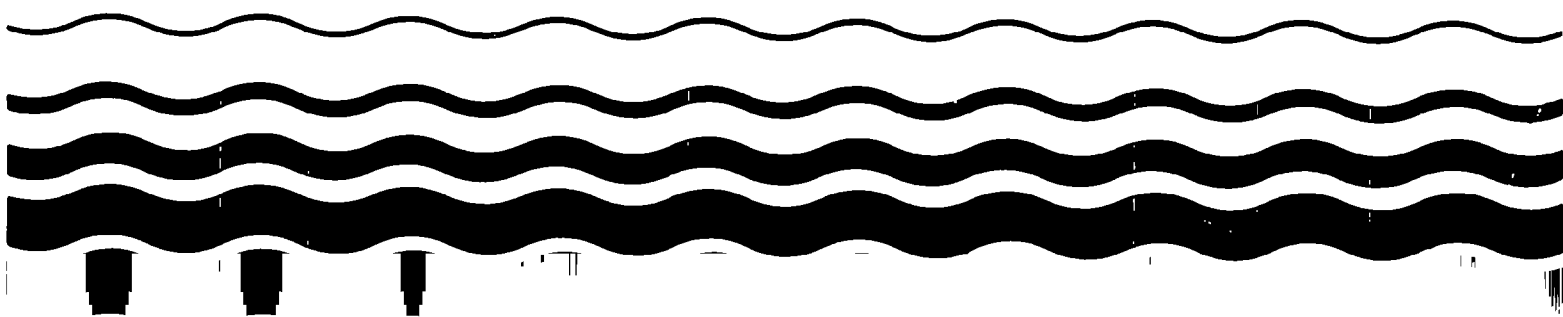




Sludge Recycling Alternatives

Report to Congress



**REPORT TO CONGRESS
ON
SLUDGE RECYCLING ALTERNATIVES**

April 1990

**U. S. Environmental Protection Agency
Office of Marine and Estuarine Protection
Washington, DC 20460**

INTRODUCTION

In 1988, the United States Congress responded to the public's increasing concern over ocean dumping by passing the Ocean Dumping Ban Act (ODBA). The Act amended the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 which regulates ocean dumping, and requires that ocean dumping of industrial waste and municipal sewage sludge be terminated by December 31, 1991. The U.S. Environmental Protection Agency (EPA or the Agency) was assigned primary responsibility for implementing ODBA, and since enactment several program actions have been initiated to ensure that the legislation's statutory requirements are met.

Termination of ocean disposal of industrial waste has already been achieved, and thus EPA is now focusing its efforts on the nine sewerage authorities in New Jersey and New York which use ocean disposal to manage their sewage sludge. ODBA required EPA, the states of New Jersey and New York, and the sewerage authorities to enter into compliance agreements that would include a negotiated schedule to design, construct, and implement an alternative system to ocean dumping by December 31, 1991. In case full implementation can not be achieved by this date, enforcement agreements will be required. Given the stringent time frame, all nine sewerage authorities entered into enforcement agreements; the agreements were signed on or before August 4, 1989. The sewerage authorities agreed to implement interim disposal plans until long-term plans could be implemented. Interim and final disposal plans, as well as compliance dates, are shown for each sewerage authority in Table 1.

Currently, most of the New Jersey sewerage authorities plan dewatering and out-of-state disposal as the interim land-based alternative and incineration is expected to be their final land-based alternative. However, many of the New Jersey sewerage authorities are continuing to investigate other alternatives. For example, the Passaic Valley Sewerage Commissioners are considering a proposal for gasification, and the Rahway Valley Sewerage Authority is considering a proposal for pelletization. In New York, the sewerage authorities will dewater and then utilize private vendors to manage their sewage sludge in the interim. The majority of responses received as a result of the request for proposal process include chemical fixation, composting, pelletization, land application and in a few cases, landfilling and incineration. Alternatives for long-term land-based disposal are still under study.

TABLE 1 CURRENT SLUDGE MANAGEMENT COMPLIANCE SCHEDULES AND PLANS FOR INTERIM AND LONG-TERM IMPLEMENTATION

SEWERAGE AUTHORITY	INTERIM		LONG-TERM	
	COMPLIANCE DATE	PLAN	COMPLIANCE DATE	PLAN
Bergen County Utilities Authority	3/17/91	Dewatering/ Out-of-state disposal	1/1/96	Incineration
Joint Meeting of Essex and Union Counties	3/17/91	Dewatering/ Out-of-state disposal	2/10/98	Incineration
Linden Roselle Sewerage Authority	3/17/91	Dewatering/ Out-of-state disposal	1/1/96	Incineration
Middlesex County Utilities Authority	3/17/91	Chemical fixation/ Landfill cover	3/17/91	Chemical fixation/ Landfill cover
Passaic Valley Sewerage Commissioners	3/17/91	Dewatering/ Out-of-state disposal	12/31/96	Incineration
Rahway Valley Sewerage Authority	3/17/91	Dewatering/ Out-of-state disposal	2/10/98	Incineration (at Joint Meeting of Essex and Union Counties)
Nassau County Department of Public Works	6/30/91 (50%) ^a 12/31/91 (100%)	Dewatering/ Private venture	12/31/94	Under study
New York City Department of Environmental Protection	12/31/91 (20%) ^b 6/30/92 (100%)	Dewatering/ Private venture	12/31/95 (50%) ^c 6/30/98 (100%)	Under study
Westchester County Department of Environmental Facilities	12/31/91	Dewatering/ Private venture	9/15/96	Under study

- ^a Under its interim plan, NCDPW plans to phase out 50% of its ocean dumping by 6/30/91 and 100% by 12/31/91
- ^b Under its interim plan, NYCDEP plans to phase out 20% of its ocean dumping by 12/31/91 and 100% by 6/30/92
- ^c Under its long-term plan, NYCDEP plans to phase in 50% of its capacity by 12/31/95 and 100% by 6/30/98

At a hearing on the FY90 Appropriations Bill, the Senate Appropriations Subcommittee on VA, HUD, and Independent Agencies considered the sewerage authorities' interim and final plans. Concern was expressed that the sewerage authorities selecting incineration had done so without fully considering other disposal alternatives. The Subcommittee stated that under ODBA and the Agency's Pollution Prevention Policy, EPA has a responsibility to identify environmentally sound sludge recycling alternatives and assist the sewerage authorities with their efforts to implement these alternatives. In Senate Conference Report 101-128, the Subcommittee requested that EPA prepare a report on actions it has taken to work with the sewerage authorities to identify and implement sludge recycling alternatives. Specifically, the Subcommittee requested the following

- A description of the process that EPA is using to assist the sewerage authorities, and
- Economic and technological feasibility assessments of alternatives that have been proposed to reuse or recycle sewage sludge

EPA ASSISTANCE IN SELECTING SLUDGE RECYCLING ALTERNATIVES

During ODBA Oversight Hearings in May 1989, the House Merchant Marine Fisheries Committee, along with the Natural Resources Defense Council, asked EPA to provide the sewerage authorities with information and assistance on sludge management technology via a roundtable meeting on land-based alternatives to ocean dumping. EPA Region II, with assistance from the EPA Office of Marine and Estuarine Protection (OMEP) and Office of Municipal Pollution Control (OMPC), responded by hosting a two-day meeting in November 1989, in East Rutherford, New Jersey. EPA invited the nine sewerage authorities, along with officials from other sewerage authorities already familiar with the operation of land-based sludge management systems. The meeting provided an open forum to identify and discuss the political, economic and technological difficulties associated with implementing land-based technologies. A report summarizing the discussions at the roundtable meeting was prepared and is included as Attachment 1.

