus clean material beyond the continental shelf, particularly in those areas where the shelf is very wide.

Requirements for Successful CMC Operations

The requirements for a successful capping operation, as suggested by Morton (1980b) appear to be

- (a) Dredging of the "hot material" is best done by clamshell in order to retain cohesiveness of material.
- (b) Dumping must be precision, involving either taut-wire buoys or bottom pingers to mark release points.
- (c) The final surface of the mound should be as smooth as possible to reduce erosion from waves or currents.
- (d) Smoothness is best achieved if the capping material is sand rather than silt.

- (e) After disposal of about two-thirds of the capping material at the buoy, the rest should be dumped in a circle with a radius equal to that of the initial mound (as determined by bathymetry) in order to insure that its flanks are covered.

BORROW PIT DISPOSAL: ANOTHER CMC TECHNIQUE

Description of the Technique

Another recent innovative approach to capping operations utilizes existing submarine borrow pits which have been made during sand mining in an outer harbor or on the continental shelf adjacent to the harbor. Because sand is becoming an important item of commerce in many regions, it is likely to become a very important technique. Where possible the final capping is done with clean sediment of similar lithology to the surrounding area. Because these pits have acted as traps for very fine material it is suggested that, where possible, dense sands not be used as the capping material since collapse of the sand cap could occur.

Example of the Borrow Pit Technique

Sand mining operations in New York Harbor have left several large pits on the Harbor floor (Bokuniewicz, 1980). The largest pit has a volume of about $25 \times 10^6 \text{m}^3$. It is about 7m deeper than the surrounding floor and has side slopes of about 10° . The Corps of Engineers, New York District has developed plans to use the borrow pits for the disposal of polluted dredged material taken from the upper Harbor pit.

Environmental Soundness

Borrow pit capping operations have several environmental advantages, viz.,

- (a) they isolate the "hot material";

- (b) filling the borrow pits and capping of the dredged material removes zones of anoxic conditions resulting from lack of normal water circulation in the pits;
- (c) filling the pits reduces the effect these deep mining holes have on wave energy refraction, which can focus on a break-water or groin with damaging results.

Usefulness of Borrow Pit Disposal

In some places this can be an extremely useful technique that appears also to be economically as well as environmentally sound. The filling of pits permits additional sand mining to be accomplished without drastically altering ambient conditions in a harbor. Also, locating the pits near the area to be dredged makes them economically valuable.

SPLIT-SITE DISPOSAL

Description of the Technique

The split-site may be useful when very large amounts of polluted material must be disposed. It involves both the dredging and the disposal processes. It also requires a somewhat elongate dumpsite that is oriented at an angle across the longshore current (Figure 7). The dumpsite has, say, six release points that are marked with a buoy for the precise dumping required by capping operations. The basic idea is to permit organisms in and downstream of the dumpsite to depurate prior to capping operations. This technique should permit the disposal of very large volumes of polluted material from a hopper dredge without serious environmental degradation.

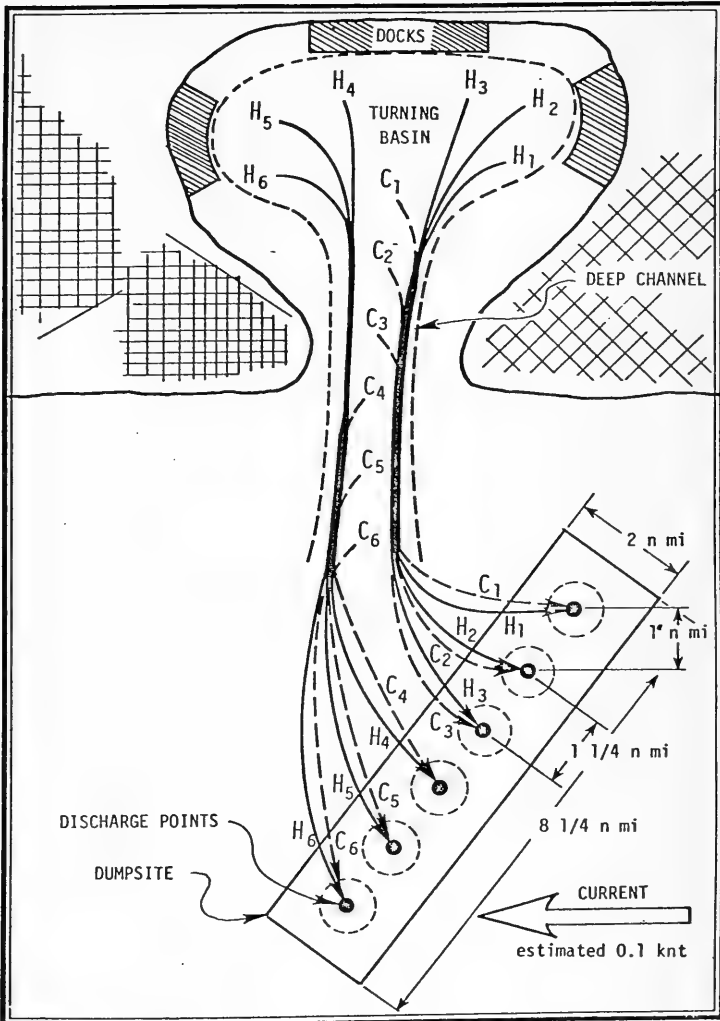


Figure 7. Depiction of the multiple capping and deperation disposal procedure.

To accomplish this objective simply involves establishing several release points within the dumpsite. The polluted dredged material is then released for, say, three days or so at release point No. 1, then at No. 2, etc. until the polluted material has been dredged out of the harbor. This in-series dumping will permit the longshore current to carry the finest part of the dredged material across the site without materially affecting adjacent release points. Meanwhile the organisms downstream of release point No. 1 are able to depurate before accumulating large quantities of serious pollutants.

The rest of the procedure involves the location and time sequence of the dredging process. As shown in Figure 7, the first dredging is done around docks or near point source releases of pollutants where "hot" sediments will occur (H in Figure 7). This enriched material is then dumped in series at the release points, while the dredging continues down the channel toward the harbor mouth where generally the sediments should be relatively clean (C in Figure 7). This clean material is then dumped in series at the release points with sufficient precision to accomplish a normal capping operation.

A Theoretical Example

There are no known examples of this modification of the CMC approach. For purposes of exemplification, consult Figure 7 and note that the dumpsite has six release points that are 1.25 nautical miles from each other and from the dumpsite's side boundaries. The longshore current is flowing about parallel to shore at a rate of 0.1 knots. Since a 1 kt current covers 1 n mile in an hour, it will take a 0.1 kt current 12.5 hours to carry sediment to the site's downstream boundary. Thus, much of the material will have settled to the bottom within the site. If we assume that the dredging of the contaminated parts of the channel and turning basin take 18 days, then organisms downstream of any given release point will have been exposed to fine material for only 3 days rather than 18 if

all the material had been dumped at the same point. Moreover, they will have 15 days to deplete should dredging take longer and dumping of hot material would have to take place at release point No. 1 again. The 15 day interval will permit organisms to reduce their body burdens of chemicals substantially, if not completely. Macek et al. (1979) analyzed tissue samples collected from fish undergoing depuration after aqueous exposure to various chemicals. Almost two-thirds of the chemicals tested had a half-life of less than one day. This simply means that when fish burdened with chemicals were placed in clean water, a minimum of 50% of the chemical residues previously detected in the tissues had been eliminated. The remaining third of the compounds had a half-life of less than 7 days.

The final step is, of course, capping. As dredging continues down the channel where bottom materials are, in this case, known to be clean, the capping procedure can be accomplished at each of the buoyed release points.

Environmental Soundness

This procedure is as environmentally sound as the capping process and has the added advantage of permitting some depuration of downstream organisms.

SPECIAL CARE DISPOSAL AREAS AND SITES

RATIONALE FOR DEEP OCEAN DISPOSAL

General

In many cases deep ocean disposal may present another feasible special care measure of the polluted material disposal. In many areas where conventional ocean disposal has become an acute problem it is assumed

"--- that it will become increasingly difficult to acquire and continue to use conventional disposal sites in the Coastal Zone, whether they are in upland areas, or in estuaries or on the inner continental slope. This problem will be aggravated by the estimated future increases in the amount of dredged material produced in waters of many nations. A viable alternative to the increasingly unsatisfactory disposal operations will eventually be needed. It is concluded --- that deep ocean sites of various types will meet this need and that their use will impose only minor stresses on deep ocean ecosystems (Pequegnat, et al., 1978)."

A parallel opinion was voiced by the eminent marine geologist K. O. Emery of Woods Hole Oceanographic Institution in 1971 (Andrelunas and Hard, 1972) when he indicated that there is much more ocean floor than dry land and advised that the deep ocean should be used for certain types of waste disposal, provided it is done under knowledgeable management to minimize ecological problems. Clearly good management is part of the special care concept.

Some Factors Favoring the Deep Ocean as a Special Care Area

There are several valid reasons why it is believed that impacts of dredged material will not create severe stresses in the deep ocean. In general, those marine scientists who favor deep ocean disposal base their opinion in part on the probability that there will be an amelioration of effects during a long transit in the water column. Also, the deep ocean has large areas and immense volumes of water to dilute materials, even within reasonable distances seaward of the continental shelf break with the continental slope. Consideration must certainly be given to the fact that the deep ocean supports a small biomass and much of it consists of deposit-feeding animals, many of which are burrowers. For instance the eminent deep-sea biologist Hjalmar Thiel of the Hydrobiological Institute of the University of Hamburg (1975) estimates that the weight of animals per unit area is as much as 10,000 times greater on the shelf than it is in the abyssal plains of the deep ocean. Perhaps, of greatest immediate significance is the fact that the deep ocean is little used by man today (no commercial fisheries

below 1000m) and, at least, for food production will not be used to a greater degree in the future. This is a view that is shared by the distinguished Russian oceanographer P. A. Moiseev (1971) as well as many fisheries experts.

Some marine scientists oppose the disposing of dredged material on the continental slope because of the fear that the rapid introduction of substantial volumes of sediment would produce catastrophic impacts. But certain natural occurrences in the form of turbidity flows or currents provide some information on the effects of rapid sediment introduction to the ocean floor. Turbidity flows are known to be a common occurrence on some continental slopes. Obviously, such flows will kill some animals and transport others to greater depths where they may not be able to reproduce, but there apparently are compensating factors. For instance, Griggs et al. (1969) found that the Cascadia Channel (2600m depth) off the coast of Oregon and Washington had been receiving numerous postglacial-age turbidity flows. Yet the benthic animal populations in the flow areas were four times as abundant as those on the adjacent Cascadia Abyssal Plain that has not been affected by such flows. It was postulated that the turbidity flows increased the utilizable organic material in the sediment, thereby enhancing the deep ocean environment.

Thus, even though there have been very few truly deep ocean disposals of dredged material that have been studied from the standpoint of impacts on the biota, there is an impressive amount of indirect evidence that the impacts in the deep ocean will not have serious effects on the benthic life. Although it is believed that much of the offshore region of the world ocean is suitable for dredged material, there are particular types of features of the deep ocean that will lend themselves well to the assimilation of polluted material.

HYPERHALINE BASINS

Description of the Basins

Anoxic hypersaline basins exist on the outer continental shelf and the upper continental slope of the northern Gulf of Mexico and elsewhere. A particularly large one was discovered in 1975 (Shokes et al., 1977) about 150 n miles due south of Morgan City, Louisiana (Figure 8, inset). The basin is about one-third full of brine that is 8.6 times as salty (310g/l) as the 1800m of normal seawater (36g/l) overlying the basin (Figure 9). This brine layer is 180m thick and occupies a J-shaped area measuring 15 by 2 n miles (Figure 8). The brine has originated from the seawater dissolution of a salt dome that is exposed somewhere on the basin wall. It is thought that this process began about 10,000 years ago and that at least 30,000 years will be required to completely fill the basin with brine.

Suitability of Brine Basins as Polluted Material Dumpsites

These brine basins are nearly devoid of life. Only simple bacterial life can exist in them. The bacteria are utilizing organic matter that descends from above and are producing methane (CH_4), ammonia (NH_3), and hydrogen sulfide (H_2S). These actions keep the dissolved oxygen content of the brine at zero (Figure 10). The following factors indicate that the basins would be excellent places into which to deposit very polluted dredged material:

- (a) the basin will retain its present configuration for at least 20,000 years
- (b) nearby abiotic
- (c) anoxic
- (d) great stability of brine layer that would not be disturbed by passage of storm waves, including those generated by hurricanes.

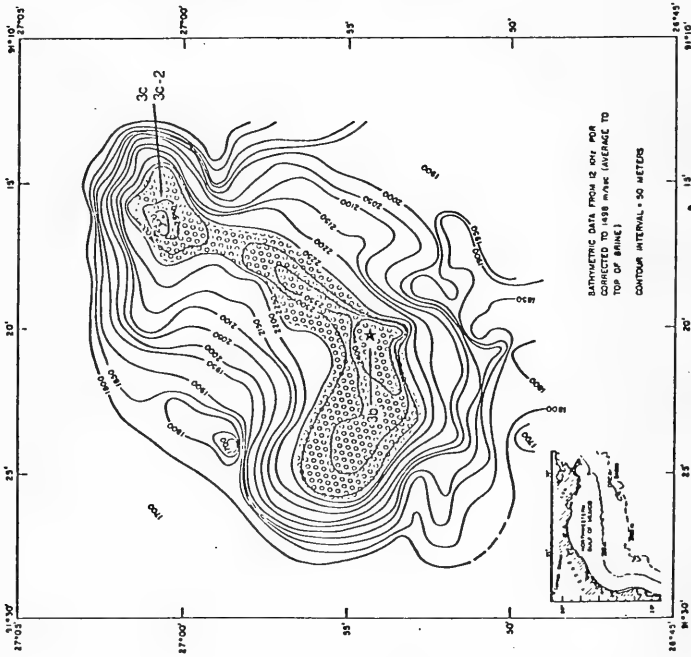


Figure 8. Hypersaline basin (Orca Basin) south of Morgan City, Louisiana. Shaded area is brine field, shown also in Figure 9.

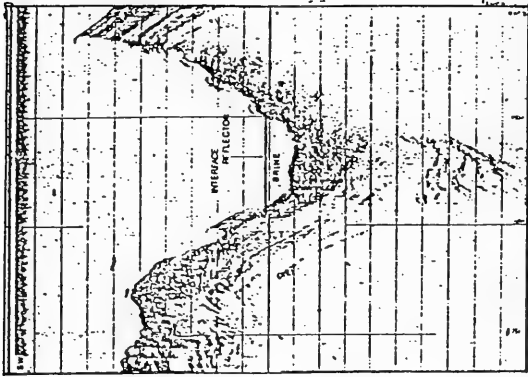


Figure 9. Minisparker line along the longitudinal axis of Orca Basin showing subbottom and midwater reflectance layers.

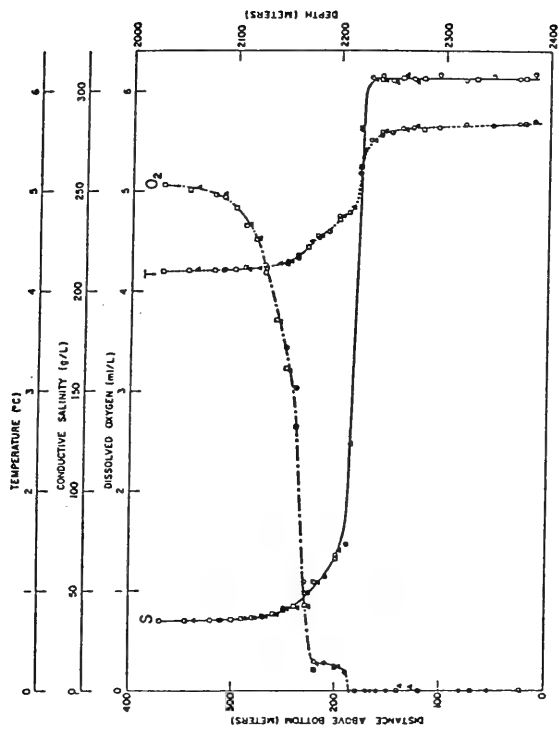


Figure 10. Vertical profiles of temperature, shipboard conductance, and dissolved oxygen above and in Orca Basin.

SUBMARINE CANYONS

Description of Submarine Canyons

Submarine canyons are sea-floor valleys that begin as notches in the continental shelf from which they cut as troughs into the continental slope and terminate in fans of sediment on the lower slope or continental rise. They are viewed by some marine scientists as being ideal locations for disposal of polluted dredged materials, that is to say, those appropriate for special care measures. It is emphasized, however, that not all canyons are equally appropriate; hence decisions as to their use should be made on a canyon by canyon basis.

Suitability of Submarine Canyons as Polluted Material Dumpsites

There are several factors favoring use of submarine canyons for disposal of dredged material. Foremost among these is the fact that they are usually dynamic features that normally act as conduits for the transport of sediment from the continental shelf to deep parts of the slope or abyssal plain. Menard (1955) realized this after he demonstrated that the quantities of sediment in subsea fans and aprons at canyon mouths far exceeded the volume of rock removed during erosion of the canyons. Another favorable factor is that the amount of life on the floor of some active canyons is quite sparse (Shepard and Dill, 1966).

Certain canyons, however, may be favored migration routes for fish and some shellfish such as lobsters may live at and around the canyon mouths. Canyons serving these purposes probably should not be used for disposal.

Some concern has also been expressed that upcanyon currents might transport material back up onto the continental shelf. Currents in most cases probably do alternate upcanyon and downcanyon with periods ranging from less than one hour to near semidiurnal tidal periods (Shepard and Marshall,

1973 a. b; Shepard et al. 1974 a. b). But Southard and Stanley (1976) report that downcanyon velocities are higher and of longer duration than up-canyon. This accounts in part for the net downcurrent transport of fine sediments in the form of migrating asymmetrical ripples.

Worldwide Occurrence of Submarine Canyons

Another fact that makes submarine canyons likely as special care disposal sites for polluted dredged material is their worldwide distribution and the fact that their origins are often not unreasonably far offshore.

European Canyons. Large submarine canyons are found along the Atlantic coasts of Europe and the north side of the Mediterranean (Shepard and Dill, 1966). Some of the best of these are located off the west coasts of France, Spain, and Portugal (Figures 11 and 12).

Other European canyons are found along southern France, the Italian Riviera, the west side of Corsica, the lower part of Italy, the south side of Crete, and along the southern coast from Tunisia to Morocco.

Japanese Canyons. Canyons occur all along the east coast of Honshu from the head of Sagami Bay to the tip of Boso Peninsula. Tokyo Canyon is one of the best known because it extends into the outer portion of Tokyo and Tateyama Bays (Figure 13). The floor of the canyon, which is 50km long, is covered with coarse sand and gravel near its termination at a water depth of 1465m.

American Canyons. There are submarine canyons on all coasts of the USA. On the West Coast canyons are found from San Diego to the Strait of Juan de Fuca. Some of the best known of these are La Jolla and Scripps Submarine Canyons (Figure 14); Monterey Canyon, which is the deepest and largest submarine canyon along the east coast, heads at the center of Monterey Bay; Columbia Canyon off the mouth of the Columbia River; and Juan de Fuca Canyon, which is the northernmost on this coast.

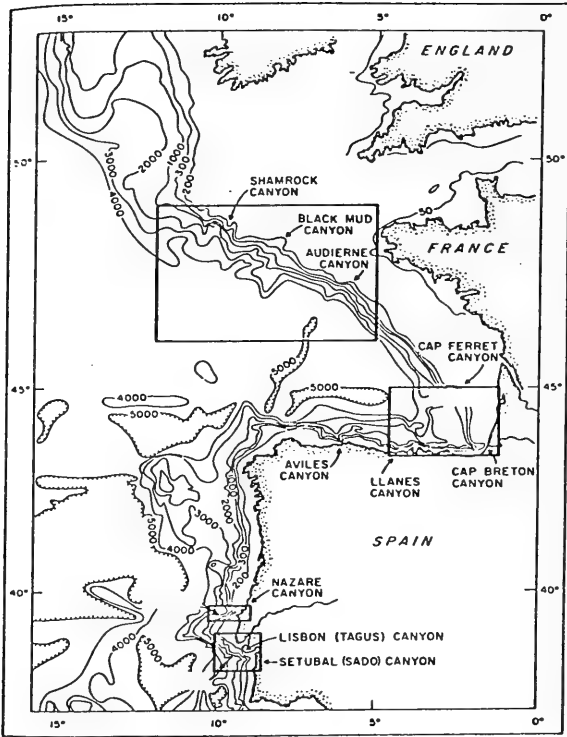


Figure 11. Outline map showing the principal canyons off western Europe.

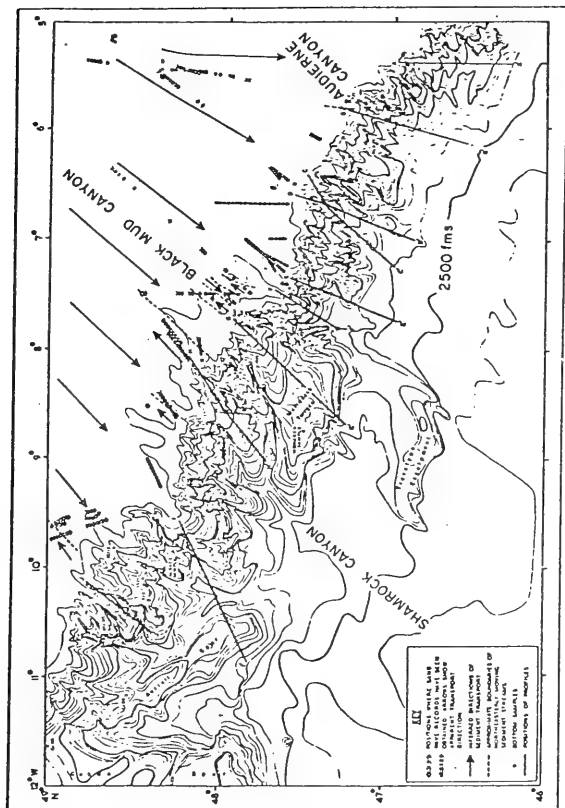


Figure 12. Canyons cutting the continental slope southwest of the English Channel. Contour interval 100 fathoms. From Hadley (1964) with canyon names added.

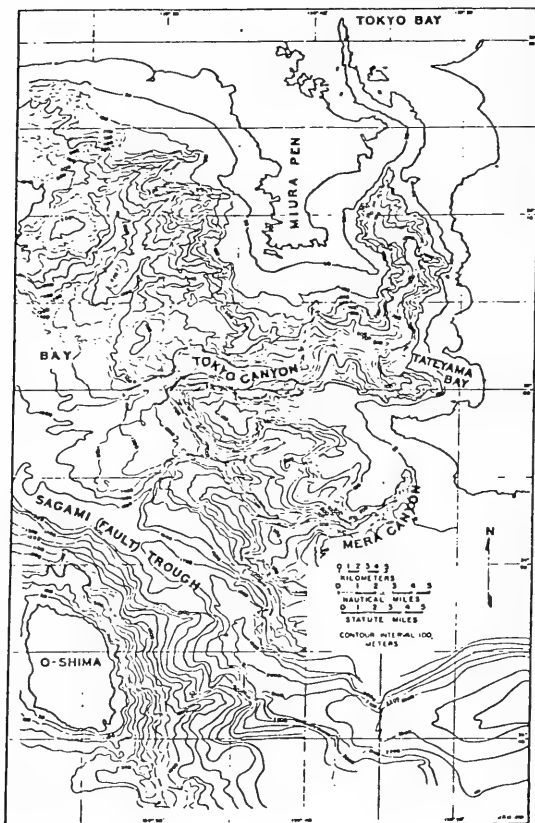


Figure 13. Canyons in the vicinity of Tokyo, based on a 1960 Scripps Institution survey and on a Japanese survey of recent date. Note the fan at the lower end of Tokyo Canyon are from Japanese interpretations. The contours are in meters.

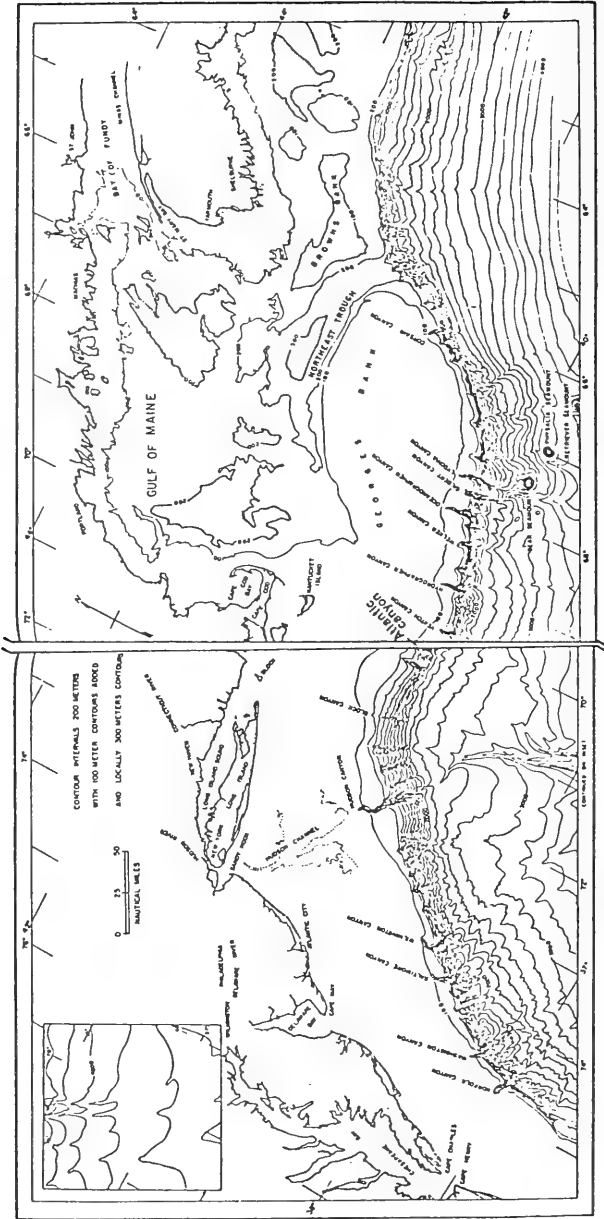


Figure 15. The canyons of the northeast coast of the United States. Modified from a map by Elazar Uchupi, U.S. Geological Survey, Misc. Geol. Investigations Map I-451.

There are many canyons off the East Coast (Figure 15). They differ from those of the west in that they head many miles out from shore, near the outer edge of the continental shelf. There are numerous canyons off Georges Bank and they occur in an almost uninterrupted series to Norfolk Canyon off Chesapeake Bay.

Off the western side of the Mississippi Delta a troughlike valley is found which qualifies as a special type of canyon.

Other Submarine Canyons. At the mouth of the Congo there is an estuary with a canyonlike valley extending into the estuary for about 25km. It accommodates the enormous amount of sediment transported by the Congo. The canyon is the longest in the world, extending some 250km from the estuary to a large outer fan. Turbidity flows occur in the canyon about 50 times per year (Heezen et al., 1957).

There are troughlike valleys outside the deltas of the Ganges, Indus, and the Niger.

CREATION OF OFFSHORE ISLANDS TO SEQUESTER VERY CONTAMINATED MATERIAL

Description of the Technique

In many places of the world there will be environmental advantages connected with the construction of artificial islands in selected offshore waters. One such advantage would be for the islands to serve as barriers against wave actions that produce serious erosion of beaches. An equally important use in the present context involves designing the centers of these islands as receptacles for extremely polluted dredged material. This process would entail creating one or more borrow-type pits into which the polluted material would be dumped and then sequestered by a cover of clean material. Accordingly, this is an extension of the capping process whereby the island's shell is constructed of clean material, whereas the central pit is filled with the pollutants and eventually capped. The cover can be left as open sand or planted to appropriate vegetation.

Environmental Soundness

One outstanding advantage of these island pits is absence of the fear of ground water contamination. The islands could also serve as excellent open habitat for many birds, such as the Least Tern that nest in sand, whose former breeding grounds are being overrun by man. The part of the island bearing plant cover would provide habitat for various other species of sea birds.

Obviously, the islands would have to be sized and positioned so as to not interfere with navigation and with the normal longshore water circulation. Also, careful positioning and thoughtful design should preclude the chance of their being washed out.

DISPOSAL BELOW THE ZONE OF MAXIMUM PLANKTON PRODUCTIVITY

Description of the Technique

In areas where disposal of dredged material must be carried out during periods of maximum phytoplankton production, it should be possible to ameliorate impacts by shunting dredged material below the zone of maximum production.

As noted earlier, the lower part of this zone in temperate regions is no deeper than 15 or so meters. It may be feasible to pipe material for that depth from a sea-going barge.

SPECIAL CARE DREDGING MEASURES

PUMPING FROM HOPPER DREDGES TO SEA-GOING BARGE

When hopper dredges are used more environmental concern is expressed over the dredging than the disposal process. This is due to the great amount of fine material released as the hoppers are overfilled in order to obtain as much sediment per shipload as possible. The turbid slurry that overruns

the weirs often creates a massive turbid plume. Moreover, it is this fine material to which many pollutants are attached. And in some instances the oxic conditions free the metals where their environmental activity is increased.

A possible solution to this problem which has more than one environmental advantage is to employ sea-going barges for transport. In many instances the hopper dredge is not only the dredger but the transporter of the material to the dumpsite. During this period of transport it is out of action, thus prolonging the dredging operation. A possible solution, which has been used successfully, would be to pump the hopper material directly into a sea-going barge without the overfill. The small decrease in sediment carried per load would very likely be compensated for by virtue of keeping the dredger on the dredging job 24 hours a day.

Moreover, these barges could be equipped to either shunt material below the zone of maximum phytoplankton production or to pump very polluted material into pits on artificial islands.

CONCLUSIONS AND RECOMMENDATIONSCONCLUSIONS

- 1) The need for dredging of ports and harbors both for enlargement and maintenance of existing channels is expected to increase in the 1980s and beyond.
- 2) A certain percentage of this dredged material, particularly that derived from maintenance dredging, may be polluted with Annex I substances.
- 3) This material must be disposed in such manner as to cause the receiving environment as little degradation as is reasonably possible.
- 4) By the same token, it is becoming increasingly difficult to find and use disposal sites on the land that can be considered safe and within reasonable distances from ports and harbors.
- 5) Examination of the marine environment reveals that it has a high potential for assimilating dredged material without creating undue environmental risk.
- 6) Therefore, after thoughtful study of the problem and the delineation of possible solutions, it is concluded that if "special care" measures are used in disposal and in dumpsite selection, the disposal into the marine environment of dredged material containing Annex I substances would in many cases present no greater risk of environmental harm than the disposal of Annex II substances.
- 7) Accepting this, it is reasonable to consider that under these circumstances, the rationale of the Convention should allow the disposal of such dredged material at sea under a "special permit," as in the case of substances listed in Annex II.

RECOMMENDATION

Finally, and most importantly, the IAPH invites the Scientific Group to take note of the matters set forth in this submission and to recommend to Contracting Parties at the Sixth Consultative Meeting a Resolution or Guideline (e.g., a new paragraph 3.2 in the classification criteria LDC IV/12/3, Annex 2) to provide, viz.:

"Wastes which contain substances listed in Annex I but which, in appropriate cases, may be safely disposed in the marine environment if special care is used in the disposal, may be dumped under a special permit, in the same manner as substances classified to Annex II."

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Mr. HAAR. I would like to, if we may, just to have a brief comment to make on the waiver provisions if we could.

Mr. BREAUX. Let me get all the member's questions and give you time after that. I would like to recognize next, as Chairman D'Armoirs said yesterday, the person who has authorized the cutoff data for ocean dumping of sewage sludge.

The chairman also said that if Mr. Hughes is the author of the cutoff data I should be called the author and father of ocean dumping, which may not be a good title.

Congressman Hughes?

Mr. HUGHES. You never heard me say that. You voted for that cutoff, as I recall, Mr. Chairman.

Mr. BREAUX. Only after my amendment about significantly degrading, but added to it, though.

Mr. HUGHES. I do remember that. I was interested in the chairman's question as to whether or not you prefer the present law or the proposed draft amendment, and your response, as I understood it, was that you prefer to stay with the present law.

There is another aspect of that and that is whether you are talking about BS or AS, which means that before SOFAR far or after SOFAR, because that becomes relevant.

I suspect you probably like the direction that we have taken in the last few months after the SOFAR decision, because that has interjected some aspects to dumping that was never contemplated by the authors of the amendment, that is to balance ocean dumping against costs and land-based alternatives.

Let me just ask you if you have any position at all as an association on provisions of the draft bill that would phase out the dumping in the New York Bight, which has been characterized as one of the most distressed if not the most distressed waters in the entire world.

Mr. LEBLANC. In the presentation that we made for the AAPA, we have not tried to focus in on particular port concerns and tried to keep the statement general.

We would have no basis in this testimony to express support for the phasing out of the use of the New York Bight, but I think a formal position on that statement would better be issued by the Port of New York-New Jersey.

I think that was the reason we did not cover that directly. We do have a number of—if it would be appropriate in response to your question, a number of other concerns relating to whether we would prefer to stay with the current law or go with the discussion drafts before the subcommittees.

If we start from the premise that we see changes that need to be made in the discussion draft as well as changes that need to be made in the current law, we might add that if the focus would be upon retaining the current provisions of the MPRSA, we feel that these provisions could be retained perhaps with one I guess relatively direct and significant amendment, and this would be in a certain provision of section 102, and it would relate to the relationship between the London Dumping Convention and our domestic legislation known as the MPRSA.

The critical problem that ports have experienced under the present provisions of the law have related to the availability of the section 103(d) waiver in a situation where based upon our current testing requirement the dredged material has been found to contain annex 1 substances as other than trace contaminants.

A problem arose at the Port of Lake Charles, at the Port of New York, and after much travail with the development of the interim matrix, pursuant to which the permit was finally granted, but the problem went like this. Article 4 of the convention prohibits, absolutely prohibits the dumping of certain substances listed in annex 1. That annex provides some exceptions to the prohibition. One is where the annex 1 substances will be rapidly rendered harmless upon disposal. Another exception is where they are present only as trace contaminants.

The convention does not specify how countries that are signatories to the convention need implement the annex 1 prohibition. It doesn't require a test procedure, doesn't contain numerical limits on interpreting test results.

The problem has risen in the regulations promulgated by the EPA under section 102. The critical trace contaminants determination is made on the basis of laboratory bioassay and bioaccumulation test results, under circumstances where you may not even know what caused the mortality in the bioassays or the tissue concentrations in the bioaccumulation.

You presume it must be annex 1 substances and it is a presumption that can have a devastating effect—

Mr. HUGHES. The convention seems to be rather clear; trace contaminants mean just that. If in fact you have substantial concentrations of a toxic substance, that would seem to violate both the letter and the intent of the accord that we signed as a signatory.

Mr. LEBLANC. The convention doesn't say what is meant by trace contaminants. It is in general terms of producing undesirable re-

sults in the marine environment and indeed other countries do not use the bioassay and bioaccumulation tests that we use.

Other countries do and this was pointed out last year in testimony before the full House committee by EPA, they use an overall form of risk assessment. They factor in the test results with all other circumstances relating to the dumping operation including need and other factors—

Mr. HUGHES. That certainly is a reasonable interpretation of the convention, however.

Mr. LEBLANC. We agree it is reasonable and our problem is that we haven't done that. We have charged off and chosen to make the critical trace contaminants determination solely on the basis of laboratory testing in which we take results and don't even know what they mean but have to presume it must be something that the convention prohibits, and it is a form of stringency not applied by other countries, and we think it has worked a disadvantage to the United States.

Mr. HUGHES. I understand your point of view. One of the things that I found interesting about the testimony of AAPA is that you oppose special fees being assessed. Do you think it is unreasonable for us to make a charge for those that would use public resources any more than we charge oil companies for the use of public lands and other resources?

Why would you find the assessment of a fee to be unconscionable or unreasonable?

Mr. LEBLANC. Let me turn this over to Colonel Haar after saying that our concern is that most ports are public bodies and have certain funding limitations inherent under applicable law. We wish to bring that to the attention of the subcommittees to point out the types of effects that a blanket imposition of fees would have on such ports.

If any such fee is going to be imposed we think the requirement of the law should take into account the public status of ports and any funding limitations.

Mr. HUGHES. Why should it be shifted to the taxpayer when in fact it has a direct relationship to economic enhancement?

Mr. BRINSON. I think, Congressman, that this is the fundamental issue that we are now facing with this plethora of user fee initiatives that we see in the Congress now.

The question is, Where is the public interest? We would submit, sir, that the public has a very definitive interest in the movement of foreign commerce and indeed the flow of commerce generally.

Ninety-five percent of the international trade moving in this country moves by ship, which means that it has to come into and out of our harbors and up and down our rivers. Dredging is absolutely essential to that function. So I guess when you draw the line and say what is the question, the question is, Does the Nation as a whole have an interest in that particular function? In this case, the disposal of dredged material in the ocean.

We submit that it is very, very clear that the Nation does indeed, simply because the Nation wouldn't get along without the flow of commerce.

Also we have had a traditional role in this country of local and State port authorities providing the initiative toward port develop-

ment and providing the investment for the land site infrastructure that makes the port system what it is.

The Federal Government historically has been providing the channel capabilities and this is a role that the Federal Government has had and has carried out for 150 years, here again, with a national interest objective.

So I think that is the question. Is it in the national interest? We submit that it very definitely is, not only for the economy but also our national defense strategies depend very heavily on the capabilities of our navigation system.

Mr. HUGHES. Mr. LeBlanc, you testified at some length on the balancing of economic and other interests in determining what is unreasonable degradation and what should be permitted to be dumped in the ocean. I wonder how you would factor in the risk that some of the pollutants and contaminants in the dredge material, such as PCB's, cadmium, and mercury, might impact the public health?

Mr. LEBLANC. I think the public health considerations, the effects of contaminants in the dredged material, the experience to date with their transport and infiltration into the environment, the capacity for assimilation at the dump site, are all factors that will constitute knowns and unknowns that have to be put into the overall mix in determining whether or not significant degradation will occur, balanced against the existence of other alternatives, the need for the operation.

These are factors that will be considered, but we feel that the balance should be struck on where lies the public interest.

Mr. HUGHES. When do you think significant degradation occurs?

Mr. LEBLANC. That is a concept that has been utilized—in some cases it may be appropriate to translate it into numerical standards, in other cases it may not.

It may be in terms of irreversible impact, extent of impact. These are terms of art used in the ocean—

Mr. HUGHES. How about when dumping in the ocean presents a high risk of transfer of harmful substances to the food chain?

Mr. LEBLANC. I think that effect would be one factor to consider. Access of the public or dependence of the public upon that food chain would be another factor to consider and I think alternative means of disposal and whether there would be greater or lesser adverse impact from the effects should be considered.

Is the no action alternative feasible or is this a situation where there is a need to go forward with it? These are decisions that will ultimately have to be taken account of in the normal permit process on a controversial subject.

It will be fully briefed by the interested parties.

One thing that has been an emerging development in the ocean dumping field is the use of special care measures to isolate highly contaminated dredged material such as the clean material capping that Dr. Pequegnat addresses in his work.

Dr. Pequegnat is presently preparing an update for presentation to the scientific group that would focus on developments and experiences with special care measures since the last session of the scientific group last year, and that will be presented in the fall.

It looks promising and I think that, too, will be a factor to consider.

Mr. HUGHES. Thank you. I thank the panel and I thank the chairman.

Mr. BREAUX. Mr. Pritchard?

Mr. PRITCHARD. I guess I would ask Mr. Brinson one question. Your contention on fees is that it is not a matter of what level they should be, but that there should be no user fees; is that correct?

Mr. BRINSON. Well, our position is that the issue of user fees must be considered in light of what the national interest is, and where it is. If there are to be user fees, if Congress decides that we should have user fees, regardless of how they are applied and under what objectives, then we would certainly hope that they are reasonable, and we think that is yet another issue.

But before we get to that decision we think that the national interest simply has to be considered and defined, and it is our position that the Nation as a whole has a fundamental interest in the capability of the navigation system, both in terms of the economy and national defense.

The Port of New York, for example, if you look at a statistical profile, serves cargo from all 48 continental States. A relatively small port like Savannah, Ga., regularly serves cargo from 25 States.

We have heard the story of the Mississippi this morning. The mandate of the Nation now with coal exports emphasizes the role of the navigation system. We think that we have to define the national interest.

It is our position that the national interest is there, it is clear, and it must be considered.

Mr. PRITCHARD. Well, I think that certainly the national interest has to be considered, and the Federal Government should play a very major role. If the Federal Government, say, was picking up 90 percent of the cost, that would certainly show an involvement and a concern and a Federal role.

So I am just trying to find out if your position is that there should be no user fees, period, or whether there is some middle ground where I think probably we will end up.

Mr. BRINSON. Well, as you can certainly understand, we have been dealing a great deal with user fees these days and I guess for the record I have to say that we don't think that any user fees are indicated.

When you look at the role of the local and State port authorities in this country and the fact that we have invested within the last 30 years some \$6 billion in infrastructure, the Federal Government has invested only \$4 billion in navigation channels. When you think that the Federal Treasury realizes direct revenues of \$6 billion annually in customs receipts collected on waterborne commerce in this country, it is not a subsidy.

We are talking about the Federal Government making a well-paying investment.

If we want to talk about subsidy, it was suggested by another congressional committee this week that perhaps we are subsidizing the Federal responsibility. My answer to you is no, we don't think

any user fees are necessary, but if you decide that one is indicated we certainly want to talk about how it is applied.

Mr. PRITCHARD. I am not surprised at your answer. I think it was good to get it on the record.

I think sometimes, however, about—how you balance out where you do some dredging. It is very easy to do some dredging in some areas, and the question is—whether the investment really makes sense or whether it becomes the pet project of some Congressman to look good and turn the heat on the corps. We can end up dredging something that is really questionable in some cases. If some responsibility and some, even if it is very slight, of the cost were shared, I think it would result in a little more rational decisions on dredging for some of these ports.

I know that I might be accused of having a narrow interest since I come from Seattle and Everett, and, of course, we have very deep water ports which we don't dredge.

I am just saying that I think there are some arguments the other way, and I would hope that we would be prudent and reasonable. Certainly these areas must be kept open. In the final analysis, you know, it has to be paid by the goods that go through the portal.

Mr. BRINSON. Mr. Pritchard, we certainly agree and we are on record as saying that we think there should be some sharing of cost between the Federal Government, although there is a Federal interest factor that is constant.

We think there should be a sharing of the cost on projects deeper than 45 feet. Clearly the public interest begins to diminish in favor of four and four direct use beneficiaries. That is cost sharing and we realize that that certainly is indicated.

Our problem though, sir, is that we have a proposed layering of user fees all of which impact on the flow of commerce in this country and there seems to be no sensitivity whatsoever, particularly among the executive agencies to identifying the cumulative impacts of these various initiatives.

I can cite for you, sir, five user fee proposals that right now, if implemented, would individually impact on a ton of cargo.

Now the question is at what point in time does it become impossible economically and feasibly for this cargo to move so we say the entire user fee initiative should be looked at in the aggregate and that the Federal interest be identified and be paramount in consideration.

Mr. PRITCHARD. Well, obviously, those costs are borne somewhere. It is just a matter of how you spread those costs out. But I would agree that the essential interest of this country in having shipment of these goods is paramount to help the position of America, and we should not look upon shipments as sort of easy targets to pick up some increasing revenue in a government that is having some problems right now.

I have no other questions. Thank you.

Mr. BREAUX. Mrs. Schneider.

Mrs. SCHNEIDER. No questions.

Mr. BREAUX. I would like to thank this panel. I am very familiar with the problems that many of you discussed. You mentioned the Port of Lake Charles. I remember the first waiver that was granted and when they did the bioassay tests, all the little critters that

they had brought in from California to see whether they could survive the dredge material, died. Everybody was very concerned about it and then EPA admitted that somebody had forgotten to feed them for 2 weeks and then when they put them into the dredge material they all died. So there are a lot of ways of determining whether a dredge material is potentially and significantly degrading.

We have a lot of work to do in that area needless to say. I would like to thank you, Colonel Haar and Mr. LeBlanc and Mr. Brinson. We would have unanimous consent that the members who are not here would have permission to submit questions for you to respond to. I think it would be helpful. Especially, members who are here who would like to submit additional questions will be able to do that.

We will excuse this panel.

Mr. BREAUX. At this time I will invite up a second panel this morning representing the Conference of Coastal Agencies. They will be represented by Mr. Lee White and Dr. Douglas Segar.

Gentlemen, we welcome you and ask you to take your place at the witness table. We will be pleased to receive your testimony.

STATEMENT OF LEE WHITE AND DR. DOUGLAS SEGAR, CONFERENCE OF COASTAL AGENCIES

Mr. WHITE. Thank you, Mr. Chairman, members of the subcommittee.

My name is Lee White. I am counsel to the Association of Metropolitan Sewerage Agencies and the coordinator of the Conference of Coastal Agencies, a relatively new group.

I am accompanied by Dr. Douglas Segar, a scientist who is a consultant to the conference. You may remember that our presentation was originally to be made by the chairman of our group, Mr. Fred Harper, the general manager of the county sanitation districts of Orange County, Calif. The time ran out last Tuesday so we appreciate the opportunity to be here today.

We have a fairly lengthy statement that has been carefully worked out to represent the recent and considered views of our members. I would like to have it submitted for the record, hit a few high spots and then receive questions for myself and Dr. Segar.

Mr. BREAUX. Without objection, the entire statement will be made a part of the record.

Mr. WHITE. Thank you.

The Conference of Coastal Agencies came into being about a year ago and we have in our membership 16 different coastal agencies, some very small and some very large ranging from New York City to Encina, Calif.; we have 8 States represented in the group including 2 agencies from the State of New Jersey and later on this morning you will hear from Mr. Rocco Ricci, the chief engineer of Passaic Valley Utility Commissioners and former head of the department of environmental protection in the State of New Jersey.

We really do have, I think, a broad cross section and our purpose for having come into existence as a committee of the Association of Metropolitan Sewerage Agencies is to make the case to the public,

make the case to Congress, and to anyone else who is interested, about the options that we believe ought to be available for the handling of sludge, including the ocean.

Nobody knows for sure that the ocean is the best option, but conversely, we have not really established that it is an option that should be totally barred, and as a consequence, we believe that it should be measured against each of the other options.

There is nothing easy about the disposition of sludge. It is not a product that everybody is clamoring for and yet it has to go somewhere. It is a product that is the result of a successful program to clean up our Nation's waters. And we believe that the handling of it should be a very serious matter and one that is based on technology and scientific inquiry.

There seems to be a few misperceptions about the handling of sludge by some agencies, all of which are local governmental agencies.

First, is that this is a New York City problem and I think the existence of our conference indicates that this is indeed a very widespread problem and one of great interest.

Second, we do not believe that indiscriminate use of the ocean is what is called for. Rather, we believe that an effort to understand carefully, technically, scientifically the impacts of putting sludge in the ocean is what is required and our agencies are committed to that.

There is a suggestion made on occasion that, left to its own devices, every agency will take the easiest or the cheapest way out and that happens to be the handy nearby ocean. I don't think that quite does justice to the members of our group.

They are themselves local governmental agencies. They are responsible to the public and they have to make decisions and they have to weigh alternatives. Just as I don't think it is necessary to have a policy that says don't put it in the ocean because it is cheaper, I don't think there ought to be a policy that says don't put it in the ocean because it might be cheaper. Economics is, in our judgment, a legitimate factor to take into account and if we don't, in weighing all the other factors, we think a gross mistake will be made.

The scientific community, on the basis of what we have ourselves found out through activities of our agencies and through other perhaps more disinterested groups, has come, we believe, to a conclusion and that is that we do not truly understand what has been happening in the ocean. Instinctively and intuitively and emotionally we have said do not use the ocean because it may be harmful. We don't think that is a solid enough basis upon which to reach a national policy. That policy ought to rest on research, on techniques of analysis and monitoring and we support the monitoring concept completely.

Our agencies that do presently put sludge in the ocean have permits that require monitoring and, as Mayor Koch testified here a couple of days ago, perhaps we are not spending enough money on monitoring and on analyzing the consequences of putting sludge in the ocean.

But to our mind, that should be done and our agencies are not only prepared to do it, but prepared to share with the Federal Government in doing so and that is one of our bedrocks.

Although our statement does not talk about user fees since we have really addressed the subcommittee staff working draft that was circulated, may I say that we really are opposed to the notion of user fees. We were when it first appeared last year and we are now. There are two basic reasons that I think underlie that position.

The first is that so far as we know there is no governmental action for which a fee is being charged. No Federal governmental body, the sewer agencies say, has facilities or other activities to prepare the ocean for sludge. Nobody has built any equipment there that has anything to do with the putting of sludge in the ocean. So it truly is not truly a user fee. It is a charge. It is an excise tax and in our judgment, one that has no legitimate basis.

Second, all of these agencies are local government agencies. There is no profit. There are no beneficiaries who are going to, in a sense, have to be equalized. This burden will pass directly to the users of the service, the citizens and the taxpayers of the various agencies that are served.

Insofar as the committee draft that has been circulated, the position of CCA, our conference, is that it is not a useful change at this time and in answer to the question that the chairman raised before, our group, if asked that question, would say we believe that the existing language is satisfactory and more, that it ought to be implemented. Our belief is, and one of the problems is that if you take a look at the language you will see that it was pretty well crafted and pretty well drafted and does the trick.

We believe that it ought to be implemented and that no change is required at this point in time.

That, I think, hits the high spots, Mr. Chairman. I might ask Dr. Segar if he would like to supplement or, if necessary, even correct what I have said.

That then is our presentation, Mr. Chairman.

[The statement of Mr. Harper follows:]

PREPARED STATEMENT OF FRED HARPER, CHAIRMAN, CONFERENCE OF COASTAL AGENCIES

INTRODUCTION

My name is Fred Harper, and I am the General Manager of the County Sanitation Districts of Orange County, California. I am also the Chairman of the Conference of Coastal Agencies (CCA), a group of 16 coastal sewerage agencies operating as a committee of the Association of Metropolitan Sewerage Agencies (AMSA).

I am speaking today on behalf of the sewerage agencies that comprise CCA: Anchorage, Alaska; East Bay Municipal Utility Districts, the City of Los Angeles, Orange County Sanitation Districts, the City of San Diego, the City and County of San Francisco, and Encina, California; Anne Arundel County and the City of Baltimore, Maryland; South Essex Sewerage District, Massachusetts; Middlesex County Utilities Authority and Passaic Valley Sewerage Commissioners, New Jersey; Nassau County and New York City, New York; Hampton Roads, Virginia; and Tacoma, Washington.

Although our parent organization, AMSA, has had a policy supporting an ocean option for sewage sludge disposal for a number of years, we formed CCA less than a year ago to make the case to the public in general, the citizens in the areas we serve, the Congress and the Executive Branch that the ocean is one possible method of handling sludge that should be carefully explored in the same fashion that we examine the use of sludge on land for fertilizing purposes and disposal in landfills, as well as incineration.

No one can say with certainty that the use of the ocean is acceptable or is the best alternative. Rather, what we hope to establish is a well conceived program for independently assessing what is the proper type of sludge, if any, that can safely be disposed of in the ocean. We have a great deal to learn about the effects of tidal action, depth and temperature of the receiving water, and other physical factors that in our view will help us as a nation determine the usefulness and acceptability of the ocean for handling sludge. There is a recent shift in scientific thought that strongly makes the case that our earlier reaction to the use of the ocean for handling sludge was primarily instinctive or emotional. We believe that a matter of this consequence should instead rest on a solid scientific and technological base and that is our primary goal.

We believe there are some substantial misperceptions regarding ocean disposal of sewage sludge that merit attention and correction. First, this is a national problem -- it is not a "New York City" problem. I represent 16 agencies from eight different states in this hearing. Second, we want to emphasize that we are not espousing a return to pre-1972 practices of indiscriminate ocean waste disposal. Our member agencies are public bodies whose principal function is to protect public health and the environment. It is our position that sewage sludge, an inescapable residue that has to go somewhere, should be disposed of in the medium, and in the manner,

in which environmental degradation and risks to human health will be minimized.

The suggestion has been made by some participants in the debate over the use of the ocean for sludge that sewerage agencies will always take the "easy" and "cheapest" alternative. That really does not do us justice. We must live with the people we serve and we are as dedicated to achieving the best possible mix of alternative strategies for handling waste as any other responsibility. Just as the ocean should not be used for disposing of sludge simply because it may be the most economical method, so it should not be barred just because it may be the most economical method.

SEWAGE SLUDGE -- THE OPTIONS

Our members are in the unenviable position of having to find a place for something that, in general, nobody wants. As a result of Congress' 1972 mandate to achieve secondary treatment of waste water, the volume of sludge produced annually in this country continues to grow at a rate far outstripping population growth. In 1977, the National Academy of Sciences/National Research Council, in its report entitled, "Multi-medium Management of Municipal Sludge", criticized the Congress' medium-by-medium approach to waste management, and singled out the then-existing policy of the U.S. Environmental Protection Agency (EPA) against any ocean disposal of sludge after 1981, as a particularly irrational waste management decision. In 1981, the National Advisory Committee on Oceans and Atmosphere (NACOA), criticized our nation's pattern of environmental regulation as one which simply "chases" man's wastes to the medium of least regulation, rather than the medium which would pose the least human health risk and environmental degradation. The NACOA report, "The Role of the Ocean in a Waste Management Strategy," also criticized EPA's absolute ban on ocean disposal of sewage sludge after 1981, and in fact specifically recommended that ocean disposal of sewage sludge, both by barge (dumping) and by pipeline, be allowed to continue so long as no unreasonable degradation, or human health risk, occurred.

There is no single method for disposing of or utilizing sewage sludge. Just as every region of the country has its unique hydrological, meteorological, and oceanographic characteristics, every sewage sludge has a unique composition of natural organic material, nutrients, metals, synthetic organics, and petroleum hydrocarbons. Sewage sludges tend to concentrate certain constituents that can be detrimental to man and the environment, when present in large enough quantities. This is because these constituents, primarily heavy metals and synthetic organic compounds, are associated with the particulate fraction of wastewater. Approximately one-half of these materials, present in a sewage plant's influent, finds its way into the sludge. It is the presence of these contaminants, when they are found in high concentrations, that gives rise to one of the most

difficult waste management problems today.

Where sludges are relatively free of such contaminants, such as, I understand, is the case in the sludge produced here in Washington, D.C., logic tells us that the sludge should be utilized for value as a soil amendment, or as fertilizer. That logic, however, has been all but lost on the general public, which tends to view sewage sludge as a "toxic" waste. Public pressure has made it all but impossible to site a land application or composting facility, or even a landfill, for the utilization or disposal of sewage sludge today. In southern California, we recently completed a 6-year study to develop a comprehensive sludge management plan for the Los Angeles and Orange County metropolitan area, the "LA/OMA" study, where public opposition to environmentally sound land alternatives made a shambles of the whole exercise. As a result of LA/OMA's "looking at" possible soil amendment operations in the California deserts to the east, several counties have passed ordinances banning the "importation" of Los Angeles' sewage sludge into their jurisdictions. In my own situation, we recently held a series of public hearings on alternative sites for land composting Orange County's sludge. At one hearing alone, over 700 people turned out, all of whom appeared to be totally opposed to anything we might propose on land. These same pressures exist, to a greater or lesser extent, everywhere you go in this country.

There are legitimate concerns about the effect of placing certain sludges on agricultural lands where some elements in the sludge can enter the food chain and pose potential problems for public health and safety; and we are properly concerned that our ground water system not become contaminated. Similarly, the incineration of sludge is not free from potential health and environmental consequences that bear the most careful attention and consideration. In non-attainment areas, such as the City of Los Angeles, sludge incineration is simply not allowed. Incineration has some obvious health and environmental drawbacks, which must be weighed against those of land and ocean-based alternatives. The incineration process itself produces a residue, approximately one-third of the original dry solids, that is concentrated in heavy metals, and which may have to be handled in some municipalities as a "hazardous" waste. When incinerator temperatures are high enough to destroy synthetic organic compounds such as polychlorinated biphenyls (PCB's), they also volatilize certain metals, particularly mercury and cadmium, and pump these metals into the atmosphere.

Regardless of what we call it, finding a resting place for sewage sludge is "disposal" of one of the residues of our society. As a fertilizer, sludge costs far more to dry and to prepare for use, and produces less fertilizer "value" per dollar invested than fertilizers from other sources. As an energy source, the major sewerage authorities are already recovering as much energy from sludge as can economically be produced, by anaerobic digestion of the sludge, a process that produces methane gas. To dry digested sludge to the point where it can be used as fuel, or

more energy can be recovered, is an energy-consuming process. So, when we talk about "recycling," or "resource recovery," with sewage sludge, we are really talking about a very expensive way to do something that could be done better, and cheaper by another process. With our methane recovery systems, we think that we are squeezing the last btu of energy out of sewage sludge that can be justified.

SLUDGE IN THE OCEAN - EFFECTS

NACOA reviewed the effects of sewage sludge disposal in the marine environment in its 1981 report. For the past ten years, the Southern California Coastal Water Research Project (SCCWRP) has been studying the effects of sewage effluent and solids on the marine ecosystems of the Southern California Bight. There is also a recent paper, presented at Woods Hole last year, by Dr. Larry Swanson and the staff of NOAA's Office of Marine Pollution Assessment and the Ocean Dumping Office, on the effects of sewage sludge disposal in the New York Bight Apex, comparing those effects with those at other proposed ocean dumpsites. My own agency, Orange County Sanitation Districts, is jointly funding, with NOAA, a research project at the California Institute of Technology that is addressing the need for additional monitoring and evaluation of sewage solids in the Southern California Bight that would result from a deep ocean outfall proposed to be built by Orange County if approval is obtained-- as an experiment--to dispose of sludge at about the 1,000 foot level into a deep marine basin.

There is a perception, which I hope to dispel, that sewage sludge disposal on the Pacific Coast is somehow an entirely separate phenomenon from the disposal of sludge on the East Coast. The qualitative character of sludges will of course differ from place to place, as do the local oceanographic conditions. But the effects of "sludge" disposal in the ocean, we believe, are comparable in the two oceans. There are only two existing pipeline dischargers of sludge in the country, Los Angeles and Boston. Los Angeles discharges about 165 dry tons per day at the head of a submarine canyon, seven miles offshore, and Boston discharges about 65 dry tons per day at the seaward edge of Boston Harbor, on the outgoing tide. We believe the potential exists for a few additional pipeline dischargers into the ocean, if it were proved environmentally sound on a case-by-case basis.

There are not many ocean "dumpers" of sludge; none at present on the West Coast. At the present time, ocean "dumping" of sewage sludge is only being conducted by agencies in the New York-New Jersey area. New York City, the biggest of those, puts about 260 dry tons per day currently at the 12-mile site in the New York Bight. We recognize that the potential exists for a small number of new East Coast dischargers, provided that they can prove that there would be no "unreasonable degradation" of the marine environment, or unreasonable danger to human health.

A consensus exists within the scientific community that the environmental problems that are encountered in ocean disposal are no more significant than those encountered in utilization of sludge on the land, and often are considerably less. For example, the marine science community generally agrees that while cadmium is a potentially severe problem in land-based disposal methods utilizing incineration or spreading of sludge on farm lands, this same cadmium is considerably less of a problem in the oceans because of the oceans' ability to lock cadmium up in ocean sediments permanently.

As mentioned earlier in this statement, the view has been expressed that if the Marine Protection, Research and Sanctuaries Act (MPRSA) is not amended, ocean disposal will always be selected as the method of choice since it is generally economically preferable to land-based disposal. However, the MPRSA, as currently written, precludes a determination from being made on that single ground. The Administrator, in determining whether to grant a permit, may consider economics only as one factor among many. It is unreasonable to believe that EPA would issue a permit for disposal of sewage sludge in the ocean simply because it was less expensive, if the environmental and human health consequences of ocean disposal were clearly more serious than those of alternative disposal methods.

In 1977 the MPRSA was amended to institute a statutory deadline of December 31, 1981, beyond which the Administrator could not issue permits for ocean dumping of sewage sludge which failed to meet the unreasonable degradation standard. This amendment was adopted in the wake of environmental disasters in the New York Bight during 1976, including a major anoxia (depletion of oxygen) and the closing of beaches due to the wash-up of floatable materials which included materials derived from sewage effluents. Little was known in 1977 about the causes of these incidents but it was thought in Congress that if sewage sludge were responsible then it surely must fail the unreasonable degradation standard, and that the dumping of such sludge must cease by 1982.

The fears that sewage sludge dumping may have been contributed to the severe incidents of 1976 have since been refuted by solid evidence. This evidence demonstrates that the environmental effects of ocean disposal of sewage sludge are minimal and that sewage sludge did not contribute to any of the incidents in 1976.

NEW SCIENTIFIC INFORMATION

Since 1977 there has been a sustained effort within the marine science community to assess available information, and to carry out research related to information gaps on the impacts of putting sewage sludge in the ocean. Some highlights of these efforts are:

1. NOAA published a report which showed that the 1976 anoxia in the New York Bight was a natural event, caused by unusual climatic conditions. If sewage sludge, put in the New York Bight,

had any role in the oxygen depletion event, it was an insignificant one at most.

2. NOAA published a report which shows that beach pollution in the New York-New Jersey area is derived from land-based sources, not ocean-dumped sewage sludge. Ocean-dumped sewage sludge does not, in fact, contain floatable materials.

3. NACOA published its report referred to earlier following an exhaustive two-year appraisal of information related to ocean disposal of waste materials. NACOA's report concluded that the human health and environmental impacts of placing sewage sludge in the ocean are small, and that ocean disposal of sewage sludge should be allowed when cross-media comparisons show this to be the most desirable option.

4. NOAA has concluded that any contribution of sewage sludge to the degradation of the New York Bight is so small that stopping sludge dumping would have no beneficial effect on that environment.

