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Dredged Materials Management Team
Honorable Steven Corodemus, Chairman
Final Report

Dredging

What is the Best Approach for New Jersey?

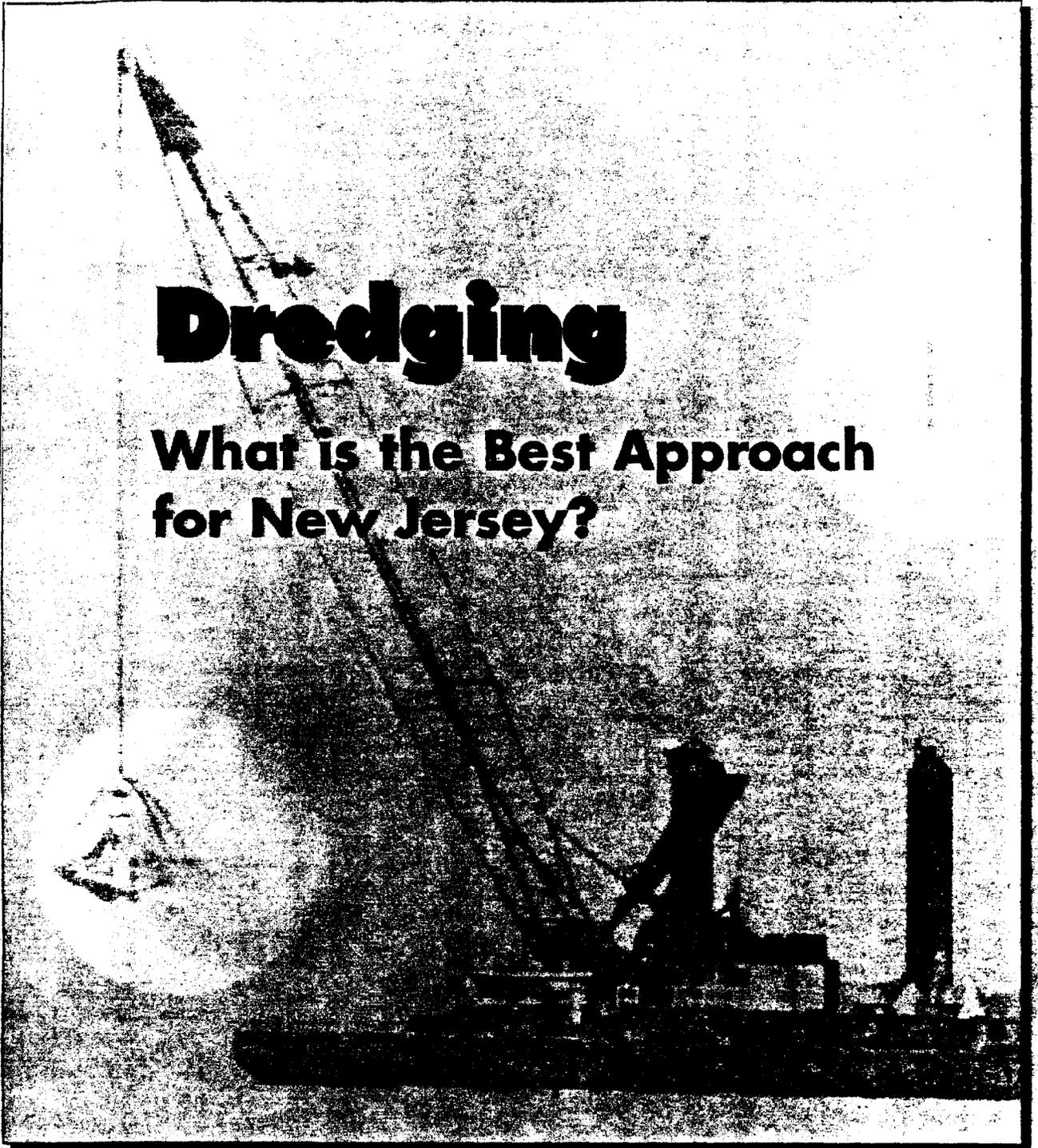


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**INTERIM REPORT OF THE GOVERNOR'S
DREDGED MATERIALS MANAGEMENT TEAM**

INTRODUCTION:

This Report presents the findings to date of Governor Whitman's Dredged Materials Management Team--a task force instituted to seek short term solutions to the most pressing dredging problems present in the Port of New York and New Jersey. Businesses whose operations depend upon ship access to the Port are concerned that dredging must occur imminently to ensure continued ship passage.

The Port of New York and New Jersey plays an important role in the region's economy. During 1993, the general cargo tonnage (both imports and exports) through the Port totaled 12.9 million long tons. The Port Authority is the New York/New Jersey agency with a mandate from the two states to promote and protect the commerce of the bi-state Port and to undertake trade and transportation projects to promote the well-being of the Port District. According to the Port Authority's 1993 Annual Financial Report, the gross operations budget for marine and other marine-related port operations was \$92,424,000. After expenses, this figure represents a net income loss of \$43,891,000.

The Port's shipping operations require the Port Authority to expend capital for berth and channel deepening projects. For nearly the past 90 years, Port deepening projects involved the dredging, by clamshell or hydraulic methods, of naturally accumulating sediments from Port berths and channels, the placement of dredged materials on barges, and the dumping at a federally designated site. However, New York and New Jersey are in a serious quandary: what to do with contaminated sediments that need to be dredged.

In recent years, state and federal agencies have determined that dredged materials from the Port of New York and New Jersey are contaminated with certain levels of potentially toxic chemicals, among them, dioxin, PCB's, PAH's, as well as heavy metals. These contaminants are harmful to fish and wildlife, and through the food chain, to humans. The resulting implementation of new federal rules to protect public health and marine resources greatly reduce the amounts of materials that can be disposed of in the ocean; yet the predominant disposal option for this material has been the Mud Dump Site, located 5.5 miles off Sandy Hook, NJ. (See Appendix A.)

Before dredged materials can be disposed of at the Mud Dump, they must be tested to determine whether they meet ocean disposal criteria set by the federal U.S. Environmental Protection Agency (USEPA). Three classes of sediments have been identified using criteria under federal

protocols outlined in the Green Book: Category 1, which meets federal criteria and can be disposed of at the Mud Dump; Category 2, which exceeds certain ocean disposal criteria but can still be disposed of at the Mud Dump with capping and/or other management strategies applied as additional protective measures (e.g. covering with clean, Category 1 material), and Category 3, which exceeds criteria to such an extent that it cannot be disposed of in the ocean. During 1993, these criteria, and increased levels of public concern resulted in increased costs for disposal of dredged materials (largely as a result of capping requirements) from the Port Newark/Elizabeth Marine Terminal. The Port Authority estimates that extra safeguards for ocean disposal increased costs for the Port from \$1 million to \$17 million.

Because of the continued need for the Port to be dredged, increased environmental concerns, and increased costs for ocean disposal, Governor Christine Todd Whitman established, in June of 1994, a Task Force--the Dredged Materials Management Team--with a mission to develop short term (0-3 years) management options for the disposal of contaminated dredged materials from the New Jersey side of the Port of New York and New Jersey. The Port must thrive and protect the important commerce to the region. It is imperative that the Port have confidence in performing dredging activities. It is equally important to protect public health and living marine resources as well as the

related economies -- tourism and fishing. Disposal alternatives must be found. The Team must make recommendations to the Governor by December, 1994. Assemblyman Steven J. Corodemus was named Chairman of the Team by Governor Whitman. This Interim Report presents a summary of the facts collected by the Team to date and raises questions to be answered as the Team continues its work.

MEMBERS OF THE DREDGED MATERIALS MANAGEMENT TEAM

The Governor conducted an extensive search and appointed a wide range of individuals for the Team, including members of the scientific community, long-shoremen's organizations, port interests, the Port Authority, and environmental groups. Four legislators representing shore and port communities were also appointed. The individuals serving on the Team are:

Steven J. Corodemus, Assemblyman, District 11--Chairman

James A. Capo, NY Shipping Association, Inc.

Albert Cernadas, International Longshoreman's Association

Dr. Angela Cristini, Ramapo College of New Jersey

Joseph M. Kyrillos, Jr., Senator, District 13

Lillian Liburdi, Port Authority of New York & New Jersey

Frank M. McDonough, Esq., Kenney, Gross, McDonough, & Stevens

Harry A. McEnroe, Assemblyman, District 28

M. Brian Maher, Maher Terminals, Inc.

Lewis J. Nagy, New Jersey Dept. of Environmental Protection

Edward O'Connor, Jr., Senator, District 31

Andrew L. Strauss, Trust for Public Land

Dennis J. Suszkowski, Ph.D., Hudson River Found. for Science
& Env. Research., Inc.

James T.B. Tripp, Environmental Defense Fund, Inc.

Cynthia A. Zipf, Clean Ocean Action

Appendix B provides the biographies of the appointed
individuals.

GOALS:

New Jersey Governor Christine Todd Whitman, in an effort to identify non-Mud Dump alternatives to be implemented at the earliest possible opportunity (except for Category 1), recently announced the formation of a state Dredged Materials Management Team--a Task Force to recommend interim plans for dredging and disposal. The Team convened in July 1994 and its mission is to focus its efforts on urgent dredging needs. Recommendations will be formulated within six months. This Task Force will concentrate its efforts on identification of upland sites, near-shore facilities, and possible sites for decontamination technology.