EPA has also developed official policies to provide guidance on sludge management issues. The Agency's Pollution Prevention Policy promotes source reduction and recycling and states that

- *Although source reduction is preferred to other management practices, the Agency recognizes the*

value of environmentally sound recycling, and is committed to promoting recycling as a second preference, above treatment, control and disposal . . . "

The Agency's Beneficial Use of Sludge Policy is directed solely towards management of sewage sludge and states that

" . . . The U.S. Environmental Protection Agency will actively promote those municipal sludge management practices that provide for the beneficial use of sludge while maintaining or improving environmental quality and protecting public health"

EPA and other agencies (e.g., Department of Agriculture, Department of the Interior, National Science Foundation, Tennessee Valley Authority) have conducted and/or funded many research initiatives, workshops, conferences, and demonstration projects to support the Beneficial Use of Sludge Policy; results have been published in numerous EPA and external publications. These publications, which are available to the sewerage authorities, their consultants, and the general public through private publishers, National Technical Information System, General Printing Office, and other means, have focused on a variety of public policy and technical issues related to beneficial use of sewage sludge. Major topics addressed include

- Health effects associated with sludge land-application practices
- Crop responses when grown on sludge amended soils
- Use of sludge compost in turf production and maintenance
- Use of sludge in land reclamation and biomass production
- Application of sludge to forest lands
- Technology assessment of in-vessel composting
- Technology assessment of static pile and windrow composting
- Technology assessment of dual digestion
- Technology assessment of chemical fixation and alkaline stabilization processes.

While EPA recognizes that it has a role in providing assistance to the sewerage authorities, it should be noted that Section 405(e) of the Clean Water Act clearly states that

" . . . the determination of the manner of disposal or use of sewage sludge is a local determination "

EPA cannot prohibit a local government from implementing a particular technology, and thus, the ultimate responsibility for evaluating and selecting a land-based sludge disposal technology lies with the local government.

EPA FEASIBILITY ASSESSMENTS OF SLUDGE RECYCLING ALTERNATIVES

Economic and technological feasibility assessments of various land-based sludge management technologies have been conducted for years as a result of EPA's Construction Grants Program. The program, which has provided over \$52 billion in federal funding since 1972 for construction of publicly owned wastewater treatment facilities, requires a facility to conduct a full evaluation of potential alternatives before selection of a technology. As a result, project- and area-specific economic and technical assessments have been conducted of various land-based sludge management alternatives. In addition, a number of area-wide sludge management studies, including specific technology assessments and pilot tests, have been funded by EPA. Examples include the Los Angeles/Orange County Metropolitan Area Regional Wastewater Solids Management Program, the San Francisco Bay Regional Wastewater Solids Study, and the New York/New Jersey Interstate Sanitation Commission Study. These project-specific assessments have not been collected or published by EPA in a central location; however, if a sewerage authority official requests information on the economic and technical feasibility of a technology, the Agency can help to direct the official to appropriate sources of information, and in many cases operating facilities. While the assessments are generally project-specific, the information can still provide a sewerage authority official with an appreciation for the positive and negative trade-offs associated with various technologies.

In some circumstances, EPA has conducted its own economic and technological assessments of proposed Construction Grants projects through the preparation of environmental impact statements. In addition, EPA has supported state-of-the-art assessments and issued design guidance and cost estimating guidance applicable to most of the major sludge use and disposal technologies. (Some of the major reference documents that have been prepared are listed in Attachment 2.) EPA is

currently planning a technical assessment of chemical fixation, a technology selected by Middlesex County Utilities Authority and under consideration by some of the other sewerage authorities. The study, which is being sponsored by OMEP and OMPC, will be conducted in the summer of 1990. It will be useful to the sewerage authorities that are still evaluating their long-term disposal alternatives.

ATTACHMENT 1

**PROCEEDINGS OF THE
SLUDGE MANAGEMENT ROUNDTABLE**

**Held
November 26-27, 1989
East Rutherford, New Jersey**

April 1990

**U. S. Environmental Protection Agency
Office of Marine and Estuarine Protection
Washington, DC 20460**

EXECUTIVE SUMMARY

In 1988, the United States Congress amended the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 by enacting the Ocean Dumping Ban Act (ODBA) to end the practice of ocean dumping of industrial waste and municipal sewage sludge. The U S Environmental Protection Agency (EPA) is delegated primary responsibility for the implementation of ODBA. Currently, all industrial-waste generators subject to ODBA have stopped dumping, however, the following nine municipal sewerage authorities in New Jersey and New York are still ocean dumping sewage sludge:

New Jersey

- Bergen County Utilities Authority (BCUA)
- Joint Meeting of Essex and Union Counties (JMEUC)
- Linden Roselle Sewerage Authority (LRSA)
- Middlesex County Utilities Authority (MCUA)
- Passaic Valley Sewerage Commissioners (PVSC)
- Rahway Valley Sewerage Authority (RVSA)

New York

- Nassau County Department of Public Works (NCDPW)
- New York City Department of Environmental Protection (NYCDEP)
- Westchester County Department of Environmental Facilities (WCDEF)

ODBA established a framework for terminating ocean disposal of sewage sludge and prohibited ocean dumping of sludge after August 14, 1989, unless the municipal sewerage authorities had received a permit and entered into a compliance or enforcement agreement with EPA and the applicable state. EPA received complete permit applications for the transport and disposal of municipal sewage sludge from all nine municipal sewerage authorities. Final permits were issued and enforcement agreements were signed by EPA, the states of New York and New Jersey, and the nine municipal sewerage authorities on or before August 4, 1989. The permits became effective on August 14, 1989; the enforcement agreements, in the form of judicial consent decrees, were filed with the court by August 14, 1989.

At an ODBA hearing on May 17, 1989, the U. S. House of Representatives Committee on Merchant Marine and Fisheries and the Natural Resources Defense Council (NRDC) asked EPA to convene a roundtable on land-based alternatives to ocean dumping of sewage sludge for the nine sewerage authorities affected by ODBA. Members of the committee reiterated the

recommendation to the Honorable William Reilly, EPA Administrator, in a letter dated July 19, 1989, emphasizing the need "to provide information and assistance to the authorities, ensuring that all potential avenues to safely manage sewage sludge on land are considered." EPA, committed to the effective implementation of ODBA and sensitive to the concerns of Congress, the public, and the municipal sewerage authorities, agreed to host a sludge management roundtable. The roundtable convened on November 27-28, 1989, in East Rutherford, New Jersey.

This document summarizes the discussions that took place among participants at the roundtable. Participants included the New York and New Jersey sewerage authority officials who are now faced with implementing land-based sludge management alternatives, guest speakers representing sewerage authorities already familiar with operation of land-based sludge management systems, state and federal regulatory officials acting as resources for the participants, a representative of the NRDC, and a roundtable facilitator. The public was invited to observe the proceedings. The opinions expressed by the roundtable participants and described herein do not necessarily reflect the opinions or policies of EPA.

EPA, with the support of New York and New Jersey state officials, sponsored the roundtable and formed a planning group to develop the agenda. The planning group recognized the importance of acquiring input for the agenda. Thus, a questionnaire was produced and distributed to all nine municipal sewerage authorities and to NRDC. The respondents were encouraged to voice their concerns and priorities through the completion of this questionnaire.

Using results from the questionnaire, the planning group identified three goals for the sludge management roundtable:

1. To understand the factors contributing to the challenges being experienced by the municipal sewerage authorities in the development of land-based sludge management.
2. To define various strategies for handling the challenges of land-based sludge management.
3. To define realistic actions to be pursued in the successful implementation of land-based sludge management alternatives.

Based on those issues rated as most challenging and other issues identified by the respondents, the topics for discussion were

focused on two major areas (1) permitting and siting and (2) technologies in relation to public health and environmental concerns.

The planning group formatted the roundtable in a manner that would stimulate productive discussion on strategies for implementing land-based management alternatives for municipal sewage sludges. The two-day roundtable consisted of three sessions. In addition, a presentation on the status of proposed 503 sludge regulations followed the conclusion of Round 1 on the first day.

Round 1 opened with introductions and comments by Richard Caspe, EPA Region II Water Management Division Director. He identified three overall objectives to be accomplished at the roundtable:

- 1 To establish a network of people experiencing similar challenges.
2. To provide a forum for an open exchange of information and ideas
- 3 To provide an increased sensitivity to the issues being faced by the New York and New Jersey authorities among all involved with sludge management.