5. Extensive monitoring and research studies of ocean dumpsites, including more than a dozen sites around the United Kingdom, and of marine pipeline discharges of sewage sludge, especially in Southern California, have confirmed that there are no impacts on human health, and that environmental impacts are minimal when digested sludge is ocean-disposed, even in large quantities.

6. The studies cited in the previous paragraph indicate that, although at some sites the biological populations are degraded in small areas of the ocean floor at or near the discharge location, the net effect of ocean disposal of sludge is beneficial. Over a much wider area, the biological populations are considerably enhanced. At many sites even the small areas of degradation are not found. Scientific opinion is now moving towards the view that sewage sludge can be used beneficially to enhance ocean productivity if distribution into the marine environment is properly managed.

7. Several studies of ocean dumpsites and pipeline discharges of sewage and sewage sludge, where dumping or discharge has been discontinued, have shown that natural ecological conditions are restored within a few years or less. The impacts of ocean disposal of sludge are, therefore, readily reversible and if any site were to become unacceptably degraded, removal of the inputs would restore the site quickly.

RECOMMENDATIONS:

We have carefully studied the draft amendments to Title I of the MPRSA that were prepared by the Oceanography Subcommittee and we are strongly opposed to them. The proposal would make a number of significant changes in a law which, to our knowledge, has never been implemented as written and intended. We believe the original nine criteria in §102(a) are an excellent set of criteria. We point

out, however, that the existing §102(a) criteria are repeated, nearly verbatim, in §403(c) of the Clean Water Act, which regulates pipeline discharges. We think that the original criteria, adopted in 1972 in both laws, should remain on the books until such time as experience shows the need for a change. That experience has not been gained to date.

Furthermore, we believe that the proposed switch from "no unreasonable degradation" to "no degradation" will, from a practical point of view, result in barring the ocean as an option to be considered in the handling of sludge. As is evident from the thrust of this statement, CCA believes such a course of action to be contrary to the national interest.

There is no best method for dealing with sewage sludge today. All of the available methods have environmental, human health, and economic consequences which vary from location to location and no single method will be favored in all locations. The choice of the best method of sludge disposal in a particular locality is a matter requiring evaluation of all the options. Since EPA had banned the use of the ocean for sludge disposal after 1981, the agency ceased supporting any research into the effects of sewage sludge on the ocean. We acknowledge that there are significant gaps in our knowledge of the effects of ocean disposal, and of the best means by which to minimize these effects. Significant gaps also exist in our knowledge of landbased and atmospheric methods of sludge disposal which may even be greater than the gaps in our knowledge of the ocean impacts of sludge. Inadequate information does not justify a ban on the use of the ocean or any other option.

We believe that effective research and monitoring and analytical studies on both ocean and land-based alternatives of handling sludges must be continued and accelerated. Only after conducting a cross-media benefit/risk/cost analysis, based on adequate data, can a rational decision be made as to the soundest disposal method or methods in each locality. Due to the considerable differences in ocean environments in different parts of the United States, we believe that cross-media analyses must be performed in individual areas and that the best disposal option will not always be the same. We believe that the existing MPRSA, when properly applied by EPA, will lead to these cross-media analyses, and that decisions regarding the best disposal option will never be made strictly on the basis of economics.

We are strongly committed to maintaining an ocean disposal option, in an effort to develop the best approaches to sludge management. This requires adequate studies of the comparative risks and benefits of all alternatives. Where the ocean is a potential option, studies will be required of the best methods for putting sewage sludge in the ocean to protect the environment and human health. Monitoring will be needed to ensure that management of sludge disposal in the ocean is carried out in a manner that meets national environmental goals.

The members of CCA recognize the financial constraints that presently limit the federal government's ability to perform the necessary research and monitoring studies. Our members are committed to the belief that sharply increased monitoring, evaluating and analyzing ocean waste disposal is necessary. We are eager to join with the federal government in sharing the burden of carrying out these studies. While monitoring is already undertaken by those municipalities discharging sludge to the oceans under requirements of their permits, our members are convinced that additional monitoring and analytical efforts are needed and we are committed to seeing that this is done.

Thank you for this opportunity to make our views known to you on this subject. This concludes my prepared presentation. I will be happy to answer any questions.

Mr. BREUX. Thank you very much, Mr. White, for your presentation and the work that you have been doing on this particular issue.

There are some who would say if Congress will allow the continuation of ocean dumping there really is no reason why communities and counties and cities would have any incentive to build better treatment facilities as long as they know they have the ocean as a disposal method which is relatively inexpensive. Therefore, why should we spend our precious tax dollars for improvement of treatment facilities.

Do you have a response to that?

Mr. WHITE. Yes, sir. Most of the agencies including the coastal agencies have been busy at work putting together facilities to handle sludge. As we all know, this whole question is a little bit up in the air and I think one of the reasons that Judge Sofaer found as he did in the *New York City* case was because he knew and could tell from the evidence that New York City was not simply sitting there and believing that somebody would come and save them. They are a responsible agency in New York City and they were making the effort that had to be made, spending tens and hundreds of millions of taxpayer dollars to handle sludge by non-ocean alternatives and that is the way it is across the country.

I don't believe that if I were running an agency, that I would be comfortable believing that that the ocean would always be the option that is available to me.

Part of our presentation, Mr. Chairman, is that we don't know. And if it turns out that after a satisfactory examination, it is unwise to put sludge in the ocean, all of a sudden people will have to not put sludge in the ocean and must be prepared for such an eventuality.

One of the reasons that a group such as the Association of Metropolitan Sewerage Agencies is perfectly comfortable with the position of the coastal agencies—sometimes there is a tendency to think that one will have it a little bit easier because the ocean is convenient—is the fact that all agencies throughout the country are having so much trouble finding land-based sites, that to the extent that coastal agencies do not compete for those land-based sites everybody else is better off.

Plus the notion that as public servants you can't be disinterested in the costs of various options.

Mr. BREAUX. Well, are the people that you represent in your association in fact, making an effort to try and find alternative land based sites? You mentioned the difficulty in California of finding land-based sites where counties have adopted resolutions saying you can't dump in our county, go somewhere else.

Mr. WHITE. The answer, Mr. Chairman, is yes, they are trying and the subanswer is, and it is murder. Nobody wants sludge to be put in their backyard or at least we have not found anybody who has been clamoring for it.

The Orange County sanitation districts decided that a useful arrangement would be to compost their sludge and, indeed, they selected a site, had public hearings and 700 irate citizens showed up. The next morning the board of supervisors of Orange County issued an edict to the sewer agencies, no composting facilities here or anywhere else.

Well that is an easy edict but still the sludge keeps coming out of that system and something has to be done with it.

Happily, the Environmental Protection Agency, at long last, is beginning to focus on the whole of the sludge management problem. Our agencies have been urging for a long time that all of these options be considered and indeed they are now beginning to do so.

One further point that I think is evident, but let me make it clear for the record. Sludge is not necessarily sludge. There are all kinds of sludges. Some that are very toxic, obviously and cannot be handled the same as those that are not.

For example, here in the Washington, D.C., area, because of the lack of industry, we have relatively toxic-free sludge. Our judgment is that EPA, NOAA, the State agencies and the local agencies plus the scientific community have an obligation to find out the impacts of different types of sludge.

Our agencies are now busily engaged in doing what I think is the right thing, going back up the chain. They have a pretreatment program which very, very effectively eliminates many or most of the toxic materials, especially heavy metals through recycling or simply closing some facility down.

That is, in our judgment, a far better approach and happily is one that is being worked on by the individual agencies.

Mr. BREAUX. Mr. Forsythe.

Mr. FORSYTHE. Thank you, Mr. Chairman. We thank you.

With regard to the situation concerning these local agencies, I think you have described it very well. You have heard the testimony from the port authorities dealing with another matter, the ocean dumping of dredge spoil and their attitude toward user fees.

You have also said that the agencies which you represent would support sharing the monitoring and research costs. And, of course, Mayor Koch said this very clearly the other day. How do you conceive of this working—what kind of mechanism could provide for this shared operation? I am a little leary of saying voluntarily it will happen. Certainly I think there can be duplication of effort and wasted moneys if every unit involved starts doing a little bit on their own.

How can we pull everyone together?

Mr. WHITE. Well, if I may say Congressman, the question is near and dear to our hearts and I happen to be a lawyer by training and instead of telling you the direct answer, I don't know, let me try a little bit to dance around it.

We have had a number of meetings with our member agencies and there is an acceptance of the notion that there should be some kind of a contribution, either in technical performance through supplying individuals and research laboratories, perhaps funding it for personnel from the Federal Government and some kind of a sharing arrangement.

We have not, however, gotten to the point of attempting to draft a mechanism. We would believe that it should have independent operation if it is to be credible. We recognize that sometimes the Federal Government, sometimes local agencies are deemed to have axes to grind. So although we do not have a specific answer to your question, I can say that if I sense the mood of our group correctly it would be perfectly willing to try to come up with a proposal and make it something that could be discussed with Congress and perhaps refined.

Mr. FORSYTHE. Well, I think this is rather critical right now, particularly as we look toward extending the Ocean Dumping Act. Even though there are those of us on this committee, as well as some others who will do everything we can to see that the best Federal effort is maintained, the budget proposals are not very encouraging in this area. I think any gap in the monitoring effort, particularly in New York, would be critical as we try to find the answers. If we can come to the conclusion, which I hope we can, that we don't have all the answers, then finding those answers should be a high priority.

We need to monitor what is happening to assure the protection of our marine resources and do the research necessary on all disposal alternatives because, as you say, the wastes are still going to be there.

As we do move into secondary treatment, which I think we should, in any area where there is any volume the sludge problem obviously becomes greater. We are going to be producing more. Happily it is about 90 plus percent water but what do we do as we move ahead in making decisions.

Doug, do you have any comments on this?

Dr. SEGAR. Well, I think there are a number of things that are fairly clear about how such studies would have to be put together. The independence of the entity that performed the studies, of course, is a very critical factor that Lee referred to. I think Mayor Koch and various people have pointed out during these hearings that the expertise in the ocean dumping area lies in a number of different places. The Federal Government, the academic environment and also in private industry. So one would have to look for a mechanism whereby each of those sectors could become involved in these research and monitoring efforts.

There are some analogs for independent study commissions which could be followed, I think, fairly readily.

One analog that we have that is perhaps a good starting point, although it is not quite, I think, what we would look for, is the Southern California Coastal Water Research Project in California.

This is a group of five agencies, I believe, who have funded a relatively independent program—relatively only in the sense that the money comes directly from the agencies. They are advised by independent scientific boards and so, in fact, scientifically they are totally independent.

This group, over the years, with a very small budget has done what I consider to be the most definitive research on sludge disposal in the entire world, I think something on the order of a quarter or less of what NOAA has been spending, for example. That mechanism has worked extremely well and it is one that we might use as an analog.

But I think in this particular instance we are talking about something a little larger and we do need more Federal help and involvement. That, of course, would be an important factor in how you define this independent study commission or whatever one would call it.

Mr. FORSYTHE. Thank you.

Mr. BREAUX. Congressman Hughes.

Mr. HUGHES. Thank you, Mr. Chairman.

Welcome, Mr. White, Dr. Segar. It is good to see you Mr. White. A couple of years ago we worked together on a number of energy issues, as I recall.

Mr. WHITE. Unfortunately we were not as successful as we wanted to be.

Mr. HUGHES. That is right. And I hope you won't be as successful as you would like to be on this occasion.

The Conference of Coastal Agencies, I just presume, just running down the overall list, are either people who are presently dumping in the ocean or would like to. Is that generally true?

Mr. WHITE. Not quite. There are a few who simply don't know but who believe that no doors ought to be slammed. That if the answer is yes, the ocean is an option, they would certainly want to consider it.

Mr. HUGHES. I don't have a list but if we just said they are either dumping in the ocean, would like to or at least are keeping that option open.

Mr. WHITE. Well, I think there is one that is very interested in what we are doing who is more interested in preserving their environment and do not want the city of Los Angeles to be coming into their area. This is El Segundo, Calif., who says basically, why should not that ocean be used because the Hyperion option is something that is distasteful.

Mr. HUGHES. I understand. I don't want to belabor the point.

I am not aware of any New Jersey municipalities that are coastal in nature that are members of the organization or do you have some New Jersey participants? Are there any New Jersey municipalities that are coastal communities?

Mr. WHITE. Passaic Valley who is a sewer agency is here, as well as Middlesex County.

Mr. HUGHES. They are not coastal, are they?

Mr. WHITE. The living authority [after consulting with Rocco Ricci] says not as you suggest, Congressman Hughes. They are not coastal.

Mr. HUGHES. I have most of the coast. We don't have any in my district and I don't know of any other coastal communities that are participants.

Mr. FORSYTHE. Would the gentleman yield? I think the impact particularly for Passaic Valley is that they look to the harbor and the waterways of the Passaic Valley, which if not coastal, are getting right close.

Mr. HUGHES. I thank my colleague for that contribution.

You know, I really am sympathetic to the problems that some of our sister cities in northern New Jersey have. I know it is a tremendous dilemma. I know that the authorities have been wrestling with this issue for some time because of the political and the economic and other problems that exist. I know that one of the authorities endeavored to float a bond issue to develop land-based alternatives particularly recycling facilities and that was rejected, because of the tremendous economic problems that exist among other.

But you know, Lee, the thing that concerns us is that in my region we hosted a major commercial fishing industry and our communities are also the sites of a multibillion-dollar tourist economy that depends upon clean water and clean air and clean beaches. And when you look at some of the experts and their testimony describing what is happening in the New York apex with skin rot, gill erosion, skin tumors, parasitic infections, microbial infections, chemical contamination, bacteria found in shellfish and other seafood and marine organisms in increasing amounts and their presence being there even a year or so after we have closed down dump sites, you can understand our concern.

Mr. WHITE. Well, Congressman, I almost every summer get to Avalon and I love it and I eat seafood there too, so you are hitting me right where I live.

Mr. HUGHES. I suspect you would not eat the seafood however if you thought that it might be contaminated.

Mr. WHITE. I certainly would not and what I would want to do is find out what contaminated it. If you take sludge out of the ocean and the seafood still is contaminated, have you not done anything? Really our pitch is we have been looking at the New York Bight for a long time. I am not a scientist. Like you, I am a lawyer. I listen to the scientific people and sometimes they can twist me one way or the other, but our finding is that the scientific community generally believes, I think there is a consensus, we say so in our statement, that we have not proven the case.

As I say, sludge is not sludge. Sometimes it has to be treated in a certain way with some of the metals removed to make it less offensive, and less hostile to ourselves.

Mr. HUGHES. Well, I don't want to dispute you, but the scientific community does not suggest that. The scientific community has established that there is a very direct relationship to many of the hard metals and other substances that are found in the sludge that is being dumped in the New York Bight area and the substances which are harmful found in the marine organisms in the seafood.

In fact, they have simulated that in laboratory tests. Just this past week NOAA was before this committee and described some of the direct relationships between some of the disfigurations, the bac-

teria and other substances that are found and the marine life and the substances found in the Bight.

Mr. WHITE. I am not modest, I am just cowardly. Let's let Dr. Segar respond to that because, frankly he and Dr. Mattson and some of the other people that we have consulted, including the NACOA report, the people from the Southern California Coastal Water Research Project have heard presentations by Dr. Goldberg who is coming later on in the hearing, make me believe that it is otherwise.

Mr. HUGHES. I know that Dr. Segar knows about the NACOA report because he helped write sections of it.

Dr. SEGAR. Congressman, that is not correct.

Mr. WHITE. Even if he did, and I don't know that he did, that committee is not about to accept the judgment of somebody blindly simply because the draft is put in front of them. I think frankly that the scientific community does not need me to defend them.

Mr. HUGHES. Well, the fact of the matter is, that it can't be disputed by any of the scientists that in fact we are finding traces of mercury, cadmium, PCB's, and bacteria in seafood.

Dr. SEGAR. I am glad you said traces, Congressman. There are traces present in seafood naturally in any event.

Let me address the first issue, which is not really an issue, the NACOA report. As you know from material that has been provided to your office, my only involvement with the NACOA report was to provide a literature review which was a basis, for one chapter of the report, the scientific synthesis chapter.

As you also know, the later drafts of that particular chapter that were put together by NACOA's staff were, in fact, altered or were changed in ways that I found objectionable. Some of the caveats, as far as the unknowns, things that we did not know about what was happening in the marine environment were, in fact, removed from the materials that I provided to the committee staff. I made several objections to this and they are on the record. You can review it if you like. It is on the record of subsequent NACOA meetings which I attended that, in fact, I had objections to interim drafts of the report, because they simply did not include a number of the caveats that I put into the original materials that I supplied to the committee.

Now, leaving that issue as dead and going on to your comments about the various observations of so-called impacts in the New York Bight, we could sit here for perhaps several hours or more and I could review technical information, literally many thousands of technical papers and reports which I have reviewed of information regarding the New York Bight. I personally have been working on the New York Bight since 1974.

Mr. HUGHES. If we took 2 hours to do that we would lose the chairman and the rest of the audience.

Dr. SEGAR. And so I will not do it.

Most of the things that you refer to come from reports which are several years old. For example, the fin rot fish diseases, the whole spectrum of fish diseases that are carried in the New York Bight; the initial data that you referred to was a very limited study that the National Marine Fisheries Service conducted a number of years ago. The most recent studies conducted by NMFS covering an

area from George's bank all the way down to the Carolinas shows that, in fact, there is no higher incident of those fish diseases in the New York Bight than there is in any other part of our coastal zone on the east coast.

Not only that, but in the last several years when the volume of sludge that has been dumped in the ocean has increased, the incidence of those diseases in the New York Bight has diminished quite markedly.

Mr. HUGHES. You were here last week when NOAA testified, where you not?

Dr. SEGAR. I was, indeed.

Mr. HUGHES. Dr. Byrne testified that recent studies indicated there were changes in the community, the bacteria was found, organisms which were higher. How can you say that the recent tests do not bear out my suggestion?

Dr. SEGAR. There are bacteria indeed found in shellfish in the New York Bight. There are bacteria found in shellfish of any part of the coastal zone of the populated world. Concentrations of bacteria in our shellfish are markedly lower than they are in many countries that don't treat their sewage.

In the New York Bight one of the problems that we have is that we have a considerable volume of untreated sewage being discharged into that area. I will not refer to my own data. I will refer to the Environmental Protection Agency under the previous Administrator. An environmental impact statement that they wrote on the 12-mile site studied very carefully the bacteria issue and concluded that 98 percent of the bacteria entering the bight apex did so through the river.

Mr. HUGHES. But the testimony has been that 30 to 40 percent of the mercury found in the bight is contributed by sludge, not by the raw sewage that is dumped in. Are you suggesting that 100 times the safety level of mercury and cadmium in the bight presents no threat?

Dr. SEGAR. I have heard you make that statement, Congressman, many times and I have tried to find the technical basis for that statement. When you refer to concentrations I am not sure what you mean.

Mr. HUGHES. I refer you to the report of the Comptroller General, January 21, 1977.

Dr. SEGAR. Well, I would like to have that particular citation read out so that we can understand exactly what it is that you are referring to.

Mrs. SCHNEIDER. Would the gentleman yield, please.

Mr. HUGHES. I will be happy to.

Mrs. SCHNEIDER. From the NOAA report that we have, the pros and cons of ocean dumping on sewage sludge at various miles, there is a section that relates the following information about the sludge contribution and I will quote it for the record.

It says, "The proportion of all contaminants that are added via sewage sludge dumping is generally small, 1 to 10 percent of the total. Potentially important exceptions are PCB's and mercury," which are needless to say significant. "Nearly half of the mercury inputs into the bight are the result of sludge dumping. For PCB's,

sludge contributes nearly one-third of the loading due to dredge material."

So I think that that pretty much amplifies some of the comments being made by Mr. Hughes.

Mr. HUGHES. I just refer you to page 15 of the report I referred to.

The 26 municipal permit holders in the New York-northern New Jersey area were dumping sewage sludge containing either cadmium or mercury that exceeded by more than 100 times the established safety levels.

Dr. SEGAR. Somewhere in the report it has to refer to what the established safety levels are. First, you are talking about concentrations in the sludges. Concentrations of cadmium and mercury in the environment do not exceed safe levels. There is no evidence that the concentrations in marine organisms in the New York Bight are any higher than in other parts of our coastal zone.

The safety levels to which you refer, I suspect, are, in fact, the interim mercury and cadmium criteria that were incorporated in the EPA regulations. Those criteria were extremely stringent interim criteria when they were established. In fact, for the cadmium case they were established on the basis of analysis of a small number of sediments, all from the Pacific Ocean. Those criteria do not any longer apply.

Mr. HUGHES. What should the criteria be? What do you think the safety levels should be?

Dr. SEGAR. We are, Congressman, very comfortable with the current criteria in the EPA regulations which in fact use bioassay and bioaccumulation testing to decide whether, in fact, those contaminants have any impact on the environment. Cadmium and mercury are both natural constituents of the environment.

The largest source of mercury to the environment is volcanoes.

Mr. HUGHES. And the concentrations are deposited in sludge. Are you suggesting to us that we are not dumping any more cadmium or mercury in the bight area than would be there anyway?

Dr. SEGAR. I am suggesting that the quantities that we are dumping in sewage sludge certainly are so small as to be negligible.

Mr. WHITE. It sounds like, Congressman, that we ought to be able to put together a response, based on what some of the people we have retained as scientific consultants tell us. Because those charges are not something I think any of our agencies would want to ignore and we are dedicated really to finding out. We know already that there are some sludges that are not acceptable and that would weigh heavily with our group.

I don't think there is any doubt about it. They are not irresponsible people. So, if we can, I would like to take the various citations and see what they are and determine whether our assumption that there is a general scientific belief that we are not very well informed about the impact of sludge on the ocean is correct.

If we are wrong on that then we need to back off.

Dr. SEGAR. Congressman, I would point out that all of those scientific issues will be addressed at considerable depth at considerable cost to both the agencies and the National Wildlife Federation.

Mr. HUGHES. We are cutting back in research.

Dr. SEGAR. These issues will be addressed in both the site designation process coming up and also in the special permit applications that are to be prepared by the dumpers.

Mr. HUGHES [presiding]. My time is up and I suspect I am now chairman of the committee.

The gentlewoman from Rhode Island.

Mrs. SCHNEIDER. I have a number of questions.

Mr. White, you had said that of course the economics are a legitimate factor in determining whether one would pursue the ocean dumping option or take another route. To what degree do you think that the various coastal States, individually or collectively through your association, are reviewing those various options?

Mr. WHITE. I think there are only two agencies that are currently putting sludge in the ocean by pipeline, Boston and the city of Los Angeles; and the city of Los Angeles is under a consent decree to not do so when they can have an alternative. And I think there are two, possibly three east coast agencies that are barging sludge. Most of them are not putting sludge in the ocean today but they are, indeed, anxious to have that particular option out there because if they don't put sludge in the ocean it has to go somewhere.

Mrs. SCHNEIDER. Do you have any numbers as to how many are doing the ocean dumping option and how many are not?

Mr. WHITE. My understanding is there are two only that are on the east coast that are barging their sludge and putting it in the ocean. Boston is using a pipeline and the city of Los Angeles on the west coast is using a pipeline to dispose of its sludge.

So there are four agencies that we are aware of.

Mrs. SCHNEIDER. And that is it?

Mr. WHITE. That is it.

Mrs. SCHNEIDER. Are you familiar with the work that is being done at the Franklin Institute in Philadelphia?

Mr. WHITE. No.

Mrs. SCHNEIDER. Well one of our witnesses later on this morning will be testifying and I would think that it would be valuable information for you to carry back to your member States because it does present an option to the ocean dumping scenario.

One of the other questions I had was that I am wondering whether you think that the burden of proof should fall on various municipalities and State governments to guarantee that there will be no degradation to the environment through applying for ocean dumping permits or do you think that EPA should be responsible for proving that there will be adverse effects before denying a permit?

Mr. WHITE. Well, first, our position is that the existing language that says, "no unreasonable degradation," is what ought to maintain rather than no "degradation." But when it comes to the question of no unreasonable degradation, it seems to me that an applicant for a permit always has the burden of establishing that they are going forward.

The difficulty is, as Judge Sofaer pointed out, that EPA has, up to now, been unable or perhaps unwilling to set out rules that will define what is unreasonable degradation or the criteria that must be employed. So I think the answer to your question is any agency

that wishes to use that option will have to have a permit and the permit will be the burden of the applying agency to comply with them.

Mrs. SCHNEIDER. Have you communicated at all with the Environmental Protection Agency indicating your support for the monitoring of these sites and indicated any concern about budget reductions in those areas?

Mr. WHITE. Yes. We believe that the EPA budget like every other one has to go through the wringer but that we hope that the monitoring will not be the program that has to go completely. Most every permit does require the agency itself to do monitoring. We believe that monitoring is a key to it and we have suggested, in response to Congressman Forsythe, that we think that some of the agencies ought to contribute in some fashion to the cost of that during this stringent budget period.

Mrs. SCHNEIDER. Have you made this, for the record, a concrete recommendation to the Environmental Protection Agency?

Mr. WHITE. I think the answer is no. We have had some discussions, but the direct formal answer is no. I can assure you that we will as a result of your question.

Mrs. SCHNEIDER. I think it is important for you to know that the monitoring budget for EPA is being so severely gutted that the responsibility and the burden more likely than not will fall upon all of your coastal States. Yet you have just gotten done telling me that you are lacking criteria in certain situations and by using this budgetary process of going after monitoring I can only see total havoc resulting. I think that now would be the time for you to communicate your concerns, not only to this committee but other committees that deal with the budget for EPA and for monitoring of ocean dumping and get on the record.

The Association of Coastal States has a lot to gain or a lot to lose, depending on how that budget does develop and at this point it is a disaster.

Mr. WHITE. That is a useful suggestion and we will certainly follow it up, because I know that we are anxious. Not only EPA but the NOAA monitoring budget is in bad shape. It is unfortunate that when things have to give, when there are cuts, we look to those things that do not absolutely immediately affect us and, indeed, it is shortsighted because this is important.

Mrs. SCHNEIDER. Well, that is what concerns me, the shortsightedness of it all. I think it is quite clear that if we do not monitor we will end up paying more in the long run either through increased taxes to clean up the problems that we may have caused or through human health problems. And I think that you are representing an organization that of course is dedicated to public service and I think it is critically important that that point be made to the decisionmakers as quickly as possible.

Those are all the questions I have, Mr. Chairman. Thank you.

Mr. HUGHES. The gentleman from Delaware is recognized.

Mr. EVANS. I would like to associate myself with the remarks of the gentlewoman from Rhode Island and the gentleman from New Jersey, Mr. Hughes. I do believe in terms of the remarks of the gentlewoman from Rhode Island that it is pennywise and dollar foolish not to focus attention on the monitoring and development of

criteria for what is harmful to the marine environment, what is going to be harmful to our economy, particularly of the coastal States.

And I would strongly recommend to you that you make sure that that is communicated to the proper individuals on behalf of your organization.

I am very concerned about the whole problem of dumping of sewage sludge in the Atlantic, particularly when it comes to those contaminants like PCB's cadmium, and mercury. I realize that just perhaps a trace is not harmful. But when it becomes more than a trace it may be extremely harmful and extremely expensive and can cause a great deal of human suffering.

I am delighted to hear you gentlemen say that you feel the burden of proof should be not on the EPA to show that there are adverse impacts or adverse effects before issuing the permits, but the burden of proof should be on the organization that is applying for the permit to prove that it is not going to be unreasonably harmful or cause unreasonable degradation of the environment.

Mr. WHITE. Congressman, I did not mean to give away the store. What I really thought I was answering was that it is the burden of every applicant to meet the criteria and the tests of the standards that EPA fixes. I don't know that I said or that I believe that there is a positive burden to come in and establish that what will be put in the ocean does anything different than meet the criteria. I don't know that we have the burden of establishing that some level of degradation has been reached.

But to the extent that those criteria are established by the appropriate authorities, then I think there is the obligation on the part of applicants to demonstrate that they can meet those tests.

Mr. EVANS. Thank you, gentlemen.

Thank you, Mr. Chairman.

Mr. HUGHES. Thank you, Mr. Evans.

I wonder if for the record, Dr. Segar, you could provide specific reference to the scientific evidence which you indicate that shows that the level of PCB's, mercury, cadmium, and other substances are at the background level you suggest in your testimony. Would you provide that for the record, whatever references you might have?

Dr. SEGAR. Congressman, we would certainly be happy to provide that in some period of time. Most of that information exists on computer data basis of the National Oceanic and Atmospheric Administration. Unfortunately because of their recent budget cuts, they have not got that down on paper so we can provide it to you directly. We have computer access to it and we are working with that data.

Mr. HUGHES. Without objection, we will leave the record open for you to submit that.

["NOAA Technical Report NMFS SSRF-721: National Marine Fisheries Service Survey of Trace Elements in the Fishery Resources" was submitted and placed in the hearing record files of the subcommittee.]

Mr. HUGHES. Also I would like for the record the position of your conference on an amendment that I intend to offer which would make municipalities that seek and receive permits for ocean dump-

ing to bear the responsibility for any subsequent cleanup that might occur as the state of the art proves that we learn a lot more about the damage that we do. I would like the position of the conference on that. I wouldn't ask you today because I know you probably have not discussed it.

Mr. WHITE. We have not.
[The information follows:]

CONFERENCE OF COASTAL AGENCIES POSITION ON AMENDMENT

The Conference of Coastal Agencies opposes the concept of absolute liability, without regard to the state of the art, without regard to any negligence or other wrongdoing on the part of the agency, without regard to the cost that might be involved, and without regard to any responsibility on the part of others. Members of CCA who either presently deposit sludge in the ocean or who may do so in the future recognize their obligation to do so in a manner that is acceptable to the public. Furthermore they recognize their duty to comply with all pertinent laws and to take appropriate measures to minimize any detriments that might result from their actions. But there is no demonstrated basis for or rationale for a requirement of absolute liability.

Mr. HUGHES. Thank you very much for your testimony.

Mr. WHITE. Thank you, Mr. Chairman.

[The following was received for the record:]

QUESTIONS SUBMITTED BY HON. GLENN M. ANDERSON AND ANSWERED BY CONFERENCE OF COASTAL AGENCIES

1. What type of monitoring and evaluation did you have in mind for municipal agencies to perform?

Municipal Ocean Dischargers should be willing and capable of collecting oceanographic, biological and chemical data on the discharge site and surrounding area.

Ocean currents, water quality analyses, chemistry of the bottom muds, physical characteristics of the biota, and chemical body burdens of the biota are the types of things that should be evaluated on a regular basis.

By regular basis, I mean, the investigative sampling should be done frequently enough to enable evaluation over the long term.

For example, the Agency I represent, Orange County, has collected data on the effects of our treated effluent on the marine environment for many years. The results of our investigations are annually reported to the State Regulatory Agencies. By reviewing this data over a span of years, the long term effect of the discharge can be evaluated.

2. Insofar as Orange County is concerned, what disposal options do you presently use?

The digested sludges are mechanically dewatered to approximately 20 percent solids by centrifuges. The material is then trucked 15 miles to a county landfill where we are required to air dry the material to 50 percent solids before burial in the landfill.

This operation is costly (labor and energy intensive) and does tend to create an odor nuisance at the treatment plant as well as at the landfill.

We are currently conducting engineering studies on an expanded land composting project at a remote site. However, we have encountered public opposition to this project.

We are also considering on site (at the treatment plants) mechanical composting. The drawback to this method is that we will wind up with more sludge to dispose of since carbonaceous material (sawdust, shredded paper, wood chips) must be added to the digested sludge to generate the heat necessary for composting.

3. If the research project with NOAA is implemented, what percentage of your sludge would go into the ocean?

The daily volume of solids removed during our treatment process is reduced by 50 percent through the anaerobic digestion process by producing 3,000,000 cu ft. of methane gas each day to provide half of our energy needs. The resulting residues, 100 percent from the digestion process which is represented by a 25 ft. x 25 ft. x 6 ft. high volume, would be discharged approximately 8.5 miles offshore in 1,000 ft. of water.

4. What changes in Federal or state law or regulations are necessary to permit the NOAA-Orange County project to proceed?

Currently the 1981 Amendments to the Federal Clean Water Act prohibit the discharge of sludge thru an ocean outfall.

We suggest that Federal legislation be enacted under section 405 to permit this research project to gain the knowledge required to scientifically evaluate the assimilative capacity of the ocean.

At the present time the California State Water Resources Control Board prohibits by regulation in its California Ocean Plan the discharge of sludge to the ocean.

In recent conversations with state personnel pertaining to our project, they are only concerned with state waters which is defined as out to the three mile limit. It may not be necessary to change any state requirements for this research project to go forward.

5. How would monitoring of any sludge disposal be evaluated and who would do it?

Presently, a planning study is underway at the California Institute of Technology, Pasadena, California under the direction of Dr. Norman Brooks, Director of their Environmental Quality Laboratory.

This independent group including representatives of EPA, NOAA, Woods Hole Oceanographic Institute, Scripps Institute of Oceanography, California Fish and Game and many nationally recognized scientists will develop a procedure by which the recommended monitoring program will be evaluated. We believe the evaluation will be done by a peer group of individuals from agencies and institutions represented in this planning group.

6. If the results of more focused monitoring and evaluation demonstrate that ocean disposal simply poses too many environmental problems, what would the Coastal Agencies then do about handling sludge?

The coastal communities would proceed with the most desirable alternative. The decision to go to composting, combustion, direct burial in landfills, land spreading or any other disposal method would be made on a case-by-case basis.

QUESTIONS SUBMITTED BY HON. EDWIN B. FORSYTHE AND ANSWERED BY CONFERENCE OF COASTAL AGENCIES

1. If costs are borne by municipalities to cover monitoring of ocean disposal, should these costs be included in an economic balance?

Economies should only be considered after Human Health and Environmental Factors, and monitoring costs should be a part of the economic analysis.

2. Do you feel there will continue to be the incentive to find cost-effective ways to reuse or recycle our wastes when one of the ocean dumping criterion is to consider the need for such dumping in terms of economics?

Yes, we have a continuing responsibility to our ratepayers to find the most cost-effective and environmentally sound program for waste disposal.

3. Is incineration a cost-effective alternative to using other media for disposal?

The costs of incineration are high but in certain circumstances it is the most environmentally sound basis of disposal.

4. With regard to the NOAA report presented at Woods Hole last year which compared the effects of the 12-mile site versus other ocean dumpsites off the northeast coast, were there any significant findings which would lead us to conclude the New York Bight Apex should be barred from consideration for waste disposal?

In our judgment, the findings and conclusions would not compel barring consideration of the New York Bight Apex for waste disposal. But, perhaps more to the point, we believe legitimate and serious questions have been raised regarding those findings and conclusions. Should certain types of materials be banned from disposal at this site or any other ocean site?

Absolutely yes—there are certain materials that should not be disposed of in the ocean.

5. Do the examples in the testimony (page 5) regarding cadmium problems also relate to a land disposal option where the sludge could be contained?

If perpetual containment could be assured, then there would be no human food chain problem. The nature and volume is such that we do not believe containment is possible.

6. Why do you feel the new language will result in barring the oceans from consideration as an alternative for waste disposal of sludge?

There are a number of provisions in the staff draft which would have this effect; the principal one among which is the absolute ban on all carcinogens.

7. If a fee system for ocean dumping were imposed, should it apply across the board to all dumpers, or should it distinguish between different types of materials and permits?

We do not support a fee system for ocean disposal. If a fee were imposed it should be limited to the actual costs incurred by the Government in administering the permit system.

8. To what extent to the existing environmental criteria for evaluating ocean dumping permit applications, by themselves, preclude ocean dumping of sewage sludge? What percentage of sewage sludge currently ocean dumped would fail these environmental tests?

The section 102A criteria by themselves do not preclude the dumping of sewage sludge. It is not possible to identify what percentage of sewage sludge would fail the environmental tests since suitable bioaccumulation tests have never been developed.

Mr. HUGHES. Our next panel consists of Dr. Edward Goldberg, Scripps Institution of Oceanography and Mr. Rocco Ricci, chief engineer of Passaic Valley Sewage Commission.

We are delighted to have both of you. Rocco Ricci is no stranger to those of us from New Jersey. Mr. Ricci served as Commissioner in our Department of Environmental Protection. Also served at the Environmental Protection Agency. Dr. Edward Goldberg is a renown scientist, oceanographer, and a teacher of my own legislative staff.

We are delighted to have both of you here today. Why don't we start with Dr. Goldberg. We have your statement which, without objection, will be made a part of the record and we hope that you can summarize it.

STATEMENT OF DR. EDWARD GOLDBERG, SCRIPPS INSTITUTION OF OCEANOGRAPHY, AND ROCCO RICCI, CHIEF ENGINEER, PASSAIC VALLEY SEWAGE COMMISSION

Mr. GOLDBERG. Thank you, sir.

Mr. Chairman, Congressmen, I am Edward D. Goldberg, a professor of chemistry at the Scripps Institution of Oceanography, the University of California at San Diego. For the past 25 years I have been involved in marine pollution problems in my research, teaching and public affairs. I have written a book on the problem of marine pollution. I have convened a number of workshops for national and international agencies. Most recently I have convened two workshops for NOAA which have attempted to identify the spectrum of marine pollutants and to formulate the assimilative capacity concept.

I have managed during 3 years for EPA the only national monitoring program for marine pollutants, the "Mussel Watch." During this period we were able to identify a serious marine pollution problem at New Bedford Harbor, Mass. Polychlorinated biphenyls, the PCBs were high in the mussels. As a consequence the fishery there was closed, when unacceptable PCB levels were measured in commercial species.

Also in a somewhat different sense we were able to establish that the dumping of radioactive waste containers off the Farralon Islands near San Francisco were contributing no problems to either human health or the health of organisms as a result of leakage.

Today, I would like to address my remarks to the general problem of modifications to the Marine Protection, Research, and Sanctuaries Act that concerns you

First of all, let me provide a historical perspective on what types of substantial information the marine scientific community can offer to these problems. There also exists a body of incomplete information that makes it difficult to assist you. Finally, I will consider our general concerns about the husbandry of this quarter of a billion tons of societal wastes, including the sewage sludge, that has to be placed somewhere.

The marine scientific community have developed effectively the strategies to manage or to control the releases of toxic pollutants to the oceans and to protect human health, to protect the integrity of ecosystems, to protect recreation, transportation and the aesthetics of the marine environment. We have developed these strategies over the last 30 years where we have been able to identify the pollutants and to control their releases. For example the British nuclear industry releases thousands of curies of highly toxic radioactive substances to the Irish Sea each year and protects the health of the most exposed individuals very effectively.

Over the last 30 years certain catastrophes have identified marine pollutants like mercury. We are able now to protect the health of most exposed consumers of mercury through the consumption of sea foods by very simple measures. The FDA maximum level of a half part per million of mercury—wet weight—in fish defines a most important safety factor.

Now formidable problems do confront the marine scientific community when it is asked to consider the entry to the oceans of such materials as sewage sludge which contains a large number of pollutants that can insult marine life.

The cause effect relationships that we have developed with respect to human health for mercury and the radioactive compounds, and those with respect to the integrity of ecosystems for the PCBs, DDT and other hydrocarbons have provided a basis to control identifiable pollutants entering the oceans. But now here we are faced with a problem where the discharged material may contain a host of toxic substances, the identities of which are unknown.

Here we are faced with the problem how to define an unacceptable input of wastes to the ocean. Can we define these unacceptable effects today objectively?

The scientific community is attempting to do this. Let me describe the difficulties we are encountering. Also, I will offer you a term that might be assessed by you as a substitute for the word "degradation" as an unacceptable impact upon the environment.

I will do this by illustration. In the Los Angeles Bight coastal zone that receives wastes discharge from 11 million people, the nature of the bottom marine communities are being changed in about 5 percent of the area.

Now, we are not causing any single species to become endangered, but we are changing 5 percent of the indigenous populations. Is this acceptable or not? Is 10 percent, is 1 percent? What is degradation and what is acceptable?

The scientists can't answer this question at the present time. I agree that the critical problem is the identification of the loss of a renewable resource through waste disposal in the ocean. The renewable resource may be food that we eat, fish, shellfish; recrea-

tion; transportation; or the integrity of ecosystems which I argue we must hand down to future generations.

We are using a renewable resource of the oceans through the discharge of any waste to the ocean system, such as sewage sludge. In the case of the southern California Bight waste disposal, we are not, on the basis of the assemblage of scientists at the Crystal Mountain workshop held in 1979, losing any renewable resource. On the basis of the conventional wisdom available to this group, there were no renewable resources being lost to the citizenry of the east coast of the United States by the sewage sludge disposal there.

I want to address one problem that was brought up by Congressman Hughes about mercury, cadmium, and PCB's. I was involved in an examination of the one serious PCB episode in the United States, the New Bedford Harbor problem. I am unaware that there is an established challenge to human health by the levels of PCB's in the New York Bight.

I am also unaware that there is a demonstrable challenge to the public health by the mercury and the cadmium levels in the New York Bight. The insults to human health, through mercury discharges to the ocean occurred, to my knowledge, only in Japan, at Minamata Bay and Niigata. I know of no situation in the United States where mercury is a marine pollutant of concern.

The only cadmium poisoning occurred in Japan, but in fresh waters, not in marine waters, through the discharge of industrial waste.

I do have concerns that present scientific knowledge is not being effectively translated today into monitoring activities of our coastal waters. The mussel watch did define important problems in coastal pollution, yet it is to be abandoned by EPA at its Narragansett Laboratory.

There are some concerns about coastal discharges of sewage sludge. They should be assessed. I would not be concerned with mercury, cadmium, or PCB's as much as I would with copper, for example. My colleague at Massachusetts Institute of Technology, Francois Morel, says that doubling the copper levels in coastal waters can alter the reproduction capabilities of the small plants, the diatoms, which are the base of the marine food chain. Other colleagues and I are concerned about a pesticide toxaphene which may be the most important single synthetic set of organic compounds polluting the Earth today. It is the most used biocide in the United States today, more than methyl parathion.

We have a continuing problem with the application of scientific discoveries into monitoring and control activities. The marine scientific community continuously alerts Federal agencies as well as public officials about what it considers first order problems today that should be assessed. Yesterday's facts may be today's irrelevancies. The concerns about the mercury, cadmium, and PCB's of yesterday should be replaced by concerns about copper and the toxaphene.

I am a marine scientist, perhaps a most provincial marine scientist. I want to protect the oceans, but I also want to protect the land resources. The resources we protect in the ocean, the basis for decisions about the discharge of materials: public health, integrity

of the ecosystems, transportation, recreation, et cetera. But they have counterparts on land.

My concern is that the promiscuous land release of our wastes, including sewage sludge, are jeopardizing one great resource, our ground waters. They furnish 40 percent of the drinking water to the population of the United States. A recent report by the National Academy of Sciences has indicated an increasing number of reports of pollution of ground waters, over the last few years, which is a consequence of both legal and illegal discharges of waste.

These waters have remained below the surface for an average time of 200 years. They can accumulate wastes over 200 years before they re-emerge and perhaps threaten human health or perhaps threaten the terrestrial ecosystems. I am sure you are aware that this concern must be assessed in the husbandry of any waste before it goes to land or sea.

I thank you for giving me this opportunity to present my moods. I feel the oceans can accommodate more wastes than they are receiving today, but it must be done with care and must be done with the conventional wisdom of marine science. I point out that conventional wisdom both in science and social science is written on sand, not stone. If I were to appear here 10 years from now, I might tell you a different story.

[The statement of Mr. Goldberg follows:]

PREPARED STATEMENT OF EDWARD D. GOLDBERG, PROFESSOR OF CHEMISTRY, SCRIPPS
INSTITUTION OF OCEANOGRAPHY

I am Edward D. Goldberg, Professor of Chemistry at the Scripps Institution of Oceanography, University of California at San Diego, La Jolla, California. For the last quarter century I have been involved in marine pollution problems both in my researches and in my teaching. I have written one book, The Health of the Oceans, for UNESCO and have conducted workshops for FAO, NOAA, EPA, UNESCO, NRC and DOE on the subject. I have published about fifty research articles on various aspects of society's alteration of the oceans.

One of society's pressing problems is the husbandry of the 3 or so billion tons of domestic, agricultural, industrial and forest wastes generated each year. This global figure represents a cube a kilometer on edge and does not include the 22 billion tons of carbon dioxide generated each year by the combustion of fossil fuels. The solution of the problem rests upon the identification of disposal sites such that the renewable resources of the environment are not jeopardized in an unacceptable way.

I submit that for any given waste in any given location the three options, land, sea or air discharge, must be evaluated primarily on a scientific base such that public health, the integrity of eco-systems and the other uses of the environment are not endangered irreversibly. Clearly, recognition in an assessment process must take into account economic, social and political factors. But it is to the scientific concerns that I wish to address my remarks to the end that in any waste management problems all options, land, sea or air, must be considered.

Further, I submit that the marine scientists have developed the strategies to obtain the appropriate information to initially consider potential impacts of waste discharge upon a given part of the marine environment generally in more systematic and knowledgeable ways that their counterparts have been able to do in the land domain. I emphasize that in the discharge of wastes to any site there is usually inadequate information to predict all possible effects. Still, the wastes have to go somewhere. We constantly must work with conventional wisdom, and we constantly must work to improve conventional wisdom.

For thirty years marine scientists have considered the manipulation of the nature of the coastal and open oceans by the entry of man's discards. The initial concern involved the release of artificial radioactivities from nuclear energy facilities. The investigators recognized the vulnerability of public health to promiscuous releases of radioactive substances through consumption of seafoods or exposure in beach areas. As a consequence, marine scientists attempted to estimate risks on the basis of controlled discharges. Today, thousands of curies of radioactivity are released to the Irish Sea, for example, by the British Nuclear Fuel Reprocessing Plant at Windscale, and simultaneously the highest exposed individuals are protected.

During these last three decades marine scientists have been alerted to other pollutants such as mercury which have entered certain marine areas and have caused mortalities and morbidities through the consumption of seafoods.

Further, there have developed deep concerns about the alteration of natural populations of marine organisms through the entry of waste materials. The decimation of some bird and sea populations has been attributed to the dissemination of DDT and its degradation products to the marine environment and with the restricted usage of this and other biocides the recovery of reproductive abilities has been witnessed. Recommendations to public officials have been made to restrict the entry of such pollutants to the oceans.

Formidable problems still confront the scientists with respect to the abilities of the oceans to accept a part of the increasing wastes generated by populations using more and more materials. Whereas in the past, the cause-effect relationships of pollutants and living organisms could be identified, the complex nature of the variety of materials entering coastal waters makes such investigations difficult, if not impossible. Methyl mercury in seafoods caused a rather unique neurological disturbance, the so-called Minimata Bay disease. DDT altered the calcium metabolism of birds resulting in very thin egg shells, easily broken, and in poor reproductive successes of the creatures. Now, many distinguished members of the marine science community are seeking the insults or stresses upon organisms created by numbers of different unidentified pollutants introduced by man. Several possible field measurements of measuring such stresses are being evaluated. For example, the abilities of marine organisms to convert their food into protoplasm, the scope for growth measurements of our British colleagues, varies by a factor of ten between polluted and non-polluted estuaries in England. Others are studying the detoxifying mechanisms of marine invertebrates for excess levels of heavy metals. The work is in progress, and I predict important break-throughs in the next few years in our abilities to measure stresses upon the marine biosphere by alien substances or increased amounts of naturally occurring materials.

Although objectivity is sought in seeking measurements of insults, subjectivity does enter into the utilization or interpretation of the results. We speak of the "assimilative capacity" of coastal waters as the amounts of materials that can be introduced per unit time without the loss or unacceptable change in renewable resources. But what is an unacceptable change?

The domestic wastes from eleven million inhabitants of California, extending from Santa Monica to San Diego, enter the Southern California bight region, about 8 billion liters per day. Increased amounts of some metals and some plant nutrients are evident in the bight waters. Alterations in the nature of the bottom communities near the outfalls are evident. Perhaps around five percent of the total bottom area of the entire marine region have altered communities of organisms. Still, the indigenous organisms appear to reproduce successfully. But is a change in five percent of the bottom flora and fauna acceptable or not? What if the change were twenty-five percent? And what is the basis for the decision? Marine biologists still are unable to define natural variations in communities. What is an unacceptable unnatural one?

About five percent of the fish collected between Santa Monica Bay and Dana Point, off the coast of Southern California, were affected with external abnormalities such as fin erosion, tumors, color anomalies and attached macroparasites.

Crucial is an answer to the question as to what constitutes an unacceptable level of external abnormalities. They are in this area apparently related to sewer discharges. Perhaps there is a natural incidence of the abnormalities. Do these abnormalities affect the survival of any of the species? At the present time, we can only treat this problem in a subjective way. But it is illustrative of the types of problems we can encounter in marine discharges.

But what about the information bases to consider the general problems of land or air (through incineration) disposal. Here my expertise is much less, but I am more than apprehensive that the available knowledge does not equal that for the marine system. In these two types of disposal our goals are to protect human health, the communities of plant and animal life and the other amenities of our surroundings.

There is one compelling reason for further and more extensive studies of the terrestrial option -- we may be jeopardizing the quality of our groundwaters, which provide drinking water for about 40% of our population, by land surface waste disposal. Organic contaminants in sewage are difficult to remove and can find their way into underground waters. Sewage sludges contain metal contaminants that can work their way into groundwaters if applied to land. Coupled with the illegal dumping of toxic wastes, the practice of land disposal has lowered the quality of our groundwaters significantly. A recent National Academy of Science report indicates that the extent of contamination in many areas is unknown, but that reports about polluted waters are increasing.

But there are further concerns. A recent World Health Organization meeting considered the risk to health of microbes in sewage sludge applied to land. The participants were made aware that salmonella poisoning was on the rise in Switzerland, the Netherlands, and the United Kingdom. Although the evidence is circumstantial, part of this rise is attributed to the path of the micro-organisms from sewage sludge to animals and then back to man. Foods of animal origin are the most important source of infection in man. In addition there are risks to animal health.

The World Health Organization group recommended that measures must be taken to effect a substantial reduction of the pathogens in sewage sludge before it is allowed to come into contact with crops or with land-producing feed for domesticated animals. Little concern was voiced about the entry of such materials into underground waters although this question should have been treated.

Clearly, we have already raised the level of contaminants in many water supplies as is evidenced by the EPA announcement that there are at least 29 toxic waste dumps in a condition even more dangerous than the Love Canal Region. But in dealing with our groundwaters, the problems are as formidable as those with the ocean, if not more so. For a given area we need more analyses. Groundwaters often occur in discrete, non-connected units. There are interconnections between the various domains of the oceans, but there are fewer scientists involved in studying the integrated impacts of waste discharge on land upon the valuable potable water resource.

The strategies of atmospheric disposal via incineration are not as yet fully developed. At the December meeting of the Oslo Commission, highly toxic chlorinated compounds including PCBs and dioxins were identified in the flue gases and fly ashes of incinerators. Although the technique of incineration looks especially attractive for many toxic organic substances, it cannot be used for many of the toxic inorganic chemicals that are not combustible.

I argue that multi-media assessment is necessary for rational waste management. As an oceanographer, I am wont to argue that we know more about the plumbing of the oceans than we do about that on land. We can predict the fate of materials discharged at the surface ocean much better than we can predict the travels of pollutants entering groundwaters and sometime in the future entering surface waters. The ages of groundwaters are difficult to obtain, whereas the periods of time that deep ocean waters lose contact with the ocean surface mixed layer, where the base of sealife originates, can be very well estimated. Still, it is quite clear that for some substances, such as high level radioactive wastes, the land option today appears most reasonable. But for a variety of substances, sewage sludge, mine tailings and dredge spoils, ocean disposal scientifically and economically is most attractive.

Mr. HUGHES. Mr. Ricci, we have your statement and we hope that you will summarize it for us.

STATEMENT OF ROCCO RICCI

Mr. RICCI. I am chief engineer of the Passaic Valley Sewage Commission. It is an agency in northern New Jersey and serves about 1.3 million people. I represent the 6 large municipal agencies in the northern part of New Jersey which serve 3.3 million people or 45 percent of the population of the State of New Jersey.

As most of you undoubtedly are aware, historically we have been disposing of our sludge at the so-called 12-mile site. However, primarily based upon the impetus of the December 31, 1981, deadline our agencies have accelerated the studies aimed at exploring the viable options that are available to us on land. Now, it should also be pointed out that the land based sludge disposal options and the current ocean disposal site on the east coast have their own unique characteristics, and I think that is important for everybody to remember.

However, it should also be pointed out that the management of the large quantities of sludge produced in all of our densely populated coastal States is still one of the major unresolved problems. I daresay that disposal of the sludge throughout the country will likewise meet the same historical scrutiny that ocean disposal has met as one becomes more acquainted with the problems which Dr. Goldberg pointed out—what are we doing to the ground waters?

The density of population and the poor air quality, the lack of large open spaces in most of the areas in the east and west coasts and the quantities of sludge that are produced present those of us as practitioners in the business with a very, very difficult situation, as well as the availability of a limited number of options that are viable.

I would like to stress something which the chairman was good enough to point out, but I think it is important to put this thing in the correct perspective, and that is to indicate that I have been working in various capacities since 1970 among other things, as an employee of the Environmental Protection Agency and as a Commissioner of the Energy Department of Environmental Protection,

and now as a senior member of an implementing agency, on the very question of how do we manage our sludge. And the key word is management, not dump.

We urge this committee not to adopt legislation which would preclude a thorough evaluation of the limited number of viable options that are available to managing this very, very difficult question, including managing ocean disposal. The most satisfactory solution to this major environmental problem cannot, in my judgment be achieved if the use of any of the media, air, ocean, or land, were to be removed from consideration by legislation which phased out or prohibited its use. A legislated phase-out or prohibition of managed ocean disposal of sludge would eliminate the opportunity to weigh the costs, both economic and social, and the environmental consequences of the various land based alternatives versus the cost and environmental effects of ocean disposal.

Since I think we can at least agree on one thing, that the production of sludge must continue, the legislation should enable the most satisfactory solution from society's point of view, considering both the environmental and economic cost to be carried out. I want to stress, and I think it has been highlighted here, particularly by Dr. Goldberg, that at this point in time we simply do not know enough to establish the environmental effects of the two viable options that we have in our coastal area. That is our part of the coast, Congressman Hughes, namely, some form of thermal destruction or managed ocean disposal.

There are very significant gaps in our knowledge of the use of the land for ultimate disposal, incineration, and particularly with reference to incineration, the air quality impacts and what do we do with the ashes produced through thermal destruction, because you will ultimately be left with approximately one-third of the amount of product that you put into the incinerator. There is where the sludge question, using thermal destruction is translated into a solid waste disposal question, which in turn gets into another whole series of unknowns.

There is a need in our judgment to adopt a well thought-out strategy to fill in the gaps, answering such questions as what criteria should be applied for determining unreasonable degradation, what is a significant environmental effect, what are reasonable risks for society to accept, whether it be incineration or managed ocean disposal of sludge.

Ultimately, in my opinion, there has to be a tradeoff with regard to the cost and environmental impacts of the two viable options for our agencies in northern New Jersey, namely, ocean disposal or some form of thermal destruction. Direct application to the land is not a viable option, since the land areas which are required are massive, particularly land areas with suitable geology, none of which are available in the State of New Jersey, although we must say that someone did suggest to us that we see if New York State and Pennsylvania would like to take our sludge and dispose of it on their land, and we were obligated to raise the question. I daresay we got back the expected answer.

Several years ago when the Federal law required us to cease ocean disposal of sludge by the end of 1981, we did not have the benefit of the many engineering studies that have been undertaken

in response to that law. The PWSC has been in the forefront of things in carrying out the necessary studies. This work has enabled us to highlight the pros and cons of the viable land-based alternatives. I myself also say that this has led us into the question of trying to locate the discharges of the heavy metals, Congressman Hughes, in particular, and we have done a lot of work in that area and our people have spent a lot of money.

We have found the major contributor of mercury to our system and have taken steps to see that they begin to remove it. So much has been done. But some of the important findings of those studies is the highlighting of those issues and questions for which much more work is required in order to make the rational judgments which are necessary as part of the process.

Let me paraphrase some of the questions in the statement. The State-Federal regulatory agencies do not know what emission standards they would want to apply for sludge incinerators. Of particular concern here are the health effects on human beings. The State and Federal agencies do not know what materials they are even concerned about—that is with reference to their concentrations in the air which we all breathe, the 3 million people in our State as well as the State of New York and Westchester County, New York City and Nassau County.

There is a broader question that has to be addressed. We have competing interests by way of the need to build resources recovery facilities, to convert powerplants to coal, and to manage the sludge using the option of—potentially using the option of thermal destruction. We are all using the same ocean above us, namely the air that we all breathe, and these are all competing social interests.

Judgments have to be made as to which provide the greatest public benefit while at the same time, protecting the environment. There is a great deal of work that must be done by the State and Federal governments involved. I should also point out, and this has reference to the heavy metals question in particular, the future quality of sludge will depend very much on the success or failure of the industrial waste pretreatment programs that the operating agencies are responsible for implementing.

We can only make our best judgments today based upon what we know today, but some of what we do not know today are what are the standards that EPA will impose upon industry by way of pretreatment standards? Or if the decision is made to leave the establishment of the standards to the local agencies, we have to know that as well. I must say to you that at this moment, the whole question of standards for the pretreatment program, which in turn translates into a better quality sludge, are simply not known.

But let me also point out that this illustrates equally clearly the fact that we may remove the industrial sludges or concentrated industrial waste through the pretreatment program, but we have converted the pollution into another problem which has to be managed and now we get back into the hazardous waste business and the solid waste management area, and again, there are many questions to be answered.

I also point out that PVSC as part of its sequence of work, including the construction of watering facilities as a preliminary for

getting out of the ocean in 1981, plus the environmental studies and an air pollution control consultant whom we retained for our proposed incinerator, and we proposed that at a cost of somewhere perhaps around the \$18 or \$19 million figure, we made a promise to the State of New Jersey and to the Federal Government over a year ago. We have still not had any response from these agencies, I believe because there are so many gaps in the knowledge, particularly as it relates to the health effects of proposed emissions even applying to the best air pollution control technology.

What are the health effects on human beings? What this leads up to is that we need time to address the large number of issues which I have at this time briefly to highlight. We recommend that the legislation which you are considering requires the USEPA, the States and the affected operating authorities to undertake cooperatively the required work to arrive at the most satisfactory environmental solution for this very, very complex and severe problem. We recommend that the approach include a realistic timeframe.

You must keep our feet to the fire as well as the agencies themselves, the EPA and the States. And we believe that the program should include a carefully done scientific assessment of the environmental impacts of controlled ocean disposal of sludge. Now, this includes the question of how do you arrive at what is an acceptable impact so to speak on the marine environment? What are the criteria that you are looking to comply with? What are the impacts that one must be concerned with? What are the risks in the marine environment that society should be willing to accept as part of the tradeoff picture?

The same things I have said about the marine environment I say must be applied to the atmospheric ocean when one considers the incineration option. And this also leads me to say that a proposed program should include an identification of all of the unresolved issues relative to the land-based processes, especially the human health questions. And we should be required jointly to go a defined path to arrive at a decision on all of these issues once we have defined the issues again, in accordance with a prescribed timeframe.

And one must in this context deal with air emissions as an example, on an area wide basis. The EPA must complete their business with reference to the industrial waste treatment program and the operating authorities must be required again to keep their feet to the fire to implement them. Then we must have the weighing of the negative and positive impacts of thermal destruction versus ocean disposal and then make a rational decision as to which is the most cost effective both from an environmental point of view and also a dollar point of view.

We also indicate that managed ocean disposal of sludge, which should gradually become better in quality, providing we are successful in the sludge treatment program, should be continued until such time as the environmental tradeoff work has reached some firm condition and then those recommendations must be implemented.

I would also recommend that there be no arbitrary decision to move the disposal site from the existing 12-mile site because again of the many unknowns in terms of what we may do to a new site, a scenario that I am not expert in, but I have read a lot of papers,

heard a lot of people suggest that we may do irreparable harm if we move it to a deeper site.

Mr. HUGHES. Can you complete your testimony, because we are going to start losing members who will be leaving for other commitments.

Mr. RICCI. I can stop right there.

[The statement of Mr. Ricci follows:]

PREPARED STATEMENT OF ROCCO RICCI, CHIEF ENGINEER, PASSAIC VALLEY SEWAGE COMMISSION

My name is Rocco Ricci and I am the Chief Engineer of the Passaic Valley Sewerage Commissioners. This agency is located in northern New Jersey and serves about 1.3 million people, including 350 significant industrial users. These remarks, relative to your hearing on the reauthorization of the Marine Protection, Research and Sanctuaries Act, are made in behalf of the six (6)¹ large agencies serving the North-eastern metropolitan area of New Jersey. The total population in this service area amounts to about 3,300,000 people, or 45 percent of the population of the entire state. These wastewater agencies have historically disposed of their sludge in the ocean at the designated "12 mile" site. Over the last several years, they have carried out extensive engineering studies relative to the development of land based options.

Our land based sludge disposal options and the current ocean disposal site on the east coast have their unique characteristics and problems; however, the management of the large quantities of sludge produced in the densely populated communities on the east and west coasts of this country is still one of the major unresolved environmental challenges. The density of population, poor air quality, lack of large open spaces in most of these areas and the quantities of sludge produced present the responsible operating agencies with a limited number of viable options.

My remarks reflect the perspective of one who has been involved in seeking a satisfactory solution to this immense problem since 1970 as an employee of the U.S. Environmental Protection Agency, as Commissioner of the New Jersey Department of Environmental Protection Agency, as Commissioner of the New Jersey Department of Environmental Protection, and now, with an implementing agency.

We urge this committee not to adopt legislation which would preclude a thorough evaluation of the limited number of viable options that are available including managed ocean disposal. The most satisfactory solution to this major environmental problem cannot, in my judgement, be achieved if the use of any of the media (air, ocean or land) were to be removed from consideration by legislation which phased out or prohibited its use.