MISSION STATEMENT

The purpose of the Dredged Materials Management Team is to investigate, develop and recommend interim strategies for dredging our ports and disposing of the dredged materials. The Mission Statement for the Team requires that it develop recommendations within six months with a specific emphasis exploring the feasibility of upland sites, near-shore containment facilities, and possible sites for decontamination technology. The Governor of the State of New Jersey has directed that the Team concentrate on the most pressing needs in the port region. The challenge is at once complex and evident; and to be successful must meet each of the following specific, distinct, but interrelated goals:

A. Job Protection/Economic Development

More than 95% of the Nation's commerce depends on ocean shipping, which some argue is the most economic, energy efficient and environmentally effective mode of transportation. The Port of New York and New Jersey has long been a major component of the Nation's shipping industry. In fact, in the 1800's, shipping in and out of the Port of New York and New Jersey represented 70% of the Nation's entire commerce. Today, the Port of New York and New Jersey remains one of the three largest seaports in the United States. According to the Port Authority of New York and New Jersey, the Port generates \$20 billion a year in economic activity including nearly \$400 million in state and local taxes. It is responsible directly and indirectly for more than 180,000 jobs and is a direct funnel for goods to the region's 15 million consumers. According to the New Jersey Motor Truck Association, the Harbor contributes significantly to the employment of more than 258,000 people paying more than \$9.8 billion in salaries in 1992 to almost 8,000 family-owned and corporate trucking businesses in the State of New Jersey.

Additionally, while the number of military installations in the New York-New Jersey Region has been declining in recent years, the area remains a major military supply depot and ordnance resupply facility. (In fact, in recent military operations, hundreds of workers loaded ships at Military Ocean Terminal Bayonne for intervention in

Haiti. Thirty-five such ships were loaded during the Gulf War.) Reduction of the ability of these facilities to meet military requirements could result in adverse action by the Base Realignment and Closure Commission in the upcoming round of considerations.

While the Port of New York and New Jersey currently handles more general and containerized cargo than any other East Coast port in the United States, the Harbor (also called the Bight Apex) is not naturally deep, and rivers continuously transport and deposit sediment, filling in the navigational channels and berthing areas. In one report, the Harbor is described as "a complex series of large embayments, tidal straits and rivers with many diverse hydrodynamic environments."¹ Approximately one million metric tons of fine-grained sediments are transported into the Harbor annually. Lending additional complexity to the task confronted by the Team, is the wide range of sediments, from fine-grained mud to sand. No matter the source or consistency, large quantities of those sediments must be dredged regularly in order to keep channels and berthing areas clear, and to accommodate modern deep draft vessels.

Retention of Port jobs is only one economic consideration in the dredging issue. Consideration must also be given to the economic impacts of dredging and dredge material disposal on the fishing and tourism industries.

¹ See Abstracts for the Conference on the Remediation of Sediments, Overview of Sediment Dynamics in New York Harbor, Suszkowski/Floberg.

Commercial and recreational fishing activities generate \$2.5 million in state revenues, not including marinas and boat sales. Shore tourism relies to a great extent on environmental conditions, and human health and safety; this tourism is critical to the States economy producing 350,000 jobs and approximately half of the states \$18 billion in annual tourism revenues.

B. Environmental Protection/Health and Safety

The sediments in and around the Harbor and the New York Bight contain a variety of contaminants in varying concentrations (See Draft NY-NJ HEP Toxics Module) which have been linked to significant environmental and human health concerns. Contaminants are from both existing and historical sources. While the specific effects of contaminated dredge spoils may be debated, there is little dispute over the types of contamination that exist.

EPA Region II monitors 52 pollutants, known as Biological Chemicals of Concern (BCCs). These pollutants include: heavy metals, such as cadmium, lead, and mercury; petroleum aromatic hydrocarbons (PAH's) such as dibenzofurans, naphthalene and benzene; chlorinated hydrocarbons, such as PCBs, dioxins and furans; pesticides; and petroleum products. Studies have shown that exposure to these chemicals in the sediments at certain levels causes adverse effects to both wildlife and people. During preparation of this Interim Report, the USEPA released its

draft reassessment which reaffirms the link between dioxin and cancer.

These facts are of great concern due to the bioaccumulative nature of the BCCs and the potential build up in the food chain -- ultimately to fish and shellfish consumed by the populace. Levels of dioxin in blue crabs studied in Newark Bay were as high as 900 parts per trillion (pptr). In fact, due to current risks of exposure, there is a ban on eating any fish or shellfish from the inner harbor area. Advisories on consumption limits are widely posted for NJ and NY for certain fish and shellfish.

GOAL SUMMARY

Accordingly, protecting both the economy and the environment are the two major goals of the Dredged Materials Management Team. To accomplish this mission the team must, at the earliest possible opportunity, identify non-mud-dump alternatives which may be implemented quickly and remain operational for a minimum of three years or until such time as a permanent solution has been implemented.

EVALUATIVE PROCESS

The general public perception may be simply one of ocean dumping versus dredging. However, the issue is extraordinarily more complex than jobs versus the environment. Jobs are at stake with environmental degradation. To develop a process by which solutions may be found, the Team must first determine:

1. The volumes of materials that require removal.
2. The levels of contamination, if any, in the material to be removed.
3. When materials must be removed.
4. Which solutions are currently available and share the common characteristics of timeliness, economic viability, and scientific soundness.

Acting as a committee of the whole, Team members, in four closely-spaced meetings, reviewed all of the data presented by the United States Army Corps of Engineers, the United States Environmental Protection Agency, Region II, the Port Authority of New York and New Jersey, the New Jersey Department of Environmental Protection, representatives of numerous academic institutions, and representatives of industry involved in the development of solutions to the challenge. Team and non-Team members alike were requested to provide a complete and comprehensive analysis of all of the information at their disposal in order that the team may make informed judgments on the issues at hand.

This report contains information up until and including the Dredged Materials Management Teams September 6 meeting. The Team met on July 20, 1994, August 1, 1994, August 22, 1994 and September 6, 1994. (Copies of the minutes are contained in Exhibit C of this document.) During the course of the meetings, more than 28 presentations were made by Team and non-Team individuals. Additionally, Team members were provided with pertinent documentary materials generated by the following agencies/corporations:²

1. The U.S. Army Corps of Engineers, New York District.
2. The United States Environmental Protection Agency, Region II.
3. The Institute of Marine and Coastal Sciences, State University of New Jersey, Rutgers.
4. The Environmental Research Center of the State University of New York and Oswego.
5. The Port Authority of New York and New Jersey.
6. The Wetlands Division, United States Environmental Protection Agency.
7. The U.S. Army Corps of Engineers, Philadelphia District.
8. The U.S. Army Corps of Engineers, Waterways Experiment Station.
9. Correspondence from various organizations including the Fishermen's Dock Cooperative, Inc. of Point Pleasant, New Jersey; The New Jersey Motor Truck Association; The Maritime Resources Council of Edison, New Jersey; a commercial proposal by Amboy Aggregates (a sand and gravel company operating in the New York, New Jersey Harbor area); and a proposal by Biogenesis Enterprises, Inc. on a proprietary system for soil and sediment washing.

² Not all documentation considered by the Team is referenced or included with this Report. The final Team Report will include a separate bibliography and complete file of all documents presented to and reviewed by the Team.

Each Team member was also presented with a draft copy of the "Dredged Material Straw Proposal" currently under review by the Dredged Material Management Forum, sponsored by Region II of the USEPA, as well as comments to that proposal, and media reports which, in any manner, involved the issues under study.

All of the foregoing materials were analyzed by individual Team members and in general discussion with the Team at its public sessions.

The Team also invited representatives of public agencies and the private sector to present and comment on past and present dredging operations, the status of specific dredging permit applications, past and present disposal techniques, the status of remediation initiatives, existing and planned decontamination facilities/techniques, and existing/proposed disposal options. In addition to the information previously noted in this Report, Team and non-Team members received presentations on:

1. The status of testing protocols.
2. The status of testing in the Harbor area.
3. The status of research on the effects of contamination on aquatic and human life.
4. The history of various research projects conducted in and around the Harbor area to date.
5. An overview of decontamination technologies.

Additionally, Team members reviewed pending proposals for the disposal of dredged materials, beneficial use of dredged materials, engineering and cost estimates for proposed disposal techniques, the use of geotextile

containers as a method of limiting migration of contaminants, and existing disposal techniques, each of which is discussed below. All meetings have been open to the public and have been noticed in advance.

SUMMARY OF PRELIMINARY FINDINGS

Over the past ten years, there have been several efforts to address the management of contaminated dredged spoils from the New York/New Jersey Harbor. These efforts have been undertaken by a variety of state and federal agencies, including the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the New Jersey Department of Environmental Protection. In addition, these efforts have been coordinated with the State of New York, since the estuary is shared between the two states. Most recently, these federal and state agencies have joined together to attempt to develop a management strategy known as the Forum, for dredged materials. The Governor's Team, while recognizing the work of these earlier and concurrent efforts, has a separate and distinct mandate: to develop short-term solutions for critical dredging needs on the New Jersey side of the Port.