Roger Dolan, general manager of the Central Contra Costa Sewerage District, California, served as the primary roundtable facilitator and began the dialogue with comments on the issues affecting land-based sludge management. During the discussion that followed, there was general consensus among the participants that the schedules to terminate ocean dumping are tight and, in most cases, more difficult than the schedules faced by the guest speakers. The sewerage authority representatives expressed confidence in their ability to meet the deadline for implementing long-term alternatives. Their most critical concern was meeting the agreed upon interim deadlines for ending ocean dumping. The New Jersey authorities were concerned about the even more stringent, state-mandated March 17, 1991, deadline. Producing dewatered sludge and hauling it to landfills was identified as the most realistic interim land-based alternative. The authorities noted that numerous difficulties are associated with implementing this disposal option, including siting dewatering facilities and finding landfill sites, gaining public acceptance, obtaining necessary state and municipal permits, constructing the necessary facilities, and transporting the dewatered sludge to landfills.

Members of EPA, the New Jersey Department of Environmental Protection, and the New York State Department of Environmental

Conservation joined the guest speakers, sewerage authorities, and NRDC in the focus group discussions in Round 2 on the second day. The purpose of the break-out groups was to discuss the issues introduced in Round 1 in greater detail. The topics were divided into two sections: (1) Focus Group A – Technologies in Relation to Public Health and Environmental Concerns and (2) Focus Group B – Permitting and Siting.

The two Focus Group A sessions addressed primarily public misconception and acceptance; traditional technologies such as land application and incineration; less conventional technologies such as chemical fixation or gasification; techniques used in the successful implementation of a dewatering/landfill disposal system, and concern for using the best technologies for long-term land-based sludge management. The two Focus Group B sessions centered on the challenge of siting and implementing sludge management systems that adhere to both state agency permitting procedures and the consent decree schedules.

The sludge management roundtable addressed the concerns and challenges presented by all of the groups involved in the implementation of land-based sludge management alternatives: (1) the city, state, and federal legislators who will make, or have made, decisions on sludge management, (2) the regulators who enforce the legislative decisions, (3) the sewerage authorities responsible for implementing sludge management alternatives, (4) the private contractors employed for sludge management, (5) the environmental and public health activists, and (6) the public, who, in many instances, believe that their health and personal property may be jeopardized by the recommended sludge management methods. Consequently, the roundtable provided EPA, the state agencies, and NRDC with an increased sensitivity to the issues being faced by the New York and New Jersey sewerage authorities in pursuing and implementing interim and long-term alternatives.

The sewerage authorities benefitted from the in-depth information exchange that took place during the roundtable. Many strategies and possible endeavors were discussed. In addition to the strategies listed in Section 3, the following suggestions were made in the final round:

1. Establish an information clearinghouse, possibly by or with support from EPA.
2. Continue the networking process that began at this roundtable.
3. Seek cooperation at all levels: federal, state, local, and private sector.

-
4. Consider the possibility of regionalization in the development of long-term solutions
 5. Use multiple contractors and diversification in implementing sludge management options
 6. Increase sewerage authority staffs for the negotiation and management of multiple contracts with the private sector.
 7. Involve a city attorney knowledgeable in the local permitting regulations for negotiating contracts
 8. Increase public awareness of the sewerage authorities' decision-making processes and sludge management activities, EPA should be more involved in providing information to the public on the public health and environmental effects of various sludge management technologies

The New York and New Jersey sewerage authorities expressed their gratitude to EPA for holding the roundtable and reiterated a firm commitment to meeting their deadlines and successfully terminating ocean dumping. The sewerage authorities strongly voiced their desire to implement the most environmentally sound sludge management alternatives and expressed a willingness to remain open-minded and flexible in their implementation plans. They also expressed the hope that the regulators maintain the same open-mindedness and flexibility

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1.0 INTRODUCTION

In 1988, the United States Congress amended the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 by enacting the Ocean Dumping Ban Act (ODBA) to end the practice of ocean dumping of industrial waste and municipal sewage sludge. The U.S. Environmental Protection Agency (EPA) is assigned primary responsibility for the implementation of ODBA. The act assigns a number of tasks to the agency, including establishing compliance and enforcement agreements, issuing and enforcing permits; collecting ocean dumping fees, and conducting monitoring, research and surveillance activities, as well as preparing Reports to Congress.

ODBA requires a compliance or enforcement agreement for all industries or sewerage authorities that use ocean disposal to manage their waste. The agreements must include a negotiated schedule to terminate ocean disposal by December 31, 1991. The schedule must include plans for the design, construction, and full implementation of a long-term, land-based, alternative system for the management of industrial waste or sewage sludge.

Currently, all industrial-waste generators subject to ODBA have stopped dumping; however, the following nine municipal sewerage authorities in New York and New Jersey are still ocean dumping sewage sludge.

New Jersey

- Bergen County Utilities Authority (BCUA)
- Joint Meeting of Essex and Union Counties (JMEUC)
- Linden Roselle Sewerage Authority (LRSA)
- Middlesex County Utilities Authority (MCUA)
- Passaic Valley Sewerage Commissioners (PVSC)
- Rahway Valley Sewerage Authority (RVSA)

New York

- Nassau County Department of Public Works (NCDPW)
- New York City Department of Environmental Protection (NYCDEP)
- Westchester County Department of Environmental Facilities (WCDEF)

ODBA established a framework for terminating ocean disposal of sewage sludge and prohibited such dumping after August 14, 1988, unless the municipal sewerage authorities had received a permit and entered into an agreement with EPA and the applicable state. EPA received complete permit applications for the transport and disposal of municipal sewage sludge from all nine municipal

sewerage authorities. Enforcement agreements were signed by EPA Region II, the U S Department of Justice, the states of New York and New Jersey, and the nine municipal sewerage authorities on or before August 4, 1989. Permits were issued to the nine authorities on or before August 4, 1989, and became effective on August 14, 1989.

EPA, along with the affected states, negotiated the enforcement agreements with the municipal sewerage authorities to ensure that the authorities will aggressively pursue the implementation of alternative land-based sludge management methods as required by ODBA. The enforcement agreements require that the municipal authorities specifically define their long-term plans by May 1, 1991. The municipal sewerage authorities' interim and long-term plans of action, as well as compliance dates, are detailed in Table 1.

The New Jersey Ocean Sludge Dumping Elimination Act requires a complete cessation of ocean disposal by March 17, 1991. A companion piece of legislation, which amends the New Jersey Water Pollution Control Act, requires the submittal of a plan for land-based sludge management by April 30, 1989. Currently, most of the New Jersey sewerage authorities plan dewatering and out-of-state disposal as the interim land-based alternative, while incineration is expected to be their final land-based alternative. However, many of the New Jersey authorities are continuing to investigate other alternatives. For example, PVSC is considering a proposal for gasification, and RVSA is considering a proposal for pelletization.

The New York sewerage authorities currently plan to dewater sludge and utilize private vendors to manage their sewage sludge in the interim. The majority of the responses received as a result of the request for proposals (RFP) process comprise chemical fixation, composting, pelletization, land application, and in a few cases, landfilling and incineration. Alternatives for long-term disposal are still under study.

Land-based sludge management alternatives are use and disposal technologies that do not involve dumping sludge into the ocean. Disposal methods include incineration of sludge with ash disposal in a landfill and direct landfilling of sludge. Land application and land reclamation are other common disposal methods. Because of the benefits derived from land application and land reclamation, these disposal methods are commonly referred to as "beneficial use." It should be noted that benefits may be derived from other alternatives as well. For example, energy can be recovered from some incinerators and landfills.

**TABLE 1. CURRENT SLUDGE MANAGEMENT COMPLIANCE SCHEDULES AND
PLANS FOR INTERIM AND LONG-TERM IMPLEMENTATION**

SEWERAGE AUTHORITY	INTERIM		LONG-TERM	
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Passaic Valley Sewerage Commissioners	3/17/91	Dewatering/ Out-of-state disposal	12/31/96	Incineration
Rahway Valley Sewerage Authority	3/17/91	Dewatering/ Out-of-state disposal	2/10/98	Incineration at Joint Meeting of Essex and Union Counties
Nassau County Department of Public Works	6/30/91 (50%) ^a 12/31/91 (100%)	Dewatering/ Private venture	12/31/94	Under study
New York City Department of Environmental Protection	12/31/91 (20%) ^b 6/30/92 (100%)	Dewatering/ Private venture	12/31/96 (50%) ^c 6/30/98 (100%)	Under study
Westchester County Department of Environmental Facilities	12/31/91	Dewatering/ Private venture	9/15/96	Under study

^a Under its interim plan, NCDPW plans to phase out 50% of its ocean dumping by 6/30/91 and 100% by 12/31/91

^b Under its interim plan, NYCDEP plans to phase out 20% of its ocean dumping by 12/31/91 and 100% by 6/30/92

^c Under its long-term plan, NYCDEP plans to phase in 50% of its capacity by 12/31/96 and 100% by 6/30/98.