A legislated phase-out or prohibition of managed ocean disposal of sludge would eliminate the opportunity to weigh the costs (both social and economic) and environmental consequences of the land based alternatives vs. the costs and environmental effects of ocean disposal. The National Environmental Policy Act requires this evaluation for any significant action which will have an impact on the environment. Since the production of sludge must continue, the legislation should enable the most satisfactory solution, considering costs and environmental impacts, to be carried out. At this point in time, we simply do not know enough to establish the environmental effects and costs for the viable options. A great deal of work must still be done to scientifically establish the effects on the marine environment of managed ocean disposal. There are also significant gaps in our knowledge of the use of the land for ultimate disposal and incineration methods, particularly with respect to air quality impacts and ash disposal.

There is a need to develop a well thought out strategy to fill in these information gaps, to undertake the necessary comparative evaluation and finally to implement the most cost effective solutions. Ultimately, there must be a trade-off with regard to the costs and environmental impacts of the two (2) viable options for our agencies, namely ocean disposal and some form of thermal destruction. Direct application to the land is not a viable option. Land areas with suitable geology are not available in the State of New Jersey.

¹ Bergen County Utilities Authority; Joint Meeting of Essex and Union Counties; Linden-Roselle Sewerage Authority; Middlesex County Utilities Authority; Passaic Valley Sewerage Commissioners; Rahway Valley Sewerage Authority.

Several years ago, when the Federal Law required us to cease ocean disposal of sludge by December 31, 1981, we did not have the benefit of the many engineering studies that have been undertaken in response to that law. Passaic Valley Sewerage Commissioners has been in the forefront of things in carrying out the necessary studies. This work has enabled us to highlight the pros and cons of the viable land based alternatives. We have established that thermal destruction is in fact the only viable solution on land for our area, but that it is not without its environmental problems. The same conclusions have been reached by the other New Jersey agencies. The studies have also enabled us to highlight the issues for which more work is required to enable rational judgements to be made. The unresolved questions and issues include the following:

1. The State and Federal regulatory agencies do not, as yet, know what emission standards are to be applied to these sludge incinerators. Of particular concern are the health effects on humans for various levels of emissions.

2. The State and Federal regulatory agencies do not as yet know what materials they should be concerned with and in what concentrations in the atmosphere.

3. The State and Federal regulatory agencies do not know, on a region-wide basis, those emissions which they consider to be acceptable for such things as sludge incinerators, resource recovery facilities and coal burning power plants. These are all competing public needs and require an area-wide analysis including an evaluation of the public benefits to be derived from each of the various emissions sources and their environmental impacts. Judgements must be made as to which provide the greatest public benefit while at the same time protecting the environment. The Federal and State agencies must coordinate their work so that we can make rational decisions to meet these vital social needs. There obviously must be a tradeoff and it is up to the Federal and State agencies to see that a full evaluation is made.

4. The future quality of our sludges will depend upon the implementation of the industrial waste pretreatment program. Judgements have been made as to the probable reduction of heavy metals through the application of the pretreatment program; however, the effectiveness of the pretreatment program can only be predicted on the basis of our best judgements today. The effectiveness of the program can only be judged after the USEPA has promulgated the required standards and industries are given sufficient time to implement the necessary pretreatment programs. The ultimate disposal of these concentrated industrial wastes and sludges from these pretreatment facilities is another important part of the total problem and must be dealt with on the Statewide basis.

5. PVSC, as part of its Sludge Management Planning, retained an air pollution control consulting firm for an evaluation of the proposed sludge incinerator alternative. A recommendation was made which included the application of the best available control technologies and which would result in the lowest achievable emissions rate. The State has similarly contracted with another consulting firm to provide emissions information. The basic work of our consultant was completed over a year ago and we are still waiting for a response from the State and Federal governments on our proposal. I am sure that the unresolved questions regarding the health effects of the proposed emissions is contributing greatly to the indecisiveness of the State and Federal governments.

Time is needed to address a large number of issues, including those which I have enumerated above with reference to incineration and relative to managed ocean disposal. We recommend that the legislation which you are considering require the USEPA, the States and the affected sewerage authorities to undertake the required work to arrive at the most satisfactory environmental solution for this severe problem. The approach, including a realistic time-frame, should include the following:

1. A carefully developed scientific assessment of the environmental impacts of controlled ocean disposal of sludge.

2. An identification of all unresolved issues relative to the land based processes, especially the human health question, and a defined path to render decisions on each of these matters. This would include the areawide Interstate Air Pollution Control considerations.

3. The USEPA must complete the requirements for the industrial waste pretreatment program and operating authorities must then move forward expeditiously with the development and implementation of their industrial waste pretreatment programs.

4. Preparation of an Environmental Impact Statement which would undertake the necessary weighing of environmental and fiscal costs for each of the options, including ocean disposal of sludge and the rendering of a judgement as to which is the most cost effective and environmentally sound solution.

5. Managed ocean disposal of sludge, which should gradually become better in quality as the pretreatment program is implemented, should be continued until such time as the environmental impact study has rendered its recommendations and those recommendations are to be implemented. Further, there should be no arbitrary decision rendered for the movement of the disposal site from its present area. Any such decision should again be made only after careful scientific studies by the Federal agencies.

CONCLUSION

Over the past several years there has been great public concern over the practice of disposing of sludge in the ocean. We have, during this period of time, established the potential human problems associated with the available land based option using thermal destruction. The agencies I represent are not advocating a continuation of business as usual; we are recommending that a thorough evaluation be made of all options, including ocean disposal. The environmental consequences of the land based options on our citizens must be carefully weighed vs. the environmental effects on the marine environment. Only after this process, as required by the National Environmental Policy Act, is completed, should we lay out our course for the most effective long term solution. We urge this committee to enact legislation which will take this approach.

Mr. HUGHES. Thank you very much. I appreciate your testimony and we will endeavor to adhere by the 5-minute rule. You can assist us if you try to keep your responses brief.

First of all, Dr. Goldberg, do you agree with the last statement made by Mr. Ricci, that we should not be moving to the 106-mile site from the present 12-mile site?

Mr. GOLDBERG. Only on a scientific basis can I answer the question. My sense would be that the 106-mile site would pose less danger to the renewable resources of the sea as a disposal site.

Mr. HUGHES. So scientifically your answer is no, you don't agree.

Mr. Ricci, given the fact that a scientist doesn't agree with you scientifically, do you still say that we shouldn't move to the 106-mile site?

Mr. RICCI. I quite frankly am not expert enough to truly answer the question scientifically. I simply relate to the weighing of the various opinions that I have heard.

Mr. HUGHES. You did have an opinion?

Mr. RICCI. As a nonexpert based on statements of other experts.

Mr. HUGHES. It is primarily an economic consideration, is it not?

Mr. RICCI. Based upon statements I have heard other scientists—I think Dr. Goldberg would acknowledge that there is some diversity of opinion as to what you might or might not do off the Continental Shelf.

Mr. HUGHES. Mr. Ricci, one of the things that you said, which I agree with, was that we should be using pretreatment and we should through point source, interruption or interception, be trying to identify is where these pollutants are getting into our wastewater treatment system. How much are we doing to try to identify putting pollutants into the system?

Mr. RICCI. We represent one-fourth of the State of New Jersey waste, in effect. We have spent several hundred thousand dollars to do that very thing, to identify all of the industrial discharges. We are inventorying all of their waste. We now have them under monitoring programs and we are monitoring.

Mr. HUGHES. Monitoring and getting rid of the substances are two different things. What are we doing to try to eliminate mercury, cadmium, PCB's at the source, which seems the thing to do?

Mr. RICCI. Mercury we are attacking. We have found the major discharge of mercury and have them on a schedule to cease that and get it down to an acceptable level.

Mr. HUGHES. That has to be an important part of any strategy?

Mr. RICCI. Yes.

Mr. HUGHES. The New York Bight is characterized as the most severely distressed part of our waters, in fact any waters in the world. You have had occasion to do research in the bight. Would you agree with that characterization?

Mr. GOLDBERG. No.

Mr. HUGHES. Where would you say in our waters are there more distressed areas?

Mr. GOLDBERG. Our waters, I can't give an example. The Bosphorus is far dirtier than the New York Bight.

Mr. HUGHES. Are there any other waters around the continental United States, that are any more severely distressed than the bight?

Mr. GOLDBERG. I can't make good judgment on that, sir.

Mr. HUGHES. But you would agree, from your studies, it is severely distressed?

Mr. GOLDBERG. Yes.

Mr. HUGHES. I think you suggested that cadmium was not presenting much of a problem, and yet as I understand it, in your Crystal Mountain study indicates that cadmium, the assimilative capacity of the bight relative to cadmium was approaching, if it had not reached serious proportions.

Mr. GOLDBERG. That was a worst possible case study. We looked at it most pessimistically. For the highest cadmium levels in sewage sludge, if oysters living on the sewage sludge accumulated cadmium at the highest possible levels and were eaten by the highest oyster consumers in that part of the area, they could in principle be subjected to nausea.

Mr. HUGHES. Let me read the conclusion. It is your conclusion, not mine: "Finally, the panel concluded that cadmium levels in bight sediments could currently be approaching or exceeding safe levels or limits for shellfish in parts of the bight."

Mr. GOLDBERG. My statement is not in conflict with that. They are approaching levels where the greatest consumers of oysters eating oysters from dredged spoils could in principle come down with nausea.

Mr. HUGHES. You have probably been the leading proponent of a assimilative capacity.

Mr. GOLDBERG. Yes, sir.

Mr. HUGHES. Have we reached the assimilative capacity in the New York Bight now?

Mr. GOLDBERG. My colleagues of the Crystal Mountain Workshop examined four substances and found that the assimilative capacity in their judgments has not been exceeded.

Mr. HUGHES. Are we going to reach the assimilative capacity someday and then recognize that we have reached it?

Mr. GOLDBERG. I don't want to sidestep the question.

Mr. HUGHES. Do you want to take the 5th amendment?

Mr. GOLDBERG. No; I don't.

Mr. HUGHES. With Lee White here, we have a good lawyer in the audience.

Mr. GOLDBERG. We may need one, sir. On the basis of what we know now or what we knew in 1979, the New York Bight, if it is in steady state with respect to the entry of a variety of pollutants, can continue to receive these pollutants without endangering human health.

Mr. HUGHES. My time is up.

Mr. Forsythe.

Mr. FORSYTHE. Thank you, Mr. Chairman.

I thank the panel, including our friend from New Jersey.

Dr. Goldberg, the issue of trace metals has been discussed not only today, but during past hearings. Is it your understanding that there is a level of trace metals below which the impact on human health is negligible?

Mr. GOLDBERG. I am concerned about specific metals impacting upon human health. We have for the marine environment one demonstrated case of that—mercury, which happened in Japan. I know of no marine site in the United States where the mercury levels impair human health today through the consumption of seafood by the greatest eaters.

Mr. FORSYTHE. The swordfish problem we had on the east coast blew over because of later information in that regard, wasn't that true?

Mr. GOLDBERG. Primarily the information I received was anecdotal about a woman who ate a pound of swordfish a day and claimed she had a disease. It was anecdotal.

Mr. FORSYTHE. You mentioned your concern about the land-based aquifers and pointed out that there are aquifers where we may not know for 200 years what we have done to them. Obviously, this is a long-range kind of problem we'll have to face. We make decisions today which may take generations to see results. But we also have many aquifers, particularly in some areas of the Mid-Atlantic area, Long Island—New Jersey, which are very close to the surface. This problem is very important as we look at the alternatives and at what we are doing to these aquifers, is it not?

Mr. GOLDBERG. I agree.

Mr. FORSYTHE. Do you think we should place more emphasis on the aquifers for sludge disposal versus the oceans at this time?

Mr. GOLDBERG. I don't want to evade the question. I think an assessment has to be made versus ocean versus land disposal for each site and each material.

Mr. FORSYTHE. Knowing what we do now, would you change what we are doing now to move disposal back onto the land, for instance, out of Passaic Valley?

Mr. GOLDBERG. With conventional wisdom, no.

Mr. FORSYTHE. It is also true, as I think Mr. Ricci pointed out, that they haven't found a site for surface disposal. Do you agree with him regarding problems of air pollution from thermal destruction?

Mr. GOLDBERG. Yes. One of the concerns that many of us had is the production of dioxins from the combustion of organic wastes in incinerators.

Mr. FORSYTHE. Do you have any idea as to what the impact might be from ocean incineration where it goes onto a boat and out to sea? Is that something we should be looking at?

Mr. GOLDBERG. Yes. There is one ship, the *Vulcanus*, operating in the Gulf of Mexico, burning organic waste. The information we have is that it is an effective way of destroying certain toxic materials.

Mr. FORSYTHE. I know there is some work going on with at-sea incineration, specifically in the New York area. They have a problem, however, because of the dewatering costs and the many other costs which are incurred before they even get it out there.

Thank you, Mr. Chairman.

Mr. HUGHES. The gentleman from Delaware is recognized for 5 minutes.

Mr. EVANS. Thank you.

Mr. Ricci, you said the key word is to "manage" the sludge and not "dump" it, but whatever you may call it, it is still placing the same in the ocean, and I think dumping comes closer to describing what is done with sewage sludge when it is put in the ocean. I am really concerned about your statement that there were some scientists who felt that we might be better off dumping harmful sewage sludge at the 12-mile site rather than the 106-mile site. It seems to me that that is inconsistent with the conventional wisdom. Most of the advocates and proponents of dumping as opposed to on-land disposal say that the ocean is big enough to cleanse itself, and certainly if you are 106 miles out versus 12 miles out, you have a much greater opportunity to cleanse the cadmium, mercury, or whatever, before it gets into very fertile feedstock areas for fish and shellfish.

That is just an assumption that I have always made based on dozens of people that I have talked to. I just haven't had the opportunity to speak to anyone who disagrees with that.

Mr. RICCI. Congressman, I have heard at seminars or seen in papers that I have read that there was some concern—again to have the specific knowledge—that some of these scientists have expressed a concern as to what the effects might be of getting this stuff down into the deep waters, colder temperatures, the thermoclines, that may affect the movement of material. It is a concern that I have heard expressed. I can't really speak to the scientific validity one way or the other.

Mr. EVANS. Thank you, Mr. Ricci.

Dr. Goldberg, did I hear you correctly? You implied that any disposal of sewage sludge containing toxic substances is bad if it is on land as opposed to the ocean?

Mr. GOLDBERG. No. In my testimony I emphasized the multimedia assessment. My argument is that for any site and for any specific type of sewage sludge the assessment has to be made as to whether land, air, or sea disposal results in minimal or zero loss of renewable resources. That is the criterion I would place.

Mr. EVANS. I would hope that someday we would be able to do a recycling process for sewage sludge. Scientists and engineers and others in America have been pretty good about developing new technology, and I would hope that that could be developed. It certainly is not going to be developed as far as the ocean is concerned, because it would be very difficult indeed for the foreseeable future

to recycle anything in the ocean, whereas on land I think it is possible. Would you agree to that?

Mr. GOLDBERG. I share your goal of recycling, and I would agree that we need more efforts toward the recycling of domestic and industrial wastes. There must be some recoverable substances of value in this material that we are throwing away.

Mr. EVANS. Dr. Goldberg, you are an expert in the assimilative capacity of the ocean, although that is very difficult to determine. It is kind of like a pot of water. All of a sudden, after it has been on the stove or on the fire for x number of minutes, it boils over, and very quickly it does that. How long did we dump various wastes into Lake Erie before detrimental effects on commercial fish became generally apparent? We eliminated some of the most important commercial fish stock almost in their entirety in Lake Erie, and it seems to me that it happened veritably overnight. How long did we know?

Mr. GOLDBERG. The discharges into the Lake Michigan area took place in substantial quantities, beginning at the turn of the century when we had extensive uses of coal burning and the intensive industrial development there.

Mr. EVANS. But it increased rather dramatically, I believe, after the Second World War?

Mr. GOLDBERG. Probably from the 1940's. Let me talk to that question a bit. I consider one of the most important marine pollution problems in need of assessment is one that would arise out of your question—the overenrichment of coastal waters and the trend toward eutrophication, like the Chesapeake Bay or the San Francisco Bay, through the introduction of plant nutrients. This is not being looked at effectively by our governmental agencies.

Mr. EVANS. Well, I think it should be, but I just wanted to ask you that question on what happened in Lake Erie. Following up the chairman—my good friend, the gentleman from New Jersey—I think it is very difficult to determine, and because the potential dangers are there to unreasonably degrade the environment and to cause irreparable damage, we have to be very, very careful indeed before we set out to reverse what the gentleman from New Jersey, with some small assistance from the gentleman from Delaware, attempted to do in 1977, which was to place a deadline and give those municipalities time to go to alternative methods of disposal.

And J. Sofaer's decision, I think, was totally inconsistent with our intent, and we need to turn something around. You don't find J. Sofaer and the administrative agencies, the EPA, telling Bill Hughes and Tom Evans that their intent was not what was on the record, and not only was it on the record, but it was placed on the record again in 1980. It was very clear what the intent was. If we need to change it, it should be the prerogative of the legislative branch of Government, and we would be reasonable in doing that. But I think we have to make absolutely certain that we don't do something that is irreparably harmful and does damage to the environment to the point where we jeopardize the safety and the health and the lives of our citizens.

Mr. GOLDBERG. I think that is correct.

Mr. EVANS. Thank you, sir.

Mr. HUGHES. Thank you, Mr. Evans.

I might say for the record that the gentleman from Delaware is too modest. He was a prime sponsor and worked very hard.

The gentlelady from Rhode Island.

Mrs. SCHNEIDER. Dr. Goldberg, you made the statement that the oceans are capable of accepting more waste but it must be done with care. Who do you see carrying on the responsibility of that care?

Mr. GOLDBERG. I think it is a variety of people who express concerns that can be translated into action. It is scientists, it is environmentalists like my friend Ken Kamlet who was here this morning, public officials like yourself, governmental agencies, and also it is international pressures that force us to consider maintaining renewable resources of our environment.

Mrs. SCHNEIDER. But the bottom line comes down to having not just haphazard review by an environmental group or very frail and unsophisticated oversight by a State agency, for example, but do you not see the value for a continuous ongoing monitoring system that is the total responsibility of the Federal Government?

Mr. GOLDBERG. I tried to establish one with your husband some years ago. It has now been phased out. The answer is yes.

Mrs. SCHNEIDER. I will ask this same question of you as I did of the previous witnesses, and that is, knowing that the budget for monitoring has been cut by 60 percent, I can't help but make an analogy that that is more than half. That is like saying to me, Claudine, we are going to cut off your right leg and your five toes on your left foot and then tell me to walk to work. It would be virtually impossible. I wonder if you share the feeling that knowing what the monitoring budget was and how it was used, and recognizing that it is now slated in the 1983 budget for 60-percent reduction, do you think that there is any serious intent on the part of the Federal Government to continue to have a role in the monitoring?

Mr. GOLDBERG. I can't answer that.

Mrs. SCHNEIDER. You mean you won't answer that?

Mr. GOLDBERG. It is not my area of expertise, judging the Government.

Mrs. SCHNEIDER. You have indicated that you support the Federal Government's role in ocean monitoring.

Mr. GOLDBERG. Yes.

Mrs. SCHNEIDER. And you have been involved in that process in the past. Now this process is being cut by 60 percent. What kind of impact do you feel that will have on the ocean monitoring system?

Mr. GOLDBERG. It is going to be disastrous. It is also going to provide public officials the opportunity to translate scientific knowledge into policy with a smaller information base, a poor springboard, a poor stepping stone with which to legislate.

Mrs. SCHNEIDER. If we have less information as legislators, then it seems to me that we will be making inadequate laws that will lead to controversy and probably the only beneficiaries will be the legal profession.

Mr. GOLDBERG. I can't disagree.

Mrs. SCHNEIDER. The other point that I would like to make is that you have indicated strong support for a multimedia study for waste disposal. This, I assume you are implying, would be the un-

dertaking of the Federal Government with strong support from the university sector would be your recommendation?

Mr. GOLDBERG. Yes, and the industrial sector.

Mrs. SCHNEIDER. And the final point that I would like to make, rather in the form of a question, although my colleagues have raised this point, but I certainly don't want to be one to let it slip by—that we recognize that scientists tell us time and time again that there are only—underline only—trace elements of one pollutant or another in one kind of fish or another.

I think that what is of concern to us—and the term that you had used was “assimilative capacity”—is that we as lawmakers, having listened to testimony on various things, whether it be ocean pollution, air pollution, or preservatives in our food, and recognizing the broad spectrum and the large number of perhaps trace contaminants that human beings are exposed to, we can't but be of the opinion that perhaps they are not responsible for poisoning, as you use the term, in Minamata Bay, but perhaps what this is contributing to is a slow death.

Needless to say, we have seen significant increases in cancer. We have seen significant increases in a multitude of different types of chemical pollutants, many we have not even been able to understand or identify yet, and one would only assume that the synergistic impact of all these chemicals in various parts of our environment would have a negative effect.

Do you not think that it is more responsible for us as lawmakers to err on the side of caution than to say well, a trace metal here or a trace metal there, is OK?

Mr. GOLDBERG. I can't disagree.

Mrs. SCHNEIDER. Thank you very much.

Thank you, Mr. Chairman.

Mr. HUGHES. Just two short questions. Is there a putrefaction problem in the bight right now?

Mr. GOLDBERG. There is.

Mr. HUGHES. Any question about that?

Mr. GOLDBERG. I think there is no question that the bight is putrefying.

Mr. HUGHES. Mr. Ricci, how would your authority feel about a provision in the legislation that would put the responsibility for any danger to the dumping area on the dumping authority?

Mr. RICCI. I don't believe I am really in a position to answer that.

Mr. HUGHES. Maybe you will want to take that back to the authority, because I am probably going to introduce an amendment.

Mr. RICCI. That is a rather far reaching amendment.

Mr. HUGHES. My fishermen in my coastal areas think it is a good idea.

Thank you very much. We appreciate your testimony.

Mr. HUGHES. Our final panel today consists of Mr. D. W. Bennett, the executive director of the American Littoral Society, and Dr. Daniel Pindzola, principal engineer, Franklin Research Center.

Gentlemen, we have your statements, which without objection will be made a part of the record. We would appreciate it if you would summarize. In fact, I am going to have to slip out because I have a group that is waiting for me and have been waiting for sometime now, and my colleague, Mr. Forsythe, will chair the bal-

ance of the hearings. But we would really appreciate it if you would try to summarize your testimony.

Let's start with Mr. Bennett. Welcome. It is good to have you.

STATEMENT OF D. W. BENNETT, EXECUTIVE DIRECTOR, AMERICAN LITTORAL SOCIETY, AND DR. DANIEL PINDZOLA, PRINCIPAL ENGINEER, FRANKLIN RESEARCH CENTER

Mr. BENNETT. The statement that I submitted is an effort to try to reflect the views of people who use the New York Bight for recreation or for making a living, commercial fishermen, sport fishermen, recreational divers, swimmers, what have you.

Our organization is interested in coastal environmental problems and our headquarters are at Sandy Hook, so we are proud of the fact that our offices are within 16 miles of 80 percent of the sludge dumping in the United States, 15 million tons a year of dredged spoils and sewer sludge and acid wastes going into the ocean within sight of my office.

The coalition is meeting to show you that we are serious, meeting this afternoon in North Jersey, tomorrow morning at Point Pleasant, and in Red Bank, to get together the fishing cooperatives in Belford in the Raritan Bay area and fishing cooperatives at Point Pleasant Beach, to consider getting Judge Sofaer's decision into another jurisdiction and see if we can activate some kind of injunctive relief against some of the dumping taking place where we consider it too close to land.

We have been active since the late sixties, and we supported the deadline in 1981 and support the amendments that you have submitted to create the deadline in 1982. We are against ocean dumping for a number of reasons. We believe that it kills marine life and certainly is doing so in the bight; the fact that you can't find the dead animals around is not necessarily proof that it is not happening.

The catch of shellfish and fish in the New York Bight has been cut in half since the midseventies, primarily accounted for by a catastrophic drop in shellfish landings from \$30 million down to less than \$10, primarily because of the fish kill. It hurts commercial fishing in the New York Bight and I cite the experience of Ed Maliszewski, who runs a boat out of Belford and has been spending 2 days a week brushing hair out of his net and blowing it out with high pressure water, because when he takes the net out in the dump sites they are filling up with human hair. It is hard to explain to him that sludge dumping does not degrade the environment, and also, with boat fishermen, and recreational divers and with clammers.

You have heard and will hear—I guess you won't any more, because this is the end of the hearings—but you have heard a lot about the huge assimilative capacity of the ocean, that it is enormous and if we dump material out there, it seems to go away. Our answer is that nothing goes away, particularly in the New York Bight, which is not in a sense the ocean. It is more a closed body of water than it is an open ocean.

Our feeling is that it goes away for a while and then it comes back and when it comes back, it comes back very hard. One of the

thing that we have been proposing is instead of there being dump sites identified as a 12-mile site or 106-mile site, that if there is to be any ocean dumping in the interim before these phaseouts, that that should be located in bodies of water, rather than specific locations.

The oceanographers find there are discrete bodies of water which move in certain directions at certain times of the year.

I can also point out that point where the 106-mile site has been designated by EPA as the result of a court case that we brought about 4 years ago, so that 106-mile site is available if the area needs to be moved from the 12-mile site.

There is a great deal of argument that ocean dumping saves money and our question is, whose money? It's very difficult to pin down the value of a commercial fishery or to show how much of it might be damaged, which is really the main problem.

Whenever you speak of ocean dumping and sludge as a primary part or a major part of the contamination in the New York Bight, there is the constant litany that it's not that, it's the river runoff or the material coming out of the Hudson River or East River. And no matter where you turn there always seems to be somebody who is pointing at another source that you should work at first.

It's been our opinion for a long time that the easiest, the best, the first step to cleaning up the bight is to start to cut down on and get rid of the sewer sludge particularly because it is contained at one point.

We see how silly it is to talk hundreds of thousands of dollars to collect it in a pot and then put it in a tanker and then truck it out to a 12-mile site and then free it again. If it's contained, keep it contained.

It would probably be very difficult to measure the impact of moving the sludge from 12 miles to 106 or moving it out of the ocean, but it's an easy first step to take to start cleaning of the bight. It's a place where hundreds of thousands of people use for recreation and for making a living.

I mentioned in my testimony on the last page some suggestions for tightening the amendment language. I won't go over them now, except to say that on page 2, line 24, it reads that "Congress finds that the reasonable use of the ocean as a receptacle of society's waste . . ."; we dislike the terminology that the ocean is a receptacle because that to me connotes that it is something that will hold something or contain it.

The ocean doesn't contain it and that's the problem. It spreads it. Ocean dumping is not only the dilution of pollutants but the spreading of toxics, and I think the term "receptacle" is a bad one.

We say don't dump in the ocean; let each waste stay with that one's responsibility to have, to hold and to treat, and that dumping is not treatment. This is disposal and we need to treat the material and not simply throw it into the ocean.

Mr. FORSYTHE. Thank you, Mr. Bennett.

Dr. Pindzola.

STATEMENT OF DANIEL PINDZOLA

Mr. PINDZOLA. Thank you, Mr. Chairman, members of the subcommittee, my name is Daniel Pindzola. I am a chemical engineer. I have been with the Franklin Institute for 13 years where my work has been in the area of waste utilization and disposal; this covers sewage sludge, dredging spoils, and industrial wastes.

The initial project that I was involved in involved ocean dumping of sludge. Since then I have been involved in a process which gets rid of sewage sludge once and for all.

With me today is Dr. Hardy Bowen, who is a principal scientist at the Franklin Institute. He is a chemical engineer and marine biologist as well. He has participated with me in the development of this Ecorock sludge disposal process.

Fortunately, I am not here today to discuss the process and consequences of ocean disposal of sludge. I am here to talk about a method which gets rid of it completely in a beneficial manner by forming a useful product, namely rock, (which I have a jar of here for your viewing) at a very low cost. The capital costs for the process are low and the operating costs are low, lower than ocean dumping, I might add.

The process is simple. It utilizes well-proven equipment and steps which have been well and carefully developed.

The heart of the process is a small rotary cement kiln which I think you would recognize as being a fairly commonplace piece of equipment.

The development was initiated and heavily funded by the U.S. Government, namely the EPA. It was with considerable foresight that individuals there 12 years ago, one in particular, Mr. Louis Lefke, who is still with EPA, saw that from whatever processes that evolved in the disposal of wastes, there would always be some residuals left to be thrown away or which could not be used. This program was picked up by the Federal Highway Administration, since the end product of this process being a rock was of some interest to them. They funded demonstration studies of the rock in highways. It tested out highly successful.

The city of Philadelphia 6 years ago cofunded with EPA the design, construction, and operation of a large-scale plant. This plant cost \$3 million, which by today's standards is quite modest. However, it's large enough to handle the sludge waste for a city the size of 200,000 persons.

The basis of the process is quite simple. Sludge is mixed with two to four parts of shredded municipal solid waste. This does not have to be raw garbage. It can be incinerator residue, which is what we are using in Philadelphia. By blending the material in this fashion the sludge easily dries and then burns out in a rotary kiln.

The ash from the kiln is fused in a small furnace; 90 percent of the energy for the process comes from the burning of the waste itself.

I will skip details of the process and concentrate on the end product usage.

It is truly a useful saleable product. There have been so many resource recovery processes which I have reviewed in the last 10 years which turn out an end product which is unmarketable be-

cause it is produced in large volume or where the market fluctuates, that the product has to be sold at a loss. This product is salable. It is a durable, tough aggregate which in tests have shown that it is a good tire skid-resistant material. Tire skid resistance is important for safety in highway streets.

I will now discuss the economics.

Continual updatings have been made during the course of this 10-year development. The process has always looked fairly economical. Right now it looks very, very cheap. A representative of the city of Philadelphia here this morning, Miss Dianne Garvey, presented me with some updated figures on ocean sludge disposal from Philadelphia. They are currently \$120 to \$130 per ton. For a city the size of Philadelphia, because of economies of scale, the price per ton is \$66 with the Ecorock process.

Now, this does not include all the economic or environmental benefits which arise from the process. Certainly, the air, the land and the water are spared burdens of dumping those wastes. Land is also spared because quarrying of additional rock is not required; and transporting waste to sites and aggregate to the city is also eliminated, not to mention elimination of blasting and runoff from quarrying.

The interesting thing is that the cost of a plant the size for New York City or Chicago is only \$24 million. The annual operating cost for New York City using the ECOROCK process would be \$8.8 million. That includes the cost of capital.

The purpose of the testimony today was to show that there is an alternative to land and ocean dumping of sludge. It's cheap, practical and environmentally sound. Moreover, it does produce a truly usable end product. No city can make enough ECOROCK to saturate its annual demand for repaving of streets.

The technology was carefully developed with public money and is in the public domain for use by all cities. Its extremely low capital cost and simplicity should be a significant factor in helping achieve its acceptance by municipalities rapidly.

Thank you.

[The statement of Mr. Pindzola follows:]

PREPARED STATEMENT OF DR. DANIEL PINDZOLA, PRINCIPAL ENGINEER, PROCESS TECHNOLOGY DEPARTMENT, THE FRANKLIN RESEARCH CENTER, A DIVISION OF THE FRANKLIN INSTITUTE, PHILADELPHIA, PA.

My name is Daniel Pindzola. I am a chemical engineer. For 13 years I have been with The Franklin Institute working mainly on waste utilization and disposal problems. My initial work at The Institute involved studies on sludge, dredge spoil, and chemical waste disposal in the ocean. Since then a major portion of my time has been spent developing what has turned out to be a practical thermal process that cheaply reduces sewage sludge and solid waste residues to an insoluble rock product. Prior to my joining The Franklin Institute, I was with the Du Pont Company for almost 7 years, where I was engaged in process research and development.

With me today is Dr. Hardy Jefferson Bowen, who is a Principal Scientist at The Franklin Institute. He is also a chemical engineer. His Ph.D. is in marine biology. He has participated in the development of the ECOROCK sludge disposal process, which I am going to discuss today.

Description of the ECOROCK Process

An alternative to ocean and land disposal of sewage sludge has been developed over the past 10 years at The Franklin Institute under government sponsorship. It is simpler, cheaper, and safer than other available disposal methods. It requires little space for operation and uses uncomplicated, well-proven process equipment; an ordinary small cement kiln is the central equipment piece.

The development was initiated and has been heavily funded by the Environmental Protection Agency. The Federal Highway Administration funded large-scale pilot plant studies to verify process conditions and operability and to produce sufficient tonnages of rock for highway surfacing tests. The City of Philadelphia co-funded with EPA the design, construction and operation of a large \$3,000,000 demonstration plant which although moderate in cost, is adequate to handle the sludge load for a city of 200,000 persons.

The basis of the process is to mix and dilute sludge with 2 to 4 parts of shredded municipal solid waste; this solid waste helps to dry and burn-out the sludge. The solid waste then fuses with the sludge ash in the kiln to produce an insoluble rock product. The process and the rock product have been named ECOROCK (Figure 1) because of their economic and ecological soundness.

In the ECOROCK process, sludge pathogens and parasites are thermally destroyed, along with toxic organic substances; toxic metals are permanently locked-up in the rock. Emissions and odors, which normally occur when sludge is burned by itself, do not occur. Because the sludge is diluted and spread over the solid waste, drying and burning are facilitated; controlled complete oxidation occurs; and the deep bed of hot highly silicious particles of solid waste ash captures and entraps emissions. The burning temperature in the kiln is kept below 1800°F by using air. The hot partly agglomerated ash particles that reach the end of the kiln after burning then drop into a small box furnace where a flame burner maintains a temperature 200-400°F above the kiln temperature. The hot ash particles quickly melt, fuse together, and flow by gravity from the furnace onto an air-cooled metal belt conveyor. As the melt is slowly air-cooled, it fuses into the rock product that is then crushed for use as a road paving aggregate. Extensive 6 year long road tests by the Federal Highway Administration have shown this resulting material to be a tough, durable aggregate with good tire skid resistance properties.

The energy from the hot combustion gases generated in the rotary kiln are captively used to dry the incoming sludge/solid waste feed stream. This is done in a conventional rotary-drier located ahead of the kiln. Over 90% of the energy requirements for the process are supplied by the burning waste

mixture.

All of the solid waste used in the process is screened through a 2 inch rotary trommel; any material not passing the 2-inch screen is hammermilled; this improves uniformity of the product. The dense rock product is inert. It is economically useful right in the municipality generating the wastes. Market surveys have shown that municipal aggregate consumption for roadway resurfacing far exceeds the amount that could ever be produced from a municipality's sludge and solid waste production; all of the ECOROCK produced would be used in the city itself.

Economics

Continual updatings on the costs for the process have been made during the course of development. These have shown it to be less costly than land or even ocean disposal in most cases. Table I gives a detailed breakdown of the currently projected costs for a 20-ton-per-day unit, such as the demonstration scale plant built on a 3/4 acre site at Philadelphia's Northeast Water Treatment Plant. Municipal incinerator residue in this case is being used as the solid waste carrier, fuel and fluxing agent for the sludge. (Its small combustible heat content of 2,000 BTU/lb. is adequate to help dry the sludge.)

Table 2 shows projected capital costs and complete annual operating costs for several levels of expanded capacity. Economies of scale drop the sludge disposal costs to approximately \$63 per ton (dry sludge basis) for a unit handling 400 tons per day of sludge solids. This is less than the \$90-per-ton cost now projected for deep ocean disposal of Philadelphia's sludge and well below the costs many cities now pay for land disposal of sludge. Moreover, these costs do not take all economic and environmental benefits into account. For example, a value higher than \$4.50 per ton for the durable, safer, skid-resistant ECOROCK aggregate might actually be realized in practice. In addition, both monetary and health benefits to society result from sparing the air, land and water from the burdens of dumping these wastes. Land is also spared from quarrying when the ECOROCK aggregate is used in place of natural

rock. Fuel usage and pollution resulting from the transportation of wastes and natural aggregate are also eliminated.

The purpose of this testimony is to show that there is an alternative to ocean dumping of sludge that is cheap, practical, and environmentally sound; moreover it produces a truly usable end product. The technology was carefully developed with government money and is in the public domain for immediate use by all cities. Its extremely low capital costs and simplicity should be a significant factor in helping put it into the hands of all municipalities rapidly.

TABLE I- ECONOMICS FOR 20-TON-PER-DAY SLUDGE DISPOSAL FACILITY*

BASIS OF OPERATION

Sludge with 20% Solids/80% Water
 Solid Waste (Incinerator Residue) with 80% Solids/20% Water
 350 Operating Days per Year

| | <u>Tons Per Year</u> |
|---|----------------------|
| Dry Sludge Feed (20 tons per day) | 7,000 |
| Dry Residue Feed (33.3 tons per day) | 11,655 |
| Aggregate Production (32 Tons per day) | 11,249 |
| | <u>\$/Yr</u> |
| DIRECT COSTS | |
| Direct Labor: 2 Operators/shift, 7 days/wk @ \$14.00/hr | \$235,200 |
| Electricity: 2,402,000 KWH @6¢ KWH | 144,120 |
| Fuel Oil: 46,655 gal/yr @ \$1.20/gal | 55,986 |
| Gasoline: 2,640 gal/yr @ \$1.30/gal | <u>3,432</u> |
| | \$438,738 |
| INDIRECT COSTS | |
| Factory General: 1% Gross Fixed Assets (\$2,867,106) | \$ 28,671 |
| Maintenance: 3% GFA | 86,013 |
| Insurance: 1% | 28,671 |
| Capital Charges: 10% GFA | <u>286,711</u> |
| | \$430,066 |
| TOTAL OPERATING COSTS | \$868,804 |
| Cost per ton of Sludge | \$124 |
| REVENUES | |
| Aggregate: 11,249 tons @ \$4.50/ton | \$ 50,621 |
| Credit for Solid Waste Disposal: 11,655 tons @ \$12/ton | <u>139,860</u> |
| Total Credits | \$190,481 |
| NET COST | \$678,323 |
| Net Cost per Ton of Dry Sludge Solids | \$97 |

* - Tons of sludge on dry weight basis; costs based on pilot-plant experience; 20 tons per day sludge: equivalent to the output for a city of 200,000 persons.

TABLE 2 - CAPITAL AND OPERATING COSTS FOR VARIOUS-SIZED ECOROCK UNITS

| Dry Sludge Processing Capacity | | Capital Costs* | Annual Operating Costs** | |
|--------------------------------------|----------------------|----------------|-----------------------------|--------------|
| <u>Tons Per Day</u> | <u>Tons Per Year</u> | | <u>\$/Ton of Sludge</u> | <u>Total</u> |
| 20 | 7,000 | \$ 4,000,000 | \$97 | \$ 679,000 |
| 200 | 70,000 | 15,900,000 | 66 | 4,620,000 |
| 400 | 140,000 | 24,100,000 | 63 | 8,820,000 |

20 TPD suitable for a city the size of Bridgeport, Charlotte,
Sacramento, Tucson

200 TPD suitable for a city the size of Philadelphia, Detroit,
San Francisco

400 TPD suitable for a city the size of New York City, Chicago,
Washington, D.C.

* - 1982 dollars

** - Includes capital charges

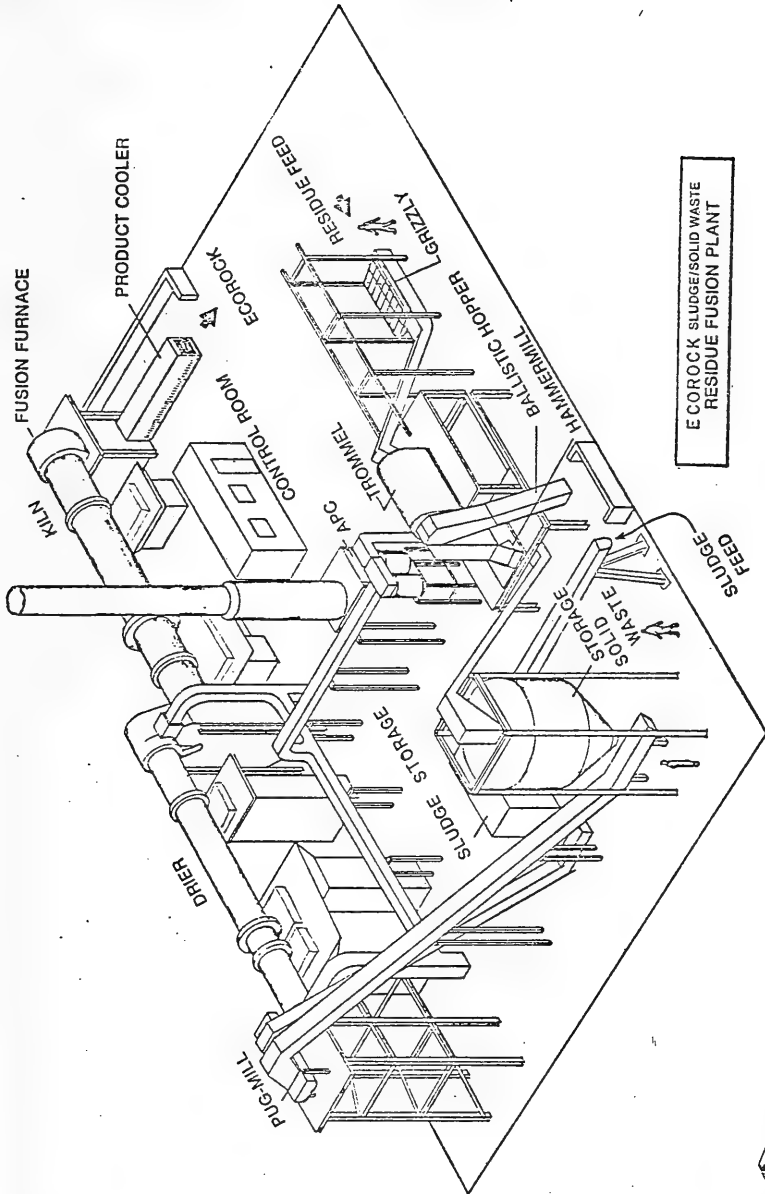
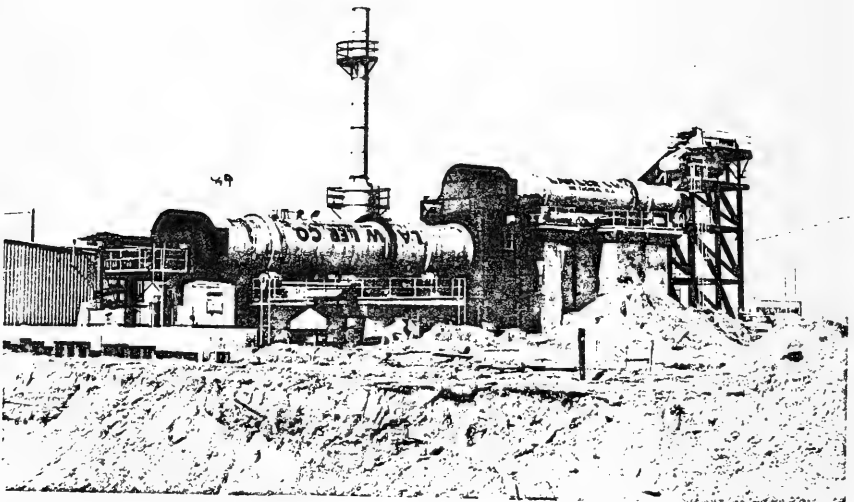
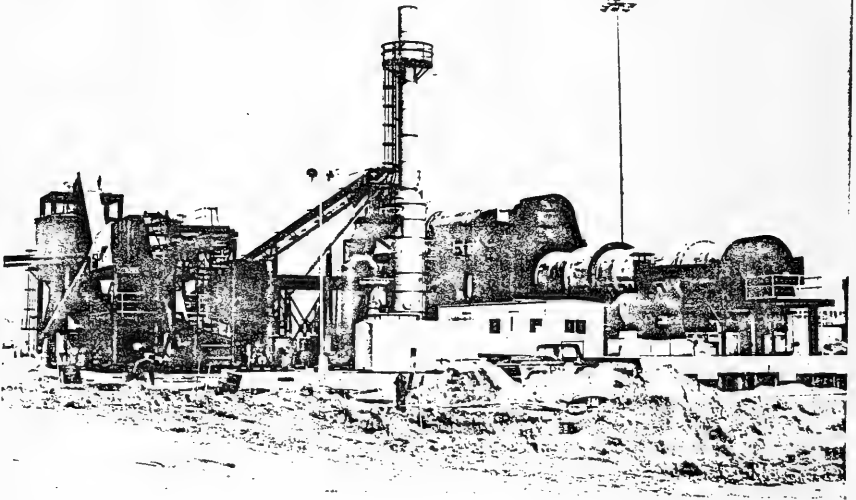


FIG. 1

ECOROCK PLANT
20 TON PER DAY



Mr. FORSYTHE. Thank you, Dr. Pindzola.

I thank both of you.

Mr. EVANS. Not often do we get three Republicans to zero Democrats in this committee or anywhere else.

Dr. Bowen, Dr. Pindzola, Dr. Bennett, welcome.

Let me congratulate you on what you have attempted to do in terms of developing an alternative to ocean dumping of sewage sludge, harmful dumping that is inexpensive and practical and environmentally sound.

You state that contaminants such as toxic metals are locked up in ECOROCK. Could you elaborate on that point for just a moment? What happens to those toxic metals when ECOROCK is used as a road surfacing material and as it's worn down, do the toxics run off into our water base? I am a little concerned.

Mr. PINDZOLA. Well, a road consists of about 92 percent rock encased in asphalt or Portland cement. The surface projections which protrude and which give a skid-resistance is a very minor part of the total amount of rock. Now only a small amount of wear occurs. This rock has been in place in a highway in Harrisburg, Pa., for 6 years; very little wear has occurred. That is why the skid numbers also remain high with this material. However, the small amount of rock that wears off, be it .01 percent or something, would, in a city where the rock is intended for use, get washed back to the sewers and be recycled back into the ECOROCK process.

In the countryside, the rock is not soluble, consequently if particles of it broke off from the surface of the road it would not dissolve in a thousand years.

Mr. EVANS. So there would be no problem with runoff?

Mr. PINDZOLA. No.

Mr. EVANS. You know you cited statistics, Dr. Pindzola, showing that if Congress dropped sludge disposal costs to approximately \$63 for a unit handling 400 tons per day, just for the record, I'd like to note that Mayor Koch when he was here, the Mayor of New York City, stated that New York produces about 260 dry tons of sewage sludge per day. It seems to me that that's well below 400 tons and New York could take advantage of this alternative.

You also indicated that the city of Philadelphia had just indicated to you that the cost of disposal in the deep sea was somewhere around \$120 per ton, which was \$30 per ton more than you thought it had been.

I asked Mayor Koch if he would give me the cost of disposal of each dry ton and I am looking forward to hearing that from him. But it seems to me that from an economic standpoint, that if it cost \$63 per ton to recycle, developing something that is reusable, that that's a lot less than \$90 per ton or \$100 per ton or \$120 per ton, and you really have killed two birds with one stone.

You are able to dispose of something in an environmentally safe manner but you are also able to use it to recycle and you use it very effectively from an economic standpoint.

I would just like to congratulate you very much indeed. I think you are on the right track.

Is EPA doing anything to make municipalities aware of what you have, since it is in the public domain?

Mr. PINDZOLA. Considerable credit is due to EPA. The idea originated with them. All I did was implement it and keep it moving through proper development over 10 years. They intend to do as much as they can once it is fully demonstrated and put on view in Philadelphia, and that plant is currently about to be run for a prolonged period of time; and hopefully for many years.

Mr. EVANS. How long is it away from being a true demonstration project?

Mr. PINDZOLA. Just a few months. It's been held up by massive construction of another nature at their water treatment plant. This plant is only a \$3 million plant among other projects which total almost \$1 billion. So it's floating in a sea of other construction.

Mr. EVANS. That's a \$3 million plant for recycling 20 tons?

Mr. PINDZOLA. Twenty tons a day, correct.

Mr. EVANS. So if you had 260 tons as New York City does, it's 13 times that, but a few million is certainly a small price to pay to develop an alternative to dumping what could be truly harmful, irreparably harmful to millions of citizens.

I congratulate you and thank you gentlemen.

Mrs. SCHNEIDER. I too would like to associate myself with the remarks of my colleague from Delaware.

Granted we have had the opportunity to have a private briefing on this, and I regret that because the hour is late more of my colleagues have not had the benefit of hearing your testimony. Also we haven't fed the staff their lunch, so I hope that they will be able to bear with us. I am most anxious to see, Dr. Pindzola, that you have the opportunity to present your testimony again either before this body or before the Science and Technology Committee, because it seems to me to be very fruitless for the United States and the Federal Government to support projects that genuinely do provide us with an economic and human health solution to some of our pollution problems without pursuing them more aggressively.

I have no further questions of you, but I would like to state that if you have any roadblocks that you are encountering insofar as attempting to promote ECOROCK, I would certainly appreciate it if you would keep this committee well informed of your progress. I think all of us are very enthusiastic about eliminating the problems that are a result of ocean dumping.

I thank all three of you gentlemen for your time and patience in what has been a very long hearing. We will take the information you have provided to us and run with it.

Thank you very much.

Thank you, Mr. Chairman.

Mr. FORSYTHE. Thank you, and I thank the panel. Though there are questions from the chairman of the committee and others, in view of the fact that the time is what it is we will adjourn the hearing until the call of the Chair.

[The following was received for the record:]

PREPARED STATEMENT OF HON. JAMES J. HOWARD, CHAIRMAN, PUBLIC WORKS AND
TRANSPORTATION COMMITTEE

I would like to thank Subcommittee Chairman Norman D'Amours for the opportunity to submit testimony on the Ocean Dumping Act Amendments of 1982.

The Marine Protection, Research and Sanctuaries Act, commonly known as the Ocean Dumping Act, was enacted in 1972 as a result of concern over the effects of unregulated ocean dumping. The Act established a policy to prohibit or strictly limit the dumping of materials harmful to people or the marine environment. The 95th Congress strengthened this legislation with my active support and established a deadline to terminate ocean dumping of harmful sewage sludge by December 31, 1981. The 96th Congress amended this law to include a ban on the dumping of harmful industrial wastes with the same termination date.

It has been three months since the dumping was to end, but still it continues. The marine environment is under siege by harmful sewage wastes, chemical byproducts, contaminated dredge spoils and radioactive wastes. These wastes contain known and unknown perils for the future of the marine environment and those who harvest the resources of the sea. Deadly trace metals, and various cancer-causing substances have accumulated at the various dumping sites regulated by the Environmental Protection Agency (EPA). We are clearly reaching a critical stage in the ability of certain regions of the ocean to neutralize or absorb wastes with the New York Bight area at the head of the list.

In 1981, EPA chose not to appeal a Federal District Court decision to allow New York City to continue dumping 3 1/2 million tons of sludge into the New York Bight. This decision, coupled with the new Administration's lack of commitment to clean up our marine environment has allowed EPA to set precedents and extend the dumping permits for certain sludge and chemical dumpers. In a chemical waste dumping application, which I have actively opposed, EPA has justified a tentative approval for continued dumping with the following statement:

"While three alternative methods of disposal are technically feasible, they are not available at reasonable incremental costs and energy expenditures..."

In another chemical dumping application submitted by National Lead Industries, the EPA has tentatively approved limited but continued acid-iron waste dumping. Energy Resources Company, Inc. submitted a "Demonstration of Compliance" document on behalf of National Lead Industries detailing the effects of acid dumping on marine life. In this report ERCO states: "these acid-iron wastes contain several constituents that are potentially lethal to aquatic organisms under conditions of acute as well as chronic exposure."

In New Jersey where both of these dumpers are based, recent efforts by the State Department of Environmental Protection to encourage and regulate land-based disposal of industrial wastes have been hampered by the continuation of a policy of "special consideration" for certain waste producers by the Environmental Protection Agency. This unique bias is in direct opposition to the policy of aggressively seeking land-based alternatives by the New Jersey Department of Environmental Protection. With an average yearly input of 1,545,000 tons of acid-iron wastes between 1973 and 1978 and a record of dumping since 1948, it is clear that the time has arrived for the cessation of acid-iron dumping.

In March 1977, the Fishery Conservation and Management Act of 1976 became effective, extending U.S. jurisdiction over offshore fisheries within 200 miles of its coast and possessions, and making it the policy of the land to use some of the most advanced ideas available about ways to manage marine fisheries. The management of our fisheries and the extraordinary efforts by those concerned with the environment will have gone unrewarded if EPA is allowed to circumvent the law and allow sludge and chemical dumping to continue. At stake is not only a major supply of animal protein, but also an American industry which provides

employment for over a quarter-of-a-million people and has an impact of over \$6.5 billion on the U.S. economy. It is a resource used by foreign fishermen from more than 17 nations, U.S. commercial fishermen, and an estimated 30 million recreational fishermen, whose catch is roughly equal in size and value to the catch of edible fish by U.S. commercial fishermen.

I am in strong support of the efforts of Chairman D'Amours to close the many loopholes in the Ocean Dumping Act. The use of the term "unreasonable degradation of the environment" has been given a new meaning by the EPA. The liberalization of this term for the justification of continued ocean dumping has caused severe damage to the ecological system along the New Jersey coast, as well as many other marine wetlands and offshore fishing areas. It is my belief that our precious marine resources will not tolerate a weakening of the Ocean Dumping Act or an extension of dumping deadlines.

EPA should favor the portion of law which gives greater assurance of environmental safety, and not conclude as they did in a recent chemical dumping application, that a "lack of demonstrated harm" settles the matter. A report published by NOAA on the results of a scientific workshop at Crystal Mountain, Washington, concluded that "in the New York Bight there is evidence that the assimilative capacities of some substances or in some areas have been reached or exceeded."

Again, I call upon this committee to carefully review the data on the effects of ocean dumping on our environment. I invite members of this committee to visit the waterways, beaches and offshore fishing grounds of my Congressional district for they are some of the most beautiful in the world. It is my hope that this committee will vote to restore strength to the Ocean Dumping Act and end the dumping of harmful sludge and chemical wastes in the New York Bight and throughout our Nation's coastal waters. We owe this protection and preservation to ourselves, our children and the earth.

PREPARED STATEMENT OF EDMUND G. BROWN, JR., GOVERNOR, STATE OF CALIFORNIA

Mr. Chairman, as Governor of the State of California, I respectfully and forcefully urge the Congress to enact a ban on the ocean disposal of radioactive waste by appropriately amending the Marine Protection, Research and Sanctuaries Act of 1972. The ocean waters off the California coast are now scarred as a result of past cavalier dumping of radioactive and other toxic materials. Waste products from a past generation have left a legacy of unknown consequence in the marine environment of the Pacific Ocean. Additional dumping of long-lived radioisotopes and persistent toxic chemicals into such a vital resource as the ocean would reflect an ecological insensitivity and weak commitment to environmental stewardship on the part of the United States.

The Reagan Administration is now moving to open the seas to an onslaught of toxic byproducts. To the people of California, that represents another repugnant disregard for the interests of our state. Combined with the efforts to expand offshore oil drilling, attempts to resume radioactive waste disposal indicate that the Administration has a perspective on the ecological role of the ocean which is entirely different than that of the State of California.

Ocean disposal of radioactive wastes is an irresponsible public policy which is fostered by a failure to solve the nuclear waste management problem. As nuclear technology has plunged ahead, the riddle of waste disposal has lingered amidst elusive promises of future solutions. The ocean must not be used as a quick-fix answer to the intensifying political and economic problem of radioactive waste disposal. Littering the seas with nuclear garbage is a shortsighted act in contempt of future life.

The Farallon Islands nuclear dumpsites have taught the people of California several important lessons. The plutonium which has leaked from steel drums on the ocean floor fifty miles west of the Golden Gate Bridge is a qualitative indicator of the potentially hideous consequences inherent in the use of the ocean as a nuclear dumping ground. Colonies of marine organisms have been attracted to the barrels and powerful deep sea currents could serve as long range transport pathways for leaked radioisotopes.

Data that has been collected from the Farallon Islands is insufficient to make any reasonable assumptions about the long-term human health consequences of the leaking barrels spread over the ocean bottom. It is likely that all the radioactive materials dumped at the Farallons, which include plutonium, will eventually be released into the sea. The behavior of the leaked radionuclides in the marine ecosystem remains a matter of conjecture.

Following a hearing of the Environment, Energy, and Natural Resources Subcommittee of the House Committee on Government Operations held in San Francisco on October 7, 1980, a commitment was made by the Environmental Protection Agency to devise a monitoring program for nuclear dumpsites in both the Atlantic and Pacific Oceans. The EPA subsequently developed a credible program to monitor ocean sediments, water and fish. However, the Reagan Administration failed to provide funding for the implementation of the monitoring program. Despite a broad scientific consensus on the need for monitoring past disposal sites, the Reagan Administration is pushing forward to resume ocean disposal of nuclear wastes. As a result, uncertainties about past disposal continue to linger over the marine environment while threats of new radioactive contaminations loom in the future.

Rachel Carson wrote about ocean disposal of radioactive waste in 1960

(The Sea Around Us, preface to revised edition, pages X and XII):

"By its very vastness and its seeming remoteness, the sea has invited the attention of those who have the problem of disposal."

"The truth is that disposal has proceeded far more rapidly than our knowledge justifies. To dispose first and investigate later is an invitation to disaster, for once radioactive elements have been deposited at sea, they are irretrievable. The mistakes that are made now are made for all time."

The Reagan Administration is now moving toward a resumption of ocean disposal of radioactive wastes on at least four fronts:

1. As announced in the Federal Register, Volume 47, Number 9, pages 2151-2152, the United States Navy is considering sinking over 100 decommissioned nuclear submarines over the next thirty years. According to the January 22, 1982 issue of Science (page 377) new evidence has come to light over the past few years which indicates that reactor components contain significant quantities of nickel-59, a radioisotope with a half-life of 80,000 years, and niobium-94 which has a half-life of 20,000 years. It is unlikely that the long-term health consequences of the submarine disposal can be predicted with any degree of certainty.

2. The Department of Energy is reportedly (Science, March 5, 1982, page 1217) looking to the oceans to dispose of thousands of tons of radioactive soil from nuclear weapons facilities.

3. The Department of Energy has announced (Federal Register Volume 46, Number 93, pages 26677-26678) plans to develop the option of seabed disposal of high level radioactive wastes as a "longer-term supplementary disposal method."

4. The Environmental Protection Agency is drafting new ocean dumping regulations which will allow ocean disposal of radioactive waste, which has not been permitted in the United States for over a decade.

The State of California opposes all four of these attempts to utilize the ocean for radioactive waste disposal. Quantitative arguments can be devised to demonstrate the dilution capacity of the seas, and such analyses depict each disposal incident as inconsequential relative to background radiation. But from a qualitative standpoint, cumulative additions to the existing environmental burden of man-made radiation in the ocean cannot be justified. Radioactive wastes disposed in the sea cannot be contained over the duration of radioactive decay. Containerization of longlived radioisotopes is not technically and economically feasible in the deep ocean environment. The safety of ocean disposal of radioactive waste cannot be assured over time.

In summary, I urge a ban on ocean disposal of radioactive wastes for the following reasons:

1. Wastes are irretrievable once they have been placed in the ocean. What may appear to be acceptable today may prove unacceptable tomorrow. It is necessary to maintain the option of future remedial action because we do not have a full understanding of the ecological consequences of ocean disposal of radioactive materials.

2. The bioaccumulation of radionuclides is poorly understood. Radioactive materials may pose serious health threats to future generations.

3. There has been no clear demonstration of the need or advantages of ocean dumping of radioactive materials other than political or financial considerations.

4. Opening the ocean as a dumping ground for radioactive wastes encourages the proliferation of such wastes, and discourages the minimization of waste generation. The policy of source reduction minimization which, reduces wastes at the point of generation, can be undermined by the use of the ocean for radioactive waste disposal.

Radioactive wastes will remain for thousands of years as a legacy that our society passes to future generations. Shortsighted disposal based on expedient political and financial considerations will compromise the quality of future life. Our legacy must be one that promotes life, not death; stewardship, not dump and run!

Monitoring of Past Radioactive Waste Ocean Dumpsites
And "Test" Sites Is Needed To Provide Effective
Assurances That There Are No Undue Hazards To Human
Health and The Environment, And To Assist In The
Development of Future Policies

(A Critique of the GAO Radioactive Waste
Ocean Dumping Report's Incomplete,
Inconsistent, and Erroneous Findings
and Conclusions)

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This Paper Has Been Endorsed By
The Following Organizations:

Center for Environmental Education
Clean Water Action Project
Committee to Bridge the Gap
Critical Mass Energy Project
Environmental Defense Fund
Friends of the Earth
Greenpeace, U.S.A.
Hudson River Sloop Clearwater, Inc.
National Audubon Society
Natural Resources Defense Council
Nuclear Information Resource Service
Oceanic Society
Southwest Research and Information Center
Sierra Club
Union of Concerned Scientists

EXECUTIVE SUMMARY

In January 1981, Senator William Roth, Jr. asked the General Accounting Office (GAO) to investigate the United States past program of radioactive waste disposal at sea. In response to that request, the GAO issued a report in October 1981 entitled "Hazards of Past Low-Level Radioactive Waste Ocean Dumping Have Been Overemphasized." It was hoped that the GAO Report would clarify issues; instead, it is permeated with inadequate documentation, misrepresentation of evidence, and failures to acknowledge the existence of other pertinent evidence. GAO's defective conclusions flow from this invalid analysis.

The GAO Report's principal findings and conclusions are three-fold:

- the Federal Government has no complete and accurate catalogue of information on how much, what kind, and where low-level nuclear waste was dumped because detailed records were not required;
- the overwhelming body of scientific research and opinion shows that concerns over the potential public health and environmental consequences posed by past ocean dumping activity are unwarranted and overemphasized; and
- although the Environmental Protection Agency has been slow in developing low-level radioactive waste ocean dumping regulations, its current approach is sound. Nonetheless, improvements are needed in developing specific dumpsite monitoring requirements.