It is too early in the process to offer any specific solution to the problem presented, nor has any consensus been reached. However, some general observations with respect to volumes, levels of contamination, and disposal

options are appropriate in order to understand the scope and complexity of the problem.

A. Volumes

For purposes of this report, dredging requirements can be divided into several categories: Federal (Navigation and Berthing), Federal (Military), Agency (PANY/NJ), State/local government and private party operations. Several of these categories of applicants have applied or are in pre-application stage for permits to remove approximately 2.73 million cubic yards of dredged materials. This figure comports with U.S. Army Corps of Engineers' data indicating annual dredging volumes which have, in recent years, decreased to 1 to 1.5 million cubic yards per year.

While the volume of materials actually dredged has decreased, we know, based on the additional data provided at Team meetings, more than 10 million cubic yards of dredged materials must be disposed of in the near time-frame. (See Appendix D.) Those figures include total amounts for public and private projects as reported by the Port Authority of New York and New Jersey and the U.S. Army Corps of Engineers as well as 4 million cubic yards which must be dredged in and around the Leonardo facilities of Naval Weapons Station Earle, New Jersey. In fact, the projected Federal (Non-Military) projects for the 1996-98 time-frame indicate almost 5 million cubic yards of work that must be accomplished.

Much of this work has been deemed essential to maintain the viability of the Port of New York and New Jersey. However, no comprehensive review of this issue nor the potential for volume reduction has been conducted. Volume reduction and a thorough investigation of dredging requirements must be a part of our review.

B. Sediment Characterization

For purposes of this Team's analysis, the U.S. Army Corps of Engineers and the Port Authority of New York and New Jersey were requested to provide a "ball park figure" on the levels of contamination in those sediments which are currently estimated as needing removal. It must be emphasized that a full sampling regime has not been developed or conducted; nor has there been an exact, final determination as to which, and how much, sediment must be disturbed. By category, the estimates according to information presented at Team meetings by the U.S. Army Corps of Engineers are as follows:

1. Category I (Essentially noncontaminated materials): 33%
2. Category II (Contaminated to some degree): 44%
3. Category III (Heavily contaminated): 23%

(Note: These percentages may change due to revision of ocean testing protocols and criteria.)

Thus dredging of the Harbor creates two issues:

1. Disposal of dredged materials, both contaminated and uncontaminated;

2. The subsidiary issue of disturbance and suspension of contaminated materials in the water column during dredging operations and during storm events.

C. Levels of Contamination

Currently, testing protocols are in development and undergoing evaluation for validity and reliability. General testing for levels of contamination in the Port area has not been conducted, nor have general sampling plans been developed. However, specific testing on an ad hoc basis has been conducted both for general scientific purposes and for specific permit applications. For purposes of determining appropriate options for the management of dredged materials, the Team is forced to rely on the current estimations provided above, and the information revealed by specific tests conducted for specific applications. Thus, no general conclusions can be adopted with regard to specific levels of contamination in specific volumes of materials at specific locations.

D. Disposal Options

The literature reviewed by the Team and the reports provided by individuals appearing at the meetings reveal the following existing options for the disposal of dredged materials:

1. Ocean disposal
2. Ocean disposal with capping
3. Upland disposal
4. Beneficial uses:
 - a. beach replenishment
 - b. sanitary landfill cover
 - c. other
5. Subaqueous borrow pits
6. Containment areas/facilities

7. Containment islands
8. Wetlands creation/stabilization
9. Decontamination

While the foregoing appears to be an extensive list of options, not all meet the criteria set forth by the Governor, nor the specific interests of members of the Team and the public. For example, depending on individual perspective and the category of material under discussion, ocean dumping may not be an option. In fact, it is the intention of the Governor to eliminate ocean dumping of contaminated materials.

Upland disposal may be equally limited. Upland disposal sites are not readily available. Intensely developed New York and New Jersey areas extremely limit available land area. Moreover, there are competing interests for those land areas. Upland disposal efforts at the Bayway Refinery and the Military Ocean Terminal, Bayonne have resulted in storage of a limited amount of dredged materials but have not provided an ultimate disposal solution.

Additionally, while the Team has not focused on any particular site, in every case where specific sites have been mentioned, local opposition to use of those sites for this purpose has been reported. However, there is much to be learned from these examples and further investigation of upland disposal alternatives should be encouraged.

Beneficial use also appears to be limited and perhaps in some cases, not cost justified. Beach replenishment

operations, for example, require a specific size and composition of materials. No comprehensive evaluation of Harbor materials has been conducted, but the availability of such materials in the dredged materials under consideration appears to be very limited. The use of dredged materials as landfill cover (current regulations limit use to daily and intermediate cover) is a decreasing option in the New York/New Jersey Metropolitan Area due to the decrease in landfill operations and comparative costs to landfill operators. Furthermore, the absence of State criteria and information on which materials may be used for fill, construction, road beds, etc. limits the discussion. However, where available and practical, beneficial use as a disposal option, even for small quantities, should not be dismissed.

Moreover, the costs of dewatering, processing and transportation for use in a beneficial mode are very high. As noted above, the availability of sites for treatment and processing of dredged materials is extremely limited.

Additional options include subaqueous pits (nearshore containment) or containment islands and the various subsets of these two approaches, such as sand mining, confined disposal facilities, etc. At the request of the Dredged Materials Management Team, the Port Authority of New York and New Jersey's Engineering Department prepared an evaluation of several proposals for the disposal of contaminated dredged material in subaqueous pits and

containment areas. (A summary of those proposals, as well as the other options heretofore mentioned, is contained in Appendix E of this Report.)

At this stage of the inquiry, subaqueous pits appear to be the most promising of the foregoing options. However, several challenges arise out of the information provided by the Port Authority.

The Governor has defined the Team's mission as one of resolving the dredged materials disposal challenge in the near time-frame. Certainly, the economic interests, as projected by the Port Authority, labor groups, and the private sector operating in and around the Port, militate for an early, rather than later, resolution of the problem.

Development of a majority of the proposals considered thus far, including subaqueous pits would, under normal circumstances, well exceed the time-frame established for the Dredged Materials Management Team's mission. Indeed, in the time normally expected to construct the proposed demonstration pit, which would provide a capacity of 1/4 million cubic yards, the Port will have "accumulated" four and one-half years of sediment at 6 million cubic yards per year.

Secondly, the costs of each of the solutions presented represent a significant issues whose early resolution is necessary to meet a challenging timeframe. A demonstration pit, as engineered (preliminary estimate which includes preliminary analysis and design for a full scale pit) by the

Port Authority of New York and New Jersey could require \$6 million and four years to construct. A full scale subaqueous pit could cost as much as \$77 million.

While many individuals and interests (not involved in this current analysis by the Dredged Materials Management Team) have suggested that a containment island may be the solution, the figures presented to the Team indicate that a small containment island with a capacity of less than 9 million cubic yards (less than two year's dredging requirement) could cost as much as \$256 million to construct. These projections may vary widely depending on such facts as a full scale engineering study would reveal.

Furthermore, the Team has yet to review funding mechanisms for the necessary studies and development of disposal alternatives. Moreover, the mechanisms for constructing, owning, operating and paying for such facilities will require an intensive review of the affected agencies, the relevant legislative and regulatory requirements, and the availability of funding sources.

Finally, while decontamination through remediation technology may in the future provide a means of reducing, in each Category, the contamination levels of dredged spoils, the state of the art has not advanced to the point where it can be considered a viable option in the short term. As Appendix F reflects, a number of approaches are currently under study and/or are being tested. The bottom line, as expressed in the summary of the recent Conference on the

Remediation of Sediments, sponsored by the Institute of Marine and Coastal Sciences at Rutgers, "Remediation technology requires years of further development, demonstration and pilot-scale testing to become practical and successful."³ Furthermore, decontamination may not result in a final disposal option, but simply a means of improving the acceptability of existing options.

Decontamination also raises other legislative and regulatory issues. For example, legislation may be required to allow the disposal of the waste stream produced by decontamination processes. Currently, such waste streams are considered "waste" under Federal regulations and may not be disposed of in the ocean.

Moreover, much like other disposal options, remediation technology may well require significant land acreage for processing. This fact will continue to be an extremely vexing and limiting factor.

E. Findings

1. The Team has a very preliminary estimate of the magnitude of the disposal problem. According to the USACE, for Category 3 material which cannot be dumped in the ocean, approximately 1.75 million cubic yards are awaiting disposal at a non-ocean alternative disposal site. There are 3.36 million cubic yards of Category 2 material that

³ Summary Document, Conference on the Remediation of Sediments, pg. 8, sponsored by Rutgers, SUNY Stony Brook & PANY/NJ.

will require disposal and there are 2.52 million cubic yards of Category 1 material that can still be disposed of at the Mud Dump.