The technologies for processing sludge prior to land application or reclamation to control pathogens vary depending on site conditions, end use, and sludge quality. Those in common use include digestion or stabilization, composting, heat or air drying, and pelletization. Sludge must be dewatered prior to the implementation of incineration and the majority of land application or reclamation alternatives.

Implementation of land-based sludge management alternatives, as well as the processes used to prepare sludge for these options, can be hindered by a variety of difficulties. For example, because New York and New Jersey are such densely populated areas, land-fill space is very limited. Also, concerns regarding human health and environmental impacts can create significant public opposition to alternatives. EPA recognizes the difficulties associated with implementing land-based sludge management alternatives. At an ODBA hearing on May 17, 1989, the U. S. House of Representatives Committee on Merchant Marine and Fisheries and the Natural Resources Defense Council (NRDC) asked EPA to convene a roundtable on land-based alternatives to ocean dumping of sewage sludge for the nine sewerage authorities affected by ODBA. Members of the committee reiterated the recommendation to William Reilly, EPA Administrator, in a letter dated July 19, 1989, emphasizing the need "to provide information and assistance to the authorities, ensuring that all potential avenues to safely manage sewage sludge on land are considered." EPA, committed to the effective implementation of ODBA and sensitive to the concerns of Congress, the public, and the municipal sewerage authorities, agreed to host a sludge management roundtable. The roundtable convened on November 27-28, 1989, in East Rutherford, New Jersey.

This document summarizes the discussion that took place at the roundtable. The roundtable participants included the New York and New Jersey sewerage authority officials who are now faced with implementing land-based sludge management alternatives, guest speakers representing sewerage authorities already familiar with operation of land-based sludge management systems; state and federal regulatory officials acting as resources for the participants; a representative of NRDC; and a roundtable facilitator. The public was invited to observe the proceedings. The opinions expressed by the roundtable participants and described herein do not necessarily reflect the opinions or policies of EPA.

2.0 ROUNDTABLE ORGANIZATION

EPA, with the support of New York and New Jersey state officials, sponsored the roundtable and formed a planning group to develop the agenda. The planning group consisted of personnel from EPA, the New Jersey Department of Environmental Protection (NJDEP), the New York State Department of Environmental Conservation (NYSDEC), and consultants are shown in Appendix A. Planning the roundtable involved three tasks: (1) identifying the roundtable attendees, (2) identifying the key issues, and (3) determining the roundtable structure and process.

2.1 ATTENDEES

Categorically, there were three groups of attendees at the sludge management roundtable:

1. DISCUSSION PARTICIPANTS

The discussion participants consisted of the roundtable facilitators, guest speakers, sewerage authority officials, and a representative from NRDC.

The primary facilitator had the responsibility for keeping the roundtable discussions directed to the appropriate issues throughout Round 1 and Round 3 and for facilitating Focus Group A during Round 2. A second facilitator directed Focus Group B during Round 2.

The guest speakers were officials from various areas of the United States who had either successfully implemented land-based sludge management systems or were in the process of implementing such programs. They were invited in order to share their experiences with the New York and New Jersey sewerage authorities.

The sewerage authority officials were from the nine New Jersey and New York municipalities affected by the ODBA.

A representative from NRDC was included in the discussion group because of the organization's involvement in the initiation of the roundtable meeting.

2. RESOURCE PEOPLE

Resource people consisted of regulatory and enforcement officials and technology experts involved with various aspects of sludge management or ocean dumping. This group included representatives from EPA Headquarters, EPA Region II, and the states of New York, and New Jersey.

3. OBSERVERS

Observers were representatives from an array of public and private interest groups concerned with the issues of ocean dumping and sludge management. EPA Region II provided the planning group with a list of more than 800 individuals who had attended public meetings and/or permit hearings on sludge management issues or who had otherwise expressed an interest in ODBA implementation during the past year. Invitations were sent to all names on the mailing list.

Names and organizations of all roundtable attendees are provided in Appendix B.

2.2 KEY ISSUES

The planning group recognized the importance of acquiring input for the roundtable agenda from the nine New Jersey and New York sewerage authorities. Their input was requested to more clearly define the goals of the roundtable and increase their commitment to participation. The planning group produced a questionnaire and distributed it to all nine municipal sewerage authorities and NRDC. The respondents were encouraged to voice their concerns and priorities through the completion of this questionnaire.

2.2.1 Results of the Questionnaire

The planning group developed a list of 10 items that the New York and New Jersey authorities and NRDC were asked to rate in terms of their importance as major challenges to the implementation of land-based sludge management alternatives. The respondents were also asked for suggestions regarding how the roundtable could assist in addressing these challenges and what other topics they felt should be included in the roundtable discussions. All nine municipal sewerage authorities completed the questionnaire (see Table 2).

Perceived environmental risks and public health concerns ranked highest in the questionnaire responses. The public's misconceptions and resulting opposition affects several areas of land-based sludge management: facility siting, the ability to obtain necessary permits, facility financing, and the need for immediate action. The Nassau County Department of Public Works (NCDPW) expressed a specific concern regarding the siting of facilities, claiming that there was no time allowed in the consent decree for educating the public on environmental and health safety, and that the media misrepresents sludge management, causing unnecessary public apprehension. The Linden Roselle Sewerage Authority (LRSA) stated that they expect "strong . . . negative reaction from various groups and the general public" in facilities siting.

TABLE 2. RESULTS OF THE QUESTIONNAIRE

ISSUE	BOUA	JMEUC	LRSA	MOUA	PVSC	RVSA	NCDPW	NYCDEP	WCDEF	TOTAL	AVG.	RANK
1 Facility siting	5	5	5	4	2	2	5	5	5	38	4.2	2
2 Sludge product marketing	5	3	1	5	5	2	3	5	5	34	3.8	6
3 Facility cost and financing	2	3	3	3	1	1	3	3	4	28	2.8	9
4 Uncertainty about impact of future sludge management regulations	4	3	3	4	1	5	5	5	5	35	3.9	5
5 Ability to obtain necessary permits	5	5	3	4	1	5	4	5	5	37	4.1	3
6 Need to act now, although future technologies may provide even greater benefits	4	4	2	2	4	1	4	2	2	25	2.8	8
7 Public acceptance and support - NIMBY vs IMBY	5	3	5	4	3	2	5	5	5	37	4.1	3
8 Feasibility of implementing available disposal options	4	3	2	4	3	5	5	4	3	33	3.7	7
9 Confidence in available technologies	3	3	2	2	3	1	1	3	3	21	2.3	10
10 Perceived environmental risks and public health	3	5	5	4	2	5	5	5	5	39	4.3	1

Ratings were based on a scale of 1 to 5, 5 being the highest level

Along with the problem of public misconceptions, there were several other concerns expressed regarding site location planning. The New York City Department of Environmental Protection (NYCDEP) noted that other states are beginning the process of tightening their regulations for acceptance of out-of-state sludge. The NCDPW defined interim facility siting as their most difficult challenge because landfill space may be impossible to obtain. Since landfilling is a common interim solution, the NCDPW suggested that EPA review and produce an up-to-date list of landfill locations and their specifications as a resource for the sewerage authorities. The Westchester County Department of Environmental Facilities (WCDEF) also commented on having difficulty finding an acceptable interim landfill site.

Both the LRSA and the NYCDEP noted that the public review process necessary for obtaining permits hinders quick decisions on permit applications. Respondents commented that facility financing also depends on public support, negative reaction to rate increases can have major implications for projects.

Although present-day technologies proved to be the least challenging issue in the questionnaire, the NYCDEP expressed a concern that the technologies available today could become unusable in the future owing to changing sludge regulations. Sewerage authorities commented that future federal and state regulations may prevent the exporting of sludge products out of state.