An analysis of an issue as complex and controversial as ocean dumping of radioactive wastes must be done with documentation and an accurate representation of all the pertinent evidence. The Report falls far short in both those tasks. This paper analyzes the GAO Report and examines the pertinent evidence. Contrary to GAO's findings and conclusions, we find that:

- the incomplete and inaccurate information that plague the issue of past ocean dumping of nuclear waste presents a serious problem which requires more complete elaboration in order to determine actual or potential hazards;
- there is not enough hard evidence to provide sufficient certainty that public health and environmental hazards will not result from past dumping practices;

- a good monitoring program of previously used sites off the U.S. coastline is both necessary and useful (1) to provide empirical data concerning such matters as toxicity, transport, and critical pathways, fates and effects of the radioactive materials, (2) to assure the public that such past dumping does not present any public health or environmental hazards, and (3) to provide scientific data which will contribute to responsible policies and regulatory requirements for the future; and
- a good monitoring program of "test" sites off the U.S. coastline, unmodified by prior dumping activities, is both necessary and useful (1) to provide baseline data that will increase our knowledge of the physical, geochemical and biological processes of the marine environment and routes back to man; and (2) to provide scientific data which will contribute to responsible policies and regulatory requirements for the future.

In arriving at these findings, this paper addresses each of the GAO Report's principal findings and conclusions. Part I describes past and present U.S. policies and activities in relation to ocean dumping of radioactive wastes. It mentions briefly the statutory and regulatory framework that has developed, and notes the fact that since the issuance of a Council on Environmental Quality report in 1970 the United States policy has been not to use the oceans as a repository for radioactive wastes. It also references the reasons for EPA's current interest in the ocean option. It is in this context that the GAO Report -- to the extent it serves as support for a reversal of U.S. policy on this important issue -- requires rebuttal.

Part II explains why there is a need for more complete information on past dumping practices. While complete and accurate data are not available, that does not negate the need for better information than now exists in order to (1) adequately assess actual or potential hazards from past U.S. dumping, and (2) formulate sound policies for the future. The GAO Report incorrectly assumes that all past dumping was low-level radioactive waste, that at most only low-risk waste remains, and that it presents low-risk to the marine environment and humans. As shown in this paper, evidence that high-level waste was dumped off our coastlines is in the public record. Similarly, evidence exists concerning the high-risk nature of some low-level radioactive wastes. Given that the specific

types of nuclear material are unknown and that available records indicate that some high-level and/or high-risk waste was dumped, it is an unsound and risky leap of faith for GAO to conclude that we need not be concerned about what was dumped.

Part III describes technical studies, testimony in public hearings, workshop findings and recommendations, and international criteria, guidelines and programs to show that U.S. efforts to date have not provided effective assurances that past dumping poses no hazards to the marine environment or humans. The limited surveys and studies that have been previously undertaken with respect to past U.S. dumping are not sufficiently conclusive to lay such an important concern to rest. Additional targeted research and monitoring, which will test the validity of present preliminary assumptions, is necessary if our government is committed to providing assurances of safety.

Part IV describes the various domestic and international evidence which show that both past dumpsites and "test" sites off the U.S. coastline can provide useful and important information as the United States formulates responsible policies for the future regarding ocean dumping of radioactive waste. The GAO Report urges the EPA to rely on international guidance as the basis for future policy decisions. Both Parts III and IV show that while the U.S. can benefit from lessons learned internationally, such guidance is no substitute for research and monitoring that is focused on past dumpsites and "test" sites off our coasts. The Report also reprimands EPA for not having revised already its ocean dumping regulations to incorporate international guidance. Since U.S. policy dating back to 1970 has been not to use the ocean as a radioactive waste dumpsite, GAO's criticism rings hollow. More importantly, such a recommendation places the "cart before the horse." Given all the findings set forth in this paper, analysis of information gathered from monitoring past dumpsites and "test" sites -- as well as of information resulting from other domestic and international ocean research and monitoring activities -- must be viewed as a prerequisite to any formal revision of this nation's regulatory program in relation to the ocean option.

FOREWARD

"[A]lthough EPA does not recommend the past dumping practices and would not permit those activities to be done the same way today, our preliminary evaluation of their environmental consequences indicates no harm to man or the marine environment. It should be clearly recognized, however, that the information we have collected is not encyclopedic. It does represent a pioneering first step in developing general monitoring programs for both abandoned and active dumpsites, but more information is desirable from a scientific and public health point of view."

Hearings before the House Subcommittee on Oceanography, 96th Cong., 96-53 (1980), at 351 (testimony of Dr. Roger Mattson).

"Existing [radioactive waste] disposal sites provide an excellent experimental situation to study the physical, chemical, and biological processes that incorporate, transform, and accumulate radioactive elements and cause these toxic substances to migrate from the disposal cannister to biological receptors (including humans)."

NOAA's National Marine Pollution Program Plan [2nd 5-Year Plan, Covering 1981-85], (September 1980) at 42.

"It has been a practice on the Pacific Coast to dispose of low-level waste by jettisoning containers of it onto the bottom of the sea in designated disposal areas. There is no evidence that this disposal practice has resulted in any inimical effect upon the environment; but neither is there evidence that harmful effects cannot eventually result from it.

"The concern here is not with any magnitudes of disposal already undertaken, but rather with understanding the implications of the continuing and increasing use of the oceans as a receptacle for disposal. History is replete with cases in which unrestricted pollution of various kinds, rapidly developing from innocuous beginnings, has subtly damaged or destroyed resources before understanding and controls could be developed." [emphasis added]

National Academy of Sciences/National Research Council, Disposal of Low-Level Radioactive Waste into Pacific Coastal Waters, (1962) at viii.

TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------|
| Introduction..... | 1 |
| I. Background: Past and Present U.S. Policies and Activities..... | 5 |
| II. The Need Exists For More Complete Information On Past Dumping Practices..... | 10 |
| III. Determinations of Hazards From Past Dumping Are Inadequate..... | 16 |
| A. Domestic Concerns..... | 16 |
| B. International Concerns..... | 25 |
| IV. Monitoring Is Needed Of Past Dumpsites and "Test" Sites As A Basis For Future Policy Decisions..... | 28 |
| A. Past Dumpsites..... | 29 |
| B. "Test" Sites..... | 31 |
| Conclusion..... | 35 |

Monitoring of Past Radioactive Waste Ocean Dumpsites
And "Test" Sites Is Needed To Provide Effective
Assurances That There Are No Undue Hazards to Human
Health and The Environment, And to Assist In the
Development of Future Policies

by Clifton E. Curtis 1/

Introduction

In January 1981, Senator William Roth, Jr. asked the General Accounting Office (GAO) to investigate the United States past program of radioactive waste disposal at sea. This program was discontinued in June of 1970; however, there has been recent discussion by U.S. government officials of reviving the practice of ocean dumping. Senator Roth's request to GAO was made in response to these discussions and his concerns about the possible health and environmental hazards that may result from ocean dumping. He requested the GAO to address three issues:

- the adequacy of Federal efforts to identify the extent and locations of radioactive wastes dumped by the U.S. Government and private industry;
- the effectiveness of Federal efforts to assure that nuclear waste already dumped into the ocean poses no undue hazard to the health of U.S. citizens or to the environment; and

1/ Mr. Curtis is an attorney with the Center for Law and Social Policy, Washington, D.C. Since 1978 he has represented environmental organizations in the U.S. and western Europe on matters related to ocean disposal of radioactive waste. During that time Mr. Curtis has been a member of the EPA/Dept. of State Ocean Dumping Advisory Committee. He served as an Advisor on the U.S. delegation to the Third Consultative Meeting of the London Dumping Convention (1978), represented Friends of the Earth, Int., at the Fourth Consultative Meeting (1979), and Greenpeace, International, at the Sixth Consultative Meeting (1981). Mr. Curtis is also a member of the National Research Council's Marine Board. He was assisted in the preparation of this paper by: Darcey Rosenblatt, a volunteer who completed her Masters in Marine Affairs, Univ. of Washington, in 1981; and Jim McLeod, a law student intern at the Center during the summer of 1982 from Vermont Law School.

- the extent of Federal efforts to assure that any future ocean dumping is done safely and in an environmentally acceptable way. 2/

In October 1981, the GAO issued its report entitled "Hazards of Past Low-Level Radioactive Waste Ocean Dumping Have Been Overemphasized." 3/ It was hoped that the GAO Report would clarify the issues; instead, it presents an incomplete and misrepresented picture of the facts and reports involved, and derives its conclusions from this inaccurate presentation. The major conclusions of the GAO Report are as follows:

- the Federal Government has no complete and accurate catalogue of information on how much, what kind, and where low-level nuclear waste was dumped because detailed records were not required;
- the overwhelming body of scientific research and opinion shows that concerns over the potential public health and environmental consequences posed by past ocean dumping activity are unwarranted and overemphasized; and
- although the Environmental Protection Agency has been slow in developing low-level radioactive waste ocean dumping regulations, its current approach is sound. Nonetheless, improvements are needed in developing specific dumpsite monitoring requirements. 4/

Included in this third conclusion is the premise that the monitoring of past ocean dumpsites to aid in developing future policy is of little benefit.

2/ Letter from the Honorable William B. Roth, Jr., to the Honorable Elmer B. Staats, Comptroller General of the U.S. General Accounting Office (Jan. 8, 1981).

3/ United States General Accounting Office, Hazards of Past Low-Level Radioactive Waste Ocean Dumping Have Been Overemphasized, EMD-82-9 (October 1981) at (i) [hereinafter cited as GAO Report].

4/ Id. at cover page.

In a discussion of methodology the GAO Report states that its

basic approach was to obtain the most diverse set of views on each issue and evaluate the evidence supporting each view. Accordingly, [they] obtained the views of over 30 nationally and internationally prominent scientific authorities on nuclear and other hazardous waste disposal techniques The experts, for the most part, were from Government agencies, national laboratories, oceanographic research organizations, universities, and nuclear industrial societies. 5/

The Report also states that interviews were conducted with various organizations knowledgeable about any sort of ocean dumping. A list of these organizations is given (GAO Report, Appendix I) and the major agencies are mentioned in the text, but beyond that there is only one case (Dr. Jackson Davis, at 14) where any of the experts is given a direct citation. In addition, the views of some of the organizations that were specifically referenced, as well as several studies used in support of GAO's findings and conclusions, were misinterpreted or misrepresented.

It is our belief that an analysis of an issue as complex and controversial as ocean dumping of radioactive wastes must be done with documentation and an accurate representation of all the pertinent literature and authorities. The GAO Report falls far short in both of these tasks.

In light of the information that is given in the GAO study and an examination of other sources, which will be mentioned in

5/ Id. at 5.

the course of this paper, we consider the GAO analysis to be incomplete and its principal conclusions to be defective. We find that:

- the incomplete and inaccurate information that plague the issue of past ocean dumping of nuclear waste presents a serious problem which requires more complete elaboration in order to determine actual or potential hazards;
- there is not enough hard evidence to provide sufficient certainty that public health and environmental hazards will not result from past dumping practices;
- a good monitoring program of previously used sites off the U.S. coastline is both necessary and useful (1) to provide empirical data concerning such matters as toxicity, transport, and critical pathways, fates and effects of the radioactive materials, (2) to assure the public that such past dumping does not present any public health or environmental hazards, and (3) to provide scientific data which will contribute to responsible policies and regulatory requirements for the future; and
- a good monitoring program of "test" sites off the U.S. coastline, unmodified by prior dumping activities, is both necessary and useful (1) to provide baseline data that will increase our knowledge of the physical, geochemical and biological processes of the marine environment and routes back to man; and (2) to provide scientific data which will contribute to responsible policies and regulatory requirements for the future.

A discussion of each of these findings follows, presented in the context of Sen. Roth's request and the GAO's findings and conclusions.

I. Background: Past and Present U.S. Policies and Activities

As indicated in the GAO Report, during the 40's, 50's, and 60's, the oceans off our U.S. coastline were used as dumpsites for radioactive wastes. Available records indicate that approximately 90,000 cannisters, with an estimated total activity of 95,000 curies, were dumped at sites in the Atlantic, Pacific and the Gulf of Mexico -- with 99.5 percent of that amount dumped prior to 1963.^{6/}

In 1970, the Council on Environmental Quality issued a report which concluded that ocean dumping of any radioactive waste presented a very serious and growing threat to the marine environment.^{7/} In that report CEQ recommended that the prohibition against dumping high-level radioactive wastes be continued, and that the dumping of low-level waste be prohibited, except in a very few cases where there exists "no alternative offering less harm to man or the environment . . . [and] only when the lack of alternatives has been demonstrated."^{8/}

Soon after the CEQ Report was published, the Marine Protection, Research and Sanctuaries Act ("Ocean Dumping Act") of 1972 was enacted.^{9/} Pursuant to Title I of the Act, no permits may be granted for dumping any high-level radioactive waste in the

6/ Oceanography Miscellaneous -- Part 2: Hearings Before the Subcommittee on Oceanography on the House Committee on Merchant Marine and Fisheries, 96th Cong., 96-53 (1980) [hereinafter cited as November 1980 Hearings], at 360.

7/ Council on Environmental Quality, Ocean Dumping: A National Policy (October 1970), at vi-vii.

8/ Id. at vii.

9/ Pub. L. 92-532, Oct. 23, 1972; 33 U.S.C. §1401 et seq., as amended.

ocean or beneath its seabed. Permits for low-level radioactive wastes may be granted under the Act only upon a determination that "such dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities."^{10/} In addition to listing specific considerations that the EPA Administrator must meet in making permit determinations, the Act also requires the Administrator to apply the standards and criteria binding upon the United States under international agreements.

Regulations and criteria pursuant to the Ocean Dumping Act were initially published in October 1973, with the most recent substantive revisions thereto published in January 1977.^{11/} Among other provisions, those regulations define high-level radioactive wastes, specify numerous permitting criteria and require that all non high-level radioactive materials must be packaged or containerized to prevent their direct dispersion or dilution in ocean waters. In relation to CEQ's recommendation that the ocean be considered a dumpsite of last resort, the regulations also require a finding prior to any permit approval that "[t]here are no practicable alternative locations and methods of disposal . . . available, . . . which have less adverse environmental impact or potential risk to other parts of the environment than ocean dumping."^{12/}

^{10/} Id. at §1412.

^{11/} 40 C.F.R. Part 227.

^{12/} Id. at §227.16(a)(2). Even prior to the enactment of the Ocean Dumping Act, the Atomic Energy Commission revised its regulations in response to the CEQ recommendation. See 10 C.F.R. §20.302(c), adopted Dec. 4, 1971.

In tandem with the enactment of a domestic law on dumping, the U.S. was a leading force behind the adoption of the 1972 International Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter ("London Dumping Convention"), which has since been ratified by the U.S. and 47 other countries.^{13/} Consistent with domestic law, the Convention prohibits dumping of high-level radioactive wastes and requires special permits for the dumping of low-level wastes, with the added understanding that the contracting parties take full account of any recommendations of the International Atomic Energy Agency (IAEA) in seeking a permit. During the past several years the IAEA has established detailed criteria for ocean dumping of radioactive waste (e.g., dumpsite depth must be at least 4,000 meters (2.5 miles), they must be between 50° south and 50° north latitude, and permit requests must be preceded by detailed environmental assessments).^{14/} These and other criteria have not been added to our domestic regulations.

Within the past year, some EPA and other government officials have expressed a renewed interest in using the oceans as a dump-

^{13/} Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, U.S.T. 2403, T.I.A.S. No. 8165 [hereinafter cited as the "London Dumping Convention" or "LDC"].

^{14/} The IAEA Revised Definition and Recommendations of 1978 Concerning Radioactive Wastes and Other Radioactive Material, INFCIRC/205/Add. 1/Rev. 1, IAEA (August 1978). These criteria were issued in relation to two provisions of the LDC, i.e., Annex I (para. 6) and Annex II (Section D).

site for low-level radioactive waste.^{15/} Since the fall of 1981, EPA officials have advised members of Congress and other individuals that revisions of the existing regulations would soon be released.

The proposed changes to the EPA regulations which have surfaced in draft form^{16/} suggest that the primary purpose behind the radioactive waste revisions is to incorporate international criteria agreed to by the U.S. and other parties to the London Dumping Convention. It appears that EPA officials recognize that permits for such dumping cannot be approved absent express inclusion of those criteria in our domestic regulations.

EPA interest in revising its regulations appears to be driven in part by federal agency interest in the ocean option. The Navy is considering the ocean as a disposal site for decommissioned nuclear submarines, and expects to issue a draft Environmental Impact Statement on that subject this summer.^{17/} At the

^{15/} In addition to this interest in low-level radioactive waste dumping, the Dept. of Energy (DOE) is engaged in a long-term research program begun in the mid-1970's to assess the feasibility of implanting high-level radioactive waste beneath the seabed. Phase II of the DOE's Seabed Disposal Program (SDP) consists of technical and environmental feasibility studies due to be completed by 1986-88. While SDP studies can provide scientific data and research that will benefit decisionmakers concerned with disposal of low-level wastes, that program is not of direct concern in the context of this paper because (1) it is focused on high-level radioactive waste seabed emplacement and (2) decisions as to the efficacy of such disposal are several years from resolution.

^{16/} Environmental Protection Agency, Ocean Dumping: Revision of Regulations and Criteria, 40 C.F.R. Parts 220-229, draft of Feb. 5, 1982.

^{17/} Permanent Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants; Intent to Prepare a Draft Environmental Impact Statement, 47 Fed. Reg. 2151 (1982).

same time, the Department of Energy is advancing a proposal to dispose of thousands of cubic yards of contaminated soils and other radioactive materials remaining from the Manhattan Project and nuclear energy programs.^{18/}

However, the most noticeable reason that EPA has presented in recent months in support of the regulatory revisions concerning ocean dumping is the conclusion that such dumping will not harm the marine environment or man. This position is anchored in the belief that past dumping has been harmless.

In stating this view, some EPA and other Administration officials have referenced the GAO Report to bolster their view that the oceans are an appropriate medium for the disposal of radioactive waste. A recent example of such a reference occurred at the June 16, 1982 hearings before the House Subcommittee on Water Resources, when an EPA official cited the GAO Report as evidence that a two-year moratorium on ocean dumping of low-level radioactive waste was unnecessary.^{19/}

It is in the context of these recent developments in U.S. policy concerning ocean dumping of radioactive waste that the GAO Report requires rebuttal. To the extent the Report serves

^{18/} U.S. Dept. of Energy, Description of the Formerly Utilized Sites Remedial Action Program, ORO-777 (Sept. 1980).

^{19/} Testimony of EPA's Steven Schatzow before the House Committee on Public Works and Transportation's Subcommittee on Water Resources, June 16, 1982, prepared testimony, page 6. The proposed moratorium was the subject of an amendment adopted by the House Merchant Marine and Fisheries Committee. As the committee report indicated, it was proposed because "[t]he uncertainties associated with radioactive waste disposal remain a major concern, and the Committee regards additional research as necessary." H.R. Rep. No. 562, 97th Cong., 2d Sess. 9 (1982).

as support for the reversal of U.S. policy on this important issue, the credibility of the debate will be distorted and ill-served.

II. The Need Exists For More Complete Information On Past Dumping Practices

At present the EPA has prime responsibility for collecting all available information on past U.S. dumping of nuclear waste. One of the more frustrating aspects of analyzing past ocean dumping is that complete data are simply not available, because there were no regulations in effect when the dumping took place requiring that complete records be kept, because in some cases records were destroyed in the intervening time, or because such information has not been retrieved from agency and other archives. Speaking to this point, a former EPA Assistant Administrator stated in the fall of 1980:

Today, the records of the ocean dumping activities consist primarily of documentation drawn from the [Atomic Energy Commission] AEC licenses and from logs indicating the general nature and quantities of the materials, the estimated radioactivity, and the coordinates of the dumping locations But, because they were regarded primarily as garbage, precise records were apparently not kept of the specific contents. 20/

In light of this information limitation the GAO recognizes that, the "lack of accurate and complete data, in the records available at [Department of Energy] DOE, [Nuclear Regulatory Commission] NRC, and the [Department of Defense] DCF has made

20/ Ocean Dumping of Radioactive Waste Off the Pacific Coast: Hearing Before a Subcommittee of the House Committee on Government Operations, 96th Cong., 2nd Sess., at 56 (1980) (statement by David Hawkins, Assistant Administrator for Air, Noise and Radiation; Environmental Protection Agency) [hereinafter cited as October 1980 Hearings].

-11-

EPA's task a virtual impossibility."^{21/} Thus, the Report qualifies EPA's efforts to gather information as adequate. While there does exist some information to dispute this claim, more importantly there is a significant distinction between EPA exercising an adequate effort under the circumstances, and EPA having the necessary information to sufficiently analyze actual or potential hazards of the past program and make future policy. This distinction is one that the GAO Report overlooked.

After repeatedly showing that the nature, amounts and locations of waste dumped at sea are unknown, the Report still finds that "DEFICIENCIES IN THE AVAILABLE DATA HAVE LITTLE IMPACT ON DETERMINING WHETHER THE WASTES PRESENT POTENTIAL ENVIRONMENTAL OR PUBLIC HEALTH CONSEQUENCES."^{22/} It is difficult to understand how this conclusion can be drawn from an equation with so many unknowns. Certainly, assumptions can be made as to the magnitude of those unknowns, but it must be acknowledged that in a situation where a number of unknown factors are involved, errors in assumptions can have an impact on determining consequences.

One critical assumption the GAO Report makes concerning the nature of nuclear waste dumped is a particularly pertinent example of the preceding argument, i.e., that all waste dumped was low-level waste. The term "low-level" implies that there is a lower risk factor involved in dumping this material than in dumping materials classified as high-level or transuranic waste. But, the terms of reference in the Report are not always so strictly

^{21/} GAO Report, supra note 3, at 9.

^{22/} Id. at 7.

defined and thus this distinction is not always clear. In any event, there is substantial evidence that the past U.S. dumping program involved more than just low-risk waste,^{23/} yet this possibility does not seem to enter into GAO's analysis.

The GAO Report defines three classes of radioactive waste: high-level; transuranic; and low-level.^{24/} These classes are, in effect, derived from the source of the waste product and thus do not give a quantitative or qualitative picture of the material's risk potential. Although the report does mention that low-level waste can be "highly contaminated,"^{25/} by continually using the term low-level and claiming that deficiencies in the data have little impact on determining the environmental and health consequences, GAO gives the erroneous impression that past dumping involved only lower risk material.

A more quantitative definition is given by the Atomic Energy Commission in its 1955 report on Radioactive Waste Disposal

23/ See Waste Dumping: Hearings Before the Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries, 97th Cong., 1st Sess. 97-20 (1981) at 388-91 (testimony of Michael Pogodzinski) [hereinafter cited as September 1981 Hearings]; and M. Herz, "Some Like It Hot: Reactivating Waste Alternatives," Oceans, Vol. 15, No. 2 (1982), at 65. See also, infra notes 27-31 and accompanying text.

24/ "High-level wastes included (1) spent or 'used' reactor fuel which will be classified as waste if not reprocessed and (2) the by-products coming out of a reprocessing plant which contain highly toxic nuclear fission products

"Transuranic waste results predominantly from reprocessing spent fuel and fabricating plutonium to produce nuclear weapons. These are man-made radioactive elements that, like high-level waste, have lives of thousands of years

"Low-level nuclear waste is generally considered to be any radioactive waste that is not high-level or transuranic waste." (footnotes omitted.) GAO Report, supra note 3, 1-2.

25/ Id. at 2. .

Practices in the Atomic Energy Industry. "Materials are considered 'high level' when the emitted radiation intensity is so strong as to materially reduce the time a person can be near the radiating body (quantitatively 2 rems or more per hour) and low-level wastes" can be handled directly without undue consideration given to time of contact (or up to 50 millirems per hour).^{26/} It is important to note that the licenses issued to disposal companies stated that the radiation level at any accessible surface on the container shall not exceed 200 millirems per hour -- four times the level permitted under the AEC standard.^{27/} While activity at the surface of a package does not determine, by itself, whether the enclosed wastes are high-or low-level, GAO fails to even consider such information to be relevant to its analysis.^{28/}

Evidence that high-level waste was dumped off our coastlines can be found in various sources. For example, the above 1955 AEC Report, cited by Hon. Glenn Anderson in congressional hearings, described the procedures used for processing high-level waste at a facility, Bettis Field, in Pittsburg, Pennsylvania.^{29/} Packaged high-level wastes were shipped from Bettis Field to a Navy dock in Earle, New Jersey. Congressman Anderson discovered that, "[i]n 1955 alone Bettis Field packaged 740 high level drums for ocean disposal."^{30/}

26/ A.B. Joseph, Radioactive Waste Disposal Practices in the Atomic Energy Industry -- A Survey of the Costs (1955) at 2-3.

27/ November 1980 Hearings, supra note 6, at 266.

28/ Under current Nuclear Regulatory Commission and Environmental Protection Agency regulations, the source of the waste is the principal factor in determining whether it is high-or low-level. See 50 C.F.R. Part 50, App. F(2) [NRC]; 40 C.F.R. §227.30 [EPA].

29/ November 1980 Hearings, supra note 6, at 270.

30/ Id.

Another AEC Report states that "reactor fuel samples and other reactor experiment materials and by products of isotope production," -- materials of "fairly high specific activities" -- were dumped into the ocean.^{31/} And congressional hearings held last year in Boston revealed that on at least one occasion "considerably hotter than normal" radioactive waste was dumped in Massachusetts Bay.^{32/}

These points are especially significant in that 25 percent of the 275-300 waste containers examined by the EPA have been damaged in some manner.^{33/} The possibility that a substantial percentage of the 90,000 cannisters that were dumped may be damaged -- and that some of them represent a potential high-level risk -- points to the significant impact that deficiencies in available data can have on determining the environmental and health consequences of past dumping practices.

Separate from "high-level" categories of wastes, while GAO correctly noted that low-level wastes can be "highly contaminated,"

31/ A. Joseph, United States Atomic Energy Comm'n, United States' Sea Disposal Operations: A Summary to December 1956 (WASH-734) (August 1957) at 4.

32/ September 1981 Hearings, supra note 23, at 389 (testimony of Michael Pogodzinski). The GAO Report does not include the Massachusetts Bay dumpsite in their list of major ocean dumpsites (GAO Report, at 9-10) even though it is listed as a primary dumpsite by the EPA (November 1980 Hearings, supra note 26, at 379). In addition to being by far the shallowest site (92 meters, approximately the length of a football field) and the closest to land (within 20 miles of Boston), this site is located in a fertile marine estuary. Over 4,000 containers of radioactive waste are recorded as being dumped into Massachusetts Bay between 1946 and 1959. The Bay is the subject of a current EPA study. See September 1981 Hearings, supra note 23, at 410; Pogodzinski, M., "Nuclear Waste Dump Sites in Coastal Waters," New England Outdoors, July 1981, at 37-42.

33/ October 1980 Hearings, supra note 20, at 19 (testimony of David Hawkins).

the report fails to consider the importance of that point in its analysis. Instead, GAO summarily equates low-level with low-risk, and in the process ignores intermediate wastes which generally are included in the "low-level" categorization. Some "low-level" radioactive materials can be extremely hot or high-risk, and studies have shown that bioaccumulation and chronic exposure to such wastes can present serious risks to human health and/or the marine environment.^{34/}

Furthermore, the GAO Report refers to the "insignificant amounts of material that have been dumped",^{35/} while also emphasizing that there is no complete catalogue of the information. The study states that there "is an overwhelming consensus among experts that even if the amounts of radioactive waste dumped in the past are significantly more than reported, they would not represent a hazard to people or to the environment."^{36/} To imply that it does not matter how much waste was dumped is an indefensible position, especially in this case where the specific type of nuclear material dumped is unknown and available records strongly suggest that some high-level and/or high-risk waste was dumped.

If the volume of waste is irrelevant, then there would appear to be little reason for the GAO to conclude, as they did, that future dumpsites should be monitored. In addition, this GAO

^{34/} See, e.g., Schell, U.R. and A. Nevissi, "Radionuclides at the U.S. Radioactive Disposal Site in the Hudson Canyon, January 1980, cited in November 1980 hearings, supra note 6, at 372-73; Impingement of Man on the Oceans, edited by Donald Hood, Riley Inter-science (1971), Chapter 12, pp. 325-379; and Feldt, et al., Radioactive Contamination of the NEA Dumping Sites, IAEA-SM-248/111 (1981).

^{35/} GAO Report, supra note 3 at (iii).

^{36/} Id. at 9-11.

statement is not supported by any quantitative information or any direct citations from experts. Unsupported references to "an overwhelming consensus among experts" as the basis for such an important finding reflects poorly on GAO's traditional attention to detail. In any event, the GAO's leap of faith, coupled with a lack of documentation, does not contribute to a useful analysis of the issues.

III. Determinations of Hazards From Past Dumping Are Inadequate

Has the government done an effective job of assessing possible dangers from past U.S. dumping of radioactive waste? While the Report mentions the efforts of various federal agencies addressing this issue, the GAO reaches an independent conclusion that "EVIDENCE OVERWHELMINGLY SHOWS PAST U.S. OCEAN DUMPING POSES NEITHER AND ENVIRONMENTAL NOR A PUBLIC HEALTH HAZARD."^{37/} GAO's analysis and review of studies on this point leaves much to be desired. As shown herein, very little evidence exists that would enable federal officials to provide effective assurances that past dumping poses no undue hazards to public health and the marine environment. Consistent with the recommendations of numerous studies and documents cited below, further monitoring is needed before such assurances can be given.

A. Domestic Concerns

It is difficult to define how much is "enough study" in a case involving nuclear waste disposal. Responsibility for environmental surveys of ocean nuclear dumping was given to EPA under the

^{37/} Id. at 11 (emphasis in original).

mandate of the Marine Protection, Research and Sanctuaries Act of 1972 (The Ocean Dumping Act.)^{38/} The Ocean Dumping Act created a regulatory/research framework to provide, inter alia, technical information for the development of future regulations through the evaluation of past sites.

Since 1974 the Farallon Island site has been investigated four times: once in 1974 (at the 900-meter depth) and once in 1975 (at 1700m) to see if specific drums could be found, and twice in 1977 (at 900m and 1700m) when samples were taken. The U.S. dumpsites in the Western Atlantic were also surveyed three times during 1974-78 (twice at 2800m, and once at 3800m) and similar experiments were conducted. These surveys were pioneering efforts; not comprehensive examinations of the ocean environment.^{39/} Many pictures were taken, but only three drums were actually recovered for direct examination.^{40/}

The GAO Report relies upon the findings of "EPA officials" in relation to those surveys as a primary basis for the Report's conclusion that ocean dumping is not hazardous, even though the Report states at one point that those surveys are of "questionable value."^{41/} In November of 1980 an EPA official was asked, by Congressman Gerry Studds, if the agency believed that the retrieval of only three

^{38/} Supra note 9.

^{39/} October 1980 Hearings, supra note 20, at 24 (testimony of David Hawkins).

^{40/} November 1980 Hearings, supra note 6, at 358-79.

^{41/} GAO Report, supra note 3, at 22.

drums out of the thousands that were dumped could constitute proof that the wastes portray no harm. Referring to the entire range of its dumpsite surveys, EPA's response was:

it has been our technical judgment based on an understanding of what materials were dumped and where they were dumped and how long ago they were dumped and our interpretation of the less than encyclopedic data that we have already collected, that there has been no harm from that past radioactive dumping. ^{42/}

There are two important points in EPA's conclusion that GAO fails to take into account. First is the use of the past tense ("there has been no harm") rather than the more positive statement GAO makes: "DUMPING POSES NEITHER AN ENVIRONMENTAL NOR A PUBLIC HEALTH HAZARD." ^{43/} However, more significant to the analysis is the premise in the EPA statement that this technical judgment is based on an understanding of the nature, quantity, and age of material dumped, when GAO's first conclusion states that this body of knowledge does not exist.

It is interesting to note that the GAO report claims that although it sought opposing points of view within the scientific community on the question of hazard potential, it was only able to find one university professor (Dr. Davis) to provide counter evidence, and this evidence they question. ^{44/} While GAO dismisses Dr. Davis' opinions by summarily indicating that the conclusions of his report "were widely questioned by other scientists familiar with the issue," ^{45/} the Report conveniently ignores the fact that

^{42/} November 1980 Hearings, supra note 6, at 438 (testimony of Dr. Roger Mattson).

^{43/} GAO Report, supra note 3, at 11 (emphasis in original).

^{44/} Id. at 14-15.

^{45/} Id.

the validity of several of his principal conclusions were expressly acknowledged by EPA at the October 1980 hearings held in San Francisco.^{46/}

The GAO Report also fails to mention a report compiled from EPA's survey of the Atlantic 3800 meter dumpsite, "Radionuclides at the U.S. Radioactive Waste Disposal Site in the Hudson Canyon," which showed significant levels of Americium-241 in the rattail fish, Coryphaenoides armatus, which the author concludes came from the radioactive wastes.^{47/} EPA calls this a speculative conclusion, saying that "[s]tudy of this data is continuing, and it appears that resolution of the open question will have to come from further baseline and dumpsite sampling."^{48/} Regardless of EPA's "official" views on this study, at minimum, GAO should have cited that report and concurred with the EPA recommendation that further monitoring is needed.

The GAO Report cites the 1971 National Academy of Sciences study "Radioactivity in the Marine Environment" as the most definitive work on "marine radioecology issues."^{49/} While that study is extensive and thorough, it deals primarily with radionuclides from "fallout," "run-off" and "out-falls" from the operation of nuclear power plants; very little attention (two-three pages) is specifically given to the ocean dumping program.^{50/} Throughout the

^{46/} See October 1980 Hearings, supra note 20, at 122-24, 129-32, and in particular, 148-49.

^{47/} W.R. Schell & A. Nevissi, supra note 34.

^{48/} November 1980 Hearings, supra note 6, at 373.

^{49/} GAO Report, supra note 3, at 12.

^{50/} National Academy of Sciences, Radioactivity in the Marine Environment (1971). Pages 35-36 of that 258-page report focus on packaged radioactive waste disposal.

NAS document a respect is shown for the potential hazards of radioactivity in the oceans. Admittedly, the NAS study generally concludes that "there is no evidence that the past and present policies and practices for radioactive waste disposal in the sea have jeopardized man or any marine species or ecosystems."^{51/} While ocean dumping of radioactive wastes is only briefly addressed in the body of the study, that general conclusion was intended to apply to ocean dumping along with other disposal policies and practices. But that conclusion was premised on the statement that the guidelines in place in 1971 "are based on many factors, not all perfectly known, and are subject to change when new and better information becomes available."^{52/} Since that study new and better information has become available, including the preliminary findings concerning rattail fish, as well as EPA evidence of a 25 percent implosion rate for cannisters (contrary to the structural integrity presumption referred to in the NAS study).^{53/}

Given GAO's reliance on the National Academy of Sciences, it is curious that the Report makes no mention of two earlier NAS studies which were completed in 1959 and 1962 -- at the height

^{51/} Id. at 5.

^{52/} Id. Instead of referencing the general conclusion of the NAS Study, which was qualified as here quoted, the GAO Report paraphrased a more specific conclusion (at 275) that focused on effluent low-level discharges from power plants, distorting that conclusion to include "ocean" discharges. See, GAO Report, supra note 3, at 12.

In the NAS study's limited discussion of ocean dumping, a similar concern with the need for better information is acknowledged in the authors' recommendation that previously used dumpsites will eventually need to be monitored in order "to safeguard users of the sea floor" (at 35).

^{53/} Id. at 36.

-2i-

of the U.S. dumping program.^{54/} Those earlier studies were based on the most advanced scientific knowledge at the time, provide much more original thought, and were much more focused on ocean dumping of radioactive wastes than the two-to-three pages devoted to that issue in the '71 NAS study. Quoting from each of those studies, the concerns presented reflect insight that is equally valuable today in light of the renewed interest in dumping:

It has been a practice on the Pacific Coast to dispose of low-level waste by jettisoning containers of it onto the bottom of the sea in designated disposal areas. There is no evidence that this disposal practice has resulted in any inimical effect upon the environment; but neither is there evidence that harmful effects cannot eventually result from it.

The concern here is not with any magnitudes of disposal already undertaken, but rather with understanding the implications of the continuing and increasing use of the oceans as a receptacle for disposal. History is replete with cases in which unrestricted pollution of various kinds, rapidly developing from innocuous beginnings, has subtly damaged or destroyed resources before understanding and controls could be developed. [emphasis added] ^{55/}

* * *

There must be sufficient monitoring of disposal sites to ensure public health and safety, and to protect marine resources. Such monitoring should not be performed solely by the regulating agency. Records of the quantity and type of radioactive wastes and the areas in which they are disposed of should be maintained in a national center. These records should be available to interested groups, and periodic summaries should be issued.

54/ National Academy of Sciences/National Research Council, Disposal of Low-Level Radioactive Waste into Pacific Coastal Waters (1962) [hereinafter cited as the 1962 NAS Study]; National Academy of Sciences, Biological Effects of Atomic Radiation (1960) [hereinafter cited as the 1959 NAS Study] [both of which are cited in the October 1980 hearings, supra note 20, at 296 and 300, respectively, in testimony presented by the Committee to Bridge the Gap].

55/ Id., 1962 NAS Study at viii.

An increasing concern about the introduction of radioactive wastes into the sea is apparent at all levels, from local communities to international organizationsThe problems involved are complex and can be solved only through the joint efforts of all agencies; local, national, and international. The future will bring new and unanticipated problems, and differing interpretations of incomplete information may lead to controversy. Joint efforts to meet present problems will depend upon available knowledge and its interpretation. A full and free exchange of basic information is necessary. ^{56/}

The GAO Report discusses a 1978 Estes Park workshop that was conducted by the National Oceanic and Atmospheric Administration (NOAA) to investigate the scientific problems of ocean pollution and to suggest programs to solve these problems. GAO reports this workshop as finding that, "[t]o date, no impacts on human health have been documented; no effects harmful to marine organisms are known, even at the sites of large discharges" ^{57/} However, it should be pointed out that again this statement is qualified by the words "to date" and "have been documented."

Also significant is the fact that the Estes Park workshop results go into some detail concerning the need for effective monitoring. This is not reported by GAO. From the workshop:

[E]xisting dumpsites should be watched for leakage of radionuclides to test the validity of present assumptions about the retention of disposed materials in the sediments and to provide a basis for the selection of future disposal areas for low-level radioactive wastes. ^{58/}

Thus, a fuller statement from the NOAA workshop again shows a tone of concern not evidenced in the GAO study.

^{56/} Id., 1959 NAS Study at 72-73.

^{57/} National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce, Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution (March 1979) at 6. [hereinafter cited as the Estes Park Workshop].

^{58/} Id.

In trying to prove there is no danger from nuclear dumping programs GAO draws on a study done by the Ad Hoc Scientific Committee on Ocean Dumping of Radioactive Wastes organized by the Oceanic Society. However, following the release of the GAO Report the Oceanic Society formally advised the GAO that their position had been misrepresented. First, the GAO Report says that "members of the Ad Hoc Committee have been vigorously opposed to dumping radioactive wastes in the ocean and set out to prove that a problem existed but did not succeed."^{59/} Michael Herz, Executive Vice President of the Society responded by stating, "[i]n fact, our committee was formed specifically to evaluate draft reports concerning research on nuclear waste dumping which had recently been released by the Environmental Protection Agency and, in the tradition of the scientific method, started from a position of neutrality on the issue of the effect of radioactive waste on the oceans."^{60/}

An even more serious misrepresentation occurs when the GAO Report states that "the Committee concluded that there is no evidence of a serious present or future threat to aquatic or human health either at Farallon Island or at the Atlantic sites"^{61/} Again, Dr. Herz responds:

^{59/} GAO Report, supra note 3, at 16-17.

^{60/} Letter from Michael Herz to Charles Bowster, Comptroller General of the United States (Dec. 11, 1981) [hereinafter cited as Herz Letter].

^{61/} GAO Report, supra note 2, at 17.

Although we indicated that most of the existing studies on the Farallon Islands and Atlantic dumpsites contain no convincing evidence of a serious present or future threat to aquatic or human health, we went on to say that "present evidence indicates a relatively small increase in radiation exposure from eating fish at the highest level of radioactivity detected . . . [and] we recommend[ed] that an expanded monitoring program be developed for bony fish, shellfish, and other marine food items. . . [and] that the monitoring program extend along the entire affected coasts." ^{62/}

In addition to misrepresenting the literature referred to above, it is significant to note that the GAO Report does not mention the "Federal Plan for Ocean Pollution Research, Development and Monitoring" which is conducted every two years by an inter-agency committee to assess the state of ocean pollution and to develop national priorities for five-year time frames. ^{63/} The plan for 1979-83 establishes radioactive dumpsite monitoring as a high priority, ^{64/} and the 1981-85 second iteration of the five-year Plan states that

[e]xisting disposal sites provide an excellent experimental situation to study the physical, chemical, and biological processes that incorporate, transform, and accumulate radioactive elements and cause these toxic substances to migrate from the disposal canister to biological receptors (including humans).

* * *

Studies undertaken by EPA and NOAA should employ existing disposal sites to determine release rates of radioactive materials to sediments and water, to

^{62/} Herz Letter, supra note 60, at 1-2.

^{63/} These five-year plans are required pursuant to the National Ocean Pollution Research and Development and Monitoring Planning Act of 1978, P.L. 95-273, May 8, 1978, 33 U.S.C. §1701, at §1704.

^{64/} Interagency Committee on Ocean Pollution Research, Development and Monitoring/Federal Coordinating Council for Science, Engineering and Technology, Federal Plan for Ocean Pollution Research, Development, and Monitoring, Fiscal Years 1979-83, at 130.

detect uptake by organisms, particularly sedentary species, and to identify bioaccumulation processes. Monitoring programs should be designed to detect any physiological or morphological abnormalities in resident biota and to identify in situ conditions where more subtle physiological processes involving radionuclides might be studied.^{65/}

B. International Concerns

The GAO Report references international activities concerning dumping at the Northeast Atlantic dumpsite, and recommends that the United States rely upon the international community's research and monitoring in relation to that site as the principal source of scientific understanding for future policy decisions by the United States. While that recommendation is addressed in the following section, it is instructive to note that the London Dumping Convention, the IAEA guidelines adopted thereunder, and other international initiatives, also recognize the need to monitor past dumping for the purpose of assessing potential hazards.^{66/}

Addressing the issue of monitoring, the IAEA guidelines state that "environmental monitoring combined with research can provide information testing the validity of present assumptions and help to provide a sound scientific basis for the conservation of ocean resources and for future monitoring operations and an

^{65/} Interagency Committee on Ocean Pollution Research, Development and Monitoring/Federal Coordinating Council for Science, Engineering and Technology, National Marine Pollution Program: Federal Plan 1981-85 (Sept. 1981) at 42.

^{66/} London Dumping Convention, supra note 13, Arts. VI.1.D, IX, Annex III(B)(4) and C(1)(2), and (3); IAEA Revised Definition, supra note 14, B.2.

improved technical basis for evaluating future practices. These studies should be carried out." (emphasis added). ^{67/}

Following the adoption of those guidelines by the United States and other LDC contracting parties in 1978, the IAEA convened an Advisory Group on Low Level Radioactive Waste Dumping in Jamaica. ^{68/} The findings of that meeting confirmed the need for continued validation of present assumptions with respect to past dumping, as shown by the definition of monitoring that was agreed upon:

Monitoring we have defined as the collection of samples and/or data, and the analysis of samples and/or all the relevant data, required to demonstrate whether an impact of the dumping operations can be seen. It must be emphasized that such data and such interpretation cannot be simply on a yes or no basis, but that the operation must be done in a sufficiently iterative way that trends can be described, and that situations tending toward ^{69/} measurable impacts can be identified and controlled.

* * *

Monitoring must report where the dumped material in fact is, and how its concentrations, distributions and bio-availability are changing with time. ^{70/}

In April 1981 the Organization for Economic Cooperation and Development's Nuclear Energy Agency (NEA), as part of its

^{67/} Id., IAEA Revised Definition, Annex, Para. 2.5.2, at 21; See also, the Oceanographic Basis of the IAEA Revised Definition and Recommendations Concerning High-Level Radioactive Waste Un-suitable for Dumping at Sea, IAEA-210 (1978) at 41-42.

^{68/} IAEA Advisory Group Meeting on Low Level Radioactive Waste Dumping, Montego Bay, Jamaica, December 11-15, 1978 [hereinafter cited as the IAEA Jamaica Advisory Group].

^{69/} Id. at 5.

^{70/} Id. at 23.

responsibilities that it has assumed in conjunction with the requirements of the LDC, approved a "Research and Environmental Surveillance Program Related to Sea Disposal of Radioactive Wastes."^{71/} This program was established as the result of a meeting of an NEA Group of Experts at which the participants "recommended that the next review of the [Northeast Atlantic] site (scheduled for 1984) should make use of more site-specific information, taking account of the particular features of the North Atlantic basin, and be less dependent on the maximizing assumptions of the generic model."^{72/} As described in its introduction, one of the two principal focuses of the environmental surveillance program is:

. . . monitoring for the purpose of radiological surveillance with the objective, in the long term, to assess whether the initial assumptions as to the safety of the site are correct, and to provide realistic radionuclide concentration data to determine if these may be attributable to the dumped waste.^{73/}

The IAEA guidelines under the LDC, the definition of monitoring that came out of the IAEA Jamaica Advisory Group meeting, and the NEA Environmental Surveillance Program all attest to the importance of site-specific monitoring to test preliminary assumptions and to provide realistic data. While the geographical focus of those findings and recommendations is the Northeast Atlantic

^{71/} Nuclear Energy Agency, Organization for Economic Cooperation and Development, Research And Environmental Surveillance Programme Related to Sea Disposal of Radioactive Waste (1981) [hereinafter cited as the NEA Surveillance Program].

^{72/} Id. at 5.

^{73/} Id.

dumpsite, which has been used much more recently than the sites off the U.S. coastlines, those concerns are valid and equally applicable to U.S. sites where substantial uncertainty remains as to the existence and status of long-lived and/or high-risk radionuclides.

In response to Senator Roth's concern about the effectiveness of federal efforts to assure that past dumping "poses no undue hazard" to man or the environment,^{74/} the existing evidence suggests strongly that GAO's conclusion is invalid. Technical studies, testimony in public hearings, workshop findings and recommendations, international criteria, guidelines and programs support the position that U.S. efforts to date have not provided effective assurances that past dumping poses no hazards to the marine environment or humans. The limited surveys and studies that have been undertaken previously with respect to past U.S. dumping are not sufficiently conclusive to lay such an important concern to rest. Additional targeted research and monitoring, which will test the validity of present preliminary assumptions, is necessary if our government is committed to providing assurances of safety.

IV. Monitoring Is Needed Of Past Dumpsites and "Test" Sites As A Basis for Future Policy Decisions

Most, if not all of the literature cited in the preceding section expressed a dual concern vis-a-vis existing dump sites:

^{74/} Supra note 2.

they need to be monitored for potential hazards; and they provide "an improved technical basis for evaluating future practices."^{75/} Yet, as we formulate responsible policies for the future regarding ocean dumping of radioactive wastes, we need not and should not be limited to sites where dumping has already occurred. Both previously used sites and "test" sites can provide illuminating answers to unresolved concerns.

A. Past Dumpsites

In light of the evidence cited in relation to the need for site-specific monitoring, it is difficult to understand how GAO could have reached its final conclusion that EPA's current approach to ocean dumping could be improved if they "recognized the limited benefits of monitoring prior dumpsites."^{76/} It seems their strongest reasoning is that there is a "lack of baseline data on the amounts of natural and fall-out related radioactivity in the oceans"^{77/} However, this does not diminish the fact that much can be learned from prior dumpsites as a basis for more informed decisions concerning proposals to dump radioactive wastes in the future.

At a one-day symposium -- "Nuclear Waste Management: The Ocean Alternative" -- that was convened in Washington, D.C. in February 1980, the need for research and monitoring was a continu-

^{75/} IAEA Revised Definition, supra, note 13; see also, Estes Park Workshop, supra, note 65.

^{76/} GAO Report, supra note 3, at 18.

^{77/} Id. at 19.

ing theme.^{78/} One of the principal speakers, Robert Dyer, EPA's Senior Oceanographer with the Office of Radiation Programs, reviewed EPA's ocean dumping surveys that were done under his direction during the 1970's. In his concluding comments, Mr. Dyer noted that:

[f]rom our initial surveys at the U.S. ocean dumpsites we can conclude that the technology exists or can be improved to properly evaluate the on-site results of deep-sea nuclear waste disposal operations. The formerly-used U.S. ocean dumpsites for nuclear waste can provide key study areas for determining both packaging performance and radionuclide transport processes.^{79/}

At the November 1980 hearings before the House Oceanographic Subcommittee, the EPA witness advised the committee that "[b]oth NOAA and EPA are committed to developing a monitoring strategy" in relation to ocean dumping of radioactive wastes.^{80/}

While that strategy has not yet been published formally, EPA's 1981 draft version, titled "Program Plan for Monitoring Radioactivity in the Oceans" states that:

[m]ore detailed information from the old dumpsites is required to improve site selection criteria, to evaluate techniques for waste containment, to develop improved dumpsite monitoring capabilities, and to better understand radiation transport processes in the deep ocean.^{81/}

^{78/} Nuclear Waste Management: The Ocean Alternative, edited by Thomas Jackson, Pergamon Press (1981). The symposium was sponsored by the Oceanic Society in cooperation with the Center for Law and Social Policy and Georgetown University.

^{79/} Id. at 43.

^{80/} November 1980 Hearings, supra note 6, at 352; see also Estes Park Workshop, supra note 65.

^{81/} U.S. Environmental Protection Agency, Draft Program Plan for Monitoring Radioactivity in the Oceans (July 20, 1981) at 9.

Hopefully that view will not be erased in response to this Administration's efforts to reduce EPA's research and monitoring budgets, though the GAO correctly notes that EPA monitoring programs have been zero-budgeted for the current fiscal year.^{82/} (Similar concern with the reduced availability of such funding was voiced in a recent report by the House Committee on Merchant Marine and Fisheries.^{83/}) Such a shift would be most unfortunate, and inconsistent with all the evidence we have cited which parallels the concern evinced in EPA's draft monitoring plan.

B. "Test" Sites

Concerning the complementary need to monitor "test" sites that are unmodified by prior dumping activities, the GAO Report appears to endorse such monitoring, but recommends reliance on "existing international ocean dumping guidance" as the principal solution to addressing future U.S. policy concerns.^{84/} Yet GAO's concluding thoughts on this point are difficult to follow, i.e.,

[m]onitorability of the international [Northeast Atlantic] dumpsite has been questioned Consequently, in developing its site selection criteria for future dumpsites, EPA should include specific criteria for assuring that site monitoring is possible as well as specific periodic monitoring requirements. ^{85/}

^{82/} GAO Report, supra note 3, at 22.

^{83/} H.R. Rep. No. 562, 97th Cong., 2d Sess. 9 (May 17, 1982).

^{84/} GAO Report, supra note 3, at 22.

^{85/} Id. at 24.

How can one determine whether site monitoring is possible (other than depth limitation standards) and what periodic monitoring requirements are appropriate and necessary absent site-specific and basin-specific assessments? Reliance on international guidance alone that is focused on the Northeast Atlantic site certainly won't provide the needed information. At the risk of relying on undocumented assertions, it is widely accepted that the ocean is not a homogenous environment: normal or ambient concentrations of marine radioactivity from natural sources and human activity vary; biological food chains, currents and physical transport mechanisms and other processes vary. Given these and other variations and discontinuities that are peculiar to specific regions of the ocean, it is essential that site-specific monitoring of "test" sites precede any change of existing U.S. policy.

Two additional examples of the value that would result from monitoring "test" sites (as well as past dumpsites) are the development of (1) a complete inventory of all radionuclides deposited in the ocean by human activity; and (2) improvement of the technical adequacy of models, based on empirical data, that will allow radiation exposure to the marine environment and man to be calculated with greater reliability and accuracy. Both of these concerns have been emphasized repeatedly -- both internationally and domestically.

Concerning the need for an inventory of all radionuclides -- which GAO acknowledges without recommending any corrective measures^{86/} -- several contracting parties to the LDC, including the United States, have recommended since at least 1978 that IAEA take the lead in preparing such an inventory so that "an estimate of the capacity of the marine environment to accept the radioactive waste from all sources can be developed."^{87/} (emphasis in original). At the recently concluded Sixth Consultative Meeting, the IAEA representative advised the contracting parties that no such inventory effort has been initiated, and that IAEA's near-term future work program did not contemplate such work being started unless the Contracting Parties performed those data gathering tasks themselves.^{88/} Domestically, the EPA has advised the Congress of the importance of such an inventory, stating at the November 1980 hearing that "[b]aseline monitoring is particularly important to provide information about the normal or ambient concentrations of marine radioactivity against which to measure the impact of any future radioactive waste dumping."^{89/}

With respect to the need for improved models, based on empirical data that comes from monitoring, a principal focus of the NEA's Environmental Surveillance Program is "to define a coordinated research and environmental surveillance programme-plan

^{86/} Id.

^{87/} Third Consultative Meeting of Contracting Parties to the LDC, Intergovernmental Maritime Organization (IMO), 9-13 October 1978, LDC III/WP.1 (statement by Canada).

^{88/} Report of the Sixth Consultative Meeting of the LDC, IMO 5-9 October 1981, Para. 7.6.

^{89/} November 1980 Hearings, supra note 6, at 351.

for the Northeast Atlantic dumpsite that will allow the radiation exposure to man to be predicted with a greater degree of reliability and accuracy," i.e., "to enable the development of more realistic models."^{90/}

While that principle is sound, and while the U.S. can benefit from experience gained under the framework of such a program, its structure and implementation serve as a good example of the limited benefits that can come from reliance on "international" activities. As designed, the program underemphasizes the importance of obtaining direct knowledge concerning present conditions at the current Northeast Atlantic dumpsite (such as data on sediments, biota, residence times and up-welling characteristics) and does not give sufficient priority to those activities that will contribute useful information for purposes of the next scheduled Northeast Atlantic site review set for 1984. Annex III of the LDC expresses a concern for the possible effects on amenities, on marine life, and on the sea, yet the program concludes that "there does not seem to be specific need at this time for routine measurements at the dump site."^{91/} In relation to the next site review schedule for 1984, only nine of the thirty-seven proposed research/monitoring activities that are listed as an attachment to the program are expected to produce results useful to that review.^{92/}

^{90/} NEA Surveillance Program, supra note 71, at 5.

^{91/} Id. at 9. But see statement of Robert Dyer at the Symposium on the Ocean Alternative, supra note 78, at 43, where he noted that "the predictive capability for determining the effects is directly related to the technical adequacy for any model which is, in turn, related to the adequacy of the oceanographic information base." (emphasis added).

^{92/} Id., Annex I, at 12-19.

As a final point on the utility of monitoring as a basis for setting future policy, the GAO reprimands the EPA for not having long ago incorporated international guidelines into EPA's domestic regulatory program.^{93/} Since United States policy dating back to 1970 has been not to use the ocean as a radioactive waste dumpsite, the GAO's criticism rings hollow. Stated differently, the GAO focus on updating our existing regulations places the proverbial "cart before the horse."^{94/} In light of all of the above findings, the analysis of information that needs to be obtained from (1) past dumpsite and "test" site monitoring, (2) other U.S.-based ocean research and monitoring, and (3) participation in international programs and activities, including IAEA advisory groups, NEA's Environmental Surveillance Program, and the International Seabed Working Group,^{95/} collectively must be viewed as a prerequisite to any formal revision of this nation's regulatory program concerning ocean dumping of radioactive wastes.

Conclusion

In conclusion, there are serious problems with the findings and recommendations of the GAO Report. The Report is permeated with inadequate documentation, misrepresentation of evidence, and failures to acknowledge the existence of other pertinent evidence.

^{93/} GAO Report, supra note 3, at 22-23.

^{94/} Heywood, John, "Proverbs," (1546), Part II, Ch. 7.

^{95/} This latter program, chaired by the Department of Energy's Glenn Boyer, is the international complement to DOE's Seabed Disposal Program. See supra, note 14.

As a result, its principal conclusions are defective. After careful consideration of the GAO Report and other pertinent evidence, we believe that our findings set forth at page 4 are the ones that should have been given in response to Senator Roth's request.

Implicit in our findings, and in the body of this paper, is the conclusion that at present it is premature to reverse the existing U.S. policy of non-ocean dumping of radioactive wastes. Unless and until a more accurate assessment of the hazards of past dumping has been completed, and unless and until past dump sites and "test" sites have been monitored in order to provide empirical data and a sound predictive capability and validation system, no serious consideration should be given to the use of the oceans as a disposal medium for radioactive wastes. Once these concerns are met, it will then be appropriate for all the variables associated with a comprehensive nuclear waste policy (e.g., economic, social, environmental and political considerations) to be addressed in relation to future decisions concerning the disposal of radioactive wastes.

This paper has been endorsed by the following organizations:

Center for Environmental Education
 Clean Water Action Project
 Committee to Bridge the Gap
 Critical Mass Energy Project
 Environmental Defense Fund
 Friends of the Earth
 Greenpeace, U.S.A
 Hudson River Sloop Clearwater, Inc.
 National Audubon Society
 Natural Resources Defense Council
 Nuclear Information Resource Service
 Oceanic Society
 Southwest Research and Information Center
 Sierra Club
 Union of Concerned Scientists

[Whereupon, at 1:15 p.m. the Subcommittee on Oceanography, the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Committee on Merchant Marine adjourned, subject to the call of the Chair.]

PROPOSED OCEAN DUMPING USER FEES

WEDNESDAY, JUNE 23, 1982

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY, SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES, AND SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH AND ENVIRONMENT, COMMITTEE ON SCIENCE AND TECHNOLOGY,

Washington, D.C.

The subcommittees met, pursuant to call, at 1 p.m., in room 1334, Longworth House Office Building, Hon. Norman E. D'Amours (chairman of the Subcommittee on Oceanography) presiding.

Present: Representatives D'Amours, Scheuer, Hughes, Patman, Carney, and Forsythe.

Staff: Howard Gaines, Mary Pat Barrett, Barbara Wyman, Christophe Tulou, Will Stelle, and Debbie Storey, Committee on Merchant Marine and Fisheries; and Robert Palmer, Committee on Science and Technology.

Mr. D'AMOURS. This joint subcommittee hearing will come to order.

The Subcommittee on Oceanography, the Subcommittee on Fisheries and Wildlife Conservation and the Environment, both of the Merchant Marine and Fisheries Committee and the Subcommittee on Natural Resources, Agriculture Research and Environment of the Science and Technology Committee, are meeting today to consider the assessment of user fees on those municipalities that choose to dump their wastes into our oceans. The purpose of the fees is to at least partially recover the costs the Federal Government now sustains as a result of the municipal dumping.

During the course of the hearings held during the last year on the reauthorization of the Marine Protection, Research, and Sanctuaries Act, one point that most all of the testifiers agreed upon was the need and the basic fairness of imposing user fees. However, it proved difficult to draft a fee proposal in such a way that it addressed a number of the major concerns being raised by the municipalities and by the Federal agencies.

The proposal before us today attempts to limit cost recovery to those costs which are reasonably to be connected with the act of dumping. Further, by establishing a Commission to oversee research, it passes on some portion of the research costs to the municipalities while, at the same time, giving the municipalities some role in determining the nature of the research to be undertaken.

This proposal has not been formally endorsed by any member of this combined panel. It is a suggested approach put together by committee staff from both the majority and minority and it represents a constructive departure point. I look forward to hearing the testimony this afternoon and working together with all interested parties in arriving at a final proposal.

Without objection, proposed amendments to H.R. 6113 and H.R. 6324 will appear in the record at this point.

[The bills, proposed amendments, and departmental reports follow:]

97TH CONGRESS
2D SESSION

H. R. 6113

To amend title I of the Marine Protection, Research, and Sanctuaries Act of 1972.

IN THE HOUSE OF REPRESENTATIVES

APRIL 20, 1982

Mr. D'AMOURS introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

A BILL

To amend title I of the Marine Protection, Research, and Sanctuaries Act of 1972.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "Ocean Dumping Amend-
4 ments Act of 1982".

5 SEC. 2. DUMPING PERMIT PROGRAM.

6 Section 102 of the Marine Protection, Research, and
7 Sanctuaries Act of 1972 (33 U.S.C. 1412) is amended as
8 follows:

1 (1) Subsection (a) is amended by striking out “,
2 but not be limited in his consideration to,” in the
3 second sentence; and by striking out paragraphs (A)
4 through (I), inclusive, and inserting in lieu thereof the
5 following:

6 “(1) The suitability of the material for ocean
7 dumping based upon, but not limited to, the following
8 environmental factors:

9 “(A) The effect of such dumping on human
10 health and welfare, including economic, esthetic,
11 and recreational values.

12 “(B) The effect of such dumping on fisheries
13 resources, plankton, fish, shellfish, wildlife, threat-
14 ened or endangered species, shorelines and
15 beaches.

16 “(C) The effect of such dumping on marine
17 ecosystems, particularly with respect to—

18 “(i) the transfer, concentration, and dis-
19 persion of such material and its byproducts
20 through biological, physical, and chemical
21 processes,

22 “(ii) potential changes in marine ecosys-
23 tem diversity, productivity, and stability, and

24 “(iii) species and community population
25 dynamics.

1 In considering the effects of dumping under this
2 subparagraph and subparagraphs (A) and (B), the
3 Administrator shall take into account the cumula-
4 tive effects of such dumping in combination with
5 such other materials as may be found or deposited
6 at the site.

7 “(D) The persistence and permanence of the
8 effects of the dumping.

9 “(E) The effect of dumping particular vol-
10 umes and concentrations of such materials.