2. The extent of the contamination problem is most critical in Reach A of the Port Newark/Elizabeth Marine Terminal. There is approximately 400,000 cubic yards of Category 3 material in this reach that must be dredged but cannot be disposed of in the ocean. At Reaches B, C, and D approximately 50,000 cubic yards of Category 2 materials need to be dredged. Maersk, Inc. has about 10,000 cubic yards at Berth One that need to be dredged.

3. There is a need for better data on the quantity and quality of sediments located in berthing areas and shipping channels.

4. There needs to be a centralized location for all the technical information pertaining to dredging. Currently, various agencies have compiled information; these include the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, New Jersey Department of Environmental Protection, and the Port Authority of New York and New Jersey. In addition, many private companies have been required to conduct studies and have their own reports that should be part of a centralized information system. The Governors Team should facilitate transmission to an appropriate body all dredging-related information which would form the basis for establishing the State of New Jersey as a world center for dredging technology and

information transfer.

5. While Decontamination technology will not be available in the short-term, it should be evaluated by the Team so that short-term recommendations recognize that decontamination will be part of a long-term solution. Further information on decontamination technology will be included in the final report.

CONCLUSION AND PROJECTIONS

The purpose of this Interim Report is to present an outline of the issues which must yet be confronted by the Dredged Materials Management Team, and the underlying subtext of those issues. The process, in its nascent stages, could not be expected to produce a final recommendation.

On the other hand, in a relatively short period of time, the members of the Dredged Materials Management Team have been exposed to a considerable amount of material much of which is highly technical in nature and much of which has taken several decades to collect. The Port of New York and New Jersey is comprised of 750 miles of waterfront and 2,600 acres of marine facilities, supported by 240 miles of Federally maintained channels with over one million linear feet of berthage. The USACE since 1977 has been looking at alternative means for the disposal of dredged materials. No final solution has yet been proposed which satisfies everyone.

Therefore, it is clear to even the most casual observer that the task faced by Governor Whitman's Dredged Materials Management Team is a daunting one, and much work remains to be done. Included within the scope of future review are:

1. Requirements for further evaluation of the dredged material
2. Necessity for funding of further research
3. Volume reduction and methods of achieving reduction

4. The volume of material that must absolutely be dredged in a 0-3 year period
5. Prioritization of sites that need to be dredged
6. Innovative on-site containment at applicant-owned facilities
7. Legislative changes necessary to implement recommendations
8. Regulatory changes necessary to implement recommendations
9. Continued development of the necessary criteria for water-based and land-based solutions
10. Decontamination technologies not only to deal with the dredged materials, but also any waste stream which may result from the treatment process
11. Funding for the construction of disposal options
12. Funding for operations and maintenance of disposal options
13. Role of tipping fees and the funding of disposal options
14. Availability of Federal/State funding for the construction and development of disposal and treatment facilities
15. Availability of private sector contributions to construction and O&M costs
16. Waivers and/or legislative relief necessary for the following:
 - a. Lease/Purchase of riparian rights.
 - b. Lease/Purchase/Construction of disposal sites
 - c. Disposal of waste stream
 - d. Development of public/private partnerships
 - e. Creation of joint authorities for construction operations and maintenance
17. Discussion of which agency or agencies (new or established) should be tasked with the leadership role in implementing the recommendations
18. Harbor Estuary Project CCMP actions that may augment Team recommendations
19. Reduction of pollution from CSO and non-point source discharges

In conclusion, any strategy(s) developed and recommended by the Dredged Materials Management Team must first address the issues outlined above, then must achieve

consensus among the diverse interests affected by, and vitally interested in, continued dredging operations. Such strategy(s) will require careful and meticulous crafting. It is for this purpose that the Dredged Materials Management Team was established.

DREDGED MATERIALS MANAGEMENT TEAM

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REVISED
MEETING MINUTES
OF THE

GOVERNOR'S DREDGED MATERIALS MANAGEMENT TEAM

JULY 20, 1994

10:00 AM

GOVERNOR'S OFFICE -- NEWARK, NEW JERSEY

Chairman Corodemus opened the meeting at 10:10 am and provided a brief overview of the establishment of the Dredged Materials Management Team by Governor Whitman in June of this year. He explained that the goal of the Team is to develop short-term solutions to the dredging crisis and make recommendations to the Governor by December.

Each Team member introduced themselves and provided information on their background, interest, and involvement with dredging issues.

Mr. William Muszynski, Deputy Regional Administrator of the U.S. Environmental Protection Agency, Region II described the Dredge Materials Management Forum that began in June of 1993. The U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the New York State Department of Environmental Conservation, and the New Jersey Dept. of Environmental Protection began a process to address the problem of contaminated sediments within the New York/New Jersey Harbor Estuary. The Forum has 13 Federal agencies as participants, along with two bi-state agencies, 14 city and county agencies, and 39 citizen groups.

Subcommittees of the Forum focus on various aspects of dredging, including a Dredging, Transport and Disposal Technologies Workgroup, a Disposal Criteria Workgroup, a Mud Dumpsite Closure Workgroup, a New Oceans Disposal Site Designation Workgroup, a Containment Facilities Workgroup, a Decontamination Technologies Workgroup, and lastly, a Site for Decontamination Technologies Workgroup. The Decontamination Technologies Workgroup and Site For Decontamination Technologies Workgroup were subsequently combined.

Three meetings of Forum participants have been held. The Forum has been moved under the auspices of the National Estuary Program--the NY/NJ Harbor Estuary Program. This program will issue a draft Comprehensive Conservation and Management Plan by October 26; nine public hearings will be held on the CCMP.

Two more meetings of the Forum will be scheduled. On August 10, 1994, a meeting of Forum Chairs will be held to accept comments on the "straw proposal." (Copies of the Straw proposal were provided to Dredge Materials Management Team Members at the meeting.) Forum V will be held in the Fall of 1994. The straw proposal provides a dual-track approach, which provides for ocean disposal for a period of nine years while non-ocean disposal alternatives are designed and implemented. It is the intention of the U.S. EPA to keep the Forum as an open process, subject to public comment. The straw proposal does not designate a new ocean disposal site.

Colonel York, US Army Corps of Engineers, provided a briefing on the USACE dredging initiatives. The Corps favors a containment island for dredged materials and has conducted extensive research into the development of containment facilities. Members of the Team requested information on federal dredging needs for channels and federal facilities. This information will be presented at the next meeting.

Commissioner Shinn, NJDEP--provided a brief history of the Department's policies and programs related to dredging. His agency favors a containment island and the use of geotextiles in containing dredged materials. Commissioner Shinn related his experience as a Freeholder in Burlington County in the development of a solid waste facility. Consensus building over a 10 year period led to the development of a facility and plan to handle Burlington County's solid waste. A similar process could be used here, to develop a plan for contaminated sediment disposal.

Ms. Lillian Liburdi, Director, Port Authority, spoke on the need for a short term solution for disposal of Category III materials. This is a top priority.

She then focused on the need to implement the Toxics Module of the NY/NJ Harbor Estuary Program Comprehensive Conservation and Management Plan. Stopping pollution at its source is critical to keeping contaminants out of dredged materials. Non-point sources of pollution and CSOs should be cleaned up. Many of the toxics found in sediments come from CSO discharges. States should take legal action against chronic polluters.

Governor Cuomo (NY) has also set up a steering committee on dredged materials. It would be good for the NY and NJ committees to meet and discuss short term solutions.

Ms. Liburdi then distributed information tables and maps to Team members outlining the status of pending dredging permits. The volume of dredged materials from the passenger terminals alone is 300,000 cu. yds./year. Because some facilities have not yet filed applications to dredge, the Port Authority is unsure of the total volumes that will need to be dredged this year; as much as 150,000 cubic yards from Howland Hook - more may need to be dredged.

Dr. Angela Cristini from Ramapo College provided information on 10 years of research on blue claw crabs and toxics in crab tissues. Dioxin bioaccumulates in crab tissues, in both the hepatopancreas and the muscle, to levels that exceed the FDA criteria of 10 ppb. Citizens in neighboring communities cannot take advantage of the crab resource, because they are too contaminated. While most marine organisms store pollutants in fatty tissue, which can be removed before cooking and preparation (e.g. fish), crabs have very little lipid; therefore, most pollutants accumulate in the hepatopancreas and there is not much that can be done with cooking and preparation to remove pollutants.

As a comparison, data from 1982 shows that carp had 200-210 pptr. dioxin, striped bass had 23-27 pptr. dioxin (whole body), and blue claw crabs from the Hackensack River had 1,063 pptr. dioxin (whole body). Dr. Cristini's advice is that no one should eat blue claw crabs from Newark Bay. Crabs taken from Sandy Hook Bay should be cleaned and the hepatopancreas removed and not eaten, prior to cooking.

The next meeting date was set as Monday, August 1, at 10:00 am in the Governor's Office in Newark. The focus of the meeting will be on containment and upland disposal. Jim Tripp of EDF suggested that the Team look into commenting as a group on the EPA's straw proposal. The Chairman asked that agenda items be submitted to his office to the attention of Jennifer DiLorenzo. He also added that he would like committee members to make the meetings a priority on their schedule in order to keep the momentum and level of work on target to meet our December goal.

Team members again expressed an interest in obtaining better information on the volumes of dredged materials for pending projects. Ms. Lillian Liburdi, and Colonel York were asked to provide that information.