The marketing of sludge products appeared to be another issue of concern. The LRSA felt that sludge marketing was not a realistic possibility. The WCDEF stated that sludge quality limits marketing options. The PVSC expressed concerns regarding the length of time needed to develop markets for sludge products and how to subcontract to private vendors. The NYCDEP expressed an additional concern regarding markets, stating that as more federal sludge products are produced existing markets will suffer. The NCDPW acknowledged that sludge product marketing would be a viable alternative unless changes in the federal sludge regulations affect current markets. The authority requested that the roundtable clarify the proposed EPA sludge management regulations and provide information on how to effectively use private contractors/vendors for tasks such as constructing and operating facilities, transporting sludge, and marketing sludge products. The WCDEF suggested that it would be helpful if the regulators would declare a clear position on the acceptability of management options and the necessary sludge characteristics for each. (The status of the federal sludge management regulations is discussed in Section 3.1.5.) The NCDPW strongly suggested including interim planning for product management in the roundtable discussions.

2.2.2 Development of Key Issues Based on Questionnaire Results

The PVSC expressed an interest in contracts that relate to large-scale landfilling or other disposal options. Suggested discussion topics were single versus multiple contracts, the appropriate length of contracts, performance bonds, and single versus multiple sludge management options. It recommended that examples of various contracts and specifications for management alternatives be brought to the roundtable for review by the participants.

Using the information from the questionnaire, the planning group identified three goals for the roundtable:

1. To fully understand the factors contributing to the challenges being experienced by the municipal sewerage authorities in the development of land-based sludge management.
2. To define various strategies for handling the challenges of land-based sludge management.
3. To define realistic actions to be pursued in the successful implementation of land-based sludge management alternatives.

Based on those issues rated as most challenging, and other issues identified by the respondents, the topics for discussion were focused on two major areas: (1) permitting and siting and (2) technologies in relation to public health and environmental concerns.

2.3 ROUNDTABLE STRUCTURE AND PROCESS

The planning group formatted the roundtable in a manner that would stimulate productive discussion on strategies for attaining land-based management solutions for wastewater treatment plant sludges. The 2-day roundtable consisted of three sessions (see Table 3). A presentation on the status of future 503 sludge regulations followed the conclusion of Round 1 on the first day.

During the first and third rounds, the sewerage authorities, the facilitator, and the guest speakers sat at the table; the resource people and observers were seated around them. The dialogue included the sewerage authorities, guest speakers, and the facilitator. The resource people participated in the discussion only at the request of those seated at the table.

TABLE 3. ROUNDTABLE AGENDA AND FORMAT

DAY 1

ROUND 1 THE CHALLENGE

OBJECTIVE

To fully understand the factors contributing to the challenges being experienced by municipal sewerage authorities in developing land-based sludge management.

- Welcome and opening remarks
- Introduction of roundtable participants
- Discussion of roundtable procedures and issues
- Open discussion
- Conclusion and consensus of Round 1
- Reception
- Presentation regarding proposed 503 sludge regulations

DAY 2

ROUND 2: DEVELOPING ALTERNATIVE STRATEGIES

OBJECTIVE

To define various strategies for handling the challenges of land-based sludge management.

- Rotation of sewerage authorities between two focus groups

Focus Group A Permitting and Siting

Focus Group B Technologies in Relation to Public Health and Environmental Concerns

ROUND 3: REALISTIC ACTIONS TO PURSUE

OBJECTIVE.

To define realistic actions to be taken for the implementation of land-based sludge management.

- Open discussion
 - Conclusions
-

Round 2 consisted of two focus groups. Focus Group A discussed permitting and siting, and Focus Group B discussed technologies in relation to public health and environmental risks. Each group had two sessions, one in the morning and one in the afternoon. The guest speakers and the resource people were assigned to a focus group based on their expertise and remained in that group for both sessions. The sewerage authorities rotated between the two focus groups to discuss both groups' topics. In the focus group sessions, the resource people sat at the table and entered into the discussion with the sewerage authorities, guest speakers, and the facilitator in each group. Although observers were not allowed to participate directly in any of the sessions, they were invited to submit questions or issues for discussion.

3.0 ROUNDTABLE DISCUSSION SUMMARY

The roundtable opened with introductions and comments by Richard Caspe, EPA Region II Water Management Division Director. He identified three overall objectives to be accomplished by the roundtable:

1. To establish a network of people experiencing similar challenges.
2. To provide a forum for an open exchange of information and ideas.
3. To provide an increased sensitivity to the issues being faced by the New York and New Jersey authorities among all involved with sludge management.

3.1 ROUND 1: THE CHALLENGE

Roger Dolan, general manager of the Central Contra Costa Sewerage District, California, served as the primary roundtable facilitator and began the dialogue with comments on the issues affecting land-based sludge management. He then requested that the participants introduce themselves to the other roundtable members. The representatives of the sewerage authorities and NRDC summarized issues that they wished to see addressed at the roundtable. Guest speakers from other sewerage authorities from around the country, invited because of their experiences in implementing land-based sludge management technologies, provided brief descriptions of their backgrounds.

During the discussion that followed, there was general consensus among the participants that the schedules to terminate ocean dumping are tight and, in most cases, more difficult than the schedules faced by the guest speakers. The sewerage authority representatives expressed confidence in their ability to meet the deadline for implementing long-term alternatives. Their most critical concern was meeting the agreed upon interim deadlines for ending ocean dumping. The New Jersey authorities were concerned about the even more stringent, state-mandated March 17, 1991, deadline. Producing dewatered sludge and hauling it to landfills was identified as the most realistic interim land-based alternative. The authorities noted that numerous difficulties are associated with implementing this disposal option, including siting dewatering facilities and finding landfill sites, gaining public acceptance, obtaining necessary state and municipal permits, constructing the necessary facilities, and transporting the dewatered sludge to landfills.

3 1 1 Facility and Landfill Siting

Landfill siting was identified as a critical issue by all of the New York and New Jersey sewerage authorities. Landfill sites are severely limited in both states. In New Jersey, landfilling is prohibited except in the case of emergency or overriding circumstances. It is becoming increasingly difficult to find out-of-state landfills. Pennsylvania has recently enacted an executive order temporarily banning other states from access to their landfills.

The authorities also stated that finding locations to build dewatering facilities presents a significant challenge. While it may be possible for some of the needed facilities to be built at the wastewater treatment plants producing the sludge, New Jersey and New York authorities with facilities in residential areas may face intense public opposition to potential odors and the increased truck traffic necessary to haul the dewatered sludge to disposal sites.

The guest speakers discussed how facility siting can be undertaken by either private contractors or the sewerage authorities. In some cases, a contractor may be more successful than the sewerage authority in locating a facility or landfill site. In other situations, the authority's ability to deal with municipal officials may be needed to acquire a site. Cooperation between the sewerage authorities and political officials is clearly necessary. Unfortunately, most politicians do not typically become involved unless a site is chosen in their locality.

NJDEP officials have stated that selection and implementation of a land-based management alternative is the responsibility of the sewerage authorities, pursuant to the New Jersey Ocean Sludge Dumping Elimination Act. Consequently, the state has declined to intercede in out-of-state management options. This position is of concern to the sewerage authorities, for they believe that a team effort is needed to successfully implement land-based disposal alternatives.

3 1 2 Public Acceptance

Clearly, gaining public acceptance of sludge management alternatives is not easy. The public may equate sludge with sewage and oppose any land-based disposal or use "in their own backyard." The participants agreed that it is essential to educate the public about land-based sludge management alternatives. However, credibility is a key issue; the public is reluctant to believe the municipal sewerage authorities. The guest speakers pointed out that it is far more effective to involve independent sources that have positive public images to answer the public's questions and provide information. The guest speaker from the State of

Washington described a project whereby 118 sewerage authorities funded the University of Washington and Washington State University to support research and public information/education programs. It was suggested during the roundtable discussion that EPA become more involved in educating the public and that perhaps the ocean dumping fees paid by the sewerage authorities could be used to implement a public, information/education program.

Public opposition can be a major impediment in using facility sites. Considering the short time frames for implementing New York's and New Jersey's interim plans, gaining public acceptance may be especially difficult. The NCDPW commented that it appears to the public that one is asking for the public's acceptance after the plans have already been put into place. NRDC stated that it is critical to involve the public in the initial planning stages, and noted that the NYCDEP has effectively involved the public via the formation of a citizens advisory committee. Another sewerage authority agreed with the value of having such a committee, but also pointed out that once a site is chosen, the anticipated impact on the affected local community will still cause opposition.