11 “(F) The effect on alternate uses of oceans,
12 such as scientific study, fishing, and other living
13 resource exploitation, and nonliving resource ex-
14 ploitation.

15 “(2) For materials determined to be unsuitable
16 under paragraph (1), the availability of prudent and
17 feasible alternatives, including other ocean or land-
18 based locations or processes for disposal or recycling,
19 or some combination of alternatives.

20 “(3) For materials determined to be suitable under
21 paragraph (1), the availability of alternatives which are
22 clearly environmentally, economically, and technologi-
23 cally acceptable, including land-based locations or proc-
24 esses for disposal or recycling, or some combination of
25 alternatives.”.

1 (2) Subsection (c) is amended to read as follows:

2 “(c)(1) The Administrator shall designate sites at which
3 materials may be dumped under permits issued under this
4 section and section 103; except that no site may be designat-
5 ed by the Administrator under this subsection until the Ad-
6 ministrator undertakes and completes an analysis of the char-
7 acteristics of the site and its suitability for dumping and of
8 the environmental effects which will likely result from dump-
9 ing. In undertaking such an analysis of each site, the Admin-
10 istrator shall take into consideration the criteria set forth in
11 subsection (a) and shall specifically take into account the fol-
12 lowing factors:

13 “(A) The types and quantities of wastes and pol-
14 lutants projected to be deposited in, and adjacent to,
15 the site from dumping and other sources.

16 “(B) The ability of the waters at the site to dis-
17 perse, detoxify, or neutralize the materials.

18 “(C) The importance of the site to the surround-
19 ing biological community, including the presence of
20 breeding, spawning, nursery or foraging areas, migra-
21 tory pathways, or areas necessary for other functions
22 or critical stages in the life cycle of marine organisms.

23 “(D) The immediate and cumulative effects on
24 human health and on the ecosystem adjacent to the

1 site and the persistent effects on the ecosystem within
2 the site.

3 “(2) The Administrator shall periodically monitor the ef-
4 fects of the dumping of materials at and adjacent to each site,
5 and shall, at the close of the third year after the site designa-
6 tion and at every three-year interval thereafter until such
7 time as the designation is terminated, estimate the extent of
8 the dumping and other waste inputs that will occur in and
9 adjacent to the site during the next three-year period.

10 “(3) If at any time the Administrator, on the basis of the
11 factors taken into account under subparagraphs (A) through
12 (D) of paragraph (1), or on the basis of the monitoring or
13 estimates, or both, required under paragraph (2), determines
14 that the site is no longer suitable for such dumping, the Ad-
15 ministrator shall—

16 “(A) limit dumping at the site to certain materials
17 or at certain times or both; or

18 “(B) suspend or terminate the designation of the
19 site under paragraph (1).”.

20 **SEC. 3. PERMIT CONDITIONS.**

21 Section 104 of the Marine Protection, Research, and
22 Sanctuaries Act of 1972 (33 U.S.C. 1414) is amended as
23 follows:

24 (1) Clause (5) of subsection (a) is amended to read
25 as follows: “(5) any special provisions deemed neces-

1 sary by the Administrator or the Secretary, as the case
2 may be, to minimize the harm from dumping, or, after
3 consultation with the Secretary of the Department in
4 which the Coast Guard is operating, for the monitoring
5 and surveillance of the transportation or dumping;
6 and”.

7 (2) Subsection (b) is amended to read as follows:

8 “(b) The Administrator or the Secretary, as the case
9 may be, shall prescribe and collect from the applicant, unless
10 the applicant is a Federal agency, an application fee in an
11 amount commensurate with the costs incurred or expected to
12 be incurred by the Administrator or Secretary in processing
13 the permit. The application fee shall be deposited to the prin-
14 cipal appropriation account or accounts used to carry out the
15 processing of permits under this title.”.

16 (3) Subsections (d) through (g) are redesignated as
17 subsections (e) through (h), respectively, and the fol-
18 lowing new subsection is inserted immediately after
19 subsection (c):

20 “(d) The Administrator or Secretary, as the case may
21 be, may issue an interim permit under section 102 or 103 in
22 cases where the expected toxicity or the potential for envi-
23 ronmental degradation from dumping is of particular concern
24 but where no prudent and feasible alternative exists. The fol-
25 lowing requirements apply in the case of an interim permit

1 and any term or condition necessary to implement these re-
2 quirements shall be in addition to any other conditions im-
3 posed with respect to that permit under subsection (a):

4 “(1) An interim permit may not be valid for a
5 period exceeding twenty-four consecutive months; but
6 may be renewed, upon application therefor, for addi-
7 tional such periods.

8 “(2) The Administrator or Secretary, as the case
9 may be, may specify those measures which the permit-
10 tee must take during the interim permit period to plan,
11 develop, acquire, or implement, as appropriate—

12 “(A) prudent and feasible alternatives for the
13 disposal of the material;

14 “(B) processes for reducing or eliminating
15 the contaminants in the material; or

16 “(C) processes for recycling the material.”.

17 (4) The following new subsection is added at the
18 end thereof:

19 “(i) The Administrator or Secretary, as the case may
20 be, may prescribe such reporting requirements as he or she
21 deems appropriate with regard to actions taken by permittees
22 pursuant to permits issued under this title.”.

1 **SEC. 4. CONVENTION ADHERENCE.**

2 Section 106 of the Marine Protection, Research, and
3 Sanctuaries Act of 1972 (33 U.S.C. 1416) is amended by
4 adding at the end thereof a new subsection as follows:

5 “(g) The Administrator and the Secretary shall adhere
6 to and apply all requirements of the London Dumping Con-
7 vention, including its annexes, to the extent these require-
8 ments do not relax the requirements of this title.”.

9 **SEC. 5. TRANSITIONAL PROVISIONS.**

10 (a) The terms and conditions of a permit issued under
11 section 102 or 103 of the Marine Protection, Research, and
12 Sanctuaries Act of 1972 before the date of the enactment of
13 this Act, and in effect on such date, shall be administered and
14 enforced without regard to the amendments made by this
15 Act; except that such permit—

16 (1) shall have force and effect until the day of ter-
17 mination specified in the permit, or until the third anni-
18 versary of the date of the enactment of this Act,
19 whichever date sooner occurs; and

20 (2) may not be renewed after the date of the en-
21 actment of this Act.

22 (b) An application for a permit under section 102 or 103
23 of such Act of 1972 that is pending on the date of the enact-
24 ment of this Act shall be processed under such Act of 1972
25 as amended by this Act.

1 (c)(1) The requirements of paragraph (1) of section
2 102(c) of such Act of 1972 (as amended by this Act) shall not
3 apply with respect to any area of ocean waters that was ap-
4 proved for dumping on a final basis before the date of the
5 enactment of this Act, but each such area shall be subject to
6 paragraphs (2) and (3) of such section 102(c) and for purposes
7 of such paragraphs each such area shall be treated as having
8 been designated under such paragraph (1) on such date of
9 enactment.

10 (2) Section 102(c) of such Act of 1972 (as in effect
11 before the date of the enactment of this Act) shall continue to
12 apply with respect to any area of ocean waters (if that area
13 was approved, before such date of enactment, for dumping on
14 an interim basis pending completion of baseline or trend as-
15 sessment surveys) until whichever of the following first
16 occurs:

17 (A) The third anniversary of the date of the en-
18 actment of this Act.

19 (B) The date on which the Administrator desig-
20 nates the site in accordance with section 102(c)(1) (as
21 amended by this Act) and any site not so designated by
22 such third anniversary shall not thereafter be used as
23 an ocean dumping site under this Act until such a des-
24 ignation is made.

1 (d) Notwithstanding any provision of title I of the
2 Marine Protection, Research, and Sanctuaries Act of 1972 to
3 the contrary, during the two-year period beginning on the
4 date of the enactment of this Act, no permit may be issued
5 under such title I that authorizes the dumping of any low-
6 level radioactive waste unless the Administrator of the Envi-
7 ronmental Protection Agency determines—

8 (1) that the proposed dumping is necessary to con-
9 duct research—

10 (A) on new technology related to ocean
11 dumping, or

12 (B) to determine the degree to which the
13 dumping of such substance will degrade the
14 marine environment;

15 (2) that the scale of the proposed dumping is lim-
16 ited to the smallest amount of such material and the
17 shortest duration of time that is necessary to fulfill the
18 purposes of the research, such that the dumping will
19 have minimal adverse impact upon human health, wel-
20 fare, and amenities, and the marine environment, eco-
21 logical systems, economic potentialities, and other le-
22 gitimate uses;

23 (3) after consultation with the Secretary of Com-
24 merce, that the potential benefits of such research will
25 outweigh any such adverse impact; and

1 (4) that the proposed dumping will be preceded by
2 appropriate baseline monitoring studies of the proposed
3 dump site and its surrounding environment.

4 Each permit issued pursuant to this subsection shall be sub-
5 ject to such conditions and restrictions as the Administrator
6 determines to be necessary to minimize possible adverse im-
7 pacts of such dumping.

8 **SEC. 6. AUTHORIZATION OF APPROPRIATIONS.**

9 Section 111 of the Marine Protection, Research, and
10 Sanctuaries Act of 1972 (33 U.S.C. 1420) is amended by
11 striking "and" immediately following "fiscal year 1981," and
12 inserting "and not to exceed \$4,213,000 for each of fiscal
13 years 1983 and 1984," immediately after "fiscal year
14 1982,".

97TH CONGRESS
2D SESSION

H. R. 6324

To authorize appropriations for atmospheric, climatic, and ocean pollution activities of the National Oceanic and Atmospheric Administration for the fiscal years 1983 and 1984, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 6, 1982

Mr. SCHEUER (for himself, Mr. BLANCHARD, Mr. BROWN of California, Mrs. SCHNEIDER, Mr. WALGBEN, and Mr. WHITE) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To authorize appropriations for atmospheric, climatic, and ocean pollution activities of the National Oceanic and Atmospheric Administration for the fiscal years 1983 and 1984, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3

SHORT TITLE

4 SECTION 1. This Act may be cited as the "Atmospher-
5 ic, Climatic, and Ocean Pollution Act of 1982".

6

TITLE I—DECLARATION OF FINDINGS AND

7

PURPOSES

8

SEC. 101. The Congress of the United States finds that:

1 (1) The oceans and atmosphere surrounding and
2 within the jurisdiction of the United States play a vital
3 role in the Nation's welfare, economic self-sufficiency,
4 and national security.

5 (2) The National Oceanic and Atmospheric Ad-
6 ministration is the lead agency for oceanic and atmos-
7 pheric matters in the Nation. It was created on Octo-
8 ber 3, 1970, by Reorganization Plan Numbered 4 of
9 1970 to bring together many of the Nation's civil pro-
10 grams related to the oceans and atmosphere. The Na-
11 tional Oceanic and Atmospheric Administration's broad
12 goals include the development and operation of nation-
13 al programs to—

14 (A) manage and conserve selected marine re-
15 sources for the economic and social good of the
16 Nation;

17 (B) monitor and predict weather and environ-
18 mental conditions for the protection of life and
19 property;

20 (C) archive, analyze, and disseminate data on
21 geophysical and solar-terrestrial phenomena;

22 (D) provide basic maps, charts, surveys, and
23 specialized data for safe navigation; and

24 (E) provide research to advance oceanic and
25 atmospheric science and technology for the better

1 management of the environment and the rational
2 use of our natural resources.

3 (3) A simplified, streamlined, and consolidated au-
4 thorization of appropriations and oversight process will
5 greatly assist the National Oceanic and Atmospheric
6 Administration in attaining its goals.

7 SEC. 102. The purposes of the Congress in this Act
8 are—

9 (1) to ensure that the National Oceanic and At-
10 mospheric Administration, the lead agency for civil
11 oceanic and atmospheric activities and programs, oper-
12 ates under a clear statutory charter; and

13 (2) to simplify, streamline, and consolidate the au-
14 thorization of appropriations for the National Oceanic
15 and Atmospheric Administration, within the Depart-
16 ment of Commerce, such that the National Oceanic
17 and Atmospheric Administration's programs can be
18 viewed in a coherent fashion, and such that the author-
19 ization process, previously fragmented and unduly time
20 consuming, will be significantly reduced.

21 TITLE II—GENERAL PROGRAM AUTHORIZA-
22 TIONS AND REPORTING REQUIREMENTS

23 SEC. 201. (a) There are authorized to be appropriated to
24 the National Oceanic and Atmospheric Administration of the

1 Department of Commerce for atmospheric, climatic, and
2 ocean pollution programs:

3 (1) \$21,398,000 in fiscal year 1983 and
4 \$22,682,000 in fiscal year 1984 for Marine Ecosys-
5 tems Research, Ocean Dumping Research, and Great
6 Lakes Research.

7 (2) \$325,554,000 in fiscal year 1983 and
8 \$345,087,000 in fiscal year 1984 for the Weather
9 Services and Supporting Research.

10 (3) \$18,764,000 in fiscal year 1983 and
11 \$19,890,000 in fiscal year 1984 for Atmospheric Re-
12 search.

13 (4) \$2,100,000 in fiscal year 1983 and
14 \$2,226,000 in fiscal year 1984 for the National Cli-
15 mate Program Office.

16 (5) \$161,208,000 in fiscal year 1983 and
17 \$170,880,000 in fiscal year 1984 for Environmental
18 Satellite Services.

19 (6) \$25,852,000 in fiscal year 1983 and
20 \$27,403,000 in fiscal year 1984 for Environmental
21 Data and Information Services.

22 (b) Funds may be transferred between categories listed
23 in subsection (a), except that no funds may be transferred
24 from any particular category or categories listed in such sub-
25 section if the total of the funds so transferred from that par-

1 ticular category would exceed 10 per centum thereof, and no
2 funds may be transferred to any particular category or cate-
3 gories listed in subsection (a) from any other category or cat-
4 egories listed in subsection (a) if the total of the funds so
5 transferred to that particular category would exceed 10 per
6 centum thereof, unless—

7 (1) a period of thirty legislative days has passed
8 after the Administrator of the National Oceanic and
9 Atmospheric Administration or his designee has trans-
10 mitted to the Speaker of the House of Representatives
11 and to the President of the Senate a written report
12 containing a full and complete statement concerning
13 the nature of the transfer involved and the reason
14 therefor; or

15 (2) each committee of the House of Representa-
16 tives and the Senate having jurisdiction over the sub-
17 ject matter involved, before the expiration of such
18 period, has transmitted to the Administrator written
19 notice to the effect that each committee has no objec-
20 tion to the proposed action.

21 SEC. 202. (a) The Administrator of the National Ocean-
22 ic and Atmospheric Administration shall keep the appropriate
23 committees of the House of Representatives and the Senate
24 fully and currently informed about all aspects of the atmos-

1 pheric, climatic, and ocean pollution activities for such Ad-
2 ministration.

3 (b) Each year, at the time of the submission of the
4 President's annual budget request, the Administrator shall
5 make available to the appropriate committees of Congress
6 sufficient copies of a report fully describing the funds request-
7 ed and the atmospheric, climatic, and ocean pollution activi-
8 ties to be carried out with these funds.

9 SEC. 203. (a) The Administrator of the National Ocean-
10 ic and Atmospheric Administration shall submit to the Con-
11 gress and the President, on the date of submission of the
12 fiscal year 1984 budget request, a report on the importance
13 of meteorological satellites to weather forecasting. Such
14 report shall include—

15 (1) a quantitative analysis of the impacts of
16 weather satellites on weather forecasting;

17 (2) a quantitative comparison of weather forecasts
18 generated when two, one, or no polar-orbiting satellites
19 are operating;

20 (3) the importance of National Oceanic and At-
21 mospheric Administration weather satellite data to
22 weather forecasting in other nations;

23 (4) a statistical analysis of expected lifetimes for
24 National Oceanic and Atmospheric Administration
25 weather satellites;

1 (5) an analysis of replacement time for a National
2 Oceanic and Atmospheric Administration weather sat-
3 ellite in the event of a launch or operational failure or
4 of consecutive launch or operational failures; and

5 (6) an analysis of the present or future appropri-
6 ateness of transferring civilian meteorological satellites
7 to the private sector.

8 (b) No moneys authorized by this Act shall be used to
9 transfer to the private sector the ownership or management
10 of any meteorological satellite system and associated ground
11 system equipment unless (1) the Secretary of Commerce or
12 his designee has presented, in writing, to the Speaker of the
13 House of Representatives and the President of the Senate,
14 and to the Committee on Science and Technology of the
15 House of Representatives and the Committee on Commerce,
16 Science, and Transportation of the Senate, a comprehensive
17 plan for the proposed transfer, and (2) each such committee
18 has transmitted to the Secretary written notice (within thirty
19 days after receipt of the plan) to the effect that such commit-
20 tee has no objection to the proposed action.

21 SEC. 204. The Administrator of the National Oceanic
22 and Atmospheric Administration shall submit to the Congress
23 and the President, on the date of submission of the fiscal year
24 1984 budget request, a report on the future organization and

1 technological capabilities of the National Weather Service.

2 Such report shall include—

3 (1) preliminary cost estimates and a preliminary
4 deployment schedule for the next generation radar
5 system;

6 (2) a plan for improvement of mesoscale weather
7 forecasting over the next decade; and

8 (3) a ten-year plan for the reorganization and con-
9 solidation of the Weather Service Forecast Offices and
10 the Weather Service Offices. The plan shall include a
11 list of the criteria to be used in determining those of-
12 fices that are to be closed or consolidated during the
13 ten-year period.

14 **TITLE III—NATIONAL CLIMATE PROGRAM**

15 **SEC. 301.** This title may be cited as the “National Cli-
16 mate Program Amendments of 1982”.

17 **SEC. 302.** Section 4 of the National Climate Program
18 Act (15 U.S.C. 2904) is amended—

19 (1) by redesignating paragraphs (1) through (3) as
20 paragraphs (2) through (4), respectively, and

21 (2) by inserting before paragraph (2), as so redesi-
22 gnated, the following new paragraph:

23 “(1) The term ‘Board’ means the Climate Pro-
24 gram Policy Board.”.

1 SEC. 303. (a) Subsection (c) of section 5 of the National
2 Climate Program Act (15 U.S.C. 2904(c)) is amended—

3 (1) by inserting “(1)” before “The Secretary”,

4 (2) by designating the third sentence as paragraph
5 (4), and

6 (3) by striking out the second sentence and insert-
7 ing in lieu thereof the following new paragraphs:

8 “(2) The Office shall—

9 “(A) serve as the lead entity responsible for ad-
10 ministering the program,

11 “(B) be headed by a Director who shall represent
12 the Climate Program Policy Board and shall be the
13 spokesman for the program,

14 “(C) serve as the staff for the Board and its sup-
15 porting committees and working groups,

16 “(D) review each agency budget request transmit-
17 ted under subsection (h)(1) and submit an analysis of
18 the requests to the Board for its review,

19 “(E) be responsible for coordinating interagency
20 participation in international climate-related activities,
21 and

22 “(F) work with the National Academy of Sciences
23 and other private, academic, State, and local groups in
24 preparing and implementing the climate plan (described
25 in subsection (d)(9)) and the program.

1 The analysis described in subparagraph (D) shall include an
2 analysis of how each agency's budget request relates to the
3 priorities and goals of the program established pursuant to
4 this Act.

5 “(3) The Secretary may provide, through the Office, fi-
6 nancial assistance, in the form of contracts or grant or coop-
7 erative agreements, for climate-related activities which are
8 needed to meet the goals and priorities of the program set
9 forth in the climate plan pursuant to subsection (d)(9), if such
10 goals and priorities are not being adequately addressed by
11 any Federal department, agency, or instrumentality.”.

12 (b) Subsection (d) of such section is amended—

13 (1) by striking out the semicolon at the end of
14 paragraph (7) and inserting in lieu thereof a period and
15 the following: “Such mechanisms may provide, among
16 others, for the following State and regional services
17 and functions: (A) studies relating to and analyses of
18 climatic effects on agricultural production, water re-
19 sources, energy needs, and other critical sectors of the
20 economy, (B) atmospheric data collection and monitor-
21 ing on a statewide and regional basis, (C) advice to re-
22 gional, State, and local government agencies regarding
23 climate-related issues, (D) information to users within
24 the State regarding climate and climatic effects, and
25 (E) information to the Secretary regarding the needs of

1 persons within the State for climate-related services,
2 information, and data. The Secretary may make annual
3 grants to any State or group of States, such grants to
4 be made available to public or private educational insti-
5 tutions, to State agencies, and to other persons or in-
6 stitutions qualified to conduct climate-related studies or
7 provide climate-related services;”,

8 (2) by striking out “biennially” in paragraph (9)
9 and inserting in lieu thereof “at a frequency (not more
10 often than biennially or less often than quadrennially)
11 determined by the Board”, and

12 (3) by striking out “the intergovernmental pro-
13 gram under section 6” in paragraph (9) and inserting
14 in lieu thereof “the intergovernmental program de-
15 scribed in paragraph (7)”.

16 (c) Such section is further amended by redesignating
17 subsections (e), (f), and (g) as subsections (f), (g), and (h),
18 respectively, and by inserting after subsection (d) the follow-
19 ing new subsection:

20 “(e) CLIMATE PROGRAM POLICY BOARD.—(1) The
21 Secretary shall establish and maintain an interagency Cli-
22 mate Program Policy Board, consisting of representatives of
23 the Federal agencies specified in subsection (b)(2) and any
24 other agency which the Secretary believes should participate
25 in the program.

1 “(2) The Board shall—

2 “(A) be responsible for coordinated planning and
3 progress review for the program,

4 “(B) review all agency and department budget re-
5 quests related to climate transmitted under subsection
6 (h)(1) and submit a report to the Office of Management
7 and Budget concerning such budget requests, and

8 “(C) establish and maintain such interagency
9 groups as the Board determines to be necessary to
10 carry out its activities.

11 “(3) The Board biennially shall select a chair from
12 among its members. A Board member who is a representa-
13 tive of an agency may not serve as chair of the Board for a
14 term if an individual who represented that same agency on
15 the Board served as the Board’s chair for the previous
16 term.”.

17 (d) Subsection (g)(2) of such section, as so redesignated,
18 is amended by inserting “with the Office” after “shall coop-
19 erate”.

20 (e) The first sentence of subsection (h)(1) of such section,
21 as so redesignated, is amended by inserting before the period
22 at the end the following: “and shall transmit a copy of such
23 request to the National Climate Program Office”.

24 SEC. 304. Section 6 of the National Climate Program
25 Act (15 U.S.C. 2905) is repealed.

1 SEC. 305. Section 7 of the National Climate Program
2 Act (15 U.S.C. 2906) is amended—

3 (1) by striking out “January 30” before paragraph
4 (a) and inserting in lieu thereof “March 31”; and
5 (2) by striking out “subsection 5(g)” in paragraph
6 (d) and inserting in lieu thereof “section 5(h)”.

7 SEC. 306. Section 8(a) of the National Climate Program
8 Act (15 U.S.C. 2907(a)) is amended by striking out “, to the
9 extent provided or approved in advance in appropriation
10 Acts,”.

11 SEC. 307. Of the funds authorized for the National Cli-
12 mate Program Office for each of fiscal years 1983 and 1984
13 pursuant to section 201(a)(4) of this Act, at least 25 per
14 centum shall be made available during each fiscal year for
15 intergovernmental climate-related activities (described in sec-
16 tion 5(d)(7) of the National Climate Program Act) and at
17 least 20 per centum shall be made available during each
18 fiscal year for experimental climate forecast centers (de-
19 scribed in section 5(d)(8) of the National Climate Program
20 Act).

21 TITLE IV—GREAT LAKES PROTECTION

22 SEC. 401. This title may be cited as the “Great Lakes
23 Protection Act of 1982”.

24 SEC. 402. The National Ocean Pollution Planning Act
25 of 1978 (33 U.S.C. 1701–1709) is amended—

1 (1) by redesignating section 2 as section 101;

2 (2) by striking out "Act" in subsection (b) of sec-
3 tion 101 (as redesignated by paragraph (1)) and insert-
4 ing in lieu thereof "title";

5 (3) by redesignating sections 4, 5, and 6 as sec-
6 tions 102, 103, and 104, respectively;

7 (4) by striking out "under section 6" in subsection
8 (b)(3) of section 103 (as redesignated by paragraph (3))
9 and inserting in lieu thereof "under section 104";

10 (5) by striking out "pursuant to section 4(b)(1)(B)"
11 in subsection (a) of section 104 (as redesignated by
12 paragraph (3)) and inserting in lieu thereof "pursuant
13 to section 102(b)(1)(B)";

14 (6) by striking out sections 3, 7, 8, 9, and 10;

15 (7) by inserting after the first section the follow-
16 ing:

17 **"SEC. 2. DEFINITIONS.**

18 "For purposes of this Act (unless the context requires
19 otherwise)—

20 "(1) the term 'Administration' means the National
21 Oceanic and Atmospheric Administration;

22 "(2) the term 'Administrator' means the Adminis-
23 trator of the National Oceanic and Atmospheric Ad-
24 ministration;

1 “(3) the term ‘Director’ means the Director of the
2 Office of Science and Technology Policy in the Execu-
3 tive Office of the President;

4 “(4) the term ‘Executive Director’ means the Ex-
5 ecutive Director of the Great Lakes Research Office
6 established by section 202 of this Act;

7 “(5) the term ‘Great Lakes’ means Lake Ontario
8 (including the Saint Lawrence River from Lake Ontar-
9 io to the forty-fifth parallel of latitude), Lake Erie,
10 Lake Huron (including Lake Saint Clair), Lake Michi-
11 gan, and Lake Superior;

12 “(6) the term ‘marine environment’ means the
13 coastal zone (as that term is defined in section 304(1)
14 of the Coastal Zone Management Act of 1972 (16
15 U.S.C. 1453(1))), the seabed, subsoil, and waters of the
16 territorial sea of the United States, the waters of any
17 zone over which the United States asserts exclusive
18 fishery management authority, the waters of the high
19 seas, the seabed and subsoil of and beyond the outer
20 Continental Shelf, and the Great Lakes;

21 “(7) the term ‘ocean and coastal resource’ means
22 any resource, whether living (including natural or cul-
23 tured plant life, fish, shellfish, marine mammals, and
24 wildlife), nonliving (including energy sources, minerals,
25 and chemical substances), manmade, tangible, intangi-

1 ble, actual, or potential which is located in, derived
2 from, or traceable to, the marine environment and in-
3 cludes the habitat of any such living resource, the
4 coastal space, the ecosystems, the nutrient-rich areas,
5 and the other components of the marine environment
6 which contribute to or provide (or which are capable of
7 contributing to or providing) recreational, scenic, es-
8 thetic, biological, habitational, commercial, economic,
9 or conservation values; and

10 “(8) the term ‘ocean pollution’ means any short-
11 term or long-term change in the marine environment.

12 “TITLE I—OCEAN POLLUTION RESEARCH”;

13 and

14 (8) by adding after section 104 (as redesignated
15 by paragraph (3)) the following new titles:

16 “TITLE II—GREAT LAKES PROTECTION

17 “SEC. 201. FINDINGS, PURPOSE, AND DECLARATION OF
18 POLICY.

19 “(a) FINDINGS.—The Congress finds that—

20 “(1) the Great Lakes (containing 95 percent of
21 the surface fresh water of the United States and 20
22 percent of the world’s fresh water) are among the
23 greatest natural resources in the world, continuously
24 serving the people of the United States and other na-

1 tions as important sources of food, fresh water, recrea-
2 tion, beauty, and enjoyment.

3 “(2) the Great Lakes are among the world’s
4 major waterways, each year carrying tons of water-
5 borne shipping to and from all parts of the globe;

6 “(3) the productivity and beauty of the Great
7 Lakes in recent years have been diminished and threat-
8 ened by water pollution, shoreline erosion, and sedi-
9 mentation;

10 “(4) numerous Federal agencies have initiated and
11 supported research projects to study, enhance, manage,
12 preserve, protect, or restore the resources of the Great
13 Lakes;

14 “(5) the various research projects relating to the
15 Great Lakes, including those conducted at the college
16 and university level and those conducted at the State
17 and local level, can be more effectively coordinated in
18 order to obtain maximum benefits; and

19 “(6) a greater awareness of the importance of pre-
20 serving and protecting the environmental quality of the
21 Great Lakes is in the national interest.

22 “(b) PURPOSE.—The purpose of this title is—

23 “(1) to provide for a rational and effective coordi-
24 nation of federally supported research aimed at increas-
25 ing fundamental knowledge in support of efforts to pre-

1 serve and protect the environmental quality of the
2 Great Lakes;

3 “(2) to identify the needs and priorities for such
4 research as will be required in the future to preserve
5 and protect the environmental quality of the Great
6 Lakes;

7 “(3) to assure a comprehensive and balanced ap-
8 proach to federally supported research on the Great
9 Lakes;

10 “(4) to encourage the utilization of the results and
11 findings of research relating to the Great Lakes in the
12 decisionmaking processes which affect the environmen-
13 tal quality of the Great Lakes; and

14 “(5) to foster public understanding, and to assure
15 greater understanding at all levels of government, of
16 the role of the Great Lakes as a unique national re-
17 source and the greatest ecological entity of its kind.

18 “(c) DECLARATION OF POLICY.—The Congress, in rec-
19 ognizing the Great Lakes to be a unique national and inter-
20 national resource, declares that—

21 “(1) it shall be the continuing policy of the Feder-
22 al Government, in cooperation with State and local
23 governments and other concerned public and private
24 organizations, to use all practicable means and meas-
25 ures in a manner calculated to enhance, preserve, and

1 protect the environmental quality of the Great Lakes,
2 to create and maintain conditions under which individ-
3 uals, industry, and the Great Lakes can exist in pro-
4 ductive harmony, and to fulfill the social, economic,
5 and other requirements of present and future genera-
6 tions; and

7 “(2) it shall be the policy of the Federal Govern-
8 ment to maximize international cooperation with
9 Canada and other nations in maintaining, enhancing,
10 preserving, and protecting the environmental quality of
11 the Great Lakes consistent with the foreign and do-
12 mestic policies of the United States.

13 **“SEC. 202. GREAT LAKES RESEARCH OFFICE.**

14 “(a)(1) **ESTABLISHMENT.**—There is established within
15 the Administration a Great Lakes Research Office. All facili-
16 ties of the Great Lakes Research Office shall be located geo-
17 graphically either in the State of Minnesota, Wisconsin,
18 Michigan, Illinois, Indiana, Ohio, Pennsylvania, or New
19 York.

20 “(2) **EXECUTIVE DIRECTOR.**—The Great Lakes Re-
21 search Office established by paragraph (1) shall be directed
22 by an Executive Director appointed by the Administrator.

23 “(3) **STAFF.**—The Executive Director may appoint
24 such staff as the Executive Director determines are neces-
25 sary to carry out the duties and responsibilities and to fulfill

1 the purposes of this title. The staff appointed pursuant to this
2 paragraph shall be appointed subject to the provisions of title
3 5 of the United States Code governing appointments in the
4 competitive service and shall be paid in accordance with the
5 provisions of chapter 51 and subchapter III of chapter 53 of
6 such title relating to classification and General Schedule pay
7 rates.

8 “(b) INVENTORY.—

9 “(1) COMPILATION.—Not later than the date oc-
10 ccurring one year after the date of the enactment of this
11 title the Executive Director shall compile an inventory
12 of all major actions taken, or planned to be taken, by
13 Federal, State, or local governments which have, or
14 may have, a significant effect on the environmental
15 quality of the Great Lakes (with the significance of the
16 effect to be determined by the Executive Director in
17 conformance with the policy set forth in section 201).
18 The inventory may be limited by the Executive Direc-
19 tor to an inventory of major actions taken after Janu-
20 ary 1, 1977.

21 “(2) REVIEW.—The Executive Director shall
22 review the inventory compiled pursuant to paragraph
23 (1), and include in the inventory any additional major
24 actions described in paragraph (1), not later than the
25 date occurring three calendar months after the date the

1 compilation of such inventory is completed and not
2 later than each date occurring three months after each
3 review is completed. The Executive Director shall con-
4 sult with Federal, State, and local officials in reviewing
5 the inventory.

6 “(3) SUBMISSION.—The inventory compiled pur-
7 suant to paragraph (1), and each review made pursuant
8 to paragraph (2), shall be submitted to the President
9 and the Congress.

10 “(c) FUNCTIONS OF EXECUTIVE DIRECTOR.—

11 “(1) KNOWLEDGE OF PROGRAMS AND PROJ-
12 ECTS.—The Executive Director shall be responsible
13 for knowledge of programs and projects conducted or
14 funded by the Federal Government which relate to the
15 Great Lakes, including any program or project assisted
16 under the National Sea Grant College Program Act
17 (33 U.S.C. 1121-1131) and any program or project
18 which carries on research directed toward enhancing,
19 preserving, or protecting the environmental quality of
20 the Great Lakes.

21 “(2) DIRECT RESEARCH.—The Executive Direc-
22 tor may direct the staff of the Great Lakes Research
23 Office to conduct direct research in order to carry out
24 the duties and responsibilities of the Office and to fulfill
25 the purposes of this title.

1 “(3) CONTRACTS.—The Executive Director may
2 enter into any contract which the Executive Director
3 determines is necessary to carry out the duties and re-
4 sponsibilities of the Office.

5 “(d) CONSULTATION AND ADVISEMENT BY EXECU-
6 TIVE DIRECTOR.—In carrying out this title, the Executive
7 Director shall—

8 “(1) consult with Federal, State, and local gov-
9 ernmental officials responsible for maintaining, enhanc-
10 ing, preserving, protecting, or monitoring the environ-
11 mental quality of the Great Lakes, including the Secre-
12 tary of the Interior, the Administrator of the Environ-
13 mental Protection Agency, the Director of the Office of
14 Science and Technology Policy in the Executive Office
15 of the President, the President of the National Acad-
16 emy of Sciences, the Director of the National Institutes
17 of Health, the Chairman of the United States Section
18 of the International Joint Commission-United States
19 and Canada, the Chairman of the United States Sec-
20 tion of the Great Lakes Fishery Commission, the Ex-
21 ecutive Director of the Great Lakes Commission, and
22 the Chief of Engineers of the United States Army
23 Corp of Engineers; and

24 “(2) advise such Federal, State, and local govern-
25 mental officials on the effect of any Federal, State, or

1 local governmental program or project on the environ-
2 mental quality of the Great Lakes.

3 “(e) REPORT.—Not later than the date occurring one
4 calendar year after the date of the enactment of this title, the
5 Executive Director shall submit to the President and the
6 Congress a report containing—

7 “(1) information on the current state of research
8 efforts conducted or supported by the Federal Govern-
9 ment to improve the environmental quality of the
10 Great Lakes;

11 “(2) recommendations for the improvement, in-
12 creased coordination, and use of such research efforts;

13 “(3) information on the degree of coordination
14 among the States in the vicinity of the Great Lakes in
15 efforts to preserve and protect the environmental qual-
16 ity of the Great Lakes; and

17 “(4) recommendations for the improvement of
18 such coordination among the States.

19 “SEC. 203. GREAT LAKES ENVIRONMENTAL IMPACT ANALYSIS.

20 “(a) APPENDIX.—The responsible Federal official shall
21 include in every statement included pursuant to section
22 102(2)(C) of the National Environmental Policy Act of 1969
23 (42 U.S.C. 4332(2)(C)) in a recommendation or report on
24 proposals for legislation, and other major Federal actions,
25 which significantly affect the Great Lakes (with the signifi-

1 cance of the effect to be determined by the Executive Direc-
2 tor in conformance with the policy set forth in section 201)
3 an appendix which makes special reference to the Great
4 Lakes and which contains—

5 “(1) an index to all material contained in such
6 statement which relates to the Great Lakes; and

7 “(2) a summary of all material contained in such
8 statement which relates to the Great Lakes.

9 “(b) COMMENTS.—The Executive Director shall submit
10 to the responsible Federal official comments on each state-
11 ment described in subsection (a) before the statement is in-
12 cluded in a recommendation or report pursuant to section
13 102(2)(C) of the National Environmental Policy Act of 1969
14 (42 U.S.C. 4332(2)(C)).

15 “(c) SUBMISSION OF APPENDIX AND COMMENTS.—
16 Copies of any appendix required to be included in a statement
17 pursuant to subsection (a), and any comments submitted by
18 the Executive Director pursuant to subsection (b), shall be
19 submitted to the President and made available to the public
20 pursuant to section 552 of title 5 of the United States Code.

21 “TITLE III—GENERAL PROVISIONS

22 “SEC. 301. INTERAGENCY COOPERATION.

23 “The head of each department, agency, or other instru-
24 mentality of the Federal Government which is engaged in,
25 concerned with, or has authority over programs relating to

1 ocean pollution research, development, and monitoring or
2 over research to maintain, enhance, preserve, or protect the
3 environmental quality of the Great Lakes—

4 “(1) shall cooperate with the Administrator in
5 carrying out the purposes of title I and shall cooperate
6 with the Administrator and the Executive Director in
7 carrying out the purposes of title II;

8 “(2) may, upon written request from the Adminis-
9 trator, Director, or Executive Director, make available
10 to the Administrator, Director, or Executive Director
11 such personnel (with their consent and without preju-
12 dice to their position and rating), services, or facilities
13 as may be necessary to assist the Administrator, Direc-
14 tor, or Executive Director in achieving the purposes of
15 this Act;

16 “(3) shall, upon written request from the Adminis-
17 trator, Director, or Executive Director, furnish such
18 data or other information as the Administrator, Direc-
19 tor, or Executive Director determines is necessary to
20 fulfill the purposes of this Act.

21 **“SEC. 302. DISSEMINATION OF INFORMATION.**

22 “(a) **OCEAN POLLUTION INFORMATION.**—The Admin-
23 istrator shall ensure that the results, findings, and informa-
24 tion regarding ocean pollution research, development, and
25 monitoring programs conducted or sponsored by the Federal

1 Government are disseminated in a timely manner and in
2 useful forms to relevant departments, agencies, and instru-
3 mentalities of the Federal Government and to other persons
4 having an interest in ocean pollution research, development,
5 and monitoring.

6 “(b) GREAT LAKES INFORMATION.—The Administra-
7 tor and the Executive Director shall ensure that the results,
8 findings, and information regarding the Great Lakes compiled
9 by the Great Lakes Research Office are disseminated in a
10 timely manner and in useful forms to relevant departments,
11 agencies, and instrumentalities of the Federal Government
12 and to other persons having an interest in the environmental
13 quality of the Great Lakes.

14 “SEC. 303. EFFECT ON OTHER LAWS.

15 “Nothing in this Act shall be construed to amend, re-
16 strict, or otherwise alter the authority of any Federal depart-
17 ment, agency, or instrumentality under any law to undertake
18 research, development, and monitoring relating to ocean pol-
19 lution, to conduct research relating to the Great Lakes, or to
20 undertake action pursuant to any other Federal law.

21 “SEC. 304. AUTHORIZATION OF APPROPRIATIONS.

22 “(a) AUTHORIZATION.—There are authorized to be ap-
23 propriated to the Administration for the purposes of carrying
24 out this Act not to exceed \$5,000,000 for the fiscal year
25 ending September 30, 1979; not to exceed \$4,300,000 for

1 the fiscal year ending September 30, 1980; not to exceed
2 \$3,000,000 for the fiscal year ending September 30, 1981;
3 not to exceed \$4,000,000 for the fiscal year ending Septem-
4 ber 30, 1982; and, of the funds authorized pursuant to sec-
5 tion 201(a) of the Atmospheric, Climatic, and Ocean Pollu-
6 tion Act 1982, not to exceed \$4,000,000 for the fiscal year
7 ending September 30, 1983 and not to exceed \$4,000,000
8 for the fiscal year ending September 30, 1984.

9 “(b) LIMITATION.—Of any amount appropriated for a
10 fiscal year ending after September 30, 1982, under the au-
11 thorization contained in subsection (a) an amount not more
12 than \$750,000 may be expended by the Executive Director
13 during a fiscal year to carry out title II of this Act.”.

14 TITLE V—OCEAN POLLUTION RESEARCH

15 SEC. 501. Section 201 of the Marine Protection, Re-
16 search, and Sanctuaries Act of 1972 (16 U.S.C. 1441) is
17 amended by striking out “from time to time, not less fre-
18 quently than annually”, and inserting in lieu thereof “not
19 later than March 1 of each year”.

20 SEC. 502. Section 202 of the Marine Protection, Re-
21 search, and Sanctuaries Act of 1972 (16 U.S.C. 1442) is
22 amended—

23 (1) by adding at the end of subsection (a) the fol-
24 lowing new sentence: “Such program shall include, but
25 not be limited to—

1 “(1) the development of techniques to quantify
2 and define, using scientific tests, the degradation of the
3 marine environment;

4 “(2) cooperative efforts with the Administrator of
5 the Environmental Protection Agency to evaluate the
6 usefulness of such techniques to the permit criteria pro-
7 gram specified in section 102(a) of the Marine Protec-
8 tion, Research, and Sanctuaries Act of 1972 (16
9 U.S.C. 1442);

10 “(3) the assessment of the ability of ocean areas
11 to assimilate materials without degrading the marine
12 environment; and

13 “(4) continuing monitoring programs to assess the
14 health of coastal ecosystems, including but not limited
15 to monitoring of bottom oxygen concentrations; con-
16 taminant levels in biota, sediments, and the water
17 column; diseases in fish and shellfish; and changes in
18 types and abundance of indicator species.”; and

19 (2) by striking out “In March of each year,” in
20 subsection (c) and inserting in lieu thereof “Not later
21 than March 1 of each year,”.

22 SEC. 503. The Administrator of the National Oceanic
23 and Atmospheric Administration, in cooperation with the Ad-
24 ministrator of the Environmental Protection Agency, shall
25 submit to the Congress and the President, not later than De-

1 cember 31, 1983, a report on sewage sludge disposal in the
2 New York City region. Such report shall include an evalua-
3 tion of the social, economic, environmental, and health fac-
4 tors associated with alternative methods of waste disposal
5 and a cost/benefit comparison of these alternatives. Such al-
6 ternatives shall include landfill disposal, incineration, and
7 ocean dumping.

8 SEC. 504. Of the funds authorized pursuant to section
9 201(a)(1) of this Act, \$12,000,000 is authorized to be appro-
10 priated in fiscal year 1983 and \$12,500,000 in fiscal year
11 1984 to carry out the provisions of title II of the Marine
12 Protection, Research, and Sanctuaries Act of 1972 (33
13 U.S.C. 1444). Of these funds, at least \$500,000 shall be
14 made available in each of the fiscal years 1983 and 1984 to
15 carry out the study authorized in section 503 of this Act.

16 **TITLE VI—OTHER PROGRAMS**

17 SEC. 601. Of the funds authorized pursuant to section
18 201(a)(3) of this Act, \$100,000 is authorized to be appropri-
19 ated in each of the fiscal years 1983 and 1984 to carry out
20 the provisions of the Act entitled "An Act to provide for the
21 reporting of weather modification activities to the Federal
22 Government", as amended (15 U.S.C. 330).

Proposed Amendment to H.R. 6113

of
In lieu/the text for section 104(d) of the Marine
Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C.
1414(b)) in the bill, insert the following:

1 “(b)(1) The Administrator or the Secretary, as the case
2 may be, shall prescribe and collect from the applicant
3 (unless the applicant is a Federal agency) an application
4 fee in an amount commensurate with the reasonable costs
5 expected to be incurred by the Administrator or Secretary in
6 processing the permit.

7 “(2) The Administrator shall prescribe and collect from
8 the applicant for a permit under section 102 (unless the
9 applicant is a Federal agency) a special fee in an amount
10 commensurate with the reasonable administrative costs to be
11 incurred by the Administrator under subsection (c)(1) of
12 such section for the designation of the site for which the
13 applicant has applied.

14 “(3) As a condition of issuing a permit under section
15 102, the Administrator shall--

16 “(A) prescribe and collect a special fee,
17 apportioned pro-rata among users of a designated site,
18 in an amount commensurate with the reasonable costs

1 expected to be incurred by the Administrator in carrying
2 out the periodic monitoring of the site required by
3 subsection (c)(2) of such section; and

4 "(B) in the case of a permit for the disposal of
5 sewage sludge, prescribe and collect a special fee for
6 purposes of financing the operation of the Ocean Waste
7 Management Commission established under section 206.

8 The special fee imposed under subparagraph (B) shall be
9 prescribed and collected on an annual basis for the fiscal
10 years within the period beginning October 1, 1982 and ending
11 September 30, 1989, and such special fee for fiscal year
12 1983 shall be collected before the 30th day after the date
13 of the enactment of this paragraph. The amount of such
14 special fee for any year for any permittee shall be an
15 amount which bears to \$2,000,000 the same ratio that the
16 sewage sludge (computed on a dry-weight basis) permitted to
17 be disposed of by the permittee during that year bears to
18 the total amount of sewage sludge (computed on a dry-weight
19 basis) permitted to be disposed of under all such permits
20 during that year.

21 "(4) All fees collected under paragraphs (1), (2), and
22 (3)(A) shall be deposited to the principal appropriation
23 account or accounts used to carry out the activities
24 described in such respective paragraphs, and shall remain
25 available until expended; except that if any Federal agency

1 other than the Environmental Protection Agency or the Corps
2 of Engineers will carry out, in whole or part, any such
3 activity, then such portion of such fees as may be necessary
4 to cover the costs incurred, or expected to be incurred, in
5 carrying out such activity shall be transferred by the
6 Administrator or Secretary, as the case may be, to such
7 other Federal agency for deposit by it into the principal
8 appropriation account or accounts used for such activities,
9 and shall remain available until expended.

10 “(5) All special fees collected under paragraph (3)(B)
11 shall be deposited by the Administrator into the Ocean Waste
12 Management Fund established by section 206(g).”.

RY402

Proposed Amendment to H.R. 6324

At the appropriate place in the bill, insert the following:

1 Sec. ____ . Title II of the Marine Protection, Research,
2 and Sanctuaries Act of 1972 (33 U.S.C. 1441-1445) is
3 amended--

4 (1) by adding at the end thereof the following new
5 section:

6 "Ocean Waste Management Commission

7 "Sec. 206. (a) There is established the Ocean Waste
8 Management Commission (hereinafter in this section referred
9 to as the 'Commission').

10 "(b)(1) The Commission shall be composed of three
11 Commissioners who shall be appointed by the President as
12 follows:

13 "(A) One Commissioner shall be appointed from lists
14 of nominees submitted to the President by those entities
15 which hold valid permits under section 102 for the
16 disposal of sewage sludge (and for purposes of this
17 subparagraph any entity entitled to dispose of sewage
18 sludge in ocean waters under court order shall be
19 treated as holding such a valid permit).

20 "(B) One Commissioner shall be appointed from lists

1 or nominees submitted to the President by the Council on
2 Environmental Quality, which shall compile such lists
3 only after consultation with the Administrator and the
4 Secretary of Commerce.

5 `` (C) One Commissioner shall be appointed from lists
6 of nominees submitted to the President by the National
7 Academy of Sciences.

8 An individual is not eligible for nomination or appointment
9 as a Commissioner unless that individual is knowledgeable in
10 marine affairs.

11 `` (2) The President shall appoint the initial
12 Commissioners of the Commission before the 60th day after
13 the date of the enactment of this section, and, for purposes
14 of achieving this deadline, the nominating entities referred
15 to in paragraph (1) shall each submit a list of not less
16 than 3 nominees to the President on a timely basis.

17 `` (3) The Commissioners shall annually elect one of
18 their number as the Chairman of the Commission.

19 `` (4)(A) The term of office of a Commissioner is 3
20 years; except that--

21 `` (i) the term of the Commissioner initially
22 appointed pursuant to paragraph (1)(B) is 2 years;

23 `` (ii) the term of office of the Commissioner
24 initially appointed pursuant to paragraph (1)(C) is one
25 year; and

1 ``(iii) the term of a Commissioner appointed to
2 replace a Commissioner under circumstances described in
3 clause (ii) of paragraph (5)(A) is as provided for in
4 that paragraph.

5 ``(B) An individual who serves as a Commissioner is not
6 eligible for reappointment to that office unless the
7 appointment was for less than 3 years and made as a result
8 of circumstances described in clause (ii) of paragraph
9 (5)(A), in which case such individual is eligible for
10 reappointment for one three-year term.

11 ``(5)(A) Not less than--

12 ``(i) 120 days before the expiration of the term of
13 a Commissioner, or

14 ``(ii) 60 days after a Commissioner ceases to serve
15 as a Commissioner for any reason other than expiration
16 of term;

17 the nominating entity referred to in paragraph (1) that
18 nominated such Commissioner shall compile and submit to the
19 President a list of not less than 3 nominees for that
20 office. Within 120 days after receiving the list, the
21 President shall appoint a Commissioner therefrom to serve a
22 three-year term, if clause (i) applies, or to serve for the
23 balance of the term of the preceding Commissioner, if clause
24 (ii) applies.

25 ``(B) In any case in which a Commissioner ceases to

1 serve as a Commissioner for any reason other than expiration
2 of term, the Chairman of the Commission, or, if the Chairman
3 so ceases to serve, the Commissioner having longest term of
4 continuous service as Commissioner, may appoint an interim
5 Commissioner to serve for the balance of the term or until a
6 Presidential appointment is made pursuant to subparagraph
7 (A). An individual appointed as an interim Commissioner
8 pursuant to this subparagraph shall have the same duties,
9 responsibilities, and powers as if appointed by the
10 President.

11 “(6) The Commission shall have an Executive Director
12 who shall be appointed (without regard to the provisions of
13 title 5, United States Code, governing appointments in the
14 competitive service) by the Chairman, with the advice of the
15 other Commissioners, and shall be paid at the rate for GS-18
16 of the General Schedule under section 5332 of title 5,
17 United States Code. The Executive Director shall have such
18 duties as the Commission may assign.

19 “(c)(1) There is established the Ocean Waste Management
20 Advisory Committee (hereinafter in this section referred to
21 as the ‘Committee’).

22 “(2) The Committee shall consist of six members who
23 shall be appointed by the Commission within 90 days after
24 the appointment of the initial Commissioners. Each of the
25 following disciplines shall be represented by a member of the
Committee who shall be knowledgeable and experienced in that

1 discipline:

2 ``(A) Marine engineering.

3 ``(B) Human health risk assessment.

4 ``(C) Economics of natural resources.

5 ``(D) Marine sediment transport geology.

6 ``(E) Marine ecology.

7 ``(F) Physical or chemical oceanography.

8 ``(3) The term of office of a member of the Committee is
9 two years and an individual is eligible for reappointment as
10 a member for any number of terms. When the term of office of
11 a member of the Committee expires, or when a member
12 otherwise ceases to serve as a member for any reason, the
13 Commission shall appoint a successor on a timely basis.

14 ``(4) The Commission shall meet with the Committee at
15 least once each year and shall consult with the Committee on
16 all research and monitoring programs conducted by the
17 Administrator and the Secretary of Commerce, and all such
18 programs proposed to be initiated by the Commission, under
19 this title and title I. The Commission shall identify in the
20 annual report to Congress required under subsection
21 (e)(1)(D) any recommendation made by the Committee that is
22 not adopted by the Commission and shall include therein an
23 explanation of the reasons for not doing so.

24 ``(d) A Commissioner and a member of the committee--

25 ``(1) may not, while serving on the Commission or

1 Committee--

2 “(A) hold any other position as an officer or
3 employee of the United States or of any State or
4 local government except as a retired officer or
5 retired civilian employee of the United States or
6 such government, or

7 “(B) be a consultant on ocean disposal of
8 wastes to any agency of the Federal government or
9 any State or local government;

10 (2) shall be compensated for a period not to exceed
11 sixty days each fiscal year at a rate equal to the daily
12 equivalent of the rate for GS-18 of the General Schedule
13 under section 5332 of title 5, United States Code, for
14 each day that the Commissioner or member is engaged in
15 the actual performance of duties vested in, and while
16 serving on, the Commission or the Committee; and

17 “(3) shall be reimbursed for travel expenses
18 incurred in Commission or Committee business, including
19 per diem in lieu of subsistence as authorized by section
20 5703 of title 5, United States Code, for persons in
21 government service employed intermittently.

22 “(e)(1) The Commission shall--

23 “(A) undertake a continuing comprehensive
24 assessment of all research and monitoring actions
25 undertaken by the United States pursuant to this title

1 and title I and the Convention with respect to the
2 disposal of sewage sludge in ocean waters;

3 “(B) to the extent that the assessment made
4 pursuant to subparagraph (A) indicates that research and
5 monitoring actions are required, and to the extent that
6 they are not duplicative of actions being undertaken by
7 other Federal agencies, cause to be undertaken, through
8 contracts and grants with appropriate organizations or
9 individuals, public or private, including agencies of
10 the Federal Government--

11 “(i) a research program to monitor and review
12 the cumulative impacts of sewage sludge disposal on
13 ocean waters, plankton, fish, shellfish, wildlife,
14 shorelines, wetlands, and beaches,

15 “(ii) such research relating to ocean disposal
16 of sewage sludge as it deems necessary, and

17 “(iii) such research and evaluation as it deems
18 necessary regarding improved methodologies for
19 comparing the human health risks and environmental
20 degradation caused by ocean disposal of sewage
21 sludge with alternative methods of sewage sludge
22 disposal;

23 “(C) on the basis of the assessments undertaken
24 pursuant to subparagraph (A), and the research and
25 monitoring activities initiated under subparagraph (B),

1 recommend to the Congress, the Administrator, and the
2 Secretary of Commerce--

3 “(1) such steps as it deems necessary for the
4 protection of the ocean environment from the adverse
5 effects of the disposal of sewage sludge,

6 “(ii) appropriate policies regarding existing
7 and future sewage sludge disposal activities, and

8 “(iii) such additional measures as it deems
9 necessary to further the policies of this Act and
10 the Convention; and

11 “(D) submit to Congress, by March 1 of each year, a
12 report which shall include, but not be limited to--

13 “(1) a description of the activities and
14 accomplishments of the Commission during the
15 immediately preceding year,

16 “(ii) the recommendations required of the
17 Commission by subparagraph (C) together with the
18 agency responses thereto required by paragraph (3),
19 and

20 “(iii) the matters required to be reported on
21 under subsection (c)(4).

22 “(2) Not less than 75 percent of the monies available
23 in the Ocean Waste Management Fund established by subsection
24 (g) for any fiscal year shall be used in carrying out
25 research and monitoring actions under paragraph (1)(B)

1 through contracts and grants.

2 “(3) The Administrator or the Secretary of Commerce, as
3 the case may be, shall respond to the Commission with
4 respect to any recommendation made by the Commission under
5 paragraph (1)(C). Such response shall be made within 120
6 days after the date on which the recommendation was made
7 and, if the recommendation is not, or will not be, adopted
8 or implemented by the Administrator or the Secretary, the
9 response shall specify the reasons therefor.

10 “(4) The research and monitoring information and data
11 acquired, and the recommendations made, by the Commission
12 under paragraph (1) are matters of public record and shall
13 be made available for public inspection.

14 “(5) For purposes of carrying out its functions under
15 paragraph (1), the Commission shall have access to all
16 studies and data compiled by Federal agencies regarding
17 ocean waste management and the Commission, to the extent
18 feasible, may utilize the facilities and services of any
19 Federal agency on a cost reimburseable basis.

20 “(f) The Commission, in carrying out its
21 responsibilities under this title, may--

22 “(1) employ and fix the compensation of necessary
23 staff personnel, not to exceed the equivalent of nine
24 full-time staff positions, without regard to the
25 provisions of title 5, United States Code, governing

1 appointments to the competitive service in addition to
2 the Executive Director appointed under subsection
3 (b)(6);

4 `` (2) acquire, furnish and equip office space;

5 `` (3) enter into contracts pursuant to subsection
6 (e)(1) without regard to the provisions of section 252
7 of title 41, United States Code;

8 `` (4) procure the services of such experts or
9 consultants as are authorized under section 3109 of
10 title 5, United States Code, at a rate not to exceed
11 \$300 dollars per day, plus expenses;

12 `` (5) incur such other expenses and exercise such
13 other powers as are consistent with and reasonably
14 required to carry out this section; and

15 `` (6) expend monies in the Ocean Waste Management
16 Fund for purposes of carrying out the functions of the
17 Commission specified in subsection (e)(1), and meeting
18 the operating and administrative expenses, of the
19 Commission and the Committee.

20 `` (g)(1) There is established in the Treasury of the
21 United States the Ocean Waste Management Fund which shall be
22 available to the Commission for the purposes specified in
23 subsection (f)(6).

24 `` (2) The Fund shall consist of all fees deposited into
25 it by the Administrator pursuant to section 104(b)(3)(B).

1 “(3) Any monies remaining in the Fund after the winding
2 down of the affairs of the Commission pursuant to subsection
3 (h) shall be deposited into the general fund of the Treasury
4 as miscellaneous receipts.

5 “(h) The Commission shall terminate on the 8th
6 anniversary of the date of the appointment of the initial
7 Commissioners under subsection (b)(2); except to the extent
8 necessary to wind down its affairs.”; and

9 (2) by amending section 204 by striking out
10 “title,” and inserting in lieu thereof “title (other
11 than section 206),”.



**GENERAL COUNSEL OF THE
UNITED STATES DEPARTMENT OF COMMERCE**
Washington, D.C. 20230

MAY 20 1982

Honorable Walter B. Jones
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

This is in response to your request for the views of the Department of Commerce concerning H.R. 6113, the "Ocean Dumping Amendments Act of 1982".

This bill would make a number of technical amendments to the Ocean Dumping Act. Because responsibility for title I of the Marine Protection, Research, and Sanctuaries Act of 1972 resides with the Environmental Protection Agency and does not affect any programs of the Department of Commerce, we have no comments on this proposed legislation.

We have been advised by the Office of Management and Budget that there is no objection to the submission of this letter to the Congress from the standpoint of the Administration's program.

Sincerely,

Sherman E. Unger
for Sherman E. Unger
General Counsel



DEPARTMENT OF THE ARMY

WASHINGTON, D. C. 20310

Honorable Walter B. Jones
Chairman, Committee on Merchant Marine
and Fisheries
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

This is in response to your letter requesting views on H.R. 6113, 97th Congress, a bill "To amend Title I of the Marine Protection, Research, and Sanctuaries Act of 1972", as reported by your Committee. The Secretary of Defense has assigned responsibility for reporting on this bill to the Department of the Army.

As reported, the bill would authorize appropriations for Fiscal Year 1983 and would make a number of changes to Title I of the Ocean Dumping Act related to EPA site designation, monitoring of dumping sites, issuance of interim permits, recovery of permit processing costs, disposal of radioactive wastes, adherence with the London Dumping Convention, continued use of existing interim sites and the authority of Federal district courts to hear mandamus actions to compel site designations.

The Department of the Army, on behalf of the Department of Defense, supports the efforts of your Committee to fashion a workable reauthorization of the Ocean Dumping Act for the next fiscal year. We are, as you know, very much interested in insuring that ocean dumping be allowed to continue unimpeded, subject to necessary and reasonable environmental safeguards. We understand that the reported bill was crafted with this same objective in mind and we welcome and support that effort. However, we feel that the actual bill contains a number of provisions that could be misinterpreted or would lead to unnecessary obstacles to reasonable ocean dumping. Accordingly, we are opposed to enactment of the bill as reported by the Committee on Merchant Marine and Fisheries and favor, instead, enactment of a simple two year reauthorization of the Ocean Dumping Act.

One of our primary concerns with the bill as reported is section 2(a)(2) which amends section 102(c) of the Act to require mandatory designation of dumping sites by the EPA for both section 102 and 103 permits. We are concerned that by making this change, the authority of the Army Corps of Engineers to dump dredged materials, or to permit such dumping pursuant to Section 103 at sites which have not received formal designation, would be precluded. Currently, dumping of dredged material may take place at a site which has received final or interim designation, or, where use of a designated site is not feasible, at a site determined pursuant to the 103 permit process. We are concerned that the change, making designations mandatory, especially when made in conjunction with section 5(a) of the bill dealing with interim designations, could be read as precluding future interim designation or dumping at a non-designated site even when use of a designated site was not feasible. We understand that this is not what is intended by the Committee on Merchant Marine and Fisheries. Nonetheless, we are concerned that this may be the practical effect of the change.

The Department of the Army also objects to the stringent monitoring requirements for all sites which would be imposed under proposed section 102(c)(2) and the definition of "monitoring" under section 6 of the bill. Monitoring should be required only where the nature and quantity of material dumped justify the additional costs of such monitoring.

The Department of the Army also believes any decision to limit dumping at a designated site used for dumping of dredged material or any suspension of the sites designation under proposed subsection 102(c)(3) should require prior consultation of the Secretary. Accordingly, we object to the proposed new section 102(c)(3) of the bill.

We are also concerned that section 5(a) of the bill could be read as precluding use of a site after completion of baseline or trend assessment surveys but before a decision on final designation is reached. This could result in halting use of the site for several months during the "gap" between completion of studies and final designation.

The Department of the Army, on behalf of the Department of Defense, also opposes section 3(4) of the bill which singles out low-level radioactive waste for unique and highly restrictive treatment. Specifically, the bill arbitrarily establishes a two-year moratorium on disposal of low-level radioactive waste in the ocean. The Department of the Army is concerned that the two year moratorium on dumping of low-level radioactive waste in section 3(4) would prohibit or interfere with the dumping of dredged material which may be contaminated by incidental quantities of radioactive material. Such dredged material poses no radiation threat to the environment. Unnecessarily strict regulatory treatment of this material could result in a total shutdown of important projects. We understand from the Committee Report of the Committee on Merchant Marine and Fisheries that this is not intended. However, because the language contained in the bill could be so interpreted we are opposed to its inclusion in the bill.