The meeting was adjourned at 12 noon.

AGENDA

Dredged Materials Management Team

July 20, 1994

10:00 a.m.

Opening Remarks - Chairman Corodemus

Introduction of Team Members

Goals for the Team/Timetable for Finding Solutions -
Chairman Corodemus

Briefing on Dredging Issues:

Bill Muszynski - EPA Deputy Regional Admin. Region II

Colonel Thomas York - U.S. Army Corps of Engineers

Robert C. Shinn, Jr., - Commissioner NJDEP

Status of Dredging Permits - Port Authority

Status of Research on Contaminant Levels - Dr. Cristini

Legislative Initiatives - N.J. Legislators

Housekeeping Items:

Minutes

Agenda Items

Meeting Materials

Best Point of Contact

Fax & Phone

Set Next Meeting Date - Place ?

Adjourn

DREDGED MATERIALS MANAGEMENT TEAM

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Cynthia A. Zipt
Clean Ocean Action

Meeting Minutes

Meeting #2

Dredged Materials Management Team

August 10, 1994

The meeting began at 10:10 am and minutes of the July 20 meeting were approved with revisions.

Discussion of upland disposal sites began with a presentation by Mr. Larry Schmidt of the NJ Dept. of Environmental Protection. Nationwide, 350 million cubic yards of dredged material is excavated each year. Much of this is hydraulically pumped to open water disposal areas (250 million cubic yards). Approximately 40 million cubic yards of dredged material nationwide is disposed of in upland facilities.

In the Delaware River, approximately 8 million cubic yards are dredged per year, and 4,000 acres of land has been used for upland disposal sites in New Jersey. Mr. Schmidt showed diagrams and photos of two Delaware River disposal sites. Private operators remove mud by using clam shell dredges and transports the material via barges and scows. The dredge bottom dumps into a rehandling basin; thus, the materials must be handled twice. The White's Basin disposal site has the appearance of being an "environmental treasure" in that wetland vegetation and native species quickly take up residence at the site after disposal operations.

For the New York Harbor, an extensive search for upland disposal sites was undertaken by the Corps in the mid-80's. The lack of suitable land is critical. Exclusionary criteria avoided wetlands and residential neighborhoods. The Corps study identified 200 sites in New Jersey and New York that might potentially be available for upland disposal of contaminated sediments. These sites were screened and narrowed to 3 sites in New Jersey; Belford, Elizabeth, and the Raritan Center. All of these sites are now subject to development pressure.

Another site in the Harbor is a privately owned site in Sayreville proposed for operation by Disch Construction. This facility is a diked upland disposal area formerly used by the Corps. Applications are now pending for permitting the Disch facility. The DEP is reviewing the application for a waterfront development permit and a water pollution control discharge permit. Problems with this site involve adjacency to residential property.

Landfill cover is another potential use of dredged materials. Delivery of dredged spoils to landfills is estimated to cost approximately \$28.00 per cubic yard. Clean fill costs about \$7.00 per cubic yard. Category 3 materials could be used at some landfills; those having liners, leachate collection and treatment systems.

The National Lead Site was also discussed. This property is in the process of remedial cleanup, and there may be potential of this site to be used for upland disposal of dredged material. This site is on the Raritan River in Sayreville.

There was a general consensus that the study on upland sites needs to be updated. Criteria are needed for the types of dredged materials that can be used on landfills. There are several issues that must be addressed when considering the use of a landfill site, including, pumping, dewatering, and trucking.

Following the presentation from NJ DEP, Ms. Cindy Zipf of Clean Ocean Action presented an overview of a subaqueous borrow pit/nearshore containment area within Newark Bay, adjacent to Port Authority property. The Port Authority will provide engineering plans and cost estimates to the Team at the next meeting.

Ms. Jennifer DiLorenzo from Assemblyman Corodemus' Office presented an overview of an island-like confined disposal facility in Newark Bay, adjacent to Port Authority Facilities. The Port Authority will provide engineering plans and cost estimates to the Team at the next meeting.

The U.S. Army Corps of Engineer then presented information on federal dredging projects. Colonel York and Mr. Joe Seebode provided information packets and CAD maps of federal project sites. Of seven projects involving Category 1 material, two have already been completed.

Colonel York discussed the Claremont/Jersey Channel. Approximately 3 million cubic yards of sediment need to be dredged. This material is likely to fail tests for ocean disposal.

A second site, MOTBY, has two reaches that need to be dredged. One reach passed ocean disposal criteria tests and one reach failed. MOTBY has an upland disposal site available, but the permit expired on July 27th. There is an urgent need to expedite permit approvals. The elevation of the disposal is ten feet, and steel sheeting and a lining are used to contain contaminated material.

A third site, at the Earle Naval Station needs dredging for 4 million cubic yards of sediment. Testing is now underway.

Overall, the USACE regulates the dredging of approximately six million cubic yards of sediment per year. Permits are pending for about 1 to 1-1/2 million cubic yards of material to be dredged for private interests, and permits are pending for 4-1/2 million cubic yards for federal dredging.

Over the years 1984-1991, approximately 5.5 to 6 million cubic yards of dredged material went to the Mud Dump for ocean disposal.

Following these presentations, a video on the use of geotextile material was shown. Geotextiles are used to contain contaminated dredged material and are being tested by the USACE in Mississippi. Tests are still underway to determine the leaching rates, if any, from geotextile bags.

The next meeting date was set for August 22, 1994 at 10:00 am at the Governor's Office in Newark.

AGENDA

MEETING #2

DREDGED MATERIALS MANAGEMENT TEAM

AUGUST 1, 1994

GOVERNOR'S OFFICE-NEWARK, NEW JERSEY

10:00 AM

1. Opening Remarks-Chairman Corodemus
2. Approval of Minutes of July 20 meeting
3. Discussion on Objectives of the Team-Chairman Corodemus
4. Discussion of Upland Proposal
 - a. Presentation by NJDEP
 - b. Subaqueous pit/nearshore containment area
 - c. Containment Island proposal
 - d. Sanitary landfill cover
 - e. National lead site
5. Presentation on Dredging projects by USACE-Colonel York
 - a. Claremont/Jersey Channel
 - b. MOTBY
 - c. Earle Naval Station
6. Video on geotextile containers--Matt Masters
Port Authority
7. Discussion on EPA straw proposal
8. Next meeting date

DREDGED MATERIALS MANAGEMENT TEAM

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MEETING MINUTES

MEETING #3

DREDGED MATERIALS MANAGEMENT TEAM

AUGUST 22, 1994

Chairman Corodemus opened the meeting at 10:15 am. Minutes were distributed from the August 1 meeting and the Chairman asked members to review them for approval later during the meeting.

Mr. Larry Schmidt, NJDEP, led a discussion on upland disposal sites, providing additional information on potential sites that were first identified at the August 1 meeting.

Mr. Schmidt discussed the application that NJDEP has received from the Warren Disch Construction Company. The application is for a lease agreement for dredged material disposal in Sayreville. The source of the dredged material is from private interests throughout New York Harbor, particularly berthing areas. Approximately 10,000-20,000 cubic yards are expected to be dredged. There are potential problems with the use of this site, which was formerly used by the U.S. Army Corps of Engineers as a dredge spoil disposal site. The system involves a series of pools that allow for spill over and settlement; ultimately the supernatant is redischarged into the bay. A decision on the need for further treatment is still pending.

Assemblyman Mikulak and the Mayor of Sayreville asked questions of NJDEP concerning the status of the application. The application is not quite complete. There is only 1000 feet between the Main Street houses and the dredge spoil site. The Mews townhouses are less than 300 feet from the site. (Attached is background information on the application and maps of the site.)

The National Lead Site is undergoing ECRA cleanup. Much of the cleanup plan is completed or underway. This may be a potential site for contaminated dredged materials disposal.

The next upland disposal site discussed was Allied Chemical in Elizabeth. This site is not on any remediation lists. This Port Elizabeth site is 106 acres assessed at \$4.7 million. It is also adjacent to IKEA and a development, called Orion, will be built nearby--166 acres of retail stores. There is a 3% sales tax--companies can defer remediation until development occurs.

Lillian Liburdi (Port Authority) noted that she has budgeted \$250,000 for an update of an upland site study. The funds will be split between the states of New York and New Jersey.

Larry Schmidt then continued with a summary of landfill cover regulations. New Jersey regulations require dewatering for use as solid waste cover. New York City does pay for landfill cover. Hackensack has little need for the use of dredge spoils as landfill cover. Middlesex County is using dewatered sewage sludge for landfill cover. The U.S. Army Corps of Engineers has a complete report on the use of dredge spoils as landfill cover.

Discussion followed on the quantities of sediments that must be dredged from the Port. The Port Authority indicated that the volume of material in Reach A that must be dredged is a half million cubic yards of Category 3 material. Reaches B & C have about 400,000 cubic yards of Category 2 material that must be removed.