3.1.3 Private Contractors

Using private contractors to build facilities and/or provide for ultimate disposal appears to be a viable solution for the New York and New Jersey sewerage authorities in meeting their interim plan deadlines, however, the sewerage authorities noted several areas of concern regarding the use of private contractors: the RFP process, legal restrictions, contract writing, using multiple contractors, contractor versus authority responsibilities, and staff availability to coordinate and manage contractors. Some of the guest speakers provided examples of RFPs and contracts to the participating roundtable sewerage authorities.

In choosing a contractor through the RFP process, the issuing sewerage authority first determines which proposals appear to be reasonable and responsible and then interviews the candidates. The authorities were advised by the guest speakers to look at the contractor's applicable experience, responsiveness to the proposal request (e.g., Do they have a permitted site? Do they have the necessary subcontractors who can pass regulatory requirements?), and the price for the job. In New York, accepting a higher bid requires a legal opinion. In New Jersey, a higher bid can be accepted if lower bids are not submitted by responsible bidders.

Several of the guest speakers emphasized the need for multiple contractors. If a contractor defaults on his contract or it is determined that a contractor should be replaced because of poor performance, a back-up plan must be in place. Ultimate

management responsibility rests with the sewerage authority, not with the contractor

The guest speakers provided some valuable success stories concerning the use of private contractors, but in many cases those sewerage authorities were not under the same time constraints that the New York and New Jersey authorities face. Requesting proposals from the private sector, setting up contracts, and providing effective management of contractors is time-consuming. In addition, the New York and New Jersey authorities have low staff levels as compared to the staffing levels of the guest speakers and they may have to rely on consultants to help manage contractors.

3.1.4 Conclusion

In concluding Round 1, the sewerage authorities identified the following issues for continued discussion during the second day sessions

- Attaining public acceptance of sites in order to meet compliance schedules.
- Managing contracts (setting up contracts, handling sludge production variability, single versus multiple hauling contracts, spill prevention/response plans)
- Dealing with critical time constraints in the implementation process.
- Exploring cooperative regional efforts.
- Identifying publicly acceptable short-term strategies for the sludge management.
- Understanding the perceived and real public concerns of marketing sludge products.
- Establishing an information network for land-based sludge management.

3.1.5 New Sludge Management Regulations

Following the conclusion of Round 1 of the roundtable, a representative of EPA's Office of Water Regulations and Standards presented an update on the status of the proposed federal sludge management regulations. Pursuant to a statutory directive in Section 405 of the Clean Water Act, EPA proposed new risk-based technical sludge regulations in February 1989. Comments on the proposed regulations are now being addressed, and EPA expects to issue the regulations in final form in October 1991. Once

issued, these regulations will appear at 40 CFR Part 503 and will establish minimum federal standards for the use and disposal of sewage sludge when applied to land, distributed and marketed, placed in sludge-only landfills or on surface disposal sites, or incinerated. In addition to the 503 regulations, EPA also proposed in August 1988 the Municipal Solid Waste Landfill Rule, which regulates all sewage sludge to be landfilled. EPA expects to issue the final rule in May 1990.

3.2 ROUND 2: DEVELOPING ALTERNATIVE STRATEGIES

Members of EPA, NJDEP, and NYSDEC joined the guest speakers, sewerage authorities, and NRDC in the focus group discussions on the second day of the roundtable. The purpose of these break-out groups was to discuss the issues introduced in Round 1 in greater detail. The topics were divided into two sections: (1) technologies in relation to public health and environmental concerns and (2) permitting and siting.

3.2.1 Focus Group A: Technologies in Relation to Public Health and Environmental Concerns

The two Focus Group A sessions primarily addressed the issues of public misconception and acceptance; traditional technologies such as land application and incineration; less conventional technologies such as chemical fixation or coal gasification; the techniques used in the successful implementation of a dewatering/landfill disposal system; and the sewerage authorities' concern for using the best technologies for long-term land-based sludge management plans.

3.2.1.1 *Public Health and Environmental Concerns*

Guest speakers experienced in the use of land application, composting, and incineration discussed their operations. These practices frequently generate public opposition; consequently, the authorities often cannot enlist the support of the local politicians or officials. In many cases, opposition stems from the fact that many people equate sludge with hazardous waste. They assume that, if sludge is unsafe for ocean disposal, it is also unsafe for land-based management alternatives. The public fears that composted sludge will poison the food chain and sludge incineration will release toxins into the air.

It is essential to educate the public on the regulations controlling the quality of sludge and land-based management options. No matter what regulations are in place, however, it will usually be difficult to gain public acceptance, particularly when material is

moved from one jurisdiction to another. A possible way to convince people in another jurisdiction to accept sludge is to show them that the very jurisdiction that produces the material is also using a substantial amount. An authority should be aware that this approach could backfire and lead to opposition to currently accepted in-state practices.

The sewerage authorities emphasized the need for credible information sources and suggested that EPA become more involved in educating the public. It is crucial to gaining public acceptance that people receive explanations in simple terms, scientific jargon tends to cause confusion. Also, terminology modifications were suggested. The word *sludge* should be replaced with a more positive word and the term *solid waste* should be avoided. Referring to sludge as waste creates a problem in perception, it implies that sludge must be disposed of and cannot be used for beneficial purposes.

[EDITORIAL NOTE. While adopting more positive terminology may be beneficial from a public acceptance standpoint, the use of *sludge* or *solid waste* can be important in maintaining disposal options. In New York State, referring to sludge as solid waste allows a municipality to enter into long-term contracts for privatization under the New York State Municipal Law 120W. If the material was not classified as a solid waste, the sewerage authorities would not have this option.]

3.2.1.2 Technologies

In the discussion of new technologies, it was evident that the sewerage authorities were keenly interested in all possible alternatives, especially beneficial use. Several newer technologies were mentioned, including gasification of sludge to produce energy and an inert, glasslike material, and a Japanese process that turns incinerator ash into glassy, sandy material suitable for use in tile. Incineration is the long-term land-based alternative for many New Jersey authorities. The sewerage authorities and guest speakers discussed the various types of furnaces and the quality of air emissions and ash that each produces, as well as the problems associated with ash hauling and landfilling.

3.2.1.3 Dewatering/Landfill Disposal System

In 1987, the City of Los Angeles faced time constraints similar to those of the New Jersey and New York authorities'. To quickly terminate ocean dumping, Los Angeles developed a program for sludge dewatering and landfill disposal. The Los Angeles guest speaker described the city's experience in detail, answering questions and providing copies of RFPs.

The Los Angeles guest speaker's description of the RFP process for securing the services of multiple contractors included details such as average contract size, duration of contracts, division of work based on daily variabilities of sludge volume, and meeting city procurement requirements. The speaker explained that an attorney from the Board of Public Works was assigned exclusively to the sewerage authority for the negotiation and compilation of contracts. This helped to ensure that the authority was in compliance with city requirements during every step of the process. When the authority went before the Board of Public Works with its recommendations, the city attorney was present and handled all legal questions, testifying to the compliance of the recommendations with all city procurement requirements.

The landfill disposal process also described in detail, addressed truck-hauling logistics that included establishing routes, monitoring, weighing, spill-response plans, schedules, costs, and loading facilities. The guest speaker emphasized that using multiple contractors established a competitive environment that promoted better performance and reliability.

3.2.1 4 Alternative Selection

The sewerage authorities discussed various sludge management technologies currently available and the possibility of newer and better technologies being developed. The New Jersey authorities raised a concern that their choices for meeting the legislative requirements to end ocean dumping might not be the best long-term alternatives with respect to the environment and public health. They commented that the consent decree schedules might not allow them enough time to thoroughly investigate all possible alternatives. There is little time for the sewerage authorities to effectively work together, sharing their knowledge of new technologies and options and developing potential regional project alternatives that might result in significant cost savings. In addition to the consent decree scheduling constraints, there are other pressures to move quickly into long-term programs. For example, the high expense of the interim solution necessitates the changeover to a long-term solution as quickly as possible. Also, it is not known how long landfills will continue to be available; before the limited space is filled, sewerage authorities must have alternative solutions in place.