Also, the proposed moratorium may ultimately interfere with the plans of the Department of the Navy to dispose of defueled, decommissioned nuclear submarines. Although the specific provision in H.R. 6113 would have no immediate effect on efforts to evaluate and select an acceptable method for submarine disposal, it would set an undesirable precedent and may lead to pressure at the end of the two year period to continue the ban into the future. If, as a result of the evaluations currently being performed by the Navy in compliance with the National Environmental Policy Act (NEPA), the Navy should determine that it is environmentally acceptable and preferable to dispose of submarines in the ocean, then the possible continuance of a ban against such disposal could restrict the options available with no technical basis for such restriction. Sea disposal of low-level radioactive material is clearly permissible under international law. The London Ocean Dumping Convention of 1972, to which the United States is a signatory, allows disposal of low-level radioactive material in the ocean. Other foreign nations are currently disposing of low-level radioactive material in the North Atlantic under the provisions of the London Convention.

The bill also allows a one-house veto by Congress of any permit issued by the EPA for ocean disposal of low-level radioactive material. This proposal merely increases the uncertainty surrounding any effort to dispose of low-level radioactive material in the ocean, and is unnecessary, considering the requirements already mandated by the Ocean Dumping Act and NEPA and their implementing regulations governing such disposal. A one-house veto provision adds one more obstacle which could be used to thwart even the most conscientious compliance with existing regulations. Moreover, we understand that the Department of Justice believes that the legislative veto provision is unconstitutional.

In addition, the bill establishes a number of new administrative requirements which appear to be already covered by existing EPA regulations or which duplicate actions that would be covered under NEPA. In some cases, these requirements are inappropriate, specifically:

(1) Paragraph (E) of subsection (j)(1) requires a "plan for the removal or containment of the disposed nuclear material if the container leaks or decomposes." This provision follows paragraph (D) which requires "an analysis of the resulting environmental and economic conditions if the containers fail to contain the radioactive waste materials when initially deposited at the specific site." The current law and its implementing regulations already cover this subject adequately. It should also be noted that some of the most environmentally preferable sites for ocean disposal which comply with international site criteria are in very deep water where removal or containment of the disposed material would be extremely expensive or not even technically feasible in some cases. Thus, the proposed provisions could rule these sites out, despite their technical merits.

(2) Paragraph (F) of subsection (j)(1) requires "a determination by each affected state whether the proposed action is consistent with its approved

Coastal Zone Management Plan." This requirement is inappropriate for several reasons. First, it is not consistent with the Coastal Zone Management Act, since any ocean dumping site meeting international site selection criteria may be far beyond the three mile breadth of state coastal zones. A determination of consistency with state Coastal Zone Management Plans would only be required for disposal activities "directly affecting" the coastal zone. Second, under current regulations implementing the CZMA, it is the federal agency involved that determines whether a federal activity directly affects a state Coastal Zone (15 CFR 930.33). If a state disagrees, it can request that the federal agency make a determination as to whether the proposed action is consistent with the state plan (15 CFR 930.35) and if both the state and the federal agency disagree, 15 CFR 930.36 provides a mediation process. On the other hand, the proposed paragraph (F) would alter the current process by requiring "each affected state" to agree that a disposal action is consistent with its plan. The term "affected state" is not defined, and could be broadly interpreted to mean any state on a coastline, even though the state would not be directly affected by the disposal action. Thus, in effect, this would give any coastal state veto power over any ocean disposal of radioactive material off that coast.

The bill also contains a provision which would allow a writ of mandamus action in Federal district court to compel the Administrator to implement the site designation provisions of the bill "in a timely manner". We share the concerns of the EPA that this provision could create undesirable results and is unnecessary in light of the adequacy of existing civil remedies.

This report has been coordinated within the Department of Defense in accordance with procedures prescribed by the Secretary of Defense.

The Office of Management and Budget advises that there is no objection to submission of this report for the consideration of the Congress.

Sincerely,



William R. Gianelli
Assistant Secretary of the Army
(Civil Works)



U.S. Department of Justice
Office of Legislative Affairs

Office of the Assistant Attorney General

Washington, D.C. 20530

JUN 30 1982

Honorable Walter B. Jones
Chairman
Committee on Merchant Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

The purpose of this letter is to inform you of the objection of the Department of Justice to Section 3 of H.R. 6113, the "Ocean Dumping Amendments of 1982."

Section 3, proposed 33 U.S.C. § 1414 (j)(4)(A), contains a legislative veto provision that would purport to authorize one House of Congress to take action that would be binding on the Executive Branch.

Section 3 of the bill adds a new subsection (j) to Section 104 of the Marine Protection, Research and Sanctuaries Act of 1972, 33 U.S.C. § 1414, which includes a provision for one House of Congress to disapprove dumping permits issued under that Act. See proposed § 104(j)(4)(A). From a constitutional perspective, this one-House legislative veto provision is invalid for two reasons. First, any exercise of legislative power by the Congress that purports to bind the Executive Branch is governed by the procedures set forth in Art. I, § 7, Cls. 2 & 3 of the Constitution. These procedures require passage of a bill or resolution by majorities of both Houses of Congress, and presentation of the item to the President for his approval or veto. Since a one-House legislative veto is not presented to the President, the provision is unconstitutional. Second, the provision violates the basic principle of the separation of powers, under which Congress is to legislate, and the Executive Branch is to execute the laws. By purporting to retain power to control the Executive Branch in its exercise of the executive function, the legislative veto provision effectively seeks to authorize one House of Congress to execute the law in violation of the separation of powers principle. We should note that these general arguments were accepted by a unanimous panel of the United States Court of Appeals for the District of Columbia Circuit in Consumer Energy Council of America v. Federal Energy Regulatory Commission, Nos. 80-2184 & 80-2312 (D.C. Cir.,

Jan. 29, 1982) (suggestion for rehearing en banc unanimously denied Mar. 10, 1982), now pending in the Supreme Court on a jurisdictional statement filed by intervenor Process Gas Consumer Group No. 80-2008 (S. Ct., Apr. 29, 1982). See also Chada v. Immigration and Naturalization Service, 634 F.2d 408 (9th Cir. 1980), pending before the Supreme Court as Nos. 80-1832, 80-2170 and 80-2171 (argued Feb. 22, 1982).

We strongly object to Section 3 of H.R. 6113 because of the importance of the constitutional issues raised by this provision.

Concerning the other provisions of this bill, we defer to the other concerned agencies.

The Office of Management and Budget has advised that there is no objection to the submission of this report from the standpoint of the Administration's program.

Sincerely,

(Signed) Robert A. McConnell

Robert A. McConnell
Assistant Attorney General

Mr. D'AMOURS. I have been requested by Mr. Forsythe that his statement be submitted for the record and, without objection, I will so order that the statement be submitted. I would also ask that the record be left open for any other opening statements of members who have been unable to attend due to other business, and that is also without objection; it is so ordered.

[The statement of Mr. Forsythe follows:]

STATEMENT OF HON. EDWIN B. FORSYTHE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Thank you, Mr. Chairman. The proposed amendments are before our committee today for the purpose of receiving testimony on the collection of user fees to recover some of the costs associated with ocean dumping.

In asking our staff to draft these amendments, I did not expect we would get the total concurrence of all our members on the provisions contained in the amendments and I still have a number of reservations about the proposed language myself. However, I am hopeful the testimony this afternoon will enable us to gain further insight on the issue of ocean dumping fees.

There are many questions which still need to be answered as we proceed to act on any user fee legislation such as what costs should be recovered, who should pay ocean dumping user fees, should certain costs be shared by the Federal Government, how do we ensure that the monies collected will be used for the purposes intended? Also, is it appropriate to provide for some type of mechanism to allow for representation from the dumpers themselves in making monitoring and research decisions? I hope we are able to answer some of these questions today.

I welcome our distinguished colleagues from the Committee on Science and Technology to today's hearing and look forward to working with them in seeking solutions to the problems associated with funding the Ocean Dumping Act and the collection of user fees.

Mr. D'AMOURS. Our first witness is Mr. Frederic Eidsness, Assistant Administrator for Water of the Environmental Protection Agency. I am going to ask that Capt. Lawrence Swanson, Director, Office of Marine Pollution Assessment, Office of Research and Development of NOAA come to the table also.

Is Captain Swanson with us? I would appreciate it, Captain, if you would come to the table also, and we will have Mr. Eidsness first.

STATEMENTS OF FREDERIC A. EIDSNESS, JR., ASSISTANT ADMINISTRATOR FOR WATER, ENVIRONMENTAL PROTECTION AGENCY, AND R. LAWRENCE SWANSON, DIRECTOR, OFFICE OF MARINE POLLUTION ASSESSMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

STATEMENT OF FREDERIC A. EIDSNESS

Mr. EIDSNESS. Good morning, Mr. Chairman, and members of the subcommittee.

I am Frederic A. Eidsness, Assistant Administrator of the Office of Water, U.S. Environmental Protection Agency.

I am pleased and sincerely appreciate the opportunity to appear before you, Mr. Chairman and members of the other subcommittees, to discuss this important topic. This is the first time that an official representing the Reagan administration has appeared before you in this context and I particularly appreciate your openness and willingness to let us contribute early in the development of what I understand now is a staff draft proposal for a user fee system.

I want you all to know that I want very much personally and so does Anne Gorsuch, the Administrator, to get going, establish and keep going a very close dialog and working relationship with you individually, and your staff members as well, over the months ahead and perhaps this is a good starting point for that.

As you know, we in the administration want to establish a user fee system to recoup costs incurred in operating the ocean dumping program. This program is jointly administered by several Federal agencies including the EPA, the Corps of Engineers, the Coast Guard, and the National Oceanic and Atmospheric Administration, otherwise known as NOAA.

Each of these agencies plays an important role in the various steps of program administration, including such activities as site designation, permitting and monitoring. These actions are done at considerable cost to the agencies of the Federal Government and are directly beneficial to disposers. It is for this reason that we strongly support a permit processing and a user fee system.

The agency is not proposing to adopt a fee system as a "penalty" for ocean dumping. The fees we plan to collect are similar to the fees collected by private landfill operators to recoup their costs for site preparation and monitoring with the only difference that we are not seeking an increment for profit.

Although we are enthusiastic in our support for a system of permit processing and user fees, we are concerned that the purpose and scope of the fee system be clearly stated and that the system work efficiently. Such a user fee must conform to three basic principles.

First, it must be administratable. That is, its administration should be simple and efficient, without creating unnecessary costs or burdensome procedures.

Second, a user fee system must be equitable. It must fairly distribute the costs of the program among the users of the program. The overall costs allocated to the program users must not be burdensome, and the allocation to any particular user must not be unfair.

Third, a user fee system must be auditable. It must be clear and specific so that there is no confusion or misunderstanding regarding the costs and procedures.

Developing a system along these three principles will require answers to a number of specific questions. These include, what will be the basis of the costs recovered by the user fee? That is, which costs will be paid for by the program users and which will not? What formula will be used to allocate the costs among the users—will it be based solely on tonnage, or will other factors be considered? What minimum necessary administrative procedures should be set up for fee collection, rebates and the like?

Because of the complexities of these issues, we propose that the law be amended to provide the agency with broad authority to implement a fee system. This system should be established in accordance with the three principles I have discussed. I would be pleased to provide the committee with the appropriate legislative language to accomplish this purpose.

We further propose to answer more detailed questions, consistent with the principles I have enunciated, in establishing the fee system through the rulemaking process. This will give the affected public a chance to participate in the development of this user fee system. We will, of course, work with the subcommittees and staff throughout the rulemaking process to develop an administratable, equitable and auditable user fee system.

Now I realize that you may have some problems as to the degree of congressional control over this fund and we appreciate that concern. For example, the agencies could present their proposed fees to the Congress annually. There may be other alternatives. We are willing to work with the subcommittees on these questions.

Now I would like to turn to a review of the amendments before the subcommittees today. Among our concerns with these amendments are: The complexity of having four different fees; the degree to which we may recoup costs for the designation of new sites; the time span for cost recovery; and the overlapping authority of the proposed Ocean Waste Management Commission with other Federal agencies and commissions.

The proposed amendment to H.R. 6113 defines four major components of the fee system. They are a permit processing fee, a site designation fee, a monitoring fee, and a special fee to support the operation of a proposed Ocean Waste Management Commission. All of these provisions appear as amendments to section 104(b) of the act. I shall review each of these proposed fees in turn, and discuss our concerns with them.

The current act provides for a permit processing fee to be assessed by the Administrator of EPA or the Secretary of the Army. This provision is modified slightly by the proposed amendment to clarify that Federal agencies are not to be assessed permit processing fees. The Agency is in full agreement with this provision.

Proposed section 104(b)(2) provides the first component of a significantly revised user fee system. It provides that the Administrator may prescribe site designation fees to users of that site, exclusive of Federal users. As you know, site designation is extremely expensive. A contract to study and conduct surveys of 32 ocean dumping areas and prepare 29 environmental impact statements on those areas required the expenditure of about \$17 million.

Thus, the Federal Government is incurring substantial costs in site designation. While we agree that a site designation fee is justifiable, we do not think that this provision is workable in its present form.

A major concern with this subsection is the degree to which the Agency will be constrained in recouping site designation costs for new sites, that is, those sites which currently do not have any users or permit applicants. This is a real situation today. For example, the Agency will soon propose to designate a "burn" site for incineration at sea in the North Atlantic. Although no permit applications have been filed, the Agency has received expressions of interest from three potential users for a North Atlantic site and a Pacific site.

The Agency sees a responsibility in anticipating the use of this technique, given the viability of incineration at sea as a means of waste management. The process of site designation can take several years. If EPA does not anticipate the need for new sites, applicants may experience serious delays. Such delays might not only be very costly, but could result in the use of less desirable disposal options.

Nonetheless, if the Agency is restricted by this amendment to only recoup costs from current users, a disincentive will exist for the Agency to provide a "new" site.

There may be environmental advantages to engaging in other site designation activity for projected needs, to determine in advance the best sites for particular types of wastes and to provide adequate leadtime for full scientific investigations. It may be preferable to designate a very few sites which multiple permittees would use rather than simply rely on permit-by-permit site designations.

For these reasons, the Agency has several concerns related to the assessment of user fees which we believe the amendments do not address. Is the Agency expected to recoup its costs from the first permittee or are we to assume that a number of permittees will eventually be identified and assess costs proportionately? Are we to recoup the administrative costs of site designation within a single year or assess costs annually over a multiyear timespan? These points should be clarified in the context of any user system.

Proposed section 104(b)(3)(A) prescribes that the Administrator should collect a special fee, apportioned among users of specific sites, to recoup the costs of periodic monitoring of the site. Site monitoring can be an expensive proposition depending on the extent of monitoring conducted. The municipalities dumping sewage sludge at the 12-mile site spend approximately \$370,000 annually on simple compliance monitoring. Monitoring deepwater sites is significantly more costly than monitoring shallow sites such as the 12-mile site.

Again, this subsection is not definitive as to the frequency of assessing these user charges. Is the Agency expected to recoup its costs on an annual basis or a multiyear period? Second, the term pro rata can be subject to many interpretations, chief among them pro rata by volume or pro rata by some formula accounting for volume and waste toxicity.

Subsection 104(b)(3)(B) sets aside a fee for sewage sludge disposers to support the financing and operation of an Ocean Waste Management Commission. The organization and purpose of this Commission appears as an amendment to H.R. 6324.

We are opposed to this fee for two reasons. First, the fee will be used by the Commission to conduct and evaluate sewage sludge research, yet no such research fund is defined for other ocean disposers.

The Agency believes that this is a discriminatory fee if imposed solely on sewage sludge disposers and believes that fees to cover all necessary ocean dumping research should be assessed on all ocean dumpers.

Second, we are opposed to the creation of yet another Government body engaged in marine research and policy. As I stated earlier in my testimony, the dumping program is already administered by four agencies—EPA, NOAA, COE, USCG—and the National Advisory Commission on the Oceans and Atmosphere [NACOA] is also available to provide its counsel and advice.

Let me expand on our concerns with the establishment of such a Commission.

Our fundamental problem with the proposed Commission is that its stated purpose is duplicative of the purposes of other agencies and commissions. The scope of the Commission is defined as advisory and research. The Federal Government already has three major agencies involved in marine environmental research: NOAA, EPA, and COE. They all have acquired considerable expertise over the years. Furthermore, we do not believe that adding another agency to the bureaucracy is good public policy.

We recognize that Congress is interested in having permittees actively involved in the Government's research activities and we entirely agree that permittees should have some input to research priorities. We can accomplish this purpose through existing mechanisms.

It should be noted here that much of the Federal research program is carried out or reviewed by independent scientists from institutions such as the Scripps Institute of Oceanography, the Woods Hole Oceanographic Institution and Cal Tech. We believe that by relying on such a wide base of scientific opinion, we can insure that the proper scientific basis is developed and used for our decision-making.

Similarly, NACOA's charter establishes it as an advisory council to Congress and the agencies. Its scope includes that of sewage sludge, as well as other issues. We believe that this broad scope is appropriate for an advisory body, as it promotes the recognition of other interlocking issues. Focusing on a single issue can result in the advisory body assuming the posture of an interest group, rather than adviser. We believe that an advisory role is important to good policymaking, and in that regard the Congress has estab-

lished NACOA, and EPA has its own advisory group in the Science Advisory Board.

In sum, the Agency appreciates the subcommittees' efforts in developing a fee system. However, we believe that this system needs clarification in many places. We are encouraged at the prospect of developing such a system and look forward to working with you in the near future.

Mr. D'AMOURS. Captain Swanson, you may proceed.

STATEMENT OF R. LAWRENCE SWANSON

Mr. SWANSON. We will submit our formal testimony for the record and I will quickly summarize.

Mr. D'AMOURS. Without objection, it is so ordered.

Mr. SWANSON. Mr. Chairman, NOAA is opposed to both of the amendments introduced in these bills. We do, however, reiterate our support for the concept of user fees. Activities that use the oceans for waste disposal should be expected to pay the costs associated with regulating and monitoring the short- and long-term effects of that use.

It can be said that failure to establish this principle in effect provides an incentive and even a subsidy to continue the use of the oceans for this purpose, and thus a potential to overuse it. The application of the concept of user fees in regard to ocean waste disposal will help to assure that adequate funds will be available to undertake necessary regulatory and monitoring activities.

NOAA endorses the proposal that EPA recover the costs associated with site designation and periodic monitoring of the dump sites. We do not agree with the draft amendment proposing the Ocean Waste Management Commission and the use of special fees for research activities.

The Commission would be charged with undertaking a continuing comprehensive assessment of all research and monitoring of sewage sludge dumping, supporting necessary research and monitoring on sewage sludge dumping research and on alternative methods of sewage sludge dumping, and submitting an annual report to Congress.

NOAA strongly opposes the concept of the Ocean Waste Management Commission. The proposed Commission and its advisory committee would introduce yet another layer of bureaucracy into the entire process. We view the Commission as an unnecessary entity that would duplicate activities of existing Government agencies.

In sum, we endorse the concept of user fees but believe the proposed scheme of implementing them would prove expensive and cumbersome. We do support such user fees as are appropriate to insure the wise use of the oceans for waste disposal purposes but believe a more simplified approach is required.

Mr. Chairman, we would be glad to work with you and your committee staff in looking further into this concept and I would be glad to try to answer any questions you might have at this time.

Thank you.

[The statement of Mr. Swanson follows:]

PREPARED STATEMENT OF R. LAWRENCE SWANSON, DIRECTOR, OFFICE OF MARINE POLLUTION ASSESSMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Mr. Chairman, members of the subcommittees, my name is Lawrence Swanson, I am the Director of the Office of Marine Pollution Assessment, which is the focal point within NOAA for the coordination of marine pollution activities in the agency, including research on ocean waste disposal. I am pleased to be here today to testify on the proposed user fee amendments to H.R. 6113 and on the proposed amendment to H.R. 6324, establishing an Ocean Waste Management Commission.

The proposed amendments to H.R. 6113, a bill to amend Title I of the Ocean Dumping Act, would establish a system of user fees to recover the costs of permitting actions and of site selection, plus a special fee by sewage sludge dumpers for purposes of research on sewage sludge problems. Amendments to H.R. 6324 would establish an Ocean Waste Management Commission to administer the research. This Commission, together with its Advisory Committee, would be charged with significant responsibilities in directing the course of research into problems associated with the ocean disposal of sewage sludge.

Mr. Chairman, NOAA is opposed to the amendments to both bills. Before I explain the reasons behind this position, I would like to say, first, that we have worked very closely with your Committee staff on many aspects of ocean waste disposal, and are sensitive to your concerns. It is in this context that we offer our critical yet we hope constructive comments on the proposed amendments.

We do reiterate our support for the concept of user fees. Activities that use the oceans for waste disposal should be expected to pay the costs associated with regulating that use. It can be said that failure to establish this principle in effect provides an incentive and even a subsidy to continue to use the oceans for this purpose, and the potential to overuse it. The application of the concept of user fees in regard to ocean waste disposal will help to assure that adequate funds will be available to undertake necessary regulatory activities. User fees represent a viable financing mechanism and provide the means for shifting the necessary costs associated with Federal regulation to those groups that benefit most from the practice of ocean dumping. The concept that those who benefit should pay the costs is fundamental policy of this Administration and NOAA fully supports it.

Therefore, NOAA endorses the proposal that EPA recover the costs associated with site designation and periodic monitoring of the dumpsites. Where we do not agree with the draft amendments is on: (1) the proposed imposition of a special fee only on sewage sludge dumpers and not also on industrial waste and dredged material dumpers; (2) the use of the fee for research activities; and (3) the need for an Ocean Waste Management Commission.

With respect to the proposed amendments to H.R. 6324, which would establish an Ocean Waste Management Commission, the Commission would be charged with: undertaking a continuing comprehensive assessment of all research and monitoring on sewage sludge dumping; supporting necessary research and monitoring on sewage sludge dumping; research on alternative methods of sewage sludge dumping; and submitting an annual report to Congress. The Commission would have three commissioners, a full-time executive director and a full-time staff of nine individuals. The Commission would be advised by a 6-member Ocean Waste Management Advisory Committee. The proposed amendment requires that the \$2,000,000 in funds to be generated each year from the special fee on sewage sludge dumpers be made available to the Commission. No less than 75 percent of these monies for any fiscal year is to be used for carrying out research and monitoring on sewage sludge dumping.

NOAA strongly opposes the establishment of an Ocean Waste Management Commission. The proposed Commission and its Advisory Committee would introduce yet another layer of bureaucracy into the entire process. We view the Commission as an unnecessary entity that would duplicate activities of existing Government Agencies. Furthermore, the cost of the Commission would divert the user fee funds that would otherwise be available for research.

In sum, we endorse the concept of user fees but believe the proposed scheme of implementing them would prove expensive and cumbersome, and duplicate a great deal of work now being undertaken or planned. We do support such user fees as are appropriate to ensure the wise use of the oceans for waste disposal purposes, but believe that a more simplified approach is required.

We have tried to analyze these amendments in a positive sense, Mr. Chairman, and hope that our comments are helpful to the Committees in their deliberations.

Mr. Chairman, this concludes my brief statement and I am prepared to answer any questions you have.

Mr. D'AMOURS. Thank you very much, Captain Swanson.

Mr. Eidsness, at various points in your testimony you have been critical of the lack of specificity in the proposals and yet you propose a simplified fee with the more complex questions to be answered later in your rulemaking processes.

How can you want us at this point to be more specific and yet desire a system that would allow you to be general and to become specific in your rulemaking later down the road?

Mr. EIDSNESS. Mr. Chairman, that is a very fair question and I am glad you asked it.

Let me back up. I have a strong professional background in the public finance area, as a consultant and as a local government official, so perhaps I suffer from knowing too much about the principles of local finance and I tend to bring that viewpoint with me here to Washington.

I think it would be desirable to have many of the specifics worked out; if not enunciated in a bill now, at least somehow read into the record so that it is clear as to how the Federal establishment is to establish and operate the user fee system.

I also know there are a number of very significant questions that need to be resolved that will take a great deal of time and staffing out and public debate such as you are doing now.

What we suggest is in the absence of an ability to get specifics in a bill now—and that may not always be the case—that the EPA through its rulemaking process could go through what I perceive to be a fairly long and comprehensive analysis of alternatives to develop a fee system which will answer many of these questions and then come back to the committee, or the committees, for their oversight and concurrence on how this system would work.

As I pointed out in my testimony—and once again this comes from my local government perspective—there are three very important principles that need to be met and I know that these are the principles that you are dealing with in one way or the other.

One is administrability, two is equity and three is auditability. I also want to reiterate that in terms of setting up any financing mechanism such as a user fee system at the local level, and I assume the same principles would apply at the national level, that we would both want to be absolutely certain to know the basis for the costs allocation.

In other words, what costs are eligible to be allocated out to the permittees which you are wrestling with, and two, what is the formula for allocation, and three, how is it to be administered. I think it is going to take some time to work those things out and if we can do it with you in the statute, that is wonderful. If we can't, though, I think the rulemaking process can do that and you can oversee the work done by the Agency through full public disclosure and debate.

Mr. D'AMOURS. Thank you, Mr. Eidsness.

Captain Swanson, you are saying now, as I understand it, that it isn't appropriate to recover research costs. But isn't NOAA currently supporting other user fee proposals that are pending before Congress to recover such costs?

Mr. SWANSON. It is my understanding there are cases where NOAA is supporting user fees to support research.

Mr. D'AMOURS. Has there been a change of position in general on this by NOAA or is this something specific? For instance, just last week NOAA testified before the Public Works Committee that it supported the recovery of research costs in this initiative.

Has there been a general change of position as to recovery of research costs or is this something aimed specifically at this legislation or has this been a change of opinion with regard to this specific legislation in the last day or two?

Mr. SWANSON. I believe I have to answer your question in two parts. This is not a general reconsideration of using user fees to recover research costs. It is addressed specifically to this particular bill and the amendments to the bills. Second, in reviewing the legislation over the last week, there has been some change in policy.

Mr. EIDSNES. Mr. Chairman, may I add something to that?

Mr. D'AMOURS. In just a minute.

Why do you distinguish present recovery of research costs in general and the attempt to do so in this proposal?

Mr. SWANSON. There are a number of issues with respect to research in this particular proposal. Much of the research necessary to be conducted is in fact generic in nature, and as a consequence of that it is very difficult to tie it directly to the permit process.

Second, I think there is concern that the important research that might have to be done in order to carry out the generic aspects of the program could not logically be funded directly by a select group of permittees.

Mr. D'AMOURS. Isn't the generic nature of research pertinent to the other bills where you are supporting user fees?

Mr. SWANSON. I am not competent to answer that question.

Mr. D'AMOURS. You are not familiar with the other bills?

Mr. SWANSON. I am not familiar with the details of the other bills.

Mr. D'AMOURS. Could you be more specific? What is there about the research fees in this bill that tend to make them generic and therefore not susceptible to the imposition of user costs?

Mr. SWANSON. The designation of sites is generally tied specifically to a locality and a particular geographic region or spot in the ocean, and much of our research that we feel is important in the generic sense covers broad geographic areas. For example, the question of disposing in the Gulf Stream has recently been raised. The nature of the research that would be necessary in that case is quite broad, and to ask a municipality or a small group of municipalities to fund it would perhaps be too much of a strain and also inappropriate.

Mr. D'AMOURS. It would seem though that it is rather difficult to consider any worthwhile research not to be generic. Can you think of any research that is worthwhile that wouldn't have general application or would be "generic?"

Mr. SWANSON. I guess all research has a generic aspect. However, the background information going into specific site designation is something that perhaps should be carried out by an individual municipality, or funded through an individual municipality. But, in the broader aspects of looking at the east coast as a region for waste disposal sites, I think it would be difficult to tie this to a small group of municipalities.

Mr. D'AMOURS. I want to move the questioning along and I want to therefore turn to somebody else, but before I do, Mr. Eidsness, I promised you you would have a chance to get your shot in on that other question I asked. Go ahead.

Mr. EIDSNESS. Thank you, Mr. Chairman.

The question of the appropriateness of allocating research costs into the user fee system is a key question and this is what I meant by what is the basis for cost allocation.

I think there is another set of principles that the Congress has used in the past that I think we all accept in making decisions. The principle is that the polluter pays, in relation to the amount of problem it creates and the beneficiary pays in the amount of benefit it gains. It is a broad concept and it is sort of a juggling act one has to go through, I think, in one's own mind, as to where you come out in terms of deciding what is eligible to allocate to whom, the polluters or the beneficiaries.

On one hand you might argue that the Congress, and the public wanted an ocean program. They have a law, they want to know more about it, they want to protect it, but also they want to allow the ocean to be at least considered for dumping under certain conditions, so that one could say there is a general benefit there. Perhaps we can draw the line on research or certain kinds of research that are very broad to be allocated back to the beneficiaries. That suggests that broad research resulting in general benefits should be paid for by something other than the user fee system.

Looking at the other side, we could say the polluters have to pay for things more directly attributable to their own specific operations, such as site designation or monitoring and things of that nature. I am not saying that all research should not be supported, but I think that some cutoff could be made by the committees, if they can, or certainly EPA under rulemaking, as to where that would be eligible.

Mr. D'AMOURS. What is EPA's position on user fees for research cost?

Mr. EIDSNESS. I don't believe we would support that in the broadest context. The problem is what is research?

Mr. D'AMOURS. Is EPA's position the same as NOAA's?

Mr. EIDSNESS. I think that is right. A broad-based research activity, partly for the purposes of stability and partly for purposes of equity ought to be financed in some other way than through a user fee system.

I should add though EPA strongly supports the need for continued research.

Mr. D'AMOURS. I appreciate that.

Mr. Forsythe.

Mr. FORSYTHE. Thank you, Mr. Chairman.

I want to apologize for being so late, but we are trying to find out what is happening on the floor with respect to legislation with which we are involved. I apologize to the witnesses for not having been able to hear their testimony, but I think you have some idea where I stand on the issue of user fees.

I do have great concern about the research-cost problem and am very interested in seeing that it be coordinated over a broader range of interests than just between the Federal agencies. I think

there are a lot of people outside the Federal Government who are very concerned about ocean dumping research and who perhaps have the tools and availability of personnel to do some coordinated research, particularly as it relates to the criteria for sludge dumping.

User fees for the dumping of sewage sludge might be all right, but not if the funds collected are used for the designation of dredged material sites. You probably can't get the same fees from the dredgers and, if this is the case, in my view it may be that I will want to take the position of no user fees at all if we are not going to be able to coordinate the research and monitoring efforts. I understand that my proposal for a commission may have only one supporter out of all the members who were interested. Fortunately it is my colleague from New Jersey who is interested in this approach. The Commission is structured after the Marine Mammal Commission but, more importantly, would coordinate research. It wouldn't draw operating funds from the U.S. taxpayers in general but would collect the money from the municipalities that are involved in the disposal of their sewage sludge through ocean dumping.

However, the problem of waste disposal is much broader than just sewage sludge disposal.

It may well be that sewage sludge is only a minor problem in terms of what is actually going into the oceans.

Do I understand you to say that you do not support the assessment of fees for your research and development activities?

Mr. EIDSNESS. Congressman, if the question is, should the fee mechanism be used to cover research as opposed to some other approach to cover the cost of research, I believe, as I tried to state clearly earlier, that the EPA would not support using a user fee mechanism as the basis for supporting the research programs that are needed in this area, for a couple of reasons.

One is the question of stability—the adequacy of the program to generate revenues to do what is needed in the research area, and whether that can be really accomplished through a fee system where there is some variability as to what kind of revenues you are going to generate.

But more important, I think, is the issue of the concept that the general public, the beneficiary, ought to be supporting a research through the general fund, through general taxes perhaps, which is institutionalized now in EPA's budget process, for example.

Mr. FORSYTHE. Aren't you talking about taxing the same people, whether it be through the Federal Government, local government, or some other public body? There is some industrial activity but that is the smallest part of the ocean pollution problem. Public dredging is done with public funds, port authority funds, city or State funds. When you get into the sewage sludge problem, here again I don't believe I know of a single private for-profit operator of a sewage treatment plant. They are public bodies and the people are paying for that service through one mechanism or another.

So we are talking about the same people, aren't we?

Mr. EIDSNESS. Well, yes and no. If the people of city *x* are paying a user fee to cover the cost of ocean dumping for costs directly related to that dumping operation, designating the site, monitoring

the site and so forth, then certainly they are very directly bearing that cost, but if they are also bearing the cost of research which is broadly applicable to a whole ocean, the Atlantic Ocean coastline or the Gulf of Mexico, then they are perhaps bearing a greater burden of expense for that kind of activity than really can be logically allocated back to them.

That says to me: Who else can pay? And who else might pay would be the beneficiaries, the general public, the taxpayers, who are not only that town but also the rest of the Nation, who could bear the expense of the kinds of activities that benefit us all.

Mr. FORSYTHE. What is going to happen in terms of these very same costs in terms of the land disposal alternatives? Will they also be assessed fees for their operations?

Mr. EIDSNES. That is an excellent question and this administration is moving forward to develop a fee system for other environmental media. I know we are asking for clear authority under the Clean Water Act this year for a fee system. We are working in other areas as well and we need to look clearly at all of these media in terms of any kind of a user system, so whatever is instituted over time makes some sense, it hangs together.

Mr. FORSYTHE. Maybe so far as this legislation is concerned, the whole idea should be put aside until we can find a more comprehensive plan for assessing user fees. While this committee wouldn't have sole jurisdiction over all of the various types of fees which is certainly one of our problems, at least we could through joint referral, look at the same package. This could have a lot of merit in view of where we stand now.

Mr. EIDSNES. I think that does, Congressman.

Mr. FORSYTHE. Are you moving somewhere where a proposal might be forthcoming?

Mr. EIDSNES. I don't think there is a comprehensive effort underway within EPA right now. I can't speak for the administration wholly on this issue to develop a package for fee systems for all environmental media at this time.

Mr. FORSYTHE. It would certainly start with EPA, wouldn't it? Aren't you involved in all areas of disposal?

Mr. EIDSNES. Yes, we would be involved in it but you know there is an example where other agencies have a direct involvement in the program. It is not just EPA. I should also point out that many States are now instituting permit fee systems for the NPDES discharge system under the Clean Water Act. For example, Colorado has one and they have wrestled with the same kind of issues where you are on this one.

Mr. FORSYTHE. I have a note that my 5 minutes have expired.

Thank you.

Mr. D'AMOURS. Mr. Scheuer, have you any questions?

Mr. SCHEUER. Let me say I appreciate very much the invitation to join you today and appreciate your many past courtesies.

I have a statement which I will offer for the record.

Mr. D'AMOURS. Without objection, it will be included in the record at this point.

[The statement of Mr. Scheuer follows:]

STATEMENT OF HON. JAMES H. SCHEUER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Thank you, Mr. D'Amours.

First, let me say that it is a pleasure to share this podium with you on an issue of mutual concern to our Subcommittees.

I hope that this will be the first of many occasions where we work together on topics of common interest—topics such as acid rain, aquaculture, and a NOAA organic act.

Our Subcommittee on Science and Technology—the Subcommittee on Natural Resources, Agriculture Research, and Environment—has examined the topics of sewage sludge disposal and ocean pollution research for parts of at least five hearings during the 97th congress.

We have found that there is an alarming lack of data comparing the environmental effects of sludge disposal by ocean dumping, incineration, or landfill disposal.

NOAA has testified that in the New York Bight, approximately 5 percent of the pollutant load is contributed by disposal of sewage sludge.

However, because of inadequacies in the research base, it is not possible to determine whether land or ocean disposal of a given waste would be more threatening to human health and the environment.

Our subcommittee also concludes that in light of increasing pressures to dump wastes of all kinds in the oceans, the fiscal year 1983 budget requests of both NOAA and EPA for ocean pollution research were totally inadequate.

The Science Committee has reported authorization bills for both of these agencies which would nearly double the Administration request for ocean pollution research funding.

Whether or not these funds are ultimately provided to NOAA and EPA by Congress, it is apparent that in a period of budgetary restraint, we have to look at all possible options for funding activities which are clearly in the public interest.

That is why I congratulate you, Mr. Chairman for developing the proposals that we are considering today.

The Ocean Waste management commission seems to be an effective and equitable mechanism for collecting additional research fees and for forging closer cooperative links between the relevant Federal agencies and the affected municipalities.

I do have some questions that I will pursue today regarding the allocation of user fees and the extent of the government activities which should be funded by the users, but I think that the concept itself is meritorious, and I look forward to hearing the testimony of our witnesses.

Mr. SCHEUER. Let me ask you a few questions about EPA and NOAA, whose research activities come under the jurisdiction of the Science Subcommittee that I chair.

First, if I understand the testimony, you would favor collection of user fees to cover the cost of permanent operations, permit processing, site designation and limited monitoring. But I take it you oppose fees to fund research programs. Perhaps you would break down your fiscal year 1983 request for activities which you are recommending be covered by these user fees?

Mr. EIDNESS. I would have to get back to you, Congressman, on the record. I think that is an excellent proposal because in my testimony I tried to point out the importance of the question of auditability and what is the basis for cost, what costs are eligible for application. When you are in local government setting a user fee system for water sewer treatment, you go to your budget and mark those line items that you can allocate out for that particular function. That would be a good step to take as a way of getting into the specifics on this.

We will get back to you on this. It would not be in the order of a formal proposal. It would be basically initial thoughts we might have on that, but it would have to be subjected to a considerable amount of debate within the agency, with the administration, you, and the public. Please accept our response in that light.

Mr. D'AMOURS. I am sure we will have permission to hold the record open until your responses come through.

Mr. SCHEUER. In addition, I would like to know what is the cost of the site designation proposed to be covered by the user fees and how you would propose the costs for site designations be allocated among users?

Mr. EIDSNESS. I think we could develop some general approaches, formulas for allocation and some strawman-type cost scenarios to get a feel, and that is exactly what we proposed in my testimony, Congressman, approaches we would go through under rulemaking to get to the very specifics. It would really take a long time to come to a specific closure on this.

Mr. SCHEUER. Why don't I go through my questions? Are we under the 5-minute rule, Mr. Chairman?

Mr. D'AMOURS. In a manner of speaking, yes.

Mr. SCHEUER. I want to be sure I get my questions in because most of them you are going to respond to in writing anyway and I don't want to exhaust my time before I have had a chance to put the questions.

With your forbearance, I will ask the questions and it will be sort of like a Mark Twain novel in four volumes translated into German, where you don't get to the verbs until the last volume.

H.R. 6113 specifies that EPA collect a special fee to cover the reasonable costs to be incurred by the Administrator in carrying out the periodic monitoring of the site. I take it you subscribe to this kind of monitoring?

Mr. EIDSNESS. In general, yes.

Mr. SCHEUER. How do you estimate the costs of such monitoring to the dumper? You don't have to give me the answer now.

Should the monitoring be done at all sites?

Do you also support the user fees for both sludge dumping and industrial dumping?

Do you support imposition of these user fees on dredged spoils? If you don't, tell us why you don't.

Now, as far as EPA is concerned, does EPA have the ability to carry out its programmatic responsibilities in ocean dumping with your current budget request? We have found the EPA current request for research to be grossly inadequate. We would like your view on whether you can carry out ocean dumping activities with your present budget or whether user fees would be required to maintain those programs in permitting, in site designation, in research, and in monitoring.

In other words, did your budget request contemplate or anticipate the addition of user fees for your budget in order to carry on these activities?

Mr. EIDSNESS. Not for fiscal year 1983, no, sir.

Mr. SCHEUER. When did your Agency decide to support user fees? I don't have to have the answer now. I just want to get all my questions in.

Mr. EIDSNESS. I like this line of questioning, Congressman, where I don't have to answer in public.

I take that back.

Mr. SCHEUER. If we were not working under a 5-minute rule, I would follow a more traditional line.

The ocean dumping law provides a scientific and regulatory framework for evaluating the comparative environmental effects of waste disposal in various media. As a matter of fact, that is what the Federal district court last fall mandated be done, because the Federal district court said that you couldn't establish when ocean dumping was unreasonable unless you knew what the comparative costs and the comparatively environmentally degrading effects were from other kinds of solid and human waste disposal processes, such as incineration and landfill.

If user fees in one medium are to be set at high levels, then user fees become a mechanism for shifting disposal away from that medium. The medium which you are prejudicing by the high fee structure could very well be the least environmentally degrading method of disposing of sewage sludge available.

So the question is, what level of user fees would be sufficient to shift sewage sludge disposal away from the ocean and toward other media such as incineration or landfill? Would this be a rational way to utilize user fees? Would the application of user fees thwart or impede our effort to get sewage sludge disposers to seek the least environmentally degrading method of sewage sludge disposal?

Do you see what I mean? Is it upsetting the formal array of market forces, particularly the concern to seek out the least environmentally degrading way of disposing of sewage sludge and maintain this user fee structure for us to do things that were unnecessarily degrading to the environment?

Now, I have asked all my questions and would be happy to have you proceed to speak to them.

My 5 minutes have expired. Thank you very much, Mr. Chairman.

Mr. D'AMOURS. You are welcome, Mr. Scheuer.

[The following was received for the record:]

QUESTIONS OF MR. SCHEUER AND ANSWERED BY EPA

Question. If I understand you correctly, you favor collection of user fees to cover the costs of permit processing, site designation, and limited monitoring, but oppose fees to fund research programs.

a. Please break down your fiscal year 1983 budget request for activities that you are recommending be covered by user fees. Specifically,

What is the cost for site designations proposed to be covered by user fees?

What is the cost for permit processing?

How would you propose that cost for site designation allocated among users?

Answer. The Agency's proposed user fee system would seek to recover those costs directly related to the administration of services rendered to permittees. These functions include permit processing, site designation, and those monitoring activities conducted in direct support of the operating, as opposed to general research, program.

Site designation includes the tasks of site surveys, environmental impact assessment preparation, and actual designation proceedings. The fiscal year 1983 budget request is approximately \$2.5 million for site designation and monitoring activities. Approximately half of allocated funds will be used to designate dredged material disposal sites for use by the Corps of Engineers. The Agency does not propose to recoup any funds expended in support of the COE dredged material disposal program through user fees; these activities would continue to be funded through general revenues.

A breakdown of total costs for site designation and monitoring activities follows: Vessel Operation, \$800,000; Scientific Party, \$400,000; Laboratory Analysis, \$900,000; Report Preparation, \$400,000.

The average cost of permit processing is \$8,000. The total cost to the Agency of permit processing is dependent on the number of permits processed in the fiscal year.

One possible option for cost recovery would be that costs for all site designation activities for section 102 permits be allocated among all section 102 permittees according to tonnage dumped. Projected annual costs would be used to calculate the fee at the beginning of each fiscal year. Sites could amortize over a period of time, such as 5 years, to make the annual fee more realistic and less burdensome.

Question. H.R. 6113 specifies that EPA collect a special fee to cover the "reasonable costs to be incurred by the administrator in carrying out the periodic monitoring of the site . . ."

- a. Would you subscribe to this type of monitoring fee?
- b. What do you estimate to be the costs of such monitoring to the dumpers?
- c. Should this monitoring be done at all sites? With what frequency?

Answer. (a) We would subscribe to a user fee which covers the costs of compliance monitoring.

(b) EPA's fiscal year 1983 budget request includes approximately \$1.25 million for monitoring activities. The Coast Guard currently spends roughly \$350,000 annually on monitoring. Of course, this is in addition to the compliance monitoring required of the permittees as a condition of the permit. This totals \$1.6 million which would be allocated to permittees in accordance with a formula, perhaps on the basis of disposed tonnage.

(c) Some monitoring activity should be conducted at all sites at which ocean dumping occurs. However, the type and frequency of monitoring required varies greatly with the type of waste dumped, the amounts dumped, and the type of site used. Appropriate monitoring programs must be developed on a site-specific basis. In general monitoring frequency is completed seasonally, quarterly in northern regions and semi-annually in southern regions and the Gulf of Mexico.

Question. You support the concept of user fees for sludge dumpers.

- a. Do you also support these user fees for industrial dumpers?

b. Do you support imposition of these user fees on dumpers of dredged spoils? If not, why not?

Answer. (a) Yes, we support the concept of user fees for all section 102 permittees, including industrial dumpers.

(b) The Corps of Engineers disposes the majority (95 percent) of dredged material disposed of in the ocean. Additional dredged material is disposed of by other federal agencies, e.g. the Department of the Navy. We do not believe that a fee should be charged to another federal agency.

We understand that the Corps is reviewing the advisability of charging fees to non-federal dumpers of dredged material and we will defer to their determination of this issue.

Question. Do you have the ability to carry out your programmatic responsibilities in ocean dumping with your current budget request, or would user fees be required to maintain your programs in permitting, site designation, and monitoring? (i.e., did your budget request anticipate user fees? When did your agency decide to support user fees?)

Answer. We have the ability to carry out our programmatic responsibilities in ocean dumping with the current budget request. That request reflects our costs for the fiscal year 1983. The request was not based on an anticipated increase in permit processing fees or the establishment of user fees. The fees would be used to recover the costs which comprise the ocean dumping program (exclusive of research). Once Congress authorizes a fee system, the Agency will develop the administrative and regulatory resources necessary to implement it.

The Agency has been reviewing the utility and desirability of user fees for quite some time. The result of that analysis, favoring the institution of user fees, was first stated publicly in EPA's testimony before the Merchant and Fisheries Committee, Subcommittees on Oceanography and on Fisheries and Wildlife Conservation and the Environment, on March 18, 1982.

Question. The Ocean Dumping Act provides a scientific and regulatory framework for evaluating the comparative environmental effects of waste disposal in various media. Obviously, if user fees in one media are set at high enough levels, user fees become a mechanism for shifting disposal away from that media.

(a) What level of user fees would be sufficient to shift sewage sludge disposal away from the ocean and toward other media? Would this be a rational way to utilize user fees?

Answer. It is not our intent to use the fee system as a means to discourage or encourage any disposal alternative. The purpose of the system is to recoup funds which the Agency expends for program activities in direct support of permittees.

It is not really possible to accurately determine a level of costs which would act to shift municipal sludge disposal away from the ocean and toward other media. This is because the costs of ocean dumping vary significantly from dumper to dumper and from site to site, and the costs of other disposal methods vary greatly from option to option and from dumper to dumper.

In general, however, it can be said that the costs of ocean dumping are lower than the costs of other alternatives, and an ocean dumping user fee would have to be very high in order to shift the economic balance. For example, New York City disposes of about 3.5 million wet tons of municipal sludge annually. Dumping this sludge at the 12 mile site costs the City about \$1.5 million annually, roughly \$1.30/ton. This compares to a user fee of roughly \$14.30/ton for land based alternatives. Thus, it would take a user fee of \$13.00/ton to equalize the costs at the 12 mile site with land disposal.

Mr. D'AMOURS. Mr. Carney.

Mr. CARNEY. I have one question of the Chair. As a member of all three subcommittees that are conducting the hearings today, do I get 15 minutes?

Mr. D'AMOURS. The answer is no.

Mr. CARNEY. Thank you, Mr. Chairman.

I think the chairman, Mr. Scheuer, brings out a very important point there with user fees. If there is an inequity between types of methods to dispose of sewage sludge, the Federal Government in a very roundabout way would be forcing one media to be used and perhaps the followup support of the communities and Members of Congress as well, and I think we have to be very careful with that.

I would like to pursue some questions along the line of monitoring and that is, I would like to know how specifically is it divided up between EPA and NOAA? That is, monitoring of the 102 permit?

Mr. EIDSNESS. Currently, how specifically? The two agencies represented here do environmental monitoring.

Mr. CARNEY. Who would do the research activity out there?

Mr. EIDSNESS. Right now, EPA is conducting research, so is NOAA, and apparently the Corps of Engineers, although I can't speak to what this research is at the present time.

Mr. SWANSON. If I might add, EPA and NOAA have divided up their roles with respect to research. We have done this, I think, rather intelligently. EPA's research is primarily in the area of aquatic toxicology in laboratory studies, whereas NOAA primarily deals with oceanic processes and environmental research and looking for effects actually occurring in the marine environment.

Mr. CARNEY. I am glad you brought that out. The effect would be the responsibility of NOAA on the marine environment. It was my understanding at a Public Works Committee hearing, EPA claimed that the dumping of sewage sludge in the New York Bight would have no effect on the New York Bight. I would have to think that that would be something officially coming out of NOAA, because they would be responsible for the R&D in that area. Would you like to comment on that, sir?

Mr. EIDSNESS. I think the Captain might be the better one. I think you are right, that NOAA was basically doing the monitoring research in much of that area.

Mr. SWANSON. In this particular case, the EPA testimony was referring to work that we had done and supplied to the EPA.

Mr. CARNEY. Then, Captain, would you agree with what EPA said at that Public Works Committee hearing, that the continuing of dumping sewage and sludge in the bight would have no effect on human health?

Mr. SWANSON. Our position on the disposal of sewage sludge at the 12-mile site is that it has caused considerable degradation in the area of about 240 square kilometers on the bottom; that it does cause some shellfish resources to be lost; but that in the vicinity of the beaches and so forth, sewage sludge cannot be blamed for causing disease or poor water quality.

Another fact that we have provided to the EPA, and I believe that was testified to last week, is that there does appear to be a steady state situation in the New York Bight when it comes to contaminants. Right now, throughout the bight apex, it is not serving as a sink. There is an input of material going into the system and there is an export of material from the system, and there is a general residue, but over the last 10 years it does not seem to be either expanding in geographic scope or that the concentrations of materials in the bottom sediments are getting any higher.

Mr. CARNEY. I would like to switch back to questioning EPA.

Mr. SCHEUER. Would my colleague yield on this point?

Mr. CARNEY. I would be more than glad to yield.

Mr. SCHEUER. It is my understanding from figures that NOAA gave us that approximately 95 percent of the degrading impact in the New York Bight comes from activities and phenomena other than sewage sludge disposal. Is that an incorrect figure?

Mr. SWANSON. The numbers we have typically used are that sewage sludge contributes in a range between 1 and 10 percent of most contaminants in the New York Bight. PCB's are an exception.

Mr. SCHEUER. Then 5 percent would form the middle range. I believe that EPA also testified before our committee that approximately 5 percent of all of the environmentally degrading effects were caused by sewage sludge.

Now, would you say our knowledge is sufficiently refined at this point such that you could tell us what the change in environmental degradation would be, if that 5 percent or 1 to 10 percent, however you want to characterize it, of degradation that comes from sewage sludge disposal were to cease tomorrow morning at 9 o'clock? Do you have a computer model that could tell us what the impact on human health and the ocean environment would be if sewage sludge comprising that roughly 5 percent were to stop tomorrow morning at 9 o'clock?

Mr. SWANSON. Our knowledge of ecological systems is not sufficient to give you a quantitative answer to that question. We have tried to deal with it in a qualitative sense and have made estimates of what would occur if sewage sludge dumping did cease, and our estimates are that there would be a marginal increase in environmental quality in the New York Bight area.

Mr. SCHEUER. Could you give us what information you know that would help us fine tune our thinking on exactly what that marginal increase would be?

Mr. SWANSON. We will supply it for the record.

[The information follows:]

SEWAGE SLUDGE DUMPING IN THE NEW YORK BIGHT APEX:
A COMPARISON WITH OTHER PROPOSED OCEAN DUMPSITES

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G. Mayer³, H. Stanford³, E. Erdheim⁴, J.L. Verber⁵ (In Press).

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Sewage Sludge Dumping in the New York Bight Apex:
A Comparison with Other Proposed Ocean Dumpsites

ABSTRACT

In 1977, the Marine Protection, Research and Sanctuaries Act (MPRSA), Public Law 92-532 was amended so that ocean dumping of "harmful" sewage sludge would not be allowed after December 31, 1981. "Harmful" sewage sludge is defined in the Act as sludge which "unreasonably" degrades the marine environment. The Environmental Protection Agency (EPA) interpreted this requirement to ban the dumping of all sewage sludge.

Recently, however, the U.S. District Court for the Southern District of New York ruled in The City of New York v. EPA that EPA's conclusive presumption that sewage sludge that is deemed harmful to the marine environment pursuant to EPA regulations will unreasonably degrade the environment is arbitrary and capricious and inconsistent with the MPRSA. The Court concluded that New York City's dumping of sewage sludge in the New York Bight could not be prohibited pursuant to this statutory bar until EPA allowed New York City the opportunity to show that its dumping would not unreasonably degrade the environment and EPA ruled on this claim pursuant to the relevant statutory factors of the MPRSA, including alternative disposal options, the impact of the dumping at the dumpsite and the need for the dumping.

This paper discusses man's impact on the New York Bight and the degree to which these impacts are associated with sewage sludge dumping. The paper also contains an assessment of potential benefits if ocean dumping of sewage sludge at the 12-Mile New York Bight site is terminated.

Two ocean dumping sites have been suggested as alternatives to the 12-Mile site and this paper compares the impact of dumping sewage sludge at these sites to the 12-Mile site. The 65-Mile site is located on the

continental shelf. This site, considered a semi-dispersive site, has been examined as a possible emergency dumpsite. However, no dumping has ever occurred at this location. The 106-Mile deep water dumpsite is a dispersive site which is now used as an industrial waste dumpsite. Projections of sludge dispersion are used to assess potential impacts at this site.

After examining the various factors of sewage sludge dumping at each of the three sites, the authors recommend continued use of the existing 12-Mile dumpsite until a regional waste disposal management strategy can be developed. Implementing either alternative by itself will yield little improvement to the New York Bight. If there is to be significant control of other contaminant inputs to the Bight, the 106-Mile site would be recommended for disposal. We do not evaluate any of these three sites against land or atmospheric disposal options which might be considered by EPA and New York City pursuant to the requirements of the MPRSA.

1. INTRODUCTION

In 1977, the Marine Protection, Research, and Sanctuaries Act (Public Law 92-532, commonly referred to as the Ocean Dumping Act) was amended so that ocean dumping of "harmful" sewage sludge would not be allowed after December 31, 1981. This Federal law defines "harmful" sewage sludge to be "... any solid, semisolid 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" (33 U.S.C. 1412a). The Environmental Protection Agency (EPA) interpreted this requirement to prohibit all ocean dumping of sewage sludge. This interpretation was challenged by the City of New York in Federal court (The City of New York v. the EPA).

New York City contended that the mandated 1981 deadline for ocean dumping of "harmful" sewage sludges should not apply to its sewage sludge even though the sludge was found to be harmful to the marine environment pursuant to EPA Ocean Dumping Criteria (Federal Register, 1977), because the sewage sludge being dumped did not "unreasonably degrade" the marine environment of the New York bight. The City argued that in determining whether ocean dumping was unreasonable, EPA must evaluate alternatives and the effects of dumping at the dumpsite. Also, the City believes that the land-based alternatives are less socially and economically desirable than ocean dumping. The City contends that Congress defined "harmful" with the intent that the definition should be used in the development of criteria for ocean dumping sewage sludge and that EPA had failed to do this. The U.S. District Court-(Southern District of New York) ruled in New York City's favor. The decision on the case was that the 1981 deadline on ocean dumping of "harmful" sewage sludge would remain intact. However, the decision allows the continued ocean dumping of sewage sludge until there is an evaluation of whether this sewage sludge will cause "unreasonable" degradation in the context of all relevant environmental, social, and economic factors provided in Section 102 of the Act. Kamlet's (1981a) review of the case has identified several additional legal questions.

Despite the environmental legislation passed during the 1970s, a comprehensive waste management program for the U.S. does not exist. It is now apparent that environmental management is often disjointed because most of the existing laws deal with regulation of disposal in only one medium, i.e., air, water, or land. Few of the recent laws specify an integrated approach to dealing with environmental problems. The sewage sludge issue in New York-New Jersey (as elsewhere) requires an integrated multi-medium approach. A second reason for our present disjointed environmental management is that environmental legislation and regulation commonly address only one class of pollutants, as if that class of pollutants could be managed independently of other anthropogenic impacts. Since sewage sludge is not the dominant pollutant source in the New York Bight, its rational management must fully consider the other waste sources to the Bight (Stanford et al., 1981). During recent examinations of appropriate land-based alternatives for sewage sludge disposal, several probable environmental, technical, and economic problems have been identified. It even seems apparent that, for some regions of the United States, these land-based disposal problems are at least as great as those resulting from ocean dumping.

There is a general consensus among resource managers that, over the long term, strategies for management of all waste materials must emphasize control at the source and recycling, thereby minimizing disposal (National Academy of Sciences, 1976; U.S. General Accounting Office, 1977; National Advisory Committee on Oceans and Atmosphere [NACOA], 1981). The NACOA (1981) special report on the role of the ocean in a waste management strategy strongly recommends that: "... waste should be disposed of in the manner and medium that minimizes the risk to human health and the environment, and at a price that this nation is prepared to pay." NACOA delineates how the environmental legislation of the 1970s resulted in a disjointed process of waste management by medium and type of waste. For example, the Ocean Dumping Act regulates disposal from ships and barges at sea, while pipe discharges (outfalls) into the nation's waterways and oceans are controlled under the Clean Water Act. The incineration of wastes is regulated by the Clean Air Act when on land and by the Ocean

Dumping Act when at sea. NACOA concluded that waste disposal regulated by this medium-by-medium approach (land, air, or water) has been responsible for shifting the risk posed by individual classes of wastes to the medium of least regulation rather than to the medium of least risk. The existing approach, through which the importance of possible impacts on land, air, water, people, and living and non-living resources are assessed separately by medium and not compared, is not working well and does not promise better results in the future.

Valid resource management must not only review the major categories of alternatives for sewage sludge management (e.g., land application, incineration, ocean dumping, etc.), but has to critically review each option in depth for suboptions. For instance, nearshore ocean dumping may be economically more advantageous than offshore dumping, however, the offshore environmental advantages may outweigh inshore economic advantages. It is our belief, that in many cases, the ocean has been used and may unfortunately continue to be as the waste disposal medium of last resort. Therefore, there is a need and responsibility, to predict the potential effects of using the ocean for waste disposal. National marine pollution programs must transform from an archaeological approach to an anticipatory approach--programs, that influence the future instead of documenting the past. As with other waste material control strategies, sewage sludge management must emphasize control of the type and volume of pollutants entering the sludge from other sources, and their subsequent recycling at the source.

In the past five years, more information has become available on both environmental effects of sewage sludge disposal and on alternatives to ocean dumping. Additional information is also available on the integrated effects of pollution and natural factors in other coastal environments. Some changes in pollution rates of the Bight have also occurred recently; for instance, greater amounts of sewage sludge are being dumped and even greater rates of sludge production are projected in the future. Recent findings in these areas are incorporated in this assessment.

Consequently, we have written this paper to provide an analysis of the problems associated with marine waste disposal as it pertains to sewage sludge in the New York Bight, the only area in the United States where sewage sludge is ocean dumped as regulated under the Ocean Dumping Act. Three marine waste disposal alternatives for ocean dumping sewage sludge are reviewed. These encompass a shallow-water site, a continental shelf site, and a deepwater site. Specifically these are the existing 12-Mile site in the New York Bight apex, the 65-Mile "alternative" site, and the 106-Mile site, respectively.

2. TECHNICAL CONSIDERATIONS

The New York Bight apex (Figure 1) is one of the most severely degraded, open coastal areas in the world. Numerous sources of pollution contribute to this degradation, including atmospheric inputs, sewage treatment plant effluent, urban runoff, and ocean dumping of municipal waste (sewage sludge), industrial wastes, and dredged material.

2.1 Cumulative Impacts of Society's Use of the New York Bight

Degradation:

Bathing beaches, particularly those bordering the apex, are physically degraded and frequently closed by the continuing occurrence of persistent, floatable materials traced to combined sewer outfalls, wastewater discharges, solid waste transfer operations, and other sources (Swanson et al., 1978). Turbidity and surface slicks, caused in part by human discharges, degrade Bight waters for recreational boaters, sportsfishermen, bathers, and others.

Disease Problems:

Estimates of the incidence of gastrointestinal symptoms among bathing beach users in the New York Bight and adjacent waters reflects the release of pathogens into these areas. For example, Cabelli et al. (1976) and O'Connor et al. (in press a) reported

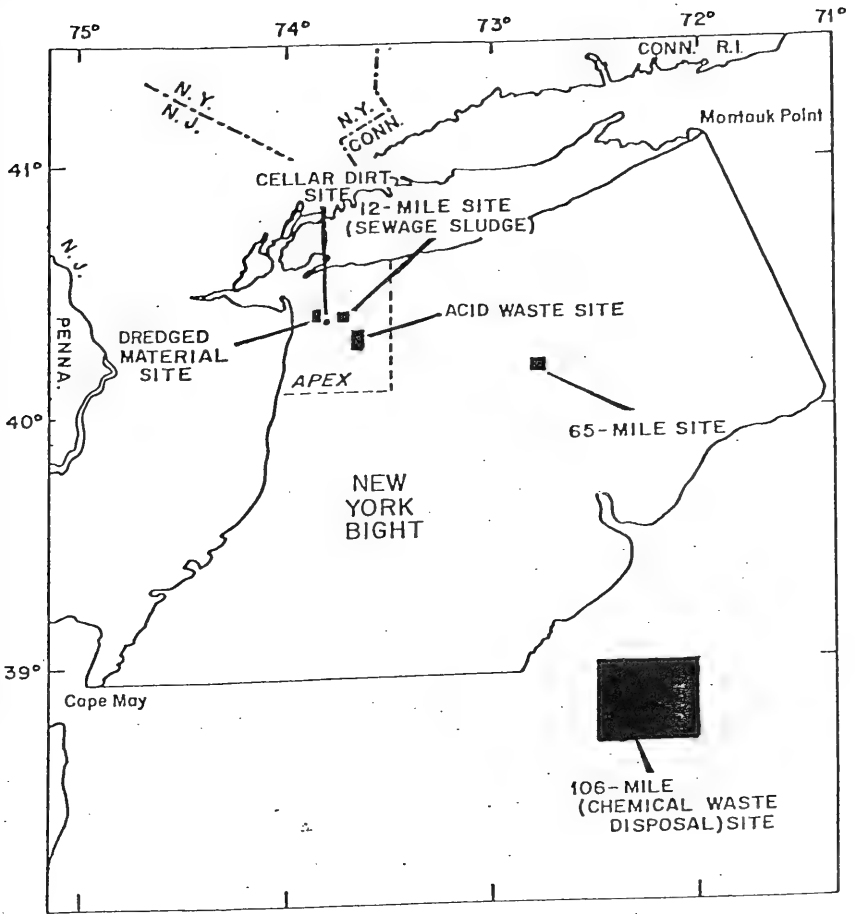


Figure 1. DUMPSITES

significantly higher incidences of well documented gastrointestinal symptoms among swimmers at Coney Island (a beach adjacent to the mouth of the Hudson-Raritan estuary) than at Rockaway's Riis Park (a beach bordering the apex).