Mr. John Tavalero, USACE provided estimates of the quantities of sediment that need to be dredged. For all categories, 7.6 million cubic yards of sediment need to be dredged. After a two year period, the quantities change. This is because the rate of siltation increases, not decreases. Federal projects are now being tested to determine which category their sediment falls into. A disposal site is also available in Long Island Sound, but only materials dredged west of the Throggs Neck Bridge can be disposed of in the Sound. The Port Authority is not yet testing Newark and Elizabeth sediments. The testing of Howland Hook sediments will take place next year.

Mr. Bob Goode of the Port Authority presented information on containment facilities in Newark Bay. These included a pit, a combination pit/containment facility, and an island confined disposal facility. Attached are engineering specifications, and cost estimates. The island is the most expensive, and pit, least.

The Team then heard a presentation on Amphipod Testing Protocols and were provided with information on testing procedures. EPA believes that former problems with ammonia toxicity have been removed and that confidence in testing procedures has been restored.

Dr. Cristini reported on the Pruell Study that indicates that bioaccumulation of dioxin at the mud dump has been significant. Uptake of contaminants has increased and has not reached a steady state.

The U.S. EPA/Corps Technical Guidance Manual is now being reviewed. The manual will not be finalized for 1 to 2 years and should not affect the deliberations of the Team.

A mission statement to be forwarded to the U.S. EPA concerning the role of the Governor's Dredged Materials Management Team was approved. The statement will be worked into the rewrite of the US EPA/USACE straw proposal.

An interim report to the Governor on the deliberations of the Team to date will be prepared for Team members to review by the September 19th meeting.

The New Jersey Dept. of Environmental Protection has begun an in-house Dredging Group. The purpose of this group is to review and expedite permitting for dredging proposals and remediation projects.

The next meeting date was set for Tuesday, September 6 at 10:00 am at the Governor's office in Newark. The following meeting will be held on September 19 at 10:00 am at the BayWay refinery in Linden. Both meetings will focus on sediment decontamination technology and siting.

The meeting was concluded at 12:20 pm.

AGENDA

MEETING #3

DREDGED MATERIALS MANAGEMENT TEAM

AUGUST 22, 1994

GOVERNOR'S OFFICE-NEWARK, NEW JERSEY

10:00 AM

1. Opening Remarks-Chairman Corodemus
2. Approval of Minutes of August 10 meeting
3. Discussion on upland disposal Site: Larry Schmidt, DEP
 - a. Sayreville-Disch Construction site
 - b. Allied Chemical Site/National Lead Site
 - c. sanitary landfill cover--cost estimates and feasibility
4. Engineering and cost estimates for subaqueous pit /nearshore facility: Port Authority
5. Engineering and cost estimates for island confined disposal facility: Port Authority
6. Update on Amphipod Testing protocols: USEPA
7. Update on status of Corps/EPA Technical Guidance on Testing in Non-ocean Waters (Gold Book EPA)
8. Mission statement for Team
9. Preparation of an interim report to Governor Whitman
10. NJ DEP--In House Dredging Group--Lew Nagy
11. Next Meeting Date

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MEETING MINUTES

MEETING #4

DREDGED MATERIALS MANAGEMENT TEAM

SEPTEMBER 6, 1994

GOVERNOR'S OFFICE-NEWARK, NEW JERSEY

Chairman Corodemus began the meeting at 10:05 am. He made a brief statement about the meeting's agenda, which focused on decontamination technology. Meeting minutes from the August 22, 1994 meeting were then approved.

Dr. Tucker from the New Jersey Dept. of Environmental Protection gave a broad overview of the decontamination technologies available. Most remediation of contaminated sediments has been at land-based sites. Remediation is dependent upon the types and concentrations of contaminants found in a particular sediment. Better data is needed on the quality and quantity of contaminants found in NY/NJ Harbor sediments. Remediation at a site is important, but contaminants must be reduced or removed at their source. The question remains whether to treat the most toxic sediments first or remediate those that may have potential for reuse.

Dr. Tucker provided information on the technologies available. Dechlorination may cost up to \$200.00 per ton. For chlorinated organics, technology options include segregation and then decontamination. Segregation is generally by extraction. Chlorinated organics are the most difficult contaminants to remove because they are hydrophobic.

Ultra-violet light can be used to photo-degrade dioxin. Extraction may be followed with use of UV light. Thermal desorption can also be used. Incineration is available but is generally opposed by the public.

There needs to be a central repository of information on the types and quantities of contaminants in sediments. The Squibb Study summarizes many sources of data, Maxus also has reports from their studies as does Tetra Tech.

John Tavalero, U.S. Army Corps of Engineers indicated that toxics are being modeled for the NY/NJ Harbor Estuary. The Corps collects data from all dredging applicants. EPA also has this data in addition to data from their

own studies. William Muszynski, U.S. EPA discussed the REMAP study, which is an effort to qualify and quantify contaminants in Harbor sediments. There is also a Corps study of contaminants in the Passaic River. Killam Associates has done a dioxin data study. Dr. Kahn of Rutgers indicated that early efforts were made to develop a systematic coring study after it was first discovered that dioxin from Diamond Shamrock had contaminated Passaic River sediments.

Cindy Zipf inquired about the strategies for remediation. Dr. Tucker responded by saying that characterization plus a combination of remediation technologies should apply. The prerequisite is to characterize sediments, then set a time table for remediation.

Bill Muszynski (USEPA) indicated that we must first decide what questions the sampling strategy is going to answer. Sampling for dredging purposes is different than sampling for deep remediation. REMAP is sampling for shallow contaminants for biota concerns. Sampling for dredging purposes and Passaic River remediation requires a different strategy.

Bill Muszynski provided information on the status of BCD (Base-Catalyzed Dechlorination) decontamination technology. It will take approximately six months to determine what type of pilot project will be needed for BCD decontamination technology. The goal is to set a pilot project size. Issues to be addressed include: volumes of sediments, dewatering, cost effectiveness, wastewater treatment and runoff. Cindy Zipf questioned what the end product of BCD would be. Is the end product a waste product or can there be some beneficial reuse? Larry Schmidt of NJ DEP responded by saying that the chemical characterization of the end product will determine whether or not the end product can be reused. Dr. Tucker indicated that there may be some beneficial reuse potential, similar to what has been done with beneficial reuse of sludge in the Pinelands.

The next presentation was by Chuck Wilde of BioGenesis, Inc., BioGenesis has a system that removes organics from soils. It has been used in Thunder Bay Harbour, Ontario to remove PCB's and PAH's from sediments. This project was reviewed by Environment Canada. A prototype machine is available that cleans 7 yards of contaminated sediment per hour, removing 95% of organics and metals.

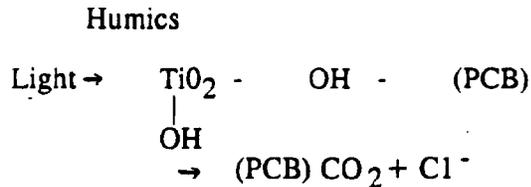
The process has also been used at an USEPA SITE (Superfund Innovative Technology Evaluation) program. The process is an ex-situ, on site extraction technology for organic pollutants and metals. The process uses surfactant blends, water, heat, mixing, and friction to clean soils. Costs range from \$70 to \$140 per ton. The system separates contaminants and does not allow readsorption to soil particles. Pilot models could be used in series to allow for more cleaning and better efficiency.

Jim Tripp questioned why it was better to have material in the water phase. The BioGenesis system is an extraction process and the water phase would then make materials available for some other type of treatment. (A 10 MGD Wastewater Treatment Facility?)

John Tavalero asked what the state of the sediment is at the end of the process? Biogenesis leaves the sediment at 20-30% water. The surfactant will be in the sediment, but it is 100% biodegradable.

Costs of the system range from \$60 to \$75/ day for a capacity of 10,000 yards per day, or \$50 to \$150 per ton. The system will work better in Bay water due to the natural bioremediation effects on residuals. Metals are removed at a rate of 30-40%. At a site in Alameda, lead is pretreated by chelating prior to the BioGenesis system.

Dr. Ronald Scrudato of SUNY Oswego presented information on photocatalytic degradation of chlorinated organics that has been undertaken at the SUNY Environmental Research Lab. The reaction is as follows:



Degradation results from photo, oxidation of contaminants such as PCBs, pesticides, and PAH's. Dioxin is reduced from 10 ppm to 1 ppm over a 10 hour period. Titanium Oxide is the catalyst that is used. It is very expensive but can be recovered for reuse. The higher the chlorination, the greater the adsorption to particulates; and the longer the photodegradation process. At the NPL site, soil at 32 ppm PCBs was reduced to 3 ppm PCBs after 60 hours using UV light. The key in the process is the availability of catalyst and light.

The Pilot scale reactor at SUNY can handle 450-500 gallons of a liquid slurry. It is a closed system, where volatiles are trapped. A mobile reactor is also available.

In the NY/NJ Harbor, photocatalytic degradation could be used in shallow water environments. Lagoons would be ideal for this process to be used.

Dr. Peter Day of Rutgers University presented information on bioremediation. Bioremediation allows for degradation of:

BTEX,
PAH's,
Phthalates, and
nitrogen compounds.

The research at Rutgers focuses on the isolation of microbial strains that speed up transformation chlorinated compounds to less toxic forms. Forced evolution strains has been successful. The focus of the research has been on maximizing the capacity of naturally occurring organisms to degrade compounds.