EPA believes that the negotiated agreements allow sufficient time for the selection of long-term land-based technologies. Some of the guest sewerage authorities disagreed, based on their past experiences in researching and implementing related programs. The group discussed further the reality of the consent decree restraints in regard to making choices and the problems of changing alternatives in midstream. With reference to technological assessments, it was pointed out that the public often questions

why the authorities do not look at other technological alternatives. It was suggested that EPA might become involved in the research and assessment of technologies on a national level. Such involvement would help all sewerage authorities in the development of long-term programs that are acceptable to the public. NRDC stated that it would support allowing more time for long-term decisions if potential technologies could be adequately analyzed.

3.2.2 Focus Group B: Siting and Permitting

The two Focus Group B sessions centered on the challenge of siting and implementing sludge management systems that adhere to both state agency permitting procedures and the consent decree schedule. NJDEP and NYSDEC differ in their required deadlines for the sewerage authorities to identify their long-term sludge management solutions and the degree of support given to the authorities in this process. Descriptions of the efforts made and time frames involved in developing and implementing sludge management projects by the Seattle and Philadelphia guest speakers emphasized the need for adequate time and flexibility to sufficiently analyze new technologies or multiple systems. The New Jersey statute imposes a rigid March 17, 1991, deadline (which NJDEP is not authorized to change) to cease ocean dumping. The guest speakers presented some worthwhile strategies for expediting the permitting and siting of new facilities.

3.2.2.1 State Requirements

The New Jersey sewerage authorities were required by NJDEP to identify both their interim and long-term sludge management plans by April 1989. Five out of the six sewerage authorities have identified incineration as their long-term option. Their next step involves going through the state permitting process, which will address the environmental and public health impacts of the proposed facilities. These sewerage authorities believe that this mandate and their consequent commitment to incineration precludes them from further pursuing other technologies and beneficial reuse. The sewerage authorities indicated that private contractors have been unwilling to commit the necessary large sums of money in advance for projects with development schedule durations of less than 1.5 to 2 years. Unfortunately, that type of schedule is not within the time constraints of the consent decrees/enforcement agreements.

NJDEP stated that the sludge management plans submitted in April 1989 can be modified only if there is a strong demonstration that a different alternative is preferable and the designated schedule will not be significantly disrupted. The sewerage authorities stated that they feel pressure to implement their currently designated technologies in order to meet the mandated

schedules and are thus unable to explore other long-term alternatives.

NYSDEC requires its sewerage authorities to complete an environmental impact statement before they designate their long-term alternatives. NYSDEC acknowledged that the sewerage authorities do need to have schedules in place to effectively implement long-term plans. However, NYSDEC also recognizes that there could be events, such as the pending Federal 503 sludge regulations, that would necessitate flexibility in enforcement of the consent decrees. To accommodate such potential changes, they will monitor the situation, and be flexible during the planning process. The planning process, however, cannot stop due to pending changes in technology and regulations. NYSDEC representatives emphasized that they recognize the difficulties that the municipal authorities will encounter, and that they are "fully committed to overcoming the gridlock in the permit process, particularly in venturing into new areas of technology."

Both states noted their inability to be involved in siting issues, neither NYSDEC nor NJDEP has the authority to locate sites or to overrule local zoning except in the case of hazardous wastes. NJDEP requires, under the State Solid Waste Management Act, that each of the counties, in the solid waste districts, site solid waste facilities. The responsibility for siting lies with the sewerage authorities until such time as the counties can implement the sludge management components of its solid waste management plans. None of the affected counties have yet implemented these plans.

3.2.2.2 Time Constraints

The experiences in land-based sludge management related by the guest speakers suggested a realistic time frame for implementing the New York and New Jersey sewerage authorities' programs. Much of the necessary permitting has already been accomplished by New Jersey's sewerage authorities: all six authorities have received dewatering permits and have implemented pretreatment programs. In general, the amount of time required for guest speaker authorities to obtain all of the state and local permits necessary for both sites and full-scale facility operations was a crucial factor. For example, the guest speaker from Philadelphia stated that the authority anticipated a ban on ocean dumping in the 1970s and thus began developing a 10-point alternative program during 1977. In 1979, when its wastewater treatment plant facilities were required to be upgraded to secondary treatment, the city instituted stringent pretreatment programs. Over a 5-year period, research was funded on various projects such as strip-mine reclamation; a parkland "soil factory" project, using compost on city facilities; an unsuccessful liquid land application; and trying an "Eco-rock" process of fusing dewatered

sludge with municipal refuse to produce pavement aggregate. Thus, in 1980, when Philadelphia was informed that the city could no longer dump in the ocean, the city was prepared, these test programs allowed the city to determine their most effective alternative and to subsequently implement these alternatives.

The guest speaker from Seattle stated that the authority faced similar challenges in 1972 when the city was forced, under tight time constraints, to end ocean disposal. At the time, it had a lagoon with only a 1-year sludge storage capacity and was looking at innovative ways of dewatering sludge. An RFP was issued to solicit private sector proposals. The University of Washington, which had a small pilot sludge application program under way on forest land, came forward with a 2-year proposal to take Seattle's sludge and, in turn, use the monies received to perform research and answer public health questions related to land application. In 1973, Seattle ceased ocean dumping with only the university research program under way; the lagoon was used as a backup disposal option. From that time through 1982, Seattle continued its efforts to find additional sludge management methods. By 1984, strip mines were taking 25 percent of Seattle's sludge for use in land reclamation. In 1988, Seattle awarded a contract to a private company for sludge dewatering. It now owns and manages forest land that is used to recycle sludge and has contracts with a private company to apply sludge to the company's property. Overall, Seattle's strategy has been to avoid high-cost facilities and to keep options open. Seattle's current sludge management program has taken 17 years to evolve. In concluding, Seattle stated that sludge management costs money, requires enormous amounts of time to pursue, and is very challenging in terms of budgeting.

3.2.2.3 Public Acceptance and Siting Strategies

The guest speakers discussed numerous public acceptance and siting strategies. The following points were stressed:

1. Keep alert to opportunities and have a planning process that contains some flexibility for change.
2. If possible, find and use a site that is already owned by the authority.
3. For an out-of-state site, secure a local sponsor who wants the material and will personally represent the project and pursue any necessary permits.
4. Advertise in other localities for available sites.
5. Regional cooperation is necessary for siting and

permitting out of state landfills, meet informally with elected and appointed officials early-on in the process

6. Maintain contacts with key regulatory agency staff members to ensure that permit applications receive priority attention and expeditious handling
7. Obtain clear directions from the appropriate states regarding requirements for facility permitting
8. Obtain support of state and local agencies to coordinate and allow for expeditious handling of permits.
9. Pursue public education through a cooperative regional effort.
10. Take a proactive stance to address misinformation spread by project opponents, to help generate positive press, find sympathetic and knowledgeable reporters and take them to model operations.
11. Work with the state regulators and legislators to redefine sludge classifications, current classification of sludge as solid waste generally limits management options and creates a negative public image
12. Produce appealing public displays of sludge products to help provide a positive image and promote beneficial use

3.3 ROUND 3: REALISTIC ACTIONS TO PURSUE

The sludge management roundtable addressed the concerns and challenges presented by all of the groups involved in the struggle to implement land-based sludge management alternatives. (1) the city, state, and federal legislators who will make, or have made, decisions on sludge management, (2) the regulators who enforce the legislative decisions, (3) the sewerage authorities responsible for implementing sludge management alternatives, (4) the private contractors employed for sludge management, (5) the environmental and public health activists, and (6) the public, who, in many instances, believe that their health and personal property may be jeopardized by the recommended sludge management methods. The roundtable provided EPA, the state agencies and NRDC with an increased sensitivity to the issues being faced by the New York and New Jersey sewerage authorities in pursuing and implementing interim and long-term alternatives. The sewerage authorities benefitted from the in-depth information

exchange that took place during the roundtable, as many strategies and possible endeavors were discussed. In addition to the strategies discussed in the Permitting and Siting section (Section 3.2.2), the following suggestions were made.