Incidences of several fish and shellfish diseases (i.e., fin erosion in flatfish and black gill in crabs and lobsters) are common, particularly in the apex. Most of the diseases are circumstantially attributable to pollutant stress or degraded environments. The full impact of these diseases on sport and commercial stocks and on ecosystem function are largely unknown (Sawyer et al. 1979, Sawyer, in press; Murchelano and Ziskowski, 1976, in press; Sherwood, in press).

Contaminant Levels:

As a result of waste loading, elevated concentrations of several contaminants are found in the waters, suspended materials, and sediments of the Bight (Sindermann, 1980). Most toxic materials discharged from the metropolitan area (mercury, lead, cadmium, and other toxic metals, synthetic organic compounds, and petroleum hydrocarbons) tend to accumulate temporarily in fine sediments of the apex, only to be resuspended, primarily during storms, and dispersed widely--even beyond the Bight (Freeland et al., 1979). Cadmium concentrations in apex waters are typically around 0.5 ug/l (Segar and Cantillo, 1976). Lead concentrations in apex waters were less than 3.0 ug/l (Alexander and Alexander, 1977). While present knowledge is unsatisfactory for assessing ecological effects of lead in marine waters, the technical literature indicates that lead concentrations of the order of 1 ug/l should be scrutinized for toxicity. PCB concentrations in apex waters immediately following dumping may reach 0.04 ug/l (Boehm, 1981). The concentrations are on the same order of magnitude as the EPA marine water quality criterion (0.030 ug/l, the chronic-concentration never to be exceeded as a 24-hour average, U.S. Federal Register, 1980) and are a cause for concern. Several recent studies have implicated sewage sludge

and dredged material dumping as principal contributors to elevated PCB levels in the sediments of the Bight (West and Hatcher, 1980; O'Connor et al., in press b; ERCO, 1981). MacLeod et al. (1981) reported PCB levels of up to 1500 ppb in the sediments of the Christiaensen Basin, a topographic low that lies between the sewage sludge and dredge materials dumpsites. This is in contrast to levels as low as 0.4 ppb in sediments from the outer Bight (MacLeod, 1981). Aromatic petroleum hydrocarbon concentrations in selected apex sediments and perhaps in waters are sufficiently high to cause suspicion of ecological damage, particularly in benthic communities (Anderson, in press; Michael, in press). Several other specific indicators of sewage-derived material (e.g., coprostanol) are also concentrated in topographic lows of the Bight where fine sediments accumulate (Hatcher, et al., 1977; Hatcher and McGillivay, 1979).

Elevated concentrations of several toxic materials are also found in Bight organisms, particularly sedentary ones, with these concentrations increasing as one approaches the apex and New York Harbor from offshore (see for example, Hall et al, 1978; O'Connor and Rachlin, in press; O'Connor et al., in press b). Similar trends have been observed in organisms from the coastal waters of the Southern California Bight (Young, in press a, b).

Large nutrient and organic carbon additions to coastal waters from waste disposal activities increase the likelihood and severity of ecologically damaging declines in dissolved oxygen concentration. Such additions did not cause but may have exacerbated the 1976 anoxia event in the New York Bight, a major economic setback to the New Jersey commercial and sportfishing industries (Swanson and Sindermann, 1979).

Biological Effects:

Viable strains of bacteria, resistant to normally-toxic concentrations of metals and antibiotics, are found in the apex (Koditschek and Guyre, 1974; Timoney et al., 1978; Litchfield et al., in press).

Resistant populations are correlated with the presence of elevated levels of toxic metals (e.g., mercury) in sediments.

Commercial shellfishing has been closed in the inner Bight in accordance with public health criteria which protect against ingestion of pathogens accumulated by shellfish (Verber, 1976). Most fishes and shellfish of commercial significance have been overexploited (Edwards, 1976), resulting in marked declines in stocks. Some have begun to respond to harvest limitations imposed during the 1970's (Grosline and Azarovitz, in press).

The combination of organic enrichment and pollutant effects have led to obvious degradation of the natural benthic invertebrate communities over approximately 240 km² (approximately 15%) of the apex (Boesch, in press).

2.2. Contaminant Sources to the New York Bight Apex

Despite abundant information, misperceptions remain as to the relative contributions of major waste sources to the New York Bight apex. The single largest pollutant source is the Hudson River plume. This bears materials washed into the estuary and apex from upstream, as well as runoff, domestic wastes, and industrial wastes discharged or spilled into the estuary by the 16 million inhabitants of the greater New York-New Jersey metropolitan area. Although much of the wastes discharged into the estuary are flushed into the apex, a portion becomes associated with estuarine sediments. These materials contribute to the pollution of the Bight when contaminated sediments are removed from the estuary by dredging and are disposed of at the dredged material dumpsite in the apex (Figure 1).

The ocean disposal of dredged materials, sewage sludge and industrial wastes represents a second major class of pollution inputs to the Bight. The remaining sources, atmospheric input and direct discharge from coastal communities, provide relatively minor quantities of most pollutants. Tables 1-3 summarize the contributions made by each of these sources to the pollution of the Bight.

Table 1. Total mass loads into the New York Bight.
 After Mueller et al. (1976). Direct Bight includes
 inputs from barge dumping and the atmosphere.

| Parameter | Mass load metric tons/day | Percentage contribution by location | | | |
|-------------------------------------|------------------------------|-------------------------------------|---------|---------------|----------------|
| | | Direct Bight | Estuary | Coastal Zone | |
| | | | | New Jersey | Long Island |
| FLOW, cfs | 82,700 | 59 | 36 | 4 | 1 |
| SS | 24,000 | 68 | 31 | 0.6 | 0.1 |
| ALK | 5,100 | 1 | 96 | 2 | 1 |
| BOD ₅ | 2,100 | 30 | 67 | 3 | 0.5 |
| COD ₅ | 10,000 | 42 | 48 | 9 | 0.5 |
| TOC | 2,600 | 37 | 58 | 4 | 0.6 |
| MBAS | 59 | | 95 | 4 | 0.5 |
| O&G | 870 | 38 | 53 | 9 | 0.6 |
| NH ₃ -N | 210 | 28 | 67 | 3 | 2 |
| ORG-N | 190 | 27 | 68 | 3 | 2 |
| TKN | 400 | 27 | 68 | 3 | 2 |
| NO ₂ +NO ₃ -N | 120 | 33 | 55 | 10 | 2 |
| TOTAL-N | 520 | 29 | 65 | 4 | 2 |
| ORTHO-P | 51 | 1 | 91 | 3 | 5 |
| TOTAL-P | 138 | 51 | 45 | 2 | 2 |
| Cd | 2.4 | 84 | 15 | 0.5 | 0.07 |
| Cr | 5.0 | 51 | 44 | 0.6 | 4 |
| Cu | 13.8 | 54 | 45 | 0.9 | 0.2 |
| Fe | 230 | 82 | 16 | 2 | 0.2 |
| Hg | 0.30 | 9 | 85 | 6 | 0.6 |
| Pb | 12.7 | 53 | 46 | 0.5 | 0.2 |
| Zn | 33 | 47 | 52 | 1 | 0.3 |
| F. Coli ^a winter | 5.6x10 ⁷ | <0.01 | 100 | 0.2 | <0.001 |
| summer | 4.9x10 ⁷ | <0.01 | 100 | 0.2 | <0.001 |
| T. Coli ^a winter | 21x10 ⁷ | <0.01 | 100 | 0.1 | <0.001 |
| summer | 11x10 ⁷ | <0.01 | 100 | 0.2 | <0.001 |

a. Coliform load [=] 10¹⁰ org/day.

Table 2. Total waste mass loads to the New York Bight (from Mueller et al., 1976). The river runoff is for that portion of the river-estuary system that is gauged for flow.

| Parameter | Percentage Contribution | | | | | | |
|-------------------------------------|-------------------------|-------------|----------------------|------------|-------------|-----|-------|
| | Direct Bight | | Coastal Zone | | | | |
| | Barge | Atmospheric | Wastewater Municipal | Industrial | | | |
| | | | River | Urban | Groundwater | | |
| FLOW | 0.02 | 59 | 5 | 0.4 | 33 | 2 | 0.4 |
| SS | 63 | 5 | 4 | 0.2 | 16 | 12 | N11 |
| ALK | 1 | N11 | 35 | 0.3 | 59 | 5 | 0.03 |
| BOD ₅ | 21 | 9 | 48 | 2 | 11 | 9 | 0.01 |
| COD | 32 | 10 | 35 | 1 | 13 | 9 | 0.01 |
| TOC | 25 | 12 | 29 | 1 | 18 | 15 | 0.02 |
| MBAS | | | 86 | | 5 | 9 | 0.05 |
| O ₆ G | 38 | | 22 | 0.7 | 16 | 23 | |
| NH ₃ -N | 24 | 4 | 55 | 3 | 10 | 4 | 0.04 |
| ORG-N | 19 | 9 | 45 | 2 | 21 | 5 | 0.02 |
| TKN | 21 | 6 | 51 | 2 | 15 | 5 | 0.02 |
| NO ₂ +NO ₃ -N | 0.07 | 33 | 6 | 0.3 | 60 | 0.6 | 0.7 |
| TOTAL-N | 16 | 13 | 40 | 2 | 25 | 4 | 0.2 |
| ORTHO-P | 1 | 1 | 72 | | 18 | 9 | N11 |
| TOTAL-P | 50 | 0.7 | 35 | 1 | 9 | 4 | N11 |
| Cd | 82 | 2 | 5 | 0.6 | 5 | 5 | 0.001 |
| Cr | 50 | 1 | 22 | 0.8 | 10 | 16 | N11 |
| Cu | 51 | 3 | 11 | 9 | 10 | 16 | 0.006 |
| Fe | 79 | 3 | 5 | 0.5 | 6 | 6 | 0.01 |
| Hg | 9 | 9 | 71 | 2 | 13 | 5 | |
| Pb | 44 | 19 | 3 | 3 | 6 | 19 | 0.004 |
| Zn | 29 | 18 | 8 | 2 | 21 | 22 | 0.009 |
| F.Coll-winter | <0.01 | N11 | 87 | 0.2 | 0.01 | 13 | N11 |
| summer | <0.01 | N11 | 85 | 0.2 | 0.01 | 15 | N11 |
| T.Coll-winter | <0.01 | N11 | 91 | 0.1 | 0.05 | 9 | N11 |
| summer | <0.01 | N11 | 84 | 0.2 | 0.1 | 16 | N11 |

Source: Stanford et al. (1981).

Table 3. Mass loads of wastes dumped in the New York Bight Apex.

| Parameter | Load, metric tons/day | Dredge spoils | Sewage sludge | Percentage | | |
|-------------------------------------|-----------------------------|------------------|------------------|---------------|-------------------|--------|
| | | | | Acid waste | Chemical waste | Rubble |
| $V, 10^6 \text{yd}^3/\text{yr}$ | 21.7c | 33 | 26 | 15 | 3 | 3 |
| SS | 15,000 | 86 | 3 | 0.7 | 0.05 | 11 |
| ALK | 45 | | 71 | | 29 | |
| BOD ₅ | 430 | 49 | 46 | | 5 | |
| COD | 3,200 | 65 | 34 | 0.1 | 1 | |
| TOC | 660 | 82 | 17 | | 1 | |
| HBAS ^d | | | | | | |
| O & G | 330 | 92 | 7 | | 0.9 | |
| NH ₃ -N | 50 | 74 ^a | 20 | 0.04 | 6 | |
| OPe-N | 35 | 74 ^a | 20 | | 6 | |
| TKN | 85 | 74 | 20 | | 6 | |
| NO ₂ +NO ₃ -N | 0.086 | | 53 | | 47 | |
| Total N | 85 | 74 | 20 | | 6 | |
| Total P | | | | | | |
| Total P | 69 | 92 | 7 | 0.3 | 0.8 | |
| Cd | 2.0 | 98 | 2 | 0.1 | 0.06 | |
| Cr | 2.5 | 93 | 3 | 4 | 0.1 | |
| Cu | 7.1 | 89 | 10 | 0.7 | 0.07 | |
| Fe ^b | 180 | | | | | |
| Hg | 0.026 | 50 | 50 | 0.04 | 0.7 | |
| Pb | 5.6 | 85 | 13 | 3 | 0.03 | |
| Zn | 9.3 | 78 | 19 | 2 | 0.7 | |

Fecal coliform = 10^8 e organisms/dayTotal coliform = 3×10^8 e organisms/day

a. Using sewage sludge TKN ratio b. From average Fe/Cu ratio for raw and digested sludge of 25, Mueller (1972). c. 18.6 cfs. d. Assumed negligible. e. From Mueller et al. (1976)

Source: Stanford et al. (1981).

In reviewing these tables, it is apparent that for most contaminants, the proportion added to the New York Bight via sewage sludge dumping is generally small i.e. 1-10% of the total. One exception is PCB's (Bopp et al., 1981; O'Connor et al., in press b). A second possible exception is DDT and its metabolites; however, there are insufficient data on the total loadings of this family of compounds to be certain of the relative contribution made by sewage sludge (O'Connor et al., in press b). Sewage sludge does not capture impressive fractions of most contaminants that enter sewage treatment plants. Much more than half of most contaminants is discharged in the effluent, leaving a relatively small fraction in the sewage sludge that is ocean dumped. The only exception of consequence is carbon (Mueller et al., 1976).

Ocean dumped sewage sludge contributes roughly 30% of the total PCB loading to the New York Bight with dredged materials contributing approximately 70% (Bopp et al., 1981), but some fraction of the dredged material PCBs is sequestered in the dumpsite mound. Bopp et al. (1981) also estimate that 25% of the PCBs in dredged material is from upstream wastewater discharges either raw or treated, from which the PCBs later settle out downstream by being adsorbed on harbor sediments. Other riverine and estuarine PCB inputs are likely far smaller, probably less than 10% of dredged material inputs (Schubel et al., in press). O'Connor, et al. (in press d) also have recently estimated the relative percentage contributions of the sources of PCBs to the Apex (Table 4). These figures indicate that ocean dumped sewage sludge contributes 19-26% of the PCBs; this generally agrees with Bopp's (1981) estimates. Dredge material contributes 51-61% of the PCBs.

2.3. Sewage Sludge Dumping in the New York Bight at the 12-Mile Site (22 km)

Ocean dumping of sewage sludge from the United States occurs, at present, only at the 12-Mile site (see Figure 1). The original sewage sludge dumpsite in the Bight apex was established in 1924. The amounts of sewage sludge dumped at the apex 12-Mile site from 1960 through 1980 are shown in Figure 2. The amounts have increased

Table 4. Range of PCB loadings to New York Bight Apex by source (O'Connor et al., in press d).

| <u>Source</u> | Maximum | | Minimum | |
|----------------------------------|-----------------|----------|-----------------|----------|
| | <u>Loading*</u> | <u>%</u> | <u>Loading*</u> | <u>%</u> |
| Atmospheric | 490 | 7 | 34 | 1 |
| Municipal Wastewater | 42 | 0.6 | 42 | 1 |
| Dredged Material | 3500 | 51 | 1800 | 61 |
| Sewage Sludge | 1300 | 19 | 750 | 26 |
| Hudson-Raritan Estuary Plume: | | | | |
| Particulate | 1037 | 15 | 62 | 2 |
| Dissolved | <u>480</u> | <u>7</u> | <u>240</u> | <u>8</u> |
| | 6849 | 99.6 | 2928 | 99 |

*kg/yr

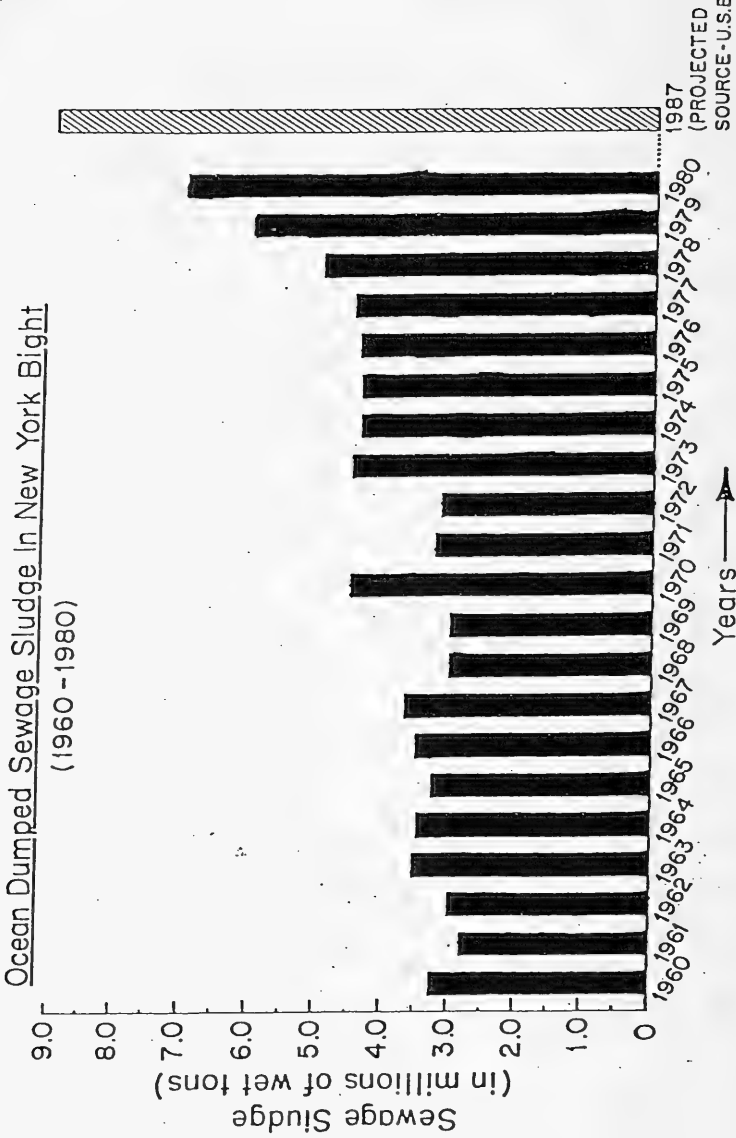


Figure 2. Quantities of Dumped Sewage Sludge in the New York Bight Over Two Decades

regularly, with the increases becoming larger in recent years as new advanced treatment plants became operational. The annual dumping rate in 1980 was about twice that of the 1960s. Even larger quantities of sewage sludge are projected for the 1980s. These recent and projected increases are related primarily to upgrading the degree of sewage treatment, including treatment of some previously untreated discharges. It should be noted that due to delays in the construction and budgeting, it is quite possible that the EPA projected 1987 value may not be reached until the turn of the century. As the improved and new treatment plants become operational, the amounts of raw sewage released daily through outfalls into the Hudson-Raritan estuary (New York Harbor area) should decrease. This point is important when considering overall sewage-related inputs to the Bight in relation to other waste inputs. As the amount of sewage sludge dumped in the Bight increases, the input of sewage-related materials from the estuary to the Bight decreases, if all other factors remain constant.

The character of dumped sewage sludge varies with the myriad of inputs to individual treatment plants. Sewage sludge reflects the makeup of the area served by a plant, and includes urban runoff and industrial waste. The quantity and quality of sewage sludge are dependent on the cyclical and periodic nature of human and manufacturing activities, the processes used by the plant, and the efficiency of plant operation (Stanford et al., 1981).

In addition, sewage sludge may be further treated, such as by dewatering, with an associated change in physical characteristics. As the quality of inputs to a sewage treatment plant improves, through pretreatment or elimination of some materials, the quality of the resulting sludge improves.

2.4. Impacts Attributable to Ocean Dumping of Sewage Sludge at 12-Mile Site

Delineating those effects directly attributable to ocean dumped sewage sludge are quite difficult because: 1) the small

proportion of contaminants in ocean dumped sewage sludge that are added (1-10% of the total, except for PCBs) when compared to the total apex contaminant load, 2) the magnitude of contaminants added to the apex by the Hudson-Raritan Estuary plume, 3) the magnitude of contaminants in ocean dumped dredged material and the close proximity of the dredged material dumpsite to the sewage sludge dumpsite, and 4) the location of the Christiaensen Basin topographical low in between the dredged material and sewage sludge dumpsites which favors erosion off both sites into the basin.

Pathogens/Disease:

A significant fraction of the pathogens reaching the sediments (and shellfish now banned from commerce) of the inner Bight is derived from sewage sludge dumped at the 12-Mile site and outfall sewer discharges (Mueller et al., 1976). However, it would appear that for the beaches of the inner Bight, the major source of pathogenic pollution is the Hudson-Raritan estuary; sludge dumping at the 12-Mile site appears to have no measurable effect on water quality at the beaches, insofar as the potential for enteric diseases is concerned (O'Connor et al., in press a).

In May 1970, a circular area with a radius of 11/km (6 n mi) centered on the sewage sludge dumpsite was closed to shellfishing by the FDA. Bacterially polluted dredged spoils were also found spread over 65 km² within this circular area. The median total coliform and fecal coliform bacteria values (MPN/100 ml) for a bottom sediment station at the center of the sewage sludge dumpsite were found to be 540,000 and 33,000 respectively (Verber, 1976).

Contaminant Levels

With respect to the Bight as a whole, the extent to which sewage sludge contributes to observed environmental loadings, body burdens, and ecological effects for a given contaminant, appears to be roughly in proportion to the percentage of the contaminant introduced with sludge.

Thus, elevated concentrations of most contaminants in the Bight and its biota, excepting PCBs, and human pathogens, are primarily due to sources other than sewage sludge. However, up to half of the elevated PCB concentrations in biota of the Bight (0.1-0.5 g/g, wet weight) may be derived from sewage sludge (O'Connor et al., in press c). The PCBs in sewage sludge are biologically more available than those in dredged materials. While PCBs are ubiquitous in the living marine resources of the region, concentrations in organisms seaward of the Hudson-Raritan Estuary are low compared to concentrations in fishes and invertebrates of the Estuary. Based upon existing data, organisms collected in Bight waters and commonly found in the human diet contain low levels of PCBs and present no health hazard to the average person. However, PCB concentrations in the waters and sediments of the Bight are high enough to be suspected of causing ecological damage.

Bottom sediment samples recently analyzed for trace metals (Cr, Cu, Ni, Pb, and Zn) have shown that the distributional pattern of sediment metals in the New York Bight apex has not changed significantly over the past five years (NOAA, 1981). The volume of sludge ocean dumped has increased over one third in the same time period.

Biological Effects:

Sewage sludge plays a major role in degrading the benthos of a small area just west of the sewage sludge dumpsite, and contributes to the altered benthic communities observed over about 240 km² (90 mi²). The principal impact over the larger area is one of organic enrichment and pathogen concentration by shellfish. However, some species (e.g. Ampelisca, Unicola irrorata, and Erichthonis rubricornis) have been almost entirely eliminated from the region, presumably as a result of toxic effects of sewage sludge combined with those of other contaminants (Boesch, in press).

The sewage sludge contribution to eutrophication based on carbon and nitrogen loadings is currently small, and will remain a small portion even with larger future projections of sewage sludge production as advance waste treatment technology becomes available (O'Connor, 1979).

Sewage sludge probably contributes to a variety of biotic effects suspected or identified in the New York Bight (Mayer, in press). However, no direct cause-and-effect relationships have been demonstrated to date. This, in part, results from the long history of human inputs to the Bight, the multiplicity of contaminants present in the Bight that may act separately or in concert, and the occurrence of multiple sources, each contributing similar wastes. Wolfe et al. (in press) presented an extensive examination of the difficulty of identifying toxicant effects in the New York Bight.

2.5. Benefits Expected if Sewage Sludge Ocean Dumping Ceased at the 12-Mile Site.

2.5a. Benefits to Society

A possible decrease in human pathogens at and around the 12-Mile site might lead the Food and Drug Administration (FDA) to consider reopening some areas to shellfishing, however, the general region around the dumpsite is not a major bivalve-producing area. Shellfish might repopulate the area if all other sources of pollution also were reduced. While present knowledge of pathogen survival in marine sediments is limited, it is possible also that existing pathogens would persist in the sediments for years and preclude reopening the inner Bight to shellfishing for a protracted period (R. Colwell, personal communication).

A definite improvement should occur in public confidence and assurance in using New Jersey and Long Island beaches. Water quality at beaches and beach quality, per se, will not be improved

because they are determined by local activities and by stranded materials from widespread sources (MESA, 1977).

Concentrations of artifacts (e.g., hair, fibrous material, etc.) derived from sewage sludge dumping will not increase and will probably decrease in the topographic lows north of the Christiaensen Basin.

The cessation of the dumping of sewage sludge at the 12-Mile site would reduce the navigational hazards produced by the barges during the dumping process.

2.5b. Benefits to the Ecosystem

With the cessation of sewage sludge dumping there should be measurable decreases in the concentrations of PCBs, bacterial pathogens and indicator organisms, and organic carbon in sediments and in associated biota. PCB loadings would decrease by 19-26% (O'Connor et al., in press d). The slight amelioration of measurable impacts will occur over a limited geographical area (approximately 200-1,000 km², probably). The benthic community in the small area immediately west of the sewage sludge site should become more normal, but the benthic degradation over wider areas (200-1,000 km²) may not change noticeably. Instances of occurrence of extremely low dissolved oxygen concentrations in bottom water in the apex (particularly in topographic depressions) probably will become less frequent and perhaps less severe (Mearns et al., in press).

2.6. The 65-Mile Site (120 km)

The 65-Mile site (Figure 1) is located on the continental shelf and has never been used for ocean dumping. It was designated as an alternative site in 1978 by EPA on the basis of economic considerations (i.e. criterion--site to be located within 120 Km (65 n mi) of the harbor entrance) in the event public health problems associated with ocean dumping activities occur in the apex. The

site is of a semi-dispersive nature in that much of the material dumped (sewage sludge) would be flushed from the site. However, the relatively shallow depths and flushing characteristics would preclude total dispersal. Some measurable quantity of the material would reach the bottom and detrimental ecological effects could be expected.

Use of the 65-Mile site offers minimal advantages over other ocean dumping locations. It would, however, cause the degradation of a pristine part of the continental shelf, potentially limiting fishing in the vicinity of the site. The following impacts can be expected if dumping were to occur at this site:

- a. Accumulation of organic carbon and a variety of toxic metals, synthetic organics, petroleum hydrocarbons, and artifacts, can be expected in topographic depressions at and near the site.
- b. Some change in the character of the sediment at and near the site from coarse (sand) to fine-grained would probably occur.
- c. A decrease of the general quality of the waters at and adjacent to the site would occur.
- d. Some impact on the benthos can be expected. Some species will be "advantaged," at the expense of others, a result, for the most part, of carbon enrichment.
- e. Organisms will be exposed to increased levels of toxic metals and organics. This probably would be reflected first as elevated levels of toxicants in liver or hepatopancrease tissues of resident benthic macroinvertebrates and fishes.
- f. Possible increased incidence of fin erosion, "black gill", and other syndromes associated with reduced environmental quality is expected.

g. Strong, vocal opposition from fishermen and some boaters is probable. The public is likely to perceive the situation as a despoiling of yet another area of the coastal ocean.

h. The Food and Drug Administration (FDA) will probably close an extensive area to shellfishing. FDA closures are based on environmental factors as well as on the type of waste inputs to an area. Higher average current velocities at the 65-mile site, compared to the 12-mile site, would suggest that a larger area of closure would be required.

2.7. The 106-Mile Site (196 km)

The 106-Mile site, beyond the edge of the continental shelf, overlies 1,700-2,800 m of water. It is 196 Km (106 n mi) southeast of Ambrose Light Tower and is the closest deepwater location to New York Harbor. The flux of seawater available for dilution in the upper mixed layer is about one million times the projected sludge input fluxes, allowing for sludge dilution to near background levels. Unlike the presently used 12-Mile site, there are no navigational hazards at the 106-Mile site that might interfere with the dumping process. Barges could discharge waste slowly and thus achieve greater initial dilution and subsequent dispersion.

The disadvantage to the 106-Mile site is its distance from shore. Use of this site would have greater economical feasibility if the sludge were dewatered so that the volume requiring transport is considerably reduced. Ninety-five percent or more of the present annual sludge volume (of six million cubic meters) is water. This would require four barge dumps per day if each barge could carry 4,000 m³ of sludge. The total volume could be decreased by a factor of four and daily treks to the dumpsite could be decreased to one, if sludge were dewatered to a level of 80% water.

Sewage sludge dumping at the 106-Mile site would probably not cause persistent biological effects in the water column. Dewatering

sludge would not alter this conclusion that the water column could safely receive the sludge. It may, however, have implications regarding seafloor impacts.

After water column dilution, iron, lead, zinc, chromium, and PCB's would be expected to occur at detectably-elevated concentrations within the mixed layer downstream from the 106-Mile site. About 500 km southwest of the site and offshore from Cape Hatteras, the sludge would be further diluted by entrainment into the Gulf Stream (O'Connor et al., in press e). This dilution would erase the chemical signature of sludge. No sludge component which would be expected to occur in the water column are likely to be of biological consequence. This applies to all the exposed organisms, including those of commercial and recreational value. The plankton community in the open ocean is more sensitive to contamination than those from coastal areas. Nevertheless, the sludge dilution should be adequate to prevent local effects (O'Connor et al., in press e). Commercial resources that may be exposed are squid, tilefish, and lobster (year-round residents near the edge of the shelf) and shad, mackerel, sea bass, scup, and flounder (winter residents near the edge of the shelf break. The exposure of any of these species would be limited, because they are not restricted to the upper mixed layer. During winter, dilutions can be expected to be ten times greater than during the summer months due to the lack of thermal stratification.

Even without sludge dewatering, benthic effects from disposal are possible. A seafloor manifestation of sludge could be created by the settleable components of sludge, if such sludge components were to settle at a rate of at least 10 m/day, thus reaching the deep-sea floor in 200 days or less (O'Connor et al., in press e). For sludges diluted by a factor of 500, about 20% was observed to settle at 10 m/day or faster. At smaller dilutions, more than 20% settled at faster rates because of flocculation. Sludge delivered at the 106-Mile site could be dumped with an initial dilution

factor of 5,000. This would decrease the magnitude of the faster-settling fraction by reducing the extent of flocculation. However, it has not been determined what the effects of dewatering will have on settling rates, and no experiments to date have indicated whether turbulence generated in the dumping process will accelerate or hinder the flocculation processes.

Estimates of sludge derived contaminant concentrations in sediment have been derived by calculating the flux of settling sludge into previously deposited sediment. Particles which settle at 10 m/day and thus reach the seafloor in 200 days would, conservatively, be spread over a 10,000 km² area. Once deposited, sludge, like natural particles, will be mixed into the sediment column by biological activity, a process called bioturbation. Data on rates of bioturbation in deep sea sediments indicate that a conservatively low rate constant for our calculations would be 0.1 cm²/yr.

Maximum concentrations of sludge components will occur at the sediment surface and will increase as long as dumping continues. After 100 years the incremental increases of trace element concentrations due to sludge will be close to existing ambient concentrations. Assuming no loss by dissolution as particles sink or degradation by bacterial action, the maximum concentrations of PCBs and PAHs after 100 years will be between 0.2 and 0.4 ug/g (dry weight), respectively (O'Connor et al., in press e).

Dispersion of sludge dumped at the 106-Mile site would be sufficient to alleviate concern about contaminant, except for those substances in the faster-settling particles that are very highly concentrated in sludge relative to natural particles. It appears that after dumping has continued for many years, part of the deep-sea floor will be contaminated with PCBs and PAHs. There is not a good coastal analogue of this situation, because coastal areas contaminated with PCBs and PAHs also contain elevated levels of total organic carbon and a variety of inorganic contaminants.

Therefore, altered benthic biological communities in these areas have not developed solely in response to PCB or PAH contamination.

Some bioaccumulation of PCBs and PAHs by benthic organisms in the deep sea probably would occur but there would be no consequences in terms of contamination of seafood or threats to the size of commercial or recreational fish stocks. Data from laboratory or field situations in the coastal ocean indicate that benthic organism tissue levels of PCB or PAH, corresponding to sediment contamination levels calculated here, would not be hazardous to maintenance of stable populations (O'Connor et al., in press e).

In making these calculations, a number of questions have been raised that require further study. The distribution of sludge settling velocities as a function of sludge treatment and discharge method should be investigated. If sludge is dumped at the 106-Mile site, chemical studies should be conducted to check estimates of water-column distribution and concentration of sludge components. Sediment traps should be deployed to collect settling sludge and to observe actual sludge fluxes. (It would be very difficult, if not futile, to seek sludge directly in the sediment). Estimates of sludge distribution on the seafloor could be refined by detailed examinations of existing long-term current meter records.

If sewage sludge dumping occurs at the 106-Mile site these impacts can be expected:

- a. There will be a perceived problem of despoiling another area of the ocean.
- b. Minor accumulations of contaminants in commercially important fishes (primarily to squid and tilefish) may occur.
- c. The flux of sewage sludge (which contains about 5% solids) to the bottom will probably be about 10% of the natural particle flux. The concentration of a number of contaminants in surficial

sediments will increase. The concentration ratio for these contaminants is given below (from O'Connor et al., in press e):

| <u>Contaminant</u> | <u>Ratio of Contaminant Concentration Contaminant in Sewage Sludge to Slope Sediment</u> |
|--------------------|--|
| Organic Carbon | 14 |
| Cadmium | 185 |
| Mercury | 50 |
| Lead | 48 |
| Zinc | 84 |
| Chromium | 65 |
| Selenium | 10 |
| PCBs | 8,000 |
| PAHs | 360 |

d. Sediment contaminant concentration increases due to sludge will be small because: 1) sludge will be diluted with natural particles as it mixes horizontally during its descent to the seafloor, and 2) once settled, sludge will be mixed into the sediment column by the process of bioturbation.

If sewage sludge is dewatered to about 80% (4 x more concentrated than present sewage sludge) the effects of such dewatering on the fate and effect of the material are unknown.

3. LEGAL CONSIDERATIONS

The Marine Protection, Research and Sanctuaries Act (MPRSA) provides for the regulation of dumping material into ocean waters. The EPA is authorized to issue permits to allow for dumping of material (other than dredged material) into ocean waters when it determines that such dumping ". . .will not unreasonably degrade or endanger human health, welfare or amenities or the marine environment, ecological systems or economic

potentialities. . ." (33 U.S.C. 1412(c)). EPA was also required to establish criteria for reviewing and evaluating permit applications based on factors set out in the MPRSA.

When the MPRSA became effective in 1973, EPA established various categories of permits authorizing ocean dumping activities. One such category, called an interim permit, was established to allow the ocean dumping of materials which did not comply with EPA's environmental criteria for acceptable ocean dumping. In 1977, EPA announced a policy to phase out all ocean dumping authorized by interim permits by December 31, 1981.

In 1977, Congress reviewed EPA's policy. The House Committee on Merchant Marine and Fisheries was concerned about EPA's progress in curbing harmful ocean dumping. The Committee questioned EPA's authority to issue interim permits under the MPRSA because the permits allowed the dumping of material which did not meet the standards of the EPA ocean dumping criteria. Because of these concerns, the Committee decided to codify EPA's phase-out policy. The major question before the Committee was whether or not to ban all dumping of sewage sludge. The full committee decided to ban the dumping of sewage sludge but defined sewage sludge to mean "...any solid, semisolid or liquid waste generated by a municipal waste water 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." (33 U.S.C. 1412a).

The "unreasonably degrade" standard in the definition of the term "sewage sludge" is the same standard already existing in the MPRSA. Whether or not the sewage sludge amendment was passed, it still is improper under the MPRSA to permit the ocean dumping of any material unless it is determined that such dumping will not unreasonably degrade or endanger human health, welfare or amenities or the marine environment, ecological systems or economic potentialities. The intent of the sewage sludge amendment was to require EPA to stop issuing "interim permits" which allowed for the dumping of materials seemingly prohibited under the Act.

New York City dumps sewage sludge into the New York Bight Apex pursuant to an interim permit. That permit requires the City to devise and implement an alternative method of disposal by December 31, 1981. When EPA refused to consider New York City's application to renew its interim permit, the City sued. EPA took the position that the sewage sludge amendment absolutely barred after December 31, 1981 all ocean dumping of sewage sludge found harmful to the marine environment. The City argued that the amendment only bars dumping in the ocean of sewage sludge which unreasonably degrades the marine environment and that in determining whether particular dumping is unreasonable, EPA must evaluate the cost and potential hazards of land-based alternatives and the effects of the proposed dumping upon the particular dumpsite.

On April 14, 1981, a New York City Federal District Court agreed with New York City in New York City v. EPA. The Court concluded that MPRSA standard for issuing ocean dumping permits was whether ocean dumping was unreasonably harmful. In determining whether this standard was met in a particular case, EPA was required to balance the relevant statutory factors. The Court found EPA's regulatory scheme deficient in that it provided a conclusive presumption of unreasonable degradation if material failed EPA's environmental impact criteria without considering any of the other statutory factors such as alternative disposal options, the impact of the dumping at the dumpsite and the need for the dumping.

The Court also determined that the sewage sludge amendment did not change the factors EPA was required to consider in determining whether dumping would unreasonably degrade the environment. The Court concluded that the amendment merely provided that after 1981 EPA may not permit dumping of sewage sludge in the ocean which fails to meet the MPRSA test for ocean dumping. While the 1981 deadline remains in effect, the Court concluded that the deadline only concerns dumping that EPA determines, pursuant to criteria that consider all of the relevant statutory factors, will unreasonably degrade the environment.

As a result of the Court's decision, EPA and New York City have agreed that EPA will evaluate the City's application for an ocean dumping

permit and solicit public comment on the City's request to redesignate the 12-Mile site for sewage sludge disposal. EPA also will solicit public comment on designating the 106-Mile site for such disposal. Until EPA takes final action on the City's requests, the City will be allowed to continue to dump its sewage sludge at the 12-Mile site.

One issue not considered by the Court is the impact of the Convention on the Prevention of Marine Pollution By Dumping of Wastes and Other Matter otherwise known as the London Ocean Dumping Convention (Convention). The Convention prohibits the dumping of wastes listed in Annex I such as organohalogens like PCBs, and mercury and requires the issuance of a special permit for the dumping of wastes listed in Annex II. A permit can be issued only after consideration of the factors listed in Annex III which are similar to the MPRSA factors. EPA cannot issue a permit to allow the dumping of material found in Annex I unless such material is found as a trace contaminant or meets one of the other limited exceptions to this provision in the Convention. No balancing of factors for the dumping of these materials is permitted under the Convention.

In summary, the 1981 dumping ban does not prohibit the dumping of all sewage sludge as this term is commonly defined. In determining whether sewage sludge can be dumped in the ocean, EPA must consider all relevant statutory factors and determine whether the dumping will unreasonably degrade the environment. Any dumping, however, must be consistent with the provisions of the Convention.

4. DISCUSSION

When open and unpriced access to common property resources is permitted, the tendency to overuse and degrade these resources by many institutions is common experience (Kamlet, 1981b). The waters, sediments, and fishes of the Bight although valuable, are not owned by anyone person or group and no single user has much incentive to protect these marine resources. Degradation of the marine environment of the New York Bight apex has led to a narrower range of available uses. For instance, shellfishing is prohibited in the inner Bight and beaches are continually fouled by objectionable, floatable wastes.

Selection of an ocean option for sewage sludge disposal should be made only in the context of a larger commitment to improve the overall quality of the New York Bight. Ocean dumping costs are usually less expensive in the short term than terrestrial alternatives that are presently available. The tendency of most institutions to minimize dollar costs for waste disposal is understandable, but the environmental consequences must be assessed. The damage to the marine environment of the Bight apex, in terms of lost sport and commercial fisheries, lost aesthetic values, and health risks from all sources of marine pollution is sufficient to warrant a rigorous plan to improve marine environmental quality. Consideration of ocean dumping of sewage sludge must be part of that commitment.

Sewage sludge dumping is a small but measurable factor in the overall degradation of the Bight apex. Ending ocean dumping in the apex would lead to improvement in environmental quality of a limited geographic area but, there are few ecological advantages in closing the existing 12-Mile site, given the immediate ocean disposal alternatives. The only potentially significant advantages are 1) major reductions in the inputs of bacterial and viral pathogens to apex sediments, and 2) reduction by approximately 25% in the PCB inputs. There are however, major pathogen sources other than sewage sludge, and there is no assurance that the existing pathogens in the apex sediments would die off substantially for several years after cessation of sewage sludge dumping. While translocation of PCBs out of the apex would be advantageous, there is no environmental advantage to disperse large quantities of PCBs more widely (result of 106-Mile site use) or to contaminating a new area (result of 65-Mile site use), since they already constitute a significant global problem.

The inputs of all pollutants are at least partially controllable, given more time and the collective will. In this context, it must be remembered that the sewage sludge dump site can be relocated to the 106-Mile site at anytime should other sources of pollution be reduced such that environmental benefits derived become significant. In fact all barge dumped inputs can be relocated.

5. CONCLUSIONS

5.1 Contamination:

Contamination and adverse biological effects from the myriad sources of wastes to the Bight are sufficiently severe to consider an overall plan for contaminant source control. In this paper, source control is used in the broadest sense, including better control of urban runoff and pre-treatment of waste streams prior to the effluent discharge. Pre-treatment and improved operation and maintenance of sewage treatment plants can provide substantial improvement in the quality of sludge, in the quality of the waste water effluent, and ultimately in the quality of dredged material. Source control will have an effect on the overall quality and quantity of anthropogenic material going into the Bight apex. A general improvement in the health of the marine environment can be expected. Moreover, source control would open a range of disposal options for sewage sludge not acceptable at present. Among these are the opportunity to recycle sludge or use some portion of it as a resource. Cleaner sludge would also be less environmentally objectionable for ocean dumping.

5.2 Dispersion:

The 12-Mile site is the least dispersive of the three available dumpsites. This is a result of the site's relatively shallow depth, the presence of a topographic depression which tends to accumulate temporarily fine-grained organic materials and associated contaminants, and the small mixing volume of waters through the apex. Dumpsites can be ranked as dispersing or accumulating grounds (Champ and Park, 1981). Figure 3 presents a ranking of the major sewage sludge ocean dumpsites from around the world, in which the New York Bight was ranked the least dispersive ground. Despite this ranking, recent examinations of toxic metals data (NOAA, 1981) suggest that the Bight has achieved a "steady state" situation with regard to contaminant inputs. Although the Bight has been the site

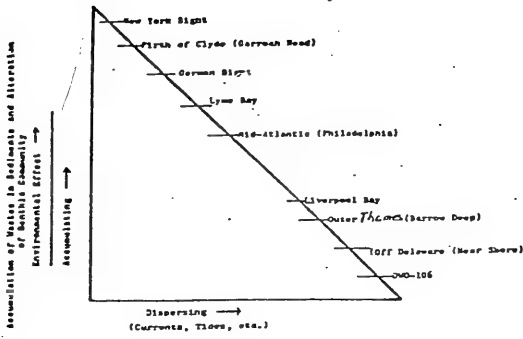


Figure 3. Comparison of sewage sludge dumpsites relating accumulating or dispersing factors (Champ and Park, 1981).

of waste disposal for many years, overall contaminant levels appear to be neither rising nor falling. Thus, even "poorly" dispersive sites may be able to dissipate large quantities of toxicants. It is also possible that an increasing trend in contaminant levels does exist, but has not yet been detected.

5.3 Institutional Factors:

Given the tendency for institutions to minimize waste management costs, additional incentives or penalties are necessary to achieve more equitable waste management strategies. Economists suggest that fees should be imposed on those who create external public costs. In this context, user fees have been proposed for the dumping sewage sludge which degrades public property. User fees could constitute a revolving fund used specifically to develop, update, and implement a strategy for the rational management of sewage sludge. Fees would be in proportion to the degradation likely to be inflicted by the various sludges, and could be based upon the value of uses lost in the Bight. Fees should be less than the incremental costs of translocating sewage sludge dumping to the 106-Mile site lest the fees encourage such movement. This approach would foster two separate mechanisms for resolving the sewage sludge issue: a desire on the part of individual dumpers to find a non-degradative solution to avoid the fee, and a fund with which to explore and implement innovative waste management strategies.

6. RECOMMENDATIONS

Issues of disposal of harmful sewage sludge should be resolved regionally; all available disposal options, such as atmospheric incineration, land disposal, and ocean dumping, should be considered, including environmental, social, and economic factors involved.

The Federal agencies should work with the regional, state, and municipal authorities to develop a regional waste disposal management strategy for the New York-New Jersey region. This strategy must consider

all forms of wastes, including those currently disposed of in the ocean (i.e., sewage sludge, dredged materials and acid wastes). The strategy must define social, economic, and ecological trade-offs for terrestrial, atmospheric, and marine disposal systems, and address all the important pollution sources, including sewage sludge.

These same agencies should develop a strategy with timetables for implementation. The regional waste disposal management plan must strive for total waste management, including source control. At present, the ocean dumping of sewage sludge constitutes only about 1-10% of waste loadings in the New York Bight. The remaining 90-99% of waste discharge must be controlled if the New York Bight waste management plan is to be effective.

Serious consideration should be given to the implementation of the user fee concept in the context of NY Bight ocean dumping. Fees would have to be in proportion to the dumped wastes' contribution to overall degradation and could be used to implement a regional waste management plan. The financial basis for establishing a fee might be the dollars saved by being permitted to continue using the 12-Mile site instead of the 106-Mile site.

7. SUMMARY

The continued use of the existing 12-Mile site is the preferred marine waste disposal alternative until a regional waste disposal management strategy can be developed. Scientific investigation has indicated that, while sewage sludge has had a measurable effect at and adjacent to the 12-Mile site which is localized, no conclusive evidence shows that sludge dumping at this site has resulted in a significant threat to public health or danger to local beaches. In decision situations where the options are to dump materials at an existing dumpsite or to dump at a new location, the preferred option may be to continue to use an existing dumpsite, thereby avoiding the despoliation of a new area. If in the future, other metropolitan regions on the east coast propose to ocean dump sewage sludge at existing or new dumpsites, comprehensive analyses

will have to be conducted to assess the immediate and long-range effects of the total waste loading.

The legislative mandate of Congress to prevent the ocean dumping of "harmful" sewage sludge will require the delineation and definition of "unreasonable degradation". This task may prove to be extremely complicated and demanding of resources. Merely understanding ecosystem processes will require extensive evaluation of sites for their potential capacity to assimilate wastes. Research in marine ecosystems, after 10 years of funding, is just beginning to understand the processes. The added dimension of waste loading will demand development of an immediate extensive synthesis and predictive capability by U.S. marine pollution research programs or they will fail to contribute to the solution of waste management problems.

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Mr. SCHEUER. I thank my colleague very much.

Mr. CARNEY. On page 50 of your testimony, you say one of the reasons you object to the amendment of H.R. 6324 is that the user fees would be used to conduct and evaluate sewage sludge research.

Now, do you feel we have completed the necessary research on the ocean dumping of sewage sludge?

Mr. EIDSNESS. I will answer in two parts, Congressman. We don't think we have done all the research that needs to be done regarding sewage sludge. There is a question of how sewage sludge research should be financed, much as I stated earlier before you were in the room. Research type activities, in my mind at least, fall in the spectrum of those combined activities that ought to be funded through the normal budgeting process that we now have as opposed to the user fee type system. The only exception to that might be research activities that apply specifically to a location where we are making a siting or permit decision.

Mr. CARNEY. I appreciate that, but then we have a little bit of a problem here because NOAA has cut the funding for R&D under title II of the Ocean Dumping Act in this regard, so what are we going to do to fund what I believe to be very necessary projects?

We thought that with the cutting of the funds in title II that perhaps the user fees would be a way that we could continue to carry out the research. Would you have any suggestion as to how we should do that and if not, what happens to the R&D program?

Mr. EIDSNESS. I can respond with respect to EPA. EPA conducted a lot of R&D and as a matter of fact, there has been a steady increase from fiscal year 1981 through the present and the proposed fiscal year 1983 in our research budget. I can give you specifics if you like, and I think that EPA's research budget is adequate with respect to NOAA. I have contacted Dr. Anthony Callio in recent days—the Deputy Director of NOAA—and have set up a meeting with him and the Director to discuss this to see what better coordination, and what research exists, and how should the agencies tackle this very issue for the coming year.

Mr. CARNEY. Thank you.

If you will submit those numbers for the record, I will appreciate it.

My 5 minutes have expired. Thank you.

[The information follows:]

QUESTIONS OF MR. CARNEY AND ANSWERED BY EPA

Question. If you will submit those numbers for the record, I will appreciate it.

Answer. The Agency's research and development program has increased its resources for ocean dumping related research from zero funding in fiscal year 1981 to \$635,000 and \$625,000 in fiscal year 1982 and its fiscal year 1983 request respectively. The Agency also undertakes other marine-related research in support of the 301(h) marine waiver program, the 403(c) ocean discharge criteria program, and 404 dredge and fill permitting program.

Question. Has Mr. Eidsness met with Dr. Anthony Callio to discuss EPA-NOAA coordination?

Answer. The Eidsness-Callio meeting has not taken place yet, but a meeting to discuss better EPA-NOAA coordination at Headquarters did occur between Mr. Eidsness' deputy, Rebecca Hanmer, and other senior EPA staff and Dr. Lawrence Swanson, Director, Office of Marine Pollution Assessment, NOAA, and Mr. Philip Cohen of Dr. Swanson's Staff. This meeting occurred on July 19. EPA and NOAA agreed on the significant issues to pursue, and this discussion will lead within the next two months to a more formal discussion at the Assistant Administrator level.

Mr. D'AMOURS. Do the members know a vote has just been signaled?

The only member of the panel who has not yet had a chance to question, would be Mr. Hughes. I will leave that option up to Mr. Hughes.

Mr. HUGHES. I think I can finish in 3 or 4 minutes.

Mr. D'AMOURS. Mr. Hughes.

Mr. HUGHES. I thank the panel.

As I understand it from the EPA's testimony in particular, EPA is looking for a very simple program, one that is understandable, one that is auditable, and one that is fair and equitable. If I understand correctly, what you want to do is to try to put any burden of regulating dumping on those that are dumping?

Mr. EIDSNESS. The cost?

Mr. HUGHES. As opposed to trying to shape policy on company fees?

Mr. EIDSNESS. Absolutely, yes sir.

Mr. HUGHES. The idea is to try to get the Federal Government, who will do the supervising, monitoring, and site selection and other things involved in the regulatory process?

Mr. EIDSNESS. I don't think the premise of any kind of fee system in this instance should be that we are going to depend upon a fee system to generate sufficient revenues to cover all the things the Federal establishment or EPA, in this instance, does with respect to ocean dumping.

I think it is to allocate costs to the dumpers on the basis of those activities which directly relate to the permitting decision and disposal decision.

Mr. HUGHES. If we are going to do that, why don't we try to recoup whatever costs are involved in that activity? If it is a good concept, why isn't it good enough to try to recoup whatever are the costs?

Mr. EIDSNESS. Congressman, earlier in my testimony I tried to explain there are two principles that I believe the Congress uses and that are widely held, principles that have to be balanced in developing any kind of public financed policy. One is the polluter base, the other is the beneficiary base. A very simple concept but hard to apply. It takes a lot of thought to do it.

I argued, as an example, to the chairman a moment ago, that the polluter, in this instance the dumpers, would bear a cost and internalize that cost of doing business. There is only one way I could cut the pie in terms of which activity should go into that category for purposes of allocating the costs. I would say the polluter pays for activities directly related to that particular decision, whereas the beneficiary pays principal. What that conjures up in my mind is that the general public wants the program.

Mr. HUGHES. We are talking about site selection for dumpers. We can identify that class of dumpers who are going to be the only ones who will use that site. Now, won't it make sense if we are going to try to recoup the cost of site selection, to identify the class, to take what is the total amount of cost for site selection as opposed to half that amount and recoup that? Wouldn't it make more sense?

Mr. EIDSNESS. Yes.

Mr. HUGHES. That is only a part of what I am interested in. I am interested in taking it one step further. How about any potential cleanup costs in the years ahead? Who should bear that responsibility? Suppose we discover 10 years from now that we have created a mess and we have to do something to rectify it? Who is going to clean that up?

Mr. EIDSNESS. That is an issue we have not focused on.

Mr. HUGHES. Now, let me ask you as a matter of policy, does the Federal Government have some degree of responsibility if we have selected a site and said this is where we want you to dump this stuff. Does the Federal Government have responsibility under that circumstance?

Mr. EIDSNESS. We haven't focused on that issue.

Mr. HUGHES. I think you better start focusing.

Mr. EIDSNESS. It is a good issue that you pose.

Mr. HUGHES. It seems to me that that also has to be factored in. One of the arguments we hear often is that when we talk in terms of putting liability on the dumpers for any damage that might be discovered years down the pike, on the polluters, is that, well, why should we pay for it, because we have been licensed by the EPA to dump? Go after EPA, they are the ones who told us to dump there.

Thank you, Mr. Chairman.

I think it is an important issue and I would like to hear from you as to how you feel about it.

Mr. D'AMOURS. The subcommittee will recess and resume this hearing at exactly 2:20. I would appreciate it if the current panel would remain. Thank you.

[Whereupon, at 2:08 p.m., the committee recessed, to reconvene at 2:25 p.m. the afternoon of the same day.]

Mr. D'AMOURS. The subcommittee hearings will resume and pending the possible return of a few of the other members, particu-

larly Mr. Hughes, who may have more questions, I would like to ask a few further questions of the panel.

Captain Swanson, following up on our dialog earlier, do you think you could submit to me in writing how NOAA distinguishes between those research cost recovery user fees that it does support and those in this bill that it does not; that is the reason for distinguishing. Could you give me that in writing? That would be very helpful to me.

Mr. SWANSON. Yes, sir.

[The information follows:]

SUPPORT OF CERTAIN RECOVERY OF RESEARCH COSTS

NOAA supports the recovery of costs, including the costs of appropriate research, through user fees. We would support the recovery of research costs where the nature of the research could be associated unequivocally with the product, service, or function involved, i.e., where it can be shown that the user to pay the fee benefits directly from the research in question. We would find it difficult to recover the research costs associated with a broad agency mission, for example. In regard to NOAA's research on problems associated with sewage sludge disposal, NOAA conducts programs of studies of a generic and long-term nature. It is this kind of broad, trend-identification investigation that could not be supported by fees of users with specific waste or site-oriented problems. NOAA thus distinguishes between the kind of research that can be associated with user fees and a broader, mission-oriented and more generic and longer-term research with which user fee identification would be difficult.

Mr. D'AMOURS. This question goes to either of you. You do distinguish apparently between monitoring work and research work, do you not?

Mr. EIDSNESS. I don't have an answer for that.

Mr. D'AMOURS. I should let Captain Swanson go, because he had an answer. He said yes.

Mr. EIDSNESS. I don't know how to make that cut. Perhaps because I am not a scientist.

Mr. D'AMOURS. How do you distinguish between monitoring and research, Captain Swanson?

Mr. SWANSON. We view monitoring as being the application of science that is reasonably well known, looking at long term trends in the marine environment, whereas, in research, we look at this as being more the development of new knowledge. In the field of ocean dumping there is a monitoring component, and there is a research component and there is also a gray area that overlaps both.

Mr. D'AMOURS. I appreciate that answer.

Mr. Borberg, representing the Conference on Coastal Agencies, is going to testify a bit later and he contends that the Federal agencies don't sustain any field costs as a result of monitoring, but instead, they charge the municipalities with the responsibility for collecting data. Is that accurate?

Mr. EIDSNESS. I would like to answer that, if I may. EPA does impose, in the discharge permits themselves, monitoring requirements, the expenses of which are borne by municipalities, but it is my understanding EPA also does compliance monitoring as well. It is done in one sense as a check on the work being done in terms of quality control and quality assurance, and in another sense, to fill in the gaps that may exist in a monitoring program, specified in a permit condition.

Mr. D'AMOURS. Is it true the municipalities collect all of the data?

Mr. EIDNESS. No, I don't think that is true. The municipalities don't collect all the data.

Mr. D'AMOURS. If they did, are there any field costs left to the Federal Government?

Mr. EIDNESS. I am not sure I understand the question.

Mr. D'AMOURS. Is the cost incurred only in the collecting of the data or are there other costs to be incurred?

Mr. SWANSON. Mr. Chairman, I think there are two types of monitoring here that are being confused. One is compliance monitoring. It is my understanding that dumpers and municipalities largely bear the burden of paying that cost, and they collect data, or contract to collect data, which is then given to EPA.

The other is environmental monitoring, and NOAA does do some environmental monitoring specifically related to ocean dumping. Those costs are funded through NOAA's activities through direct appropriation; we obtain no costs from the municipalities for environmental monitoring.

Mr. D'AMOURS. Do you perform any analytical work on the data collected by municipalities?

Mr. SWANSON. Very often we obtain from EPA, or sometimes directly from municipalities, data for analysis, along with the data NOAA collects from other places. We try to use as broad a data base as we can.

Mr. D'AMOURS. I have no further questions of this panel.

I would like to ask that the record be will kept open for the submission of further questions by subcommittee members and also for the return of answers by the panel to questions that have already been posed.

I thank you both very much for your attendance here this afternoon.

Mr. EIDNESS. Thank you, Mr. Chairman.

Mr. SWANSON. Thank you.

Mr. D'AMOURS. Our next witness is Mr. James Borberg, General Manager, Hampton Roads, Virginia Sanitation District. He is here representing the Conference on Coastal Agencies.

Mr. Borberg, welcome.

We have a series of two votes pending on the floor, so we will have to take a recess for 20 minutes, and we will be back here to resume at 2:50. I appreciate your patience.

[A short recess was taken]

Mr. D'AMOURS. Thank you for your patience, Mr. Borberg. You may proceed.

STATEMENT OF JAMES R. BORBERG, GENERAL MANAGER, HAMPTON ROADS, VIRGINIA SANITATION DISTRICT, REPRESENTING THE CONFERENCE ON COASTAL AGENCIES, ACCOMPANIED BY JAMES S. MATTSON, ATTORNEY AT LAW; AND DOUGLAS A. SEGAR, PRESIDENT, SEAMOCEAN, INCORPORATED

Mr. BORBERG. As you mentioned, I am the General Manager of the Hampton Roads Sanitation District, which is a sewage treatment agency in southeast Virginia, serving about 25 percent of the

population of the Commonwealth. I represent the Conference of Coastal Agencies, a group of 16 coastal sewage agencies which formed a committee of the Association of Metropolitan Sewage Agencies.

With me today is Dr. Mattson, and Dr. Segar, who I think are familiar to you.

You have my formal testimony, and to save your valuable time, I request that it be entered in the record, and I will highlight five important points.

Mr. D'AMOURS. We would appreciate that. Thank you.
[The statement of Mr. Borberg follows:]

PREPARED STATEMENT BY JAMES R. BORBERG, REPRESENTING THE CONFERENCE OF
COASTAL AGENCIES

INTRODUCTION

My name is James Borberg, and I am the General Manager of the Hampton Roads Sanitation District of Virginia Beach, Virginia. Today I am also representing the Conference of Coastal Agencies (CCA), a group of 16 coastal sewerage agencies operating as a committee of the Association of Metropolitan Sewerage Agencies (AMSA).

The sewerage agencies that comprise CCA are: Anchorage, Alaska; East Bay Municipal Utility Districts, the City of Los Angeles, Orange County Sanitation Districts, the City of San Diego, the City and County of San Francisco, and Encina, California; Anne Arundel County and the City of Baltimore, Maryland; South Essex Sewerage District, Massachusetts; Middlesex County Utilities Authority and Passaic Valley Sewerage Commissioners, New Jersey; Nassau County and New York City, New York; Hampton Roads, Virginia; and Tacoma, Washington.

Although our parent organization, AMSA, has had a policy supporting an ocean option for sewage sludge disposal for a number of years, we formed CCA a year ago to make the case to the public in general, the citizens in the areas we serve, the Congress and the Executive Branch that the ocean is one possible method of handling sludge that should be carefully explored in the same fashion that we examine the use of sludge on land for fertilizing purposes and disposal in landfills, as well as incineration.

Last March, in testimony before two subcommittees of the House Committee on Merchant Marine and Fisheries, CCA set forth its position on the role of the oceans in a national sewage sludge management strategy. I remind those who attended that hearing, and reiterate for the members of the Science and Technology Committee, what we emphasized in that earlier testimony. We stated that we are not advocating indiscriminate use of the ocean for sludge disposal; but that we seek a well-conceived program for assessing what types of sewage sludges can benefit the oceans and can safely be assimilated by them. We believe there is a great deal to be learned about the effects of placing sewage solids in the ocean, both from the marine point of view and from the point of view of the treatment plant operator. It is our stated objective that the beneficial elements of sewage sludge be effectively utilized and that sludge be disposed of in the manner, and in the medium, in which environmental degradation and human health risk will be minimized. We are concerned that some groups react to the notion of using the ocean for this purpose in an emotional manner; we believe such decisions must be made based upon solid scientific information and not on emotional grounds.

For a more thorough discussion of the options for sewage sludge management, the effects of sludge in the ocean, and the state of marine science in this area, I refer you to our March

23, 1982 testimony, a copy of which is attached to our testimony today, and which I request be incorporated into the record of this hearing.

Before discussing the proposed "user fees" and Ocean Waste Management Commission, I would like to comment on what I regard as a general deficiency of the proposals and, in fact, on most legislation dealing with the ocean. The emphasis is always on the disposal aspect rather than on the beneficial aspects of putting sludge in the ocean. We know from our experiences with land disposal that there are great benefits to be derived from the proper use of sludge. There is also a growing awareness that, under proper conditions, sludge can provide substantial benefits to the aquatic environment of the oceans.