Dr. Day also spoke on the use of plants--phytoremediation--to remove heavy metals from soils. Plant roots absorb metals from soils which move to above ground leaves and shoots. Plants can have a high capacity to absorb metals. Mustard plants are halophytic and can absorb contaminants in 10-14 days. The life cycle of the plant is 3-4 months from seed to seed. Phragmites may be a good plant for phytoremediation of NY/NJ Harbor sediments.

The last presentation was by Dr. Peter Kahn of Rutgers University. He spoke on the human health effects of dioxins. There are 75 different dioxins and 12 are considered dangerous. In addition, there are also certain diobenzofurans, co-planar PCBs, and chlorinated naphthalenes that are toxic to humans.

Most research has focused on the effects of these contaminants in wildlife or in laboratory rats. The most severe effects occur at puberty. PCB's have caused sexual dysfunction in alligators from Lake Apopca, FL.

Dioxins have been shown to be toxic to immune systems, especially in developing young (of both humans and wildlife). Children in Times Beach, Mo. that were exposed to dioxin have immune disorders.

Dioxin is an endocrine disrupter and hormone mimetic. It causes liver damage in most species. It also causes neurological, and psychological disorders. It can cause kidney damage and chloracne--a skin disorder.

Dioxin causes cancer, and promotes carcinogenesis of other toxins. Responses to dioxin exposure varies from individuals to individual. Sources of dioxins to humans are food related. Since dioxins are soluble in fats, they can be found in dairy, meat, and fish products.

Selected populations are at risk for toxics exposure. In the Great Lakes, exposure has resulted in poorer mental capacity in children. In Newark Bay, we need to:

1. determine who is most directly affected, such as subsistence fishermen, and
2. The levels of contaminants moving up the food chain.

Prudent public policy must be adopted in the absence of accurate scientific information. The public must be involved in decision making. Levels of contamination in sediments in Newark are greater than those found in the Great Lakes.

Bioavailability of dioxins need to be determined. The nature of the soils at the former Diamond Shamrock Plant kept much of the dioxin bound. Dredging of contaminated sediments may make dioxin more bioavailable. Data on blue claw crabs does show that dioxin is bioavailable from Harbor sediments.

The Chairman concluded the meeting by asking members to identify possible sites for decontamination technologies and bring suggestions to the next meeting on September 19th. This meeting will be held at the Bayway Refinery in Linden, NJ.

The meeting was adjourned at 1:15 p.m.

AGENDA

MEETING #4

DREDGED MATERIALS MANAGEMENT TEAM

September 6, 1994

GOVERNOR'S OFFICE-NEWARK, NEW JERSEY

10:00 AM

1. Opening Remarks-Chairman Corodemus
2. Approval of Minutes of August 22 Meeting
3. Discussion on Decontamination Technology/other non-ocean disposal alternatives
 - a. Overview of Decontamination Technologies Available Dr. Robert Tucker
 - b. Status of BCD Decontamination Technology US EPA
 - c. Enviro-Tech Marketing, Inc./Bio Genesis Enterprises, Inc. Chuck Wilde
 - d. Photocatalytic Degradation of Contaminated Solids Dr. Ronald Scudato
Env. Res. Center
SUNY Oswego
 - e. An Overview of Microbial Degradation of Contaminated Sediments Dr. Peter Day, Rutgers
AgBio Tech Center
4. Siting of Decontamination Facilities
Chairman Corodemus
5. Discussion of Human Health Effects of Dioxin
Dr. Peter Kahn
Rutgers
6. Next Meeting Date and Location

1992 Waterborne Commerce for the Most Used Federal Channels in the Port of New York and New Jersey

Federal Channel	Traffic Tonnage (Thousands of Short Tons)	Depths in Feet below MLW	
		Control	Project
NY and NJ Channels (Arthur Kill and Kill Van Kull)	80,117	20 (AK) 40 (KVK)	30(AK) 45 (KVK)
Bay Ridge and Red Hook Channels	2,977	26	40
Bronx River	226	6	10
Buttermilk Channel	26,089	32/35	36/40
East River	28,778	35/40	35/40
Flushing Bay	1,958	*	15
Gowanus Canal	2,175	22	30
Hudson River Channel	16,616	45	47
Hackensack River	2,035	18	30
Hudson River (NYC to Albany)	15,149	14/32	14/32
Jamaica Bay	1,025	*	12/20
Anchorage Channel	96,515	30/45	30/45
Newark Bay	22,804	35/40	35/45
Newtown Creek	1,283	10	23
Passaic River	5,023	7	30
Port Chester Harbor	308	3	12
Raritan River	2,520	17	25
Sandy Hook Channel	1,200	30	35
Shrewsbury River	171	2	6
Westchester Creek	255	*	12
East Chester Creek	1,194	8	10
Coney Island Creek	689	12	12
East Rockaway Inlet	962	12	12
Raritan River to Arthur Kill Cutoff Channel	1,947	20	20
Lower Bay Channels (Ambrose, Main Ship and Sandy Hook)	75,531	30/45	30/45

TOTAL

387,547

* Latest Surveys Not Yet Finalized.

- Source: 1. Waterborne Commerce of the United States, 1992
Department of the Army, Corps of Engineers
2. Project Maps Book, Department of the Army,
New York District
3. New York District, Operations Division

Prepared by: The Port Authority of New York and New Jersey August 18, 1994

Dredged Materials Management Team

Hon. Steven J. Corodemus
Assemblyman, District 11

Mr. James Capo
President
New York Shipping Association

Mr. Albert Cernadas
International Longshoremen's Association

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Governor's Office of Policy & Planning

Hon. Joseph M. Kyrillos, Jr.
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Mr. Lewis J. Nagy
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INTERIM REPORT

DREDGED MATERIALS MANAGEMENT TEAM

NOVEMBER 22, 1994

- H. DR. ANGELA CRISTINI, RAMAPO COLLEGE OF NEW JERSEY
1. "An Alternate Approach for New Jersey a Disposal Plan for Dredged Materials 1994-2005".
 2. Letter from Army Corps of Engineers to Dr. Angela Cristini, dated November 30, 1994 concerning her conceptual plan.
 3. Response, dated December 6, 1994, from Dr. Angela Cristini on conceptual plan.
 4. Results of testing by Dr. Cristini.
- I. SEPARATION AND RECOVERY SYSTEMS, INC. - presentation to the Dredged Materials Management Team, dated December 6, 1994.
- J. NATURAL RESOURCE DYNAMICS, INC. - Letter from Sylvester J. Fletcher, Certified Professional Soil Scientist concerning his ideas for disposal, dated December 13, 1994.

APPENDIX D-3
POTENTIAL DECONTAMINATION TECHNOLOGIES/
PROJECTS/PROPOSALS
ADDITIONAL REFERENCES

I. "STATE OF NEW JERSEY"

Modification to the Amendment offered by Mr. Menendez of New Jersey, Plan for Deployment of Defense Environmental Technologies for Dredging Requirements of Dual-Use Ports.

II. OTHER SOURCES

A. AMBOY AGGREGATES - Proposal by Amboy Aggregates to Construct Dredge Material Borrow Pits, presented July 14, 1994.

B. BAYKEEPER, NY/NJ HARBOR, AMERICAN LITTORAL SOCIETY

1. Contained Upland Disposal of Contaminated Dredge Spoil, memorandum dated September 6, 1994.

2. Willner, Andrew. Baykeeper/ALS Suggestion for Compensation for Shallow Water Habitat Loss Due to Alternatives to Ocean Disposal of Contaminated Dredge Spoils, dated October 11, 1994.

C. BIOGENESIS ENTERPRISES, INC. - Presentation for the Dredged Materials Management Team, September 6, 1994.

D. CLEAN OCEAN ACTION - "An Alternate Proposal for the Disposal of Contaminated Dredged Material", undated.

E. FISHERMEN'S DOCK CO-OPERATIVE, INC. - "A Dredge Spoils Solution", undated.

F. OPPENHEIMER ENVIRONMENTAL COMPANY - Letter and C.V. advising of compatibility with bioremediation product, dated November 21, 1994.

G. DAMES & MOORE

1. Dredged Materials Management Statement of Qualifications.

2. Letter to Assemblyman Corodemus on Proposed Feasibility Assessment for a Dredged Sediment Treatment and Handling Facility on Staten Island, New York.