1. Establish an information clearinghouse, possibly by or with support from EPA.
2. Continue the network process that began at this roundtable.
3. Seek cooperation at all levels: federal, state, local, and private sector.
4. Consider the possibility of regionalization in the development of long-term solutions.
5. Increase sewerage authority staffs for the negotiation and management of multiple contracts with the private sector.
6. Use multiple contractors and diversification in sludge management options.
7. Involve a city attorney knowledgeable in the local permitting regulations for negotiating contracts.
8. Increase public awareness of the sewerage authorities' decision-making processes and sludge management activities along with the effect on public health and the environment, possibly through more involvement by EPA.

The New York and New Jersey sewerage authorities expressed their gratitude to EPA for holding the roundtable and reiterated a firm commitment to meeting their deadlines and successfully terminating ocean dumping. The sewerage authorities strongly voiced their desire to implement the most environmentally sound sludge management alternatives and expressed a willingness to remain open-minded and flexible in their implementation plans. They also expressed the hope that the regulators maintain the same open-mindedness and flexibility.

APPENDIX A

ROUNDTABLE PLANNING GROUP MEMBERS

Federal	Bruce Kiselica Elizabeth Lonoff Karen Klima Sandy Germann Lee Pasarew Bob Bastian	Environmental Protection Agency Region II Environmental Protection Agency Region II Office of Marine & Estuarine Protection Office of Marine & Estuarine Protection Office of Municipal Pollution Control Office of Municipal Pollution Control
State	Helen Pettit Penny Hinferty Bob Hampston	New Jersey Department of Environmental Protection New Jersey Department of Environmental Protection New York State Department of Environmental Conservation
Consultants	Carlton Hunt Elisabeth Smolski Linda Hanfin Nola Sparks	Battelle Memorial Institute, Duxbury Operations Battelle Memorial Institute, Duxbury Operations Hanfin Associates, Inc. Hanfin Associates, Inc.

APPENDIX B

ROUNDTABLE ATTENDEES

Name

Organization

DISCUSSION PARTICIPANTS:

FACILITATORS.

Primary & Focus Group B

Roger Dolan

Central Contra Costa Sewerage District

Focus Group A

Linda Hanfin

Hanfin Associates, Inc.

SPEAKERS

Eric Buehrens

Massachusetts Water Resources Authority

Peter Machno

Municipality of Metropolitan Seattle

Gary Gagnon

Milwaukee Metropolitan Sewerage District

Michael J. Wallis

East Bay Municipal Utilities District

Thomas E. Walton, III

formerly with City of Philadelphia

Ray Kearney

City of Los Angeles

SEWERAGE AUTHORITY OFFICIALS & NRDC:

Edward O. Wagner

NY City Dept. of Environmental Protection

Steven A. Fangmann

Nassau County Dept. of Public Works

Nicholas R. Smolney

Middlesex County Utilities Authority

Jerome Sheehan

Bergen County Utilities Authority

Richard P. Tokarski

Rahway Valley Sewerage Authority

Michael J. Brinker, Jr.

Joint Meeting of Essex and Union Counties

Gary G. Fare

Linden Roselle Sewerage Authority

Joseph La Vigna

Westchester County Dept. of Env. Facilities

Sheldon Lipke

Passaic Valley Sewerage Commissioners

Nina M. Sankovitch

Natural Resources Defense Council

RESOURCE PEOPLE:

William R. Diamond

EPA HQ

Alan Rubin

EPA HQ

Robert Bastian

EPA HQ

Martha Kirkpatrick

EPA HQ

Richard Caspe

EPA Region II

Charles E. Hoffmann

EPA Region II

ROUNDTABLE ATTENDEES

Name

Organization

RESOURCE PEOPLE (continued)

Bruce Kiselica	EPA Region II
Robert G. Hampston	NY State Dept. of Environmental Conservation
Richard J. Hammond	NY State Dept. of Environmental Conservation
Helen Pettit	NJ Dept. of Environmental Protection

OBSERVERS

Robert E. Adamski	Borough of Brooklyn
Kelley Augustine	NJ Dept. of Environmental Protection
Iciah Atay	NJ Dept. of Environmental Protection
Nicholas Bartilucci	Dvirka & Bartilucci
Diane Black	League of Women Voters
Marci L. Bortman	U.S. House of Rep. Committee on Merchant Marine & Fisheries
Laurel Bryant	U.S. House of Rep. Committee on Merchant Marine & Fisheries
Marjorie Bryant	New York City Council
Julian Capik	Middlesex County Environmental Coalition
Henry J. Chlupsa	Dvirka & Bartilucci
Chris Clark	Apex Resources/NSI
Don Clark	Cornucopia of New Jersey
James I. Collins	Industrial Innovations, Inc.
Kevin Conti	Demetrakis, Sinisi & Carmel
Vincent Corrado	Passaic Valley Sewerage Commissioners
C. J. Crumm	Foster Wheeler USA
Peter Day	Rutgers University/Cook College
John Dedyo	Seelye, Stevenson, Value & Knecht
Bonnie Delaney	Asbury Park Press
Chris Dollase	U.S. House of Rep. Committee on Merchant Marine & Fisheries
Andrew L. Doyle	Rahway Valley Sewerage Authority
Jennifer Epp	NY State Senate Subcommittee on Long Island Marine District
Hugh Ettinger	Bedminster Bioconversion Corporation
Tracy Faulkner	Chemfix Technologies, Inc.
Rod Fujita	Environmental Defense Fund
Sandy Germann	EPA HQ
Karen J. Giroux	Rutgers University/Cook College
Penny Hilferty	NJ Dept. of Environmental Protection
Carlton Hunt	Battelle Memorial Institute, Duxbury Operations
Thomas A. Immerso	Nassau County Dept. of Public Works
Stephen Johnson	Pennsylvania D.E.R.
Natasha Kaplan	Thomas E. Walton Associates, Ltd.

ROUNDTABLE ATTENDEES

Name

Organization

OBSERVERS (continued)

Herbert L. Kaufman	Clinton Bogert Associates
Carl Koch	Greeley & Hansen Engineers
Ernest A. Kollitides	Dehydro-Tech Corporation
Bob Kukenberger	Blasland, Bouck & Lee
Ellen Lane	Gannett Westchester Newspapers
Elizabeth Lohr	Sludge Newsletter
Elizabeth Lonoff	EPA Region II
Alfonso Lopez	NY City Dept. of Environmental Protection
Per A. Lorentzen, Jr	Global Energy, Inc
George Lutzic	NY City Dept. of Environmental Protection
Larry McClure	Bergen County Utilities Authority
William Mikula	Blasland, Bouck & Lee
Percival Miller	NY State Legislative Commission on Solid Waste Management
Fred Munson	Greenpeace USA
Barbar Novick	League of Women Voters
Lee Pasarew	EPA HQ
John J. Pascucci	Nassau County Dept of Public Works
Herman R. Phillips, Jr	EPA Region II
Maresh Podar	EPA HQ
Robert L. Raab	City of Long Beach, NY
Gerald O. Rennerts	Sludge Disposal International, Ltd
Kevin Richardson	Star Ledger
Peter Ruffier	Association of Metro Sewerage Agencies
Helmur W. Schulz	Global Energy, Inc.
Irving F. Shaw	Mayor, Village of East Rockaway, NY
Tim Shea	Engineering Science, Inc.
Elisabeth Smolski	Battelle Memorial Institute, Duxbury Operations
Nola Sparks	Hanfin Associates, Inc.
William C. Sullivan, Jr	Gordon, Gordon & Haley
Pete Tortorici	Bay Park Civic Association
Judith Wells	U.S. House of Rep Committee on Merchant Marine & Fisheries
Vicki Wessels	Hanfin Associates, Inc.
Can Wild	NJ Dept. of Environmental Protection

ATTACHMENT 2

**MAJOR REFERENCE DOCUMENTS PREPARED BY EPA
ON SLUDGE MANAGEMENT ISSUES**

April 1990

**U. S. Environmental Protection Agency
Office of Marine and Estuarine Protection
Washington, DC 20460**

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- EPA 1989 Summary Report In-Vessel Composting of Municipal Wastewater Sludge EPA 625/8-89-016 Center for Environmental Research Information, U S Environmental Protection Agency, Cincinnati, OH
- EPA 1989 Start-up and Operation of Chemical Process Technologies in the Municipal Sector The Carver-Greenfield Process for Sludge Drying EPA 430/09-90-007 Office of Water, U S Environmental Protection Agency, Washington, DC
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