We urge Congress and the Executive Branch agencies to recognize these beneficial uses and to treat the problem not as simply getting rid of harmful waste material, but as a problem of ensuring that the positive and useful elements of sludge are not wasted but are put to beneficial use. Thus we suggest that wherever the term "ocean disposal" is used it be broadened to "ocean utilization and disposal". See subsection 206(e)i)(B)(ii) of the proposed amendment to H.R. 6324 (p.7). Also in subsection (iii) I would suggest that "for comparing the human health risks and environmental degradation caused by ocean disposal of sewage sludge" should read: "for comparing the benefits as well as the human health risks and environmental degradation...".

I asked my staff at the Hampton Roads Sanitation District to review the literature on enhancing the marine environment with wastewater solids and although the staff report will probably be expanded, I would like to submit for the record of this hearing the brief report which is attached to my testimony.

Now I shall comment on the "user fees" and Commission proposals.

USER FEES

As we have stated on several occasions, we are committed to seeing that our decisions to dispose of or utilize our sewage sludges are based upon sound scientific judgment. When we place sludge in a landfill, as some have pointed out, we usually pay a fee to the landfill owner or operator. This fee reimburses the landowner for the cost of taking his land out of other productive uses, and for costs associated with preparing the landfill and for actual handling of the sludge. For the record, let me also note at this point that many of our sewerage agencies across the country prepare their sludge for use as a most effective fertilizer which is sold to users with a substantial financial return to those agencies. The proposal that those who place sewage sludge in the ocean should pay a fee, on a per-

ton basis in order to achieve some sort of parity with sewerage agencies who pay fees to landfill owners, may be superficially attractive, but is based upon a faulty premise.

As Professor John Norton Moore, of the University of Virginia Law School, pointed out during a seminar in February of this year, the oceans certainly are a "common property" resource, as the pro-fee argument stresses. But, as Professor Moore said, so too are the great reservoirs of groundwater that serve 40 percent of our population as drinking water supplies. So too is the atmosphere a "common property" resource. The proposal to tax users of one common property resource -- the ocean -- makes no more sense than to tax those who operate incinerators for their use of the atmosphere, or to place a tax on land disposal to cover the risks of contaminating groundwater. These three media -- air, groundwater and the oceans -- are all common property resources. They are similar in that government does nothing to "prepare" them for waste disposal, as a landowner does a landfill.

As we understand the concept of user charges, it is to require those who specially benefit and profit from activities undertaken with Federal tax dollars to pay their fair share of those costs thus relieving the burden on all taxpayers. No Federal money is spent preparing the ocean and, indeed, we believe there are and can be some benefits to the marine environment from appropriately prepared sludges. And I should point out that the local governmental agencies I represent in this hearing are all non-profit agencies, benefitting the millions of citizens who reside in our service areas. User charges are simply not appropriate for this activity.

Our members strongly oppose an arbitrary tax on ocean utilization or disposal of sludge, to the extent that it is unrelated to actual government costs in relation to such activity. We do not oppose a legislative proposal that would have those who use the ocean for waste disposal -- including dredged material, sewage sludge, and industrial waste disposal -- pay the reasonable, actual costs of government for site designation and permit processing. It is not unreasonable to expect those who use the ocean to pay a pro-rata share of the overhead incurred by the Federal Government.

Our positions on research and monitoring are somewhat different from that on administrative costs, or "overhead". As NPDES permittees, we are all accustomed to carrying out routine monitoring of our effluent discharges. In fact, many sewerage agencies have highly qualified chemists, biologists, oceanographers, and other laboratory personnel in-house, to meet the authority's internal needs as well as its monitoring requirements. The City of Los Angeles, for example, spent over \$1.5 million last year on routine monitoring of its ocean outfalls.

We prefer to negotiate the monitoring requirements of our NPDES and Section 102 permits directly with the EPA on a case-by-case basis, and would not care to see EPA, or NOAA, carrying out that function in-house. Each geographic location, and each waste stream, requires its own carefully tailored monitoring program. We simply do not see any value in handing a Federal agency a "blank check", with the amount to be paid by coastal sewerage agencies, for them to use in creating yet another Federal bureaucracy with no consideration for cost-effectiveness. I suppose that what we are saying is: thanks for offering to help us out, but we would rather do it ourselves.

One aspect of the proposal that troubles us is the frequent reference to "reasonable costs". We have no basic quarrel with the concept and appreciate the difficulty of drafting tighter language. However, we have lived through situations in which there are genuine differences of opinion as to what is reasonable. Since under the proposed arrangement, the public funds of our agencies will have to be spent for the various activities, we propose that there be a mechanism for resolving any such questions without the necessity of litigation or other lengthy and expensive administrative hearings. We believe an arbitration arrangement should be built into the language of the proposed bill; if the Ocean Waste Management Commission is created, we believe it would be an appropriate body to resolve any questions that may arise on what constitutes "reasonable costs". If the Commission is not established, a satisfactory arrangement would be to have the Federal agency and the local agency each designate a representative who would agree on a third member of the reviewing group. We do not anticipate great problems over this matter but I believe you can understand our desire not to be compelled to undertake unnecessary or even marginal activities without some opportunity to challenge the proposed assignments.

Our position on user fees for research on ocean utilization and disposal of sewage sludge is different from that on monitoring. We have long expressed our concern with the cutbacks at the Federal level in ocean pollution research, particularly with the drastic cuts proposed for NOAA's program in FY 1983. One of our member agencies, Orange County Sanitation Districts, has already joined with NOAA in co-sponsoring research in this area at the California Institute of Technology, with NOAA paying two-thirds and the Sanitation Districts paying one-third. Because we strongly believe that more research in this area should be done, and we recognize the potential benefits to our ratepayers, we support the proposal that an independent, research-oriented Commission be created, and funded by fees collected from those who use the ocean for sewage sludge.

THE COMMISSION PROPOSAL

We support the creation of an independent Commission -- with the Section 102 sewage sludge permittees given a voice in the nomination of one of three Commissioners -- that would have a well-defined charter to conduct "gap-filling" research in this area, as well as oversight responsibility over NOAA's and EPA's research efforts in ocean waste disposal. We have tried to pin down the actual Federal budget for this research, but the budgetary process makes this a near-impossible task. We do not believe that the total Federal effort in research applicable to ocean utilization and disposal of sewage sludge is more than \$2- to \$4 million, and we cannot support a budget for the proposed Commission in excess of \$2 million per year or for more than eight to ten years for the Commission to do its work. We have been in constant consultation with the staff of the Merchant Marine and Fisheries Committee on this proposal, and we will continue to work with your staff as the idea continues to evolve.

This concludes my prepared statement. I will be happy to try to answer any questions you might have.

Enhancement of the Marine Environment
With
Wastewater Solids

The ocean environment on the offshore continental shelf can be characterized as having suppressed productivity due to the limited availability of macro and micro nutrients. Wastewater solids when introduced into the marine environment in a controlled manner can supply these nutrients and enhance productivity. Current and past practices have not emphasized the beneficial application of wastewater solids in the ocean. As a consequence, there is only a limited amount of information regarding management alternatives designed to optimize recycling of wastewater-borne nutrients in the ocean. There is, however, sufficient data available to show that when managed properly the application of wastewater solids in the ocean environment is beneficial.

Enhancement of shelf productivity can occur through two mechanisms. The first is by increasing available nutrients in the water column and thereby supporting increased planktonic biomass¹. However, there is virtually no data available to determine the significance of enhanced planktonic productivity on the offshore continental shelf.

The second mechanism involves the benthic environment. Wastewater solids contain sufficient quantities of organic matter which provides food for benthic organisms. Shelf sediments do not optimally support benthic organisms because they are generally

low in organic content. Therefore, the addition of organic matter to sediments will increase the productivity and diversity of the benthic organisms. The enhancement of the benthic community as a result of the application of wastewater solids in the shelf area has been studied extensively.^{2,3,4,5,6,7} In all instances, zones existed around the sites studied where biological productivity was beneficially enhanced. This zone of enhancement was present even around those areas where large quantities of wastewater solids have been deposited over long periods of time. Unfortunately, no studies have been designed to determine management strategies to optimize this enhancement.

The increased productivity and diversity of the benthic community provides food for higher levels of the marine food chain. Many marine animals feed on benthic organisms which in turn provide food for larger predatory fish. Increased quantities and diversity of species have been observed in the zone of enhanced benthic communities around wastewater solids application areas.^{8,9,10,11,12,13} Therefore, the potential exists for enhancement of offshore fishing via recycling of wastewater-borne nutrients in the ocean. An additional benefit to be derived would be the potential for reduced harvesting costs because of the tendency of fish to concentrate in areas of high food availability. This potential would need to be studied in order to quantify benefits.

Bioaccumulation has been cited as a negative factor in the recycling of wastewater solids in the ocean. This concern,

however, is not significantly different from that related to land application, a potential problem which has been mitigated by proper management controls. Development of similar controls is feasible for recycle through ocean application. Studies around various application sites which emphasize disposal rather than recycle operations have shown conflicting results.^{14,15,16,17} None of the studies, however, have presented evidence indicating that significant problems exist.^{14,15,16,17} Further studies are needed to develop management strategies which will insure that no problems with bioaccumulation occur.

Public health concerns with respect to ocean application apparently do not pose any problems. The literature indicates that the ocean environment is toxic to most, if not all, pathogenic organisms. Studies have shown the presence of a strong viral inactivation mechanism in sea water which limits survival of viruses to less than three days.^{18,19} Therefore, migration of viruses from the site of wastewater solids application should not occur. Studies around active sites such as the New York bight off Delaware Bay have shown that wastewater solids application increases bacterial levels in the immediate vicinity of the site for only short periods after application.^{14,20,21,22,23}

In summary, the literature supports beneficial recycling of wastewater solids-borne nutrients in the ocean. This is particularly significant in light of the fact that the data were derived from projects which emphasized disposal rather than recycle operations. There is considerable need for studies designed to develop general

management strategies for recycle operations. Some of the general areas which must be addressed are:

1. Determination of application rates and frequency of application required for optimizing biological productivity.
2. Develop guidelines on acceptable wastewater solids quality for heavy metals and other contaminants.
3. Develop guidelines pertaining to site life and other control strategies for eliminating problems associated with heavy metals and pesticides.

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Mr. BORBERG. With respect to the proposed legislation, our main problem is that it presently stresses only negative factors. I like to think of a sewage treatment plant in a positive vein in that they take liquid waste products of our society and through a very sophisticated and expensive process, turn this material into water that ranges from merely environmentally acceptable for discharge, to water suitable for potable purposes.

The second product of many of our plants, with proper industrial pretreatment control, is a clean, nontoxic organic material that is an excellent fertilizer. A great deal of work has been done on the land using this organic material as a fertilizer, which may reduce chemical costs by as much as \$50 an acre. Properly managed in the ocean, this organic material in many cases, could have the same fertilizing effect.

One of the problems in the past practices has been that this organic material has simply been dumped in very confined areas, which is about the equivalent of taking truckload after truckload of fertilizer and dumping it in the middle of a field and then concluding that the material is harmful, since few positive benefits can be observed.

I have asked my staff—and I will add that it is a very small staff, to research literature and put together a paper which is inclosed in my testimony, which points out many beneficial uses. I would also

like to add for the record a reference from a 1978 report by the National Academy of Sciences, which indicates that nutrients in sewage increase production of fish and other food organisms in coastal waters.

The second point I would like to touch on is we strongly support the concept of the Ocean Waste Management Commission. However, in keeping with my previous remarks, we think that the mission should be modified to emphasize the beneficial effects of proper utilization of sewage solids in the ocean, along with the general negative effect of sludge dumping. We support the funding of the Commission rate of \$2 million a year for a period of 8 to 10 years.

With respect to user fees, we believe that user fees are proper when the Government performs a service, such as the operation of a landfill. However, we believe that these fees are improper when they are imposed as a tax without some service being performed. We have no problem with paying reasonable costs for permit and site designation, but if there is a dispute over what is reasonable, we suggest that the Ocean Waste Management Commission arbitrate this matter.

With respect to monitoring, monitoring of the ocean management program should be handled by the sewage agency in the same manner that we presently use for all of our discharges under the NPDES permit system. This has proven very effective in the past and regulatory authorities have ample means to achieve compliance.

In conclusion, the gentleman from EPA accused me and our field agencies of being polluters. I want to emphasize that we are not polluters. We are concerned public officials representing the millions of people that we serve. We are committed to sound management and fiscal principles. There have been many programs in the past and there will be others in the future but we are accustomed to complying with guidance by regulatory agencies.

Given a reasonable set of regulations, we can accomplish your objectives.

Thank you, Mr. Chairman.

Mr. D'AMOURS. Thank you very much, Mr. Borberg, for abbreviating your testimony as you did.

I take it then, Mr. Borberg, that you support the Commission idea as funded and as suggested in the draft recommendations?

Mr. BORBERG. Yes, we do, primarily because it sets up an agency where we have an input and can get research that benefits not only our agencies but the public in general.

Mr. D'AMOURS. You have heard the administration witnesses who preceded you testify that this was another layer of bureaucracy and really unnecessary.

How would you respond to that if you were in a position to do so?

Mr. BORBERG. It certainly is another organization, but I think it is a unique one. The legislation specifically limits its size, and it provides that most of the money is to be used for research.

We certainly subscribe to that, and we feel that the bureaucracy in this organization is a small price to pay for obtaining research from most of the funds that we will contribute.

Mr. D'AMOURS. Do you see any gaps in the current Federal monitoring and research efforts?

Mr. BORBERG. I think those are two separate things. I think our agencies are better equipped to monitor than are Federal agencies. We will go out and gather the information. The Federal Government or the Commission has to do basic research to determine what to do with the information we gather, and what it means.

In other words, they must set up certain parameters, limits, whatever, and then we can go out and get that data and comply with it.

I don't really see a need for the Federal Government to do monitoring. They may want to check on us, as they do now under the NPDES system, but right now we monitor all of our effluents and submit the data to the State organizations and to EPA.

Mr. D'AMOURS. Do you see any gaps, then, in the Federal research efforts that you think might be filled by the creation of a commission such as is proposed?

Mr. BORBERG. I think there needs to be more research done on the ocean environment. As I mentioned in my testimony, most of the work that has been done in the past has been negative. You dump this material in a big pile, and you say—you know, it doesn't do any good; in fact, look at all the harm it does.

I wouldn't expect anything else, but I think that if you properly treat the material, the organic material that goes in the ocean, if you have industrial pretreatment standards, which many, many agencies do, you wind up with a material that can fertilize crops, trees, grass, reclaim land, and the fertilization process in the ocean is very similar.

I think that our agency believes that a similar fertilization process could be done in the ocean. I am not saying that all material is suitable for that, but I think that that is a whole other side of the picture that has not been looked at, and I think added research needs to be done in this sector.

Mr. D'AMOURS. So you see this as one of the gaps that the commission, such as proposed, might help to fill?

Mr. BORBERG. Yes, sir.

Mr. D'AMOURS. Were it created and funded.

Mr. BORBERG. Yes, sir.

Mr. D'AMOURS. In anticipation of your testimony, I referred EPA and NOAA to your testimony where you contend that NOAA and EPA incur no field costs for monitoring because they assign the work to be done to the municipalities. NOAA and EPA both responded to that negatively.

I want to give you an opportunity to address their response.

Mr. BORBERG. Perhaps we are not completely cognizant of every place that NOAA and EPA spend money. I would think, though, that our member organizations fund the far greater portion of the monitoring effort undertaken in this country. Certainly EPA and NOAA might do some on their own, and they might check on our agency, but I think basically our agency is the one that picks up most of the bill for monitoring, and we would recommend that this continue.

Mr. D'AMOURS. I want to thank you, Mr. Borberg.

I have no further questions at this time.

Does anyone else on the subcommittees have any questions?

Mr. Scheuer?

Mr. SCHEUER. Mr. Chairman, I appreciate your kindness. I would like to ask unanimous consent to submit questions for the record.

Mr. D'AMOURS. Why don't I once and for all ask unanimous consent for all panels and all witnesses, that the record be kept open, and that any members of the subcommittees be allowed to ask questions and to receive answers from the witnesses.

There being no objection, that is so ordered.

Thank you very much for your very helpful testimony and perspective, Mr. Borberg, and for your patience.

Mr. BORBERG. Thank you very much for asking me.

Mr. D'AMOURS. The next witness is Edward Osann, director of the water resources program, Resources Conservation Department, National Wildlife Federation.

STATEMENT OF EDWARD OSANN, DIRECTOR, WATER RESOURCES PROGRAM, RESOURCES CONSERVATION DEPARTMENT, NATIONAL WILDLIFE FEDERATION

Mr. OSANN. Thank you, Mr. Chairman.

My statement is several pages in length and I won't attempt to read it from start to finish. I will attempt to simply hit the high spots for the benefit of the committee this afternoon.

Mr. D'AMOURS. Your testimony will appear in its entirety in the record as submitted, Mr. Osann. I appreciate your being willing to summarize it. Please proceed.

Mr. OSANN. Thank you, Mr. Chairman.

As indicated, my name is Edward Osann. I am the director of the national wildlife federation's water resources program.

I believe that the committee, the Committee on Merchant Marine and Fisheries, in its action originally on H.R. 6113, took testimony from Dr. Kenneth Kamlet, who is the director of our pollution and toxic substances program. I would also point out he is the principal litigator for the Federation's ongoing work on ocean dumping litigation, with which a number of the members of the Committee on Merchant Marine and Fisheries are familiar.

At this time, the National Wildlife Federation is in support of an amendment to H.R. 6113 which would provide for the collection of user fees for ocean dumping, but we are opposed at this time to the draft amendment to H.R. 6324 to establish an Ocean Waste Management Commission and an Ocean Waste Management Advisory Committee.

The ocean has traditionally been a cost-free and convenient place to dump many materials which are hard to dispose of on land. Control over the ocean dumping of harmful materials was established by law 10 years ago.

During 1980, about 110 million tons of material of all types were dumped into the ocean under regulations and permits issued by the Corps of Engineers and the Environmental Protection Agency. The deadlines for stopping the dumping of harmful sewage sludge have been repeatedly postponed and pressure is mounting to loosen standards and allow increased volumes of dumping in future years, dumping of all sorts of materials.

Through a rational system of user fees, the Federal Government has the opportunity to promote both economic and environmental efficiency in the allocation and use of resources. The Federation has found in our own review of many natural resources programs, ranging from grazing to forestry to water resource development, hydroelectric power, and so on, that resources that are underpriced tend to be overused, and wasted rather than conserved.

Today, the oceans, a resource held in common for all citizens, are underpriced and in danger of being overused for purposes of waste disposal. An ocean-dumping user fee would supplement regulatory control, deter unnecessary ocean dumping, and spur the research and utilization of economical and environmentally sound alternatives.

I would like to go directly to where we feel the draft user fee proposal now before the subcommittees is insufficient. We feel it is deficient in two important respects:

First, that ocean dumping fees should be levied for all classes of material dumped in the oceans, including dredged material; and second, that ocean dumping fees should relate to fair market value rather than simply keeping the Federal Government whole for its administrative expenses of the dump site designation and permitting program.

With regard to the first point, we would note that the Merchant Marine Committee, in its action last year on the Omnibus Reconciliation Act, proposed a user fee that would apply to all classes of materials. We support this concept, and encourage the committee to pursue it further this year.

Presently there is a bias toward ocean disposal in the Corps of Engineers' dredging program that results from the requirement of local sponsors to provide for the lands and easements, rights of way, retaining works and stabilization measures required for the on-land disposal of dredged material. Local sponsors of Federal navigation projects, we feel, should bear a parallel responsibility for the costs involved in open ocean disposal.

Regarding the second point, we feel that an important principle for Congress to follow in establishing user fees for ocean dumping is that the user should pay according to the benefits he receives and the costs imposed on society. The draft proposal now before the subcommittee we feel takes an unduly narrow view of the cost to society of ocean dumping; that is to say, simply the Federal Government's administrative costs, and bears no relationship to the fair market value of ocean dumping when compared to other waste disposal options.

We urge the Congress to consider ocean dumping in its larger context, and end the practice of offering valuable waste disposal sites at nominal cost or at no cost.

We feel the market value could be established by a review of the costs of competing disposal alternatives. It need not be imposed immediately, but rather could be phased in over a period of years.

We recognize that the composition of material that is dumped in the ocean varies widely, and suggest that consideration might be given to allowing a range of administrative flexibility in establishing the fee based upon the degree of degradation of the marine environment.

Finally, we recommend that some minimum fee or floor be set initially by the Congress for fiscal year 1983, such as \$2 per wet ton, keeping open the options for adjustments in future years.

Our estimate of a fee set at \$2 per wet ton would yield in the range of \$200 to \$250 million for fiscal year 1983.

Finally, with regard to H.R. 6324 and the proposed amendment, the Federation cannot recommend the establishment of the Ocean Waste Management Commission and Advisory Board contemplated by this proposal.

We do not see any powers or authorities extended to this Commission that do not now reside in the executive branch already, and we feel that it would be preferable to deal with Agency shortcomings more directly, in the reauthorization and appropriations process, oversight hearings and so on, and that a commission structure and advisory board structure would not be a fully effective substitute for congressional oversight, and the concurrent public involvement in both the legislative and the administrative process.

I would be glad to attempt to answer any questions you might have now, Mr. Chairman, either orally or for the record.

[Mr. Osann's statement follows:]

PREPARED STATEMENT OF EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM,
NATIONAL WILDLIFE FEDERATION

My name is Edward Osann. I am the Director of the National Wildlife Federation's Water Resources Program. The Federation, with members and affiliate organizations in all 50 states, Guam, Puerto Rico, and the Virgin Islands, is the nation's largest citizen organization dedicated to the conservation and wise use of natural resources.

During the past decade alone, our membership has adopted more than 50 resolutions establishing Federation policy on various aspects of water resource conservation and development. Among these are resolutions in support of user fees to fully recover the costs of port and inland navigation projects. The Federation and its affiliates have a history of working with state officials and the Federal construction agencies to resolve differences over water projects or policies. We have commented on scores of projects; we have litigated numerous times as well, in those instances where earlier efforts to resolve differences have failed. We have strongly supported legislative efforts, on both appropriations and authorizations, to redirect the Federal water resources development program.

At this time, the Federation is in support of an amendment to H.R. 6113 providing for the collection of user fees for ocean dumping, but opposed to the draft amendment to H.R. 6324 to establish an ocean waste management commission and an ocean waste management advisory committee.

OCEAN DUMPING USER FEES—AN IDEA WHOSE TIME HAS COME

The ocean has traditionally been a cost-free and convenient place to dump many materials which are hard to dispose of on land. Control over the ocean dumping of harmful materials was established by law ten years ago, with deadlines set to phase out the dumping of harmful sewage sludge. During 1980, 110 million tons of material—sewage sludge, industrial waste, and dredge spoil—were dumped into the ocean under regulations and permits issued by the Corps of Engineers and the Environmental Protection Agency. The deadlines for stopping the dumping of harmful sewage sludge have been repeatedly postponed, and pressure is mounting to loosen standards and allow increased volumes of dumping in future years.

Concurrently, the Federal government is facing its worst fiscal crisis in decades. Funding for a wide variety of domestic programs and regulatory activities is uncertain. The time has come to end this particularly inappropriate public subsidy for those entities which have opted to use the oceans for waste disposal.

Through a rational system of user fees, the Federal government has the opportunity to promote both economic and environmental efficiency in the allocation and use of resources. The Federation has found in our review of many natural resource programs that resources that are underpriced are overused, and wasted rather than

conserved. Today, the oceans, a resource held in common for all citizens, are underpriced and in danger of being overused for purposes of waste disposal. An ocean dumping user fee would supplement regulatory control, deter unnecessary ocean dumping, and spur the search and utilization of economical and environmentally sound alternatives.

THE DRAFT USER FEE PROPOSAL IS INSUFFICIENT

The staff draft proposal which is the subject of this hearing is deficient in two important respects:

Ocean dumping fees should be levied for all classes of users, including dredged material;

Ocean dumping fees should relate to the fair market value of ocean disposal, rather than simply keeping the Federal government "whole" for its administration of the dump site designation and permitting program.

The Federation strongly supports a fee structure that would extend to dredged material. Presently, there is a bias toward ocean disposal in the Corps dredging program that results from the requirement of local sponsors to provide the lands and easements, retaining works, and stabilization measures required for the disposal of dredged material. Local sponsors of federal navigation projects should bear a parallel responsibility for the costs involved in open ocean disposal. The user fee proposal advanced by the Merchant Marine Committee last year as part of the Omnibus Reconciliation Act applied to local sponsors of Federal navigation projects, and we are still convinced that this is the most appropriate way of proceeding with an ocean dumping user fee.

One important principle for the Congress to follow in establishing user fees for ocean dumping is that the user should pay according to the benefits he receives and the costs which he imposes on society. The draft proposal now before the subcommittee takes an unduly narrow view of the costs to society of ocean dumping, i.e., the Federal government's administrative costs, and bears no relationship to the fair market value of ocean dumping when compared with other waste disposal options. We urge the Congress to consider ocean dumping in this larger context, and end the practice of offering valuable waste disposal sites at nominal cost. The market value can be established by a review of the costs of competing disposal alternatives. It need not be imposed immediately, but rather could be phased in over a period of years. We recognize that the composition of material that is dumped in the ocean varies widely, and suggest that consideration be given to allowing a range of administrative flexibility in establishing the fee based upon the degree of degradation of the marine environment. Finally, we recommend that some minimum fee or floor be set initially by the Congress for Fiscal 1983, such as \$2 per wet ton, keeping open the options for adjustments in future years.

A NEW COMMISSION IS NOT NECESSARY

At this time, the Federation cannot recommend the establishment of the ocean waste management commission and advisory board contemplated by the draft amendment to H.R. 6324. We do not discern any powers or authorities extended to this commission that do not now reside within the Executive Branch agencies that have principal responsibilities for this program at the present time. Our preference is to deal with agency shortcomings more directly, in the reauthorization and appropriation process. The commission and advisory board do not, in our opinion, constitute an effective substitute for Congressional oversight and public involvement in the existing legislative and administrative processes.

We appreciate this opportunity to present these views, and I would be happy to respond to any questions the subcommittees might raise.

Mr. D'AMOURS. Thank you, Mr. Osann. I appreciate your testimony.

How do you set a fair market price on the use of the ocean for disposal?

Mr. OSANN. Well, if there were a larger number of competitors, one way, a very straightforward way, of setting a fair market price would be by auction. But our concern is that there are relatively few potential users for some sites of the 12 dozen or so sites. There may be only one user, and that wouldn't be a terribly satisfactory way of establishing market value.

We would recommend that the executive branch, the administrators, consider the range of costs of alternative disposal techniques, methodologies, and so on, on land disposal, ocean incineration and so on.

Mr. D'AMOURS. So you would set fair market price by running a comparative analysis with land disposal, setting the cost to reflect alternative land disposal options?

Mr. OSANN. That is correct; setting the cost to reflect the value to the prospective dumper of the use of the dump site.

Mr. D'AMOURS. So your cost in each case would be approximately what it would cost him to dump on land?

Mr. OSANN. Land disposal may or may not be the most cost effective alternative to ocean dumping in each case for each kind of material, but we suggest that the range of alternatives be considered, and be used for establishing the market value and, of course, you would have to consider as an offset to the market value of the ocean disposal site the transportation costs of getting to and from there.

Mr. D'AMOURS. You were here when Mr. Borberg identified at least one gap in EPA and NOAA research in the area of ocean disposal.

You indicated in your testimony just now, I think, that you really didn't see anything that might be gained by the establishment of the commission that we referred to.

Mr. OSANN. That is correct.

Mr. D'AMOURS. Do you disagree with Mr. Borberg that there are any gaps in NOAA and EPA performance?

Mr. OSANN. Performance is one thing, and authority is another, and I am not aware of gaps in the authority of the agencies to perform the necessary research in the area of ocean dumping.

Mr. D'AMOURS. But the question was phrased in terms of performance. Are there any gaps in terms of performance?

Mr. OSANN. I would prefer to respond to that for the record, Mr. Chairman. I cannot give you specific instances.

[The information follows:]

GAPS IN FEDERAL PERFORMANCE OF OCEAN DUMPING RESEARCH

Federal research on the fate and effects of ocean dumping of contaminated materials has yet to adequately address a number of significant areas. NOAA and EPA proposals to meet some of the existing research needs are currently being analyzed in the federal government's FY 83 budget exercise. Some of the most pressing research needs are listed below:

(1) Overall Research Emphasis: Due largely to the shifting federal policy of ocean dumping—particularly the previous assumption that all ocean dumping of sewage sludge would be phased out by the end of 1981—there is no overall federal plan for ocean dumping research (although there is a plan for marine pollution research in general). There is a need for a comprehensive plan for establishing and meeting the highest priority research needs to replace the current "shotgun" approach to federally-supported ocean dumping research.

(2) Long-Term Effects: NOAA has been engaged in research on the long-term effects of ocean dumping for nearly a decade. However, partially due to the poor design of some of this research, there is still a pressing need in this area. While progress has been made in evaluating the gross degradation that has occurred in the ocean over a fairly lengthy period (10 years, for example), surprisingly little has been learned about why such long-term degradation occurs and about the more subtle components of such degradation. For example, the effects of bioaccumulated contaminants on a species' reproductive capabilities need to be actively investigated.

(3) **Synergistic Effects:** The synergistic effects of ocean pollutants (i.e., the combined impact on the marine ecosystem of two or more contaminants) are very poorly understood. Research thus far has tended to focus on the adverse effects of isolated pollutants.

(4) **Mesoscale Studies:** One approach to studying the "total ecosystem" impact of ocean dumping is through mesoscale studies—the use of huge holding tanks to simulate a marine environment that includes numerous interacting species. Such studies could prove to be valuable means of validating conclusions based on small scale laboratory experiments. Mesoscale studies such as those recently initiated at the University of Rhode Island and at Woods Hole should be encouraged.

(5) **Potential Effects of Non-ocean Alternatives:** There is a need for more research by EPA into the potential environmental and health effects of land-based sludge disposal options (including incineration, composting, landfilling, agricultural application, etc.).

(6) **Cataloguing the Source and End-point of Toxic Contaminants:** This type of study, being considered by NOAA for fiscal year 1983, could be an important research planning device. The object is to catalogue what "serious" toxics are currently being produced and where in the marine environment they are likely to concentrate. With such information, research efforts can be more efficiently directed.

(7) **Chemical Behavior of Marine Pollutants:** More needs to be known about the chemical behavior of pollutants, such as metals and PCBs, in the marine environment—for example, studies are needed on the rate of release into solution of contaminants attached to particles dumped into the ocean.

(8) **Marine Environmental Quality Index:** NOAA is attempting to develop a marine environmental quality index to be used by government decisionmakers to determine whether a substance is suitable for ocean dumping (i.e. whether it "unreasonably degrades" the marine environment). The idea is to expand greatly the current range of parameters used to test the suitability of materials proposed for dumping. This effort should be supported with adequate funding.

(9) **Pathogens in Ocean-dumped Wastes:** Certain wastes, including sewage sludge, are high in pathogen content—including bacteria, virus and parasites. Very little attention has been given to the potential problems associated with the dumping of such wastes, including the recently-observed phenomenon of intermicrobe genetic transfer; that is, the transfer of the genetic material from microbes in sewage to microbes naturally occurring in the marine environment.

(10) **Correlation of Laboratory and Field Results:** To protect ocean resources from potentially dangerous pollutants, it is essential that wastes proposed for ocean dumping be screened and evaluated *before* a dumping permit is issued. This in turn compels regulators to place heavy reliance on predictive laboratory tests. The problem, however, is that laboratory tests are vulnerable to the criticism that the results they yield bear no necessary resemblance to impacts that would occur on very different conditions in the environment. Laboratory tests are criticized by some as exaggerating potential impacts in the field, and by others as underestimating them. We believe most experts would agree that more research is needed on the relationship between laboratory tests and field measurements and on improving the correlation between the two.

(11) **Sediment Quality Criteria:** Ocean-dumped pollutants that are associated with particulate matter—such as dredge spoils and sewage sludges—can often be expected to accumulate in some fashion on the ocean bottom. Evidence from incidents like the Kepone disaster on the James River, as well as from pollution problems in the Southern California Bight, the Hudson River, and the Great Lakes, suggests that ocean bottom sediments can serve as a reservoir of contaminants which are especially accessible to bottom-dwelling marine organisms (and thence through the food chain to man and other predators). It is by no means entirely clear whether sediment-bound contaminants must first be released into the water before being bioaccumulated or whether they can be taken up by direct ingestion of or contact with bottom sediments. Nor do we know how much of which contaminants when present in bottom sediments pose a risk to aquatic life and the food chain. Consequently, an important research/regulatory need is the development of "sediment quality criteria," analogous to the water quality criteria employed for man years, which can be used as a guide to potentially dangerous levels of bottom accumulations.

Mr. D'AMOURS. Assuming we impose user fees, the municipalities seem reluctant to give EPA and NOAA a blank check as to how this research or when this research is to be conducted. That is one

of the reasons that Mr. Borberg, representing the Conference on Coastal Agencies, testified in favor of the commission.

Don't you see some merit in this position, and if you do, do you see any alternative to a commission that might help to meet these concerns?

Mr. OSANN. I can certainly see his interest in advancing that position. I think we all prefer to operate under conditions of certainty rather than conditions of uncertainty. The Congress could handle that problem, however, by establishing at the outset a fee that might be subject to later adjustment, either upward or downward.

Mr. D'AMOURS. Given the current mindset, philosophy, or however you might choose to describe EPA and NOAA's ardor for controlling or monitoring polluters wherever or however they might be found, don't you think a commission would help to fill a void?

Mr. OSANN. We think the fee would help to fill a void.

Mr. D'AMOURS. But turning it over to the same people who in some instances, at least, philosophically don't seem terribly inclined to perform their mandate?

Mr. OSANN. The criticism that I think we have levied most strongly in a wide range of environmental programs is the lack of gusto in their regulatory functions, and our view is that a fee would begin to bring to bear some of the pressures, some of the leverage of the marketplace as a backstop to the regulatory activities of the agencies; not as a complete substitute, but as a backstop to those.

Mr. D'AMOURS. You say you would bring that?

Mr. OSANN. We see the fee as being an important backstop to the regulatory activities of the agencies.

Mr. D'AMOURS. If there is no special commission what makes you think that they would perform any differently with these new fees than they do now?

It is true that their research budgets are being cut back, but can you assume that this money will go to that end?

Mr. OSANN. Not necessarily, and in fact, we are not recommending that the fees be established as a dedicated fund. What we are saying is that the effect of the fee structure in the marketplace on prospective dumpers will be to—

Mr. D'AMOURS. I see. So you see the fees not as a research aid and not as a way of encouraging NOAA or EPA to increase their research and monitoring, but only as a factor that might prohibit or discourage the alternative of ocean dumping?

Mr. OSANN. That is correct.

Mr. D'AMOURS. I have no further questions at this time.

Mr. Scheuer, do you have any questions of this witness?

Mr. SCHEUER. No questions.

Mr. D'AMOURS. Thank you very much, Mr. Osann, for your testimony and for waiting as long as you did to testify.

There being no further witnesses or questions of witnesses, the subcommittees will stand adjourned.

[The following was received for the record:]

QUESTIONS SUBMITTED BY MR. FORSYTHE AND ANSWERED BY EPA

Question. How is the present monitoring program divided between EPA, NOAA, and the 102 permittees?

Answer. In general, monitoring responsibilities are divided along the following lines: permittees and EPA have site-specific monitoring responsibilities; EPA is responsible for monitoring data related to dumpsite designation and management; and NOAA is concerned with ecosystem response and trend analysis, and other broad issues related to ocean pollution and to the continuing health of the oceans.

EPA administers a program of compliance monitoring conducted by dumpers in accordance with permit provisions. This effort is oriented toward specific wastes, concentrations, locations, water quality, and other factors associated with EPA's site management responsibilities. Sewage sludge disposal permittees at the 12 mile site are monitoring their disposal activities in a cooperative manner, pooling their resources proportional to the amount of wastes dumped in the Bight. In addition, Region II USEPA (NY) also monitors beach areas in the summer months to assure bathers of safe swimming.

A second category of monitoring is required for several reasons: (1) to assist EPA in decisions on whether use of given dumpsites should be continued or discontinued, and under what circumstances, and (2) to meet NOAA's concerns on waste interactions, and the ability of ecosystems to accept wastes under varying conditions. These joint needs can often be met by common data. For example, cooperative NOAA/EPA programs such as the Northeast Monitoring Program, have been developed.

In addition, the Coast Guard conducts permittee compliance monitoring, using shipriders and flyovers, in support of the ocean dumping program.

Question. Is there general agreement between the Federal agencies on the monitoring activities that are necessary for ocean dumping?

How would you define "monitoring" in terms of what activities would be carried out and in what ocean areas for purpose of collecting a fee?

Answer. The Federal agencies do generally agree on what monitoring activities are necessary for ocean dumping. The Agency and NOAA have engaged in several joint projects, among them the Northeast Monitoring Program mentioned earlier.

Monitoring consists of three general types of activities: compliance monitoring, to ensure that the terms and conditions of a permit are being met; site-specific monitoring to identify the impacts of ocean dumping and to ensure that it is not having undesirable or unanticipated impacts in or around the site being used; and general environmental monitoring, to monitor the health of the marine environment and the impacts of marine pollution from all sources. An ocean dumping user fee should recover the costs for the first two types of monitoring, but not for the latter type.

Question. What would be the ideal budget for an adequate monitoring program and what would be the objectives of such a program?

An "adequate" monitoring program and the "ideal" budget for it can only be defined in relation to the specific dumping activities being monitored. The types and amounts of wastes being dumped, and the sites being used, will determine the kinds of monitoring needed and the costs for such monitoring. For example, the ocean dumping of municipal sludge and other wastes with solid components should be monitored to detect whether there is settling of the solids and to determine what impacts, if any, may occur. Such monitoring would not be appropriate for liquid chemical wastes, and may not be feasible or appropriate at deepwater sites off the outer continental shelf. Any type of monitoring is significantly more expensive at deepwater sites than at nearshore, shallower sites.

Based on the dumping currently ongoing, EPA expects to spend approximately \$1,250,000 on monitoring activities in fiscal year 1983. This is in addition to the monitoring activities carried out by permittees and other Federal agencies. For the type and amount of dumping involved, this is an adequate budget for an adequate monitoring program.

Question. Is it reasonable to expect your Agency to be able to accurately estimate the costs to be incurred for your monitoring activities sufficiently in advance in order to assess the fees to user?

Answer. There will be no problem in estimating the costs of monitoring and other program operation activities provided the fee is assessed on a yearly basis. These estimates would be made as part of the budget process, with or without the user fee, and could be fairly well estimated within about six months before the beginning of a fiscal year as both permittees and the Agency have a fairly good idea as to the expected volume to be disposed of in any year.

Question. Isn't it true that EPA required daily reports from the 102 permittees concerning their monitoring activities?

It is my understanding that these reports sometimes fall far behind in being delivered to EPA—sometimes by several months. Why didn't you demand this information from the permittees in a more timely manner?

Answer. EPA requires the permittees dumping municipal sludge at the 12 mile site to report daily on their monitoring for impacts to the beaches of New York and New Jersey only during the summer months. This information has been submitted daily over the telephone.

It is true that the written reports and laboratory data required of the permittees have, at times, been submitted late. We discussed this situation with the permittees, and determined that it could be corrected without the need for enforcement action. Permittee reports are currently all up to date.

Question. Is an EIS required for all proposed ocean dumping sites?

Answer. EPA regulations require the Agency to prepare EISs for site designations "where such a statement is required by EPA policy." 40 C.F.R. § 228.6(b). EPA published a "Statement of Policy" on May 7, 1974, announcing its intention to prepare voluntary EISs on a number of activities, including the designation of ocean disposal sites under the Marine Protection, Research, and Sanctuaries Act (MPRSA). On October 21, 1974, the Agency published a "Statement of Procedures" for implementation of its voluntary EIS program. Both policy statements explicitly state that they do not subject EPA to the requirements of the National Environmental Policy Act (NEPA).

Also, EPA has agreed to a "stipulation of settlement and dismissal" in *National Wildlife Federation v. Train*, Civ. No. 80-0405 (D.D.C. 1980), which provides that EISs must be prepared on a number of specific ocean sites for the disposal of dredged and nondredged material.

Apart from the obligations it has voluntarily undertaken, EPA is not required by either the MPRSA or NEPA to prepare an EIS for the designation of ocean disposal sites. See *Maryland v. Train*, 415 F. Supp. 116 (D. Md. 1976). However, under MPRSA, EPA is required to consider a wide range of environmental factors and provide for adequate public participation in the site designation process.

Question. With regard to the past site designation process, who chose the site to be studied and who carried out the data collection activities—EPA, NOAA, or the applicant?

Answer. EPA has generally selected the sites to be studied. Since primarily historical sites have been used to date, applicants have not generally played a large role in site selection, although recommendations and information from applicants have always been welcomed.

Data needed were obtained by field surveys and by using available data from other federal agencies and potential permittees. For example, NOAA has provided data to EPA for site designation purposes on the New York Bight and the 12 mile site and the Corps has provided data on dredged material sites.

Question. To what extent does NOAA get involved in the site designation process?

Answer. NOAA's involvement in the site designation process is fairly indirect. Where NOAA has conducted or is conducting relevant studies, data on sites under consideration are provided.

Two notable exceptions to this "indirect involvement" are NOAA's (a) current research and preparing reports for a proposed 65-mile sewage sludge site in the New York Bight, and (b) current studies associated with establishment of a dredged material site off Norfolk, Virginia.

Question. In the future, does EPA plan to study and designate sewage sludge sites on its own or do you expect to look at new sites when you receive applications from the prospective dumpers?

Answer. In the absence of a perceived existing or anticipated demand, EPA has no current plan to designate any ocean dump sites. However, there may be environmental advantages to designating sites for projected needs, to determine in advance the best sites for particular types of wastes and to provide adequate lead time for full scientific investigations. This is currently the case in the Agency's review of sites suitable for ocean incineration. EPA will respond to anticipated need, and may not always wait until a formal application is received to initiate the site selection and designation process.

Question. Do you think the existence of a Commission would encourage or discourage research by your Agency?

Answer. We believe that the establishment of a Commission would probably have the effect of discouraging research with respect to municipal sludge dumping. It would be difficult to fund such projects within the Agency if a separate organization, the Commission, were responsible for conducting and funding similar research on its own. Moreover, Agency resources would probably be diverted to reviewing Commission research results, thereby further reducing the Agency's own research activity.

Question. You have indicated that there are existing mechanisms to accomplish the coordination function of the proposed Commission. Are there any problems associated with these mechanisms and is there any representation from municipal sewerage agencies with regard to their decision-making and recommendation functions?

Answer. The National Advisory Committee on Oceans and Atmosphere (NACOA) advises Federal programs governing oceans and the atmosphere including any gaps in these programs. NACOA consists of representatives from academic institutions, environmental groups, and affected industries.

EPA, NOAA, and the Corps have a close working relationship which ensures coordination of all Federal research in this area. NOAA's research is closely coordinated with affected groups. Independently of NOAA, EPA's research plans undergo peer review both inside and outside the Agency before they are implemented. This review is carried out by researchers, academicians, and trade groups such as the Association of Municipal Sewerage Agencies (AMSA), as appropriate. Moreover, EPA's regional personnel who have contact with the permittees are involved in designing Agency ocean research strategies and can provide for permittee priorities in this context. Therefore, the mechanisms for coordination do exist and, we believe, are working.

Question. If special fees were collected from 102 permittees and earmarked for additional site designation activities, is there any possibility those funds would be used for the designation of dredged material sites?

How would you divide the site designation and monitoring costs among users under your proposal?

Answer. We believe that it would be inappropriate to utilize special fees collected from municipal and/or industrial dumpers for any activities related solely to dredged material sites. Moreover, we do not believe that we should charge other federal agencies for their ocean disposal activities. Since the majority of dredged material is disposed of by the Corps we plan to continue to fund these activities through the budget process. We will probably set up two separate accounts for the disposal program, one for dredged materials the other for non-dredged. Up to now, this division of accounts has not been necessary as both the dredged and non-dredged programs as supported through the same funding source.

We are still evaluating alternative bases for the fee, such as the degree of toxicity of the material dumped, whether or not the material has been ocean dumped in the past, and where the sites are located (e.g., on or off the Continental Shelf).

Question. If EPA had the authority to recover all costs associated with ocean dumping, what range of fees would you expect to assess 102 permittees for:

- (a) processing permit applications?
- (b) designating dump sites?
- (c) monitoring activities?
- (d) research?
- (e) development?

Answer. (a) The average cost for processing a permit application is \$8,000.

(b) The average cost for designating an ocean dumping site is \$500,000. Of course, the exact cost of designating a specific site will depend on the existing available information on that site, the depth and hydrology of the site, the wastes to be dumped there, and the proximity of the site to special or critical areas. The fee assessed each permittee will depend on the numbers of sites and dumpers, and the method of allocation utilized.

(c) The costs for monitoring activities will also vary greatly depending on the wastes being dumped, the depth and hydrology of the site, the proximity of the site to areas of human use or valuable marine resources, and the like. For example, Federal agencies have been spending roughly \$2.5 million annually on monitoring in addition to the monitoring conducted by the 102 permittees themselves.

(d) and (e) The cost for research and development activities have been roughly \$2.0 million annually.

QUESTIONS SUBMITTED BY MR. FORSYTHE AND ANSWERED BY NOAA

Question 1. How is the present monitoring program divided between EPA, NOAA, and the 102 permittees?

Answer. In an attempt to define the respective roles of the Federal agencies, municipalities, and dumpers in respect to monitoring, NOAA and EPA recently sponsored a series of regional workshops, addressing such factors as what constitutes adequate monitoring, the objectives and the various forms of monitoring, and how to integrate regional strategies into a national framework. Based on the results of

those workshops, together with evolutionary views resulting from changed outlooks on waste disposal issues, it is possible to analyze monitoring from several perspectives:

There is a category of "compliance monitoring" for which the dumpers and EPA have primary responsibility, with EPA administering a program of monitoring conducted by dumpers in accordance with permit provisions. This effort is oriented towards specific wastes, concentrations, water quality and other factors associated with regulatory matters.

A second, "site-specific" type of monitoring is required to assist EPA in decisions on whether use of given sites should be continued or discontinued, and in what circumstances, and to meet NOAA's concerns on waste interactions, ecosystem response to stress including pollution, and the ability of ocean systems to accept wastes under differing conditions. These joint needs can often be met by common data, and cooperative programs have been formulated to obtain the required information. One such program involves EPA's Narragansett Laboratory and NOAA's Northeast Fisheries Center and Office of Marine Pollution Assessment, which provides periodic data on the conditions in and about several key dumpsites. Another is NOAA's Northeast Monitoring Program, developed through NOAA's research in the New York Bight and designed in consultation with EPA. In addition, programs by NOAA's National Marine Fisheries Service to assess commercial fish and shellfish populations, incidence of disease, reproductive capabilities, etc. also contribute monitoring data since they represent periodic measurements that reveal both natural and manmade variations and the reaction of living marine resources to environmental stress.

Finally, NOAA is concerned with broad-scale trends associated with the health of the oceans and of its living (and other) resources, and considers the implication of ocean waste disposal together with other causes of ocean pollution. Data from all monitoring efforts contribute to this "environmental monitoring" function, as does information from programs of research. The larger time-frame and the broader issues in ocean pollution as a whole make it impracticable to define given studies solely as monitoring; nevertheless, all meaningful information is intergrated properly. In this regard, we believe it important to establish the relationship between monitoring and research, as noted in the answer to question #3.

In general, therefore, permittees and EPA have compliance monitoring needs and responsibilities, EPA and NOAA are involved in site-specific monitoring related to dumpsite management and ecosystem response purposes, respectively, and NOAA is concerned with broader environmental issues relating ocean dumping to ocean pollution overall and the continuing health of the oceans on a mesoscale time frame.

Question 2. Is there general agreement between the Federal agencies on the monitoring activities that are necessary for ocean dumping?

Answer. Both EPA and NOAA are in general agreement on the activities necessary, as described above.

Question 2(a). How would you define monitoring in terms of what activities would be carried out and in what ocean areas for purposes of collecting a fee?

Answer. Permittee costs for monitoring are incurred by dumpers, but EPA should recover some appropriate portion of the administrative costs for maintaining the data and reviewing and asserting it. Costs associated with EPA and NOAA site-specific monitoring requirements, as described in the answer to question #1, should be recovered through user fees. Costs associated with NOAA's broader environmental mission in ocean pollution should not be recovered or be part of the fee process. The ocean area of greatest concern in the near term lies off the northeastern coast. Next in order of urgency are the southeast, Great Lakes, Gulf of Mexico, and in the southwest, northwest, and Alaska. These are relative priorities, based on levels of concern, with conditions subject to change.

Question 3. Can you determine the effects of ocean dumping from your existing monitoring program?

Answer. Properly integrated programs of research and monitoring are required to determine and predict the effects of ocean dumping. Monitoring does discern changes in ecological conditions and reveal trends in the quality or quantity of seafood catch, incidence of disease in fish and shellfish, alterations in the water column, bottom buildup of material, changes in benthic populations, variations in dissolved oxygen concentrations, etc. These trends may be of great significance whether there is ability to demonstrate cause and effect vis a vis dumping or not. But questions such as the degree to which data obtained through monitoring can be associated directly with dumping, or how dumping contributes to contamination from all sources in given regions, rely on programs of research. Research is also needed to devise strategies for monitoring, e.g., the measurements to be taken, their

locations, frequency, and similar variables. An understanding of steady-state conditions in an area subject to stress—gained through research—is also essential to be able to relate the importance of monitoring data. Only in this way may a detectable adverse effect be associated with its possible cause.

Conversely, lack of a detectable increase in degradation may not mean that dumping is having little effect; natural variation in the environmental state of the area may be large enough to mask trends due to dumping. Monitoring alone, for example, might have led to the conclusion that the 1976 oxygen depletion (anoxia) incident in the New York Bight was due to ocean dumping of sewage sludge, whereas prior and subsequent research was able to demonstrate convincingly that sewage sludge dumping played an insignificant role. In another case, we have learned through periodic monitoring that some species of fish in the New York Bight contain measurable amounts of PCBs, petroleum hydrocarbons, and other organic contaminants. Yet this cannot be attributed to a specific waste source in the absence of complementary research. Monitoring may also reveal areas where additional research is required, and monitoring and research are thus coupled elements in programs designed to determine the effects of ocean dumping.

Question 4. Is the NOAA data collection program under the Ocean Dumping Act carried out solely for the purpose of determining the effects of ocean dumping or do you use the information for other purposes?

Answer. NOAA collects and interprets data and conducts programs of monitoring and research under the Ocean Dumping Act to determine the effects of dumping, ascertain the possible long-term effects of pollution, overfishing, and man-induced changes on ocean ecosystems, gain important insights on oceanic processes affecting dumping, and scientifically assess the potential of ocean use in waste disposal issues.

Question 5. Does NOAA conduct both research and monitoring pursuant to the Ocean Dumping Act?

Answer. NOAA does conduct both research and monitoring under this Act. The answers to questions #1-4 address the nature of these efforts and why they are undertaken. NOAA's annual reports to the Congress describe the individual efforts in more detail. Additional information on grants and contracts, dumpsites and/or geographical area studied, institutions and laboratories with whom work is sponsored, costs, etc., can be provided.

Question 6. What would be the ideal budget for an adequate monitoring program and what would be the objectives of such a program?

Answer. Presumably, any ideal budget would be one that provided for all the necessary costs: ship time and use of other platforms, instrumentation, data processing and assessment, personnel, etc. Carrying this one step further, monitoring could be conducted in more than one geographic region simultaneously, and it would be necessary to structure complementary programs of research. Any realistic assessment of budgetary needs must, however, take into account a wide variety of factors; among these are program balance and policies to reduce the Federal budget deficit and spur economic growth and well-being. We believe that the President's FY83 budget provides for an adequate monitoring program, but that recovery of costs through an equitable system of user fees deserves serious consideration. The objectives of one NOAA monitoring program that we consider to be adequate (Northeast Monitoring Program, a joint effort by NOAA's National Ocean Survey and National Marine Fisheries Service), are as follows:

Determine or confirm the existing levels, trends, and variations of contaminants in water, sediments, and biota, and effects of these contaminants on living marine organisms.

Establish and maintain an interactive archive of data resulting from other marine pollution monitoring programs in the Northeast and foster cooperation and coordination of estuarine/shelf environmental monitoring and research efforts off the Middle Atlantic and New England States.

Summarize, in collaboration with other responsible agencies, information on pollutant inputs and effects to estuarine and coastal water.

Provide data and relevant information, in a timely manner for planning and management, to regulatory organizations and the general public.

Determine the effects of major activities such as offshore oil exploration, drilling, and development; dumping; and toxic waste discharge on the coastal marine environment and its resources.

Detect, and provide appropriate and early warnings of severe or irreversible changes in the coastal marine ecosystem and in its resources. This includes interaction with agencies responsible for coordination of both routine and crisis response activities (oil spills, harmful waste and toxic chemical discharge, etc.).

Question 7. Is it reasonable to expect your agency to be able to accurately estimate the costs to be incurred for your monitoring activities sufficiently in advance in order to fairly assess the fees to users?

Answer. Within normal ranges of predictability, costs to be incurred for monitoring can be estimated in advance for fee purposes. Actual costs might be determined through some audit arrangement with provision for cost adjustment or forward-carried credit.

Question 8. With regard to the past site designation process, who chose the site to be studied and who carried out the data collection activities-EPA, NOAA, or the applicant?

Answer. EPA either designated the site to be studied or established historical sites on an interim basis until adequate studies could be carried out. Data needed were obtained by field surveys or by using existing data from all sources including that held by NOAA or by potential users of the site. NOAA has provided data to EPA and to EPA contractors for EIS and site designation purposes in sites in the New York Bight and at the 106-mile site. EISs are reviewed by all concerned parties including NOAA, the applicants, and appropriate community and conservation groups. NOAA has been involved directly in the site designation process for a) conducting research and preparing reports for a proposed 65-mile sewage sludge site in the New York Bight, and b) current studies associated with establishment of a dredged material site off Norfolk, Virginia.

Question 9. To what extent does NOAA get involved in the site selection process?

Answer. The answer to this question is provided in #8 above. In addition, discussions are in progress with EPA to give NOAA some appropriate role in phases of the site selection process.

Question 10. It is appropriate to designate specific sites for dumping of waste material into ocean waters, assuming they meet the criteria for such dumping, or would it ever be desirable to dump the materials in more than one area?

Answer. Decisions associated with designation of single-use and/or single or multiple sites depend on the specific circumstances surrounding the problem. From the environmental standpoint it is possible that multiple sites might be desirable if the volume of wastes exceeded the ability of a single site to accept or disperse it properly. However, it appears that some sites (e.g., the 106-mile site) can accommodate volumes of wastes in excess of that now being disposed. Further, some site may be used for given combinations of wastes (such as chemical wastes and sewage sludge) while others should not. Conceptually, it is possible that large areas such as slope waters in general or the Gulf Stream could be used for disposal purposes, i.e., it may be feasible to depart from using fixed, finite sites, although further investigation of such disposal strategies is required.

Question 11. Do you think the existence of a Commission would encourage or discourage research by your agency?

Answer. Existence of a Commission would inevitably lead to overlap and duplication, complicating roles and research responsibilities. The resulting confusion would not make for an environment conducive to effective research.

QUESTIONS SUBMITTED BY CONGRESSMAN FORSYTHE AND ANSWERED BY CONFERENCE OF COASTAL AGENCIES

USER FEES

Question 1. You have heard the testimony from EPA and NOAA concerning their views on the collection of user fees. Would you please comment on their proposal to set up a user fee system through the regulatory process?

Answer. CCA believes that user fees for ocean waste disposal should not include any costs other than the administrative costs of site designation and permit processing. There would be no need to go through a rulemaking process to establish the user fees that we would find equitable. We do believe that a mandatory arbitration process should be used to settle disputes over what is, and what is not, to be included as part of the government's "reasonable" administrative costs.

Question 2. How would your agencies define "reasonable administrative costs" incurred by EPA or NOAA for the processing of a permit or the designation of a site for the dumping of sewage sludge?

Answer. We would like to see records of actual costs of site designation, and permit processing, in the past. Any proposed increases in such costs should be explained by the agency before they move to collect such increases; and any disputes

over the "reasonableness" of particular items should be resolved by binding arbitration.

Question 3. Are your agencies willing to collect the information necessary for EPA to designate a site for the dumping of sewage sludge?

Answer. Under current regulations, if a new site is proposed for ocean dumping of sewage sludge, the entity making the proposal (or requesting a permit to dump there) is required to provide sufficient data to EPA for a designation decision to be made. We see no reason to change this system.

Question 4. You have indicated you would be willing to share the monitoring costs with the Federal Government but that you would be opposed to EPA or NOAA doing any routine monitoring. Why?

Answer. We are not opposed to EPA or NOAA engaging in monitoring activities. We believe, however, that distinction must be made between "compliance" monitoring, which should be carried out by the permittee with spot-checking by the EPA, and the term "monitoring" as it is used by NOAA. Their "monitoring" (NOAA's) is our "research" (the permittees). We are willing to share in "monitoring" by NOAA, as part of their Title II responsibilities, or in similar activities by EPA. The problem here is simply one of semantics; there are too many interpretations of the word "monitoring."

Question 5. What range or costs do you feel are reasonable if EPA were to assess your agencies a fee for:

- a. processing the permit?
- b. designating a dump site?
- c. monitoring ocean dumping at the site?
- d. research on the long-term effects and alternatives?

Answer. EPA has indicated in its testimony before Congress this year that a \$ 102 permit processing fee would run about \$8,000.00. That seems reasonable to us. We do not have any idea what EPA's administrative costs of site designation are, so we cannot respond to part (b) of your question. We are flatly opposed to the assessment of user fees for "monitoring" and "research," parts (c) and (d) of your question, as we are convinced that such a fee could become a "blank check" to be applied to whatever program costs the agency chose to include. Without some control over the monitoring and research expenditures in the hands of the permittees, we are concerned that the funds raised in this manner might be wasted by EPA. This is the reason that we support the Commission proposal; we need to be assured that our money will be spent for useful and constructive purposes.

Question 6. If there is no Ocean Waste Management Commission, what would your agencies like to see as an arbitration mechanism to resolve the differences between your agencies and the Federal agencies regarding what costs are reasonable?

Answer. Even with the Commission, we refer you to the procedures of the American Arbitration Association. We gave a copy of their procedures to Ms. Barbara Wyman of the Committee staff.

Question 7. What amount do you feel is necessary for ocean dumping research each year and how should it be divided between the permittees and the Federal Government?

Answer. We believe that an overall effort in the range of \$5 to \$6 million per year, on sewage sludge effects alone, is adequate for research and NOAA-defined "monitoring," if it is properly directed. Of that amount, we have expressed support for the Commission proposal, in which the permittees would put up approximately one-third of the total, or \$2 million per year.

COMMISSION

Question 8. With regard to the Ocean Waste Management Commission proposal, do you have any recommendations concerning the qualifications of the Commissioners or the Advisory Committee?

Answer. We see two problems in the draft language, in the qualifications and conflict-of-interest provisions affecting Advisory Committee members. First, the rigid requirement that six disciplines be represented at all times on the Committee is unworkable. There is no way to predict the year-to-year variations in the Commission's priorities, and it would be a mistake to tie the Commission's hands on picking the type of expertise it really needs. We suggest three changes; first, that the Commission choose, "to the maximum extent practicable" Committee members from among the listed disciplines; second, that physical and chemical oceanography be split into two categories, rather than one, and third, that "marine sediment transport geology" be changed to "marine geology."

In the conflict-of-interest provisions, we are surprised to see identical restrictions on both Commission and Committee members. This helps assure that only persons with no knowledge of the subject matter will be appointed to the Committee. We recommend deleting the second ("consultant") conflict provision where Committee members are concerned. Since, as we read the language, parties other than Federal Government employees and sewerage agency employees could sit on the Commission and the Advisory Committee, there is an element of possible unfairness. We believe employees or consultants of our agencies should be treated on the same basis as other interested groups: either all potentially interested parties should be excluded or included. Either approach would produce parity, but our preferred position would be to permit participation by qualified people.

We note, although you have not asked us, that the provision that Commissioners serve "until replaced," even beyond the end of their terms, has been dropped from the draft language. We believe such a provision should be included in order to avoid the problem of late replacement appointments.

Question 9. Do you feel that the creation of an independent Commission would create another layer of bureaucracy for your agencies?

Answer. No. We think such an oversight group is absolutely necessary in order to bring some order, and cost-effectiveness, to the ocean dumping research (and "monitoring") programs at both EPA and NOAA.

Question 10. You have indicated that you would not support a research budget of not more than \$2 million for the Commission. Would you support increasing this amount if a number of additional coastal municipalities receive permits for ocean dumping in the future?

Answer. No. This is not a problem that yields to throwing money at it. There are only a finite number of competent researchers available in this field, and more money will just produce a scramble by less-qualified investigators, and a dilution of the overall quality of the research effort.

Question 11. Why do you feel that 8 to 10 years is sufficient time for the Commission to do its work—is it because you feel there will be no need for further research or monitoring activities?

Answer. We believe that there must be a "sunset" provision terminating the Commission's existence after a reasonable time—enough time to do a thorough job, however. We do not want to see an empire created, and we are only too well aware of the propensity for federal programs to acquire a life of their own, long after their original task is finished. If the Commission's work is unfinished at the end of its existence, nothing stops Congress from extending it, and the fee, on a year-to-year basis or for whatever period it chooses. We do, of course, expect that monitoring will continue beyond the lifetime of the Commission, but in the light of the additional knowledge to be gained by Commission-sponsored studies, this monitoring can be effectively performed through compliance monitoring and NOAA's continuing Title II responsibilities.

[Whereupon, at 3:15 p.m., the subcommittee adjourned.]