Residuals/Metals	Metcalf & Eddy: METALEX	Extraction process using leaching and electroprecipitation to extract and recover metals	Concentrated contaminants in oily sludge	*Recyclable oil *Recyclable metals
Residuals/Organics	SRS: BCD	Thermal-chemical treatment, uses heat and reagent to cause dehydrohalogenation reaction	Concentrated contaminants in oily sludge	*Dechlorinated oil
Residuals/Organics	SUNY Oswego: Photocatalytic Degradation	Degradation system using titanium oxide as a catalyst to degrade chlorinated organics	Concentrated contaminants in oily sludge	*Dechlorinated oil *Recyclable titanium oxide
Water	Metcalf & Eddy: Water Treatment	Oil/water separation, with additional filtering as required	Contaminated water	*Clean water *Recyclable filter material *Recyclable oil

REQUIREMENT

#2:

Material Treatment

STEPS	VENDOR/ TECHNOLOGY	TECHNOLOGY TYPE/ PRINCIPLES/CONTAMINANTS	INCOMING MATERIAL	PROVIDES
Fines	Biogenesis: Sediment Washing	Sediment washing using water and biosurfactants in a modular unit, to remove organic and metal contaminants from fines.	Contaminated fines	*Clean sediment *Treatable Water *Treatable residuals
	SRS: Thermal Desorption	Thermal treatment uses high temperature (between 200° and 1000° F.) to achieve removal of organic contaminants.	Contaminated fines	*Clean Soil
Sands/Gravels	BioCops: Bioremediation	Bioremediation using microbial addition to treat organic contaminants	Contaminated sands and gravels	*Clean soil
	Biogenesis: Soil Washing	Soil washing using water and biosurfactants in a modular unit, to remove organic and metal contaminants	Contaminated sands and gravels	*Clean soil *Treatable water *Treatable residuals
	Rutgers: Phytoremediation	Use of plants to absorb metals from soils	Concentrated contaminants in oily sludge	*Clean soil

**APPENDIX D-2
TREATMENT TRAIN INTEGRATION:**

**REQUIREMENT #1:
Initial Material
Handling**

STEPS	VENDOR/ TECHNOLOGY	TECHNOLOGY TYPE/ PRINCIPLE	PROVIDES
Project Management	Metcalf & Eddy: NJ-based multi-disciplined staff	Project management of sediment remediation facility	*Single entity responsible for entire project
	Dames & Moore: Sediment Management Facility	Management of a land-based facility for decontaminating material from small projects.	*Site for pilot-scale treatment train.
Dredging/Sediment Management	Metcalf & Eddy: Cable - Arm Clamshell	Innovative bucket for dewatering while dredging.	*Sediment dewatered to 50 - 80%.
Oversize/Debris Screening	Metcalf & Eddy: HYDROSEP	Soil scalping- separates and removes oversized material	*Oversize material *Smaller material for further processing
Particle-size Separation/Volume Reduction	ABE: Soil Washing Metcalf & Eddy: Soil Washing	Cellular flow concept- ion exchange and filtering Modular system: uses screening and hydraulic classification to reduce volume of soil to be treated.	*Stratified material *Treatable water *Treatable fines *Sands/gravels *Treatable water

train capable of decontaminating the sediments in the NY/NJ area. This information is by no means exhaustive, including only those representations made to the Team. But it demonstrates that there is technology available to design, integrate, and cost out a pilot-to-full-scale treatment facility. According to the presentation made by Metcalf & Eddy, a full-scale sediment management facility, utilizing conventional management and treatment methods, with infrastructure in place, can be operational within three to six months. Pilot testing and evaluation of the innovative technologies outlined by the Team could be initiated at the facility within three months, with results and conclusions available within twelve months. Integration of successful technologies into full-scale production could be (with vendor cooperation) completed within eighteen months.

APPENDIX D-1
DECONTAMINATION TECHNOLOGIES

I. BACKGROUND: Practical Technology Integration
for Sediment Decontamination

The vendors, academics, and members of industry that made presentations to the Dredged Material Management Team (Team) demonstrated that there are a variety of viable solutions for contaminated sediment management currently available. The sediments in the waterways of NY/NJ contains a wide variety of contaminants, including "contaminants of concern" such as dioxins/furans, PCB's, and heavy metals, which make the material unacceptable for unrestricted ocean disposal. Several of the presenters provided examples of technologies that have proven successful in either removing these contaminants from sediment or destroying them.

It is possible, upon reviewing the technologies presented, to configure systems which are cost effective for sediment containing even the worst contaminants. When configuring a system, costs associated with each technology must be considered, and each component must be the most efficient as well as effective for the cost. The concept of volume reduction is a sensible approach, provided the objective of the system is to reserve the most expensive (per cubic yard) processes for the smallest amount of material. The pricing supplied by each vendor may often include services which are necessary to the vendor's technology, but are also included in other vendor's pricing, creating a pricing overlap. A working integration plan would identify and reconcile such situations, and determine which vendor can best perform that service.

A material handling facility incorporating a decontamination treatment train provides an ongoing and progressive solution to the management of contaminated sediment. It also provides maximization of limited funds, considering it has the longest lifetime and the largest capacity (when compared to containment-oriented solutions).

The technologies that are summarized below have been proven at pilot scale or larger, and have supporting documentation available¹. The table which follows categorizes the technologies, and is intended to suggest a variety of combinations which would be applicable to a managed treatment

¹ The exception is ABE, which based its presentation on the principles of its historical mining technology, rather than company research.

Cost per CYD is \$45-90 (price is for treatment of remaining sediment - after volume reduction process).

Metcalf & Eddy: Water treatment

High-efficiency oil/water separator, followed by high rate filters, and granule-activated carbon. M&E has been operating water treatment systems similar to this operation for over 90 years.

Throughput rates 0-2,000 gallons per minute.
Cost - \$.10 per 1,000 gallons.

Rutgers: Phytoremediation

Removal of heavy metals from soil through planting halophytic plants (such as mustard), which can absorb contaminants in 10-14 days. Use of this method requires ample groundspace for planting.

Costs were not presented.

SRS: Thermal desorption

Treatment using high temperatures to remove organic contaminants from soils. Material must be dewatered for treatment to be economically feasible - moisture content will impact price per CYD.

Throughput rates are 5-10 tons per hour.
Cost per CYD \$50-100.

SRS: Base-catalyzed dechlorination

Treatment uses heat (650-800 F.) and catalyst to completely dehalogenate material being treated. Process parameters include moisture content, reagent dosage, metal content, clay content, and target level of treatment objectives.

Throughput rates are 5-10 tons per hour.
Cost per CYD \$80-140 (price includes thermal component).

SUNY Oswego: Photocatalytic degradation

System uses light plus catalyst (titanium oxide) to degrade chlorinated organics. The catalyst is recovered and reused in the system. Process parameters include level of chlorinated-adsorption to particulates, which increases the length of the photodegradation process.

Throughput rates are variable, based on the vessel size. Pilot-scale reactor at SUNY can handle 450-500 gallons of slurry.

Cost per CYD \$250-300.

Throughput rates at 7 CYD per hour with pilot-scale unit, 50 CYD per hour for production-scale unit.
Units can be paralleled for high production rates.
Costs are estimated at \$35-90 per CYD.

Proven at pilot-scale, Environment Canada, Wastewater Technology Centre.

Dames & Moore: Sediment Management Facility

Material handling and decontamination of dredged material at an upland site with ultimate disposal of cleaned material at Fresh Kills Landfill.

Throughput rates will vary depending on which treatments are used. Expected capacity is 300,000 to 500,000 CYD.
Costs are estimated to be \$68-70 per CYD.

Metcalf & Eddy: Project Management

NJ-based staff, including environmental scientists, regulatory experts, civil engineers, chemical engineers, process specialists, project managers, construction managers, dredge specialists, and wetlands experts. Capability for oversight and management proven at previous sediment remediation projects: Dade County, FL; Meyers Superfund Site; NJ, River Raisin, Detroit, Michigan.
Costs based on personnel usage.

Metcalf & Eddy: Cable-Arm Clamshell

Technology for precision dredging utilizing satellite positioning, and dewater material during dredging. Used at production rate at River Raisin, Detroit, Michigan.
Throughput rate of dredging is 100 CYD per hour/per bucket.
Cost per CYD \$8-15.

Metcalf & Eddy: HYDROSEP (including Soil/Sediment Washing module)

Water-based material handling system applied to dredge spoils to remove oversize material, separate sands and gravels from fines for further treatment.
Throughput rate is \$25-50 CYD per hour/per train.
Cost per CYD \$30-60.

Metcalf & Eddy: METALEX

Removal of metals from volume-reduced residual material using technologies which M&E currently has on-line. These systems provide metals in a form suitable for recycling.
Throughput rate is based on feed.

Appendix D

I. Vendors and Technologies Presented to the Dredged Materials Management Team²

ABE: Soil Washing

Cellular flow concept soil stratified system. Uses an ion exchange system and carbon-filtering and treatment with company-developed chemical solutions.

Throughput rates are estimated to be 500-2500 gallons of slurry per minute - however, barge overflow and contact water issues are not addressed, which will greatly reduce quoted rates.

Costs are estimated at \$57-80 per cubic yard (CYD)³
ABE requires guarantee of one million CYD's per year.

Bio Cops: Bioremediation

Remediation of dredged material using micro-organisms to biodegrade organic contaminants within a relatively short period of time. The system has been used commercially, and is currently being tested by the Port Authority of NY and NJ on local sediments at the request of the Dredged Material Management Team.

Throughput rate is variable, depending on available vessel space.

Costs are estimated at \$52-60 per CYD.

BioGenesis: Soil Washing w/Biosurfactant

Modular system for treatment of sand/gravel in a washing unit using biosurfactants to remove contaminants. System can be adapted to treat oversize material.

Throughput rates are 30-50 CYD per hour - units can be paralleled for higher production rates.

Costs are estimated at \$35-90 per CYD.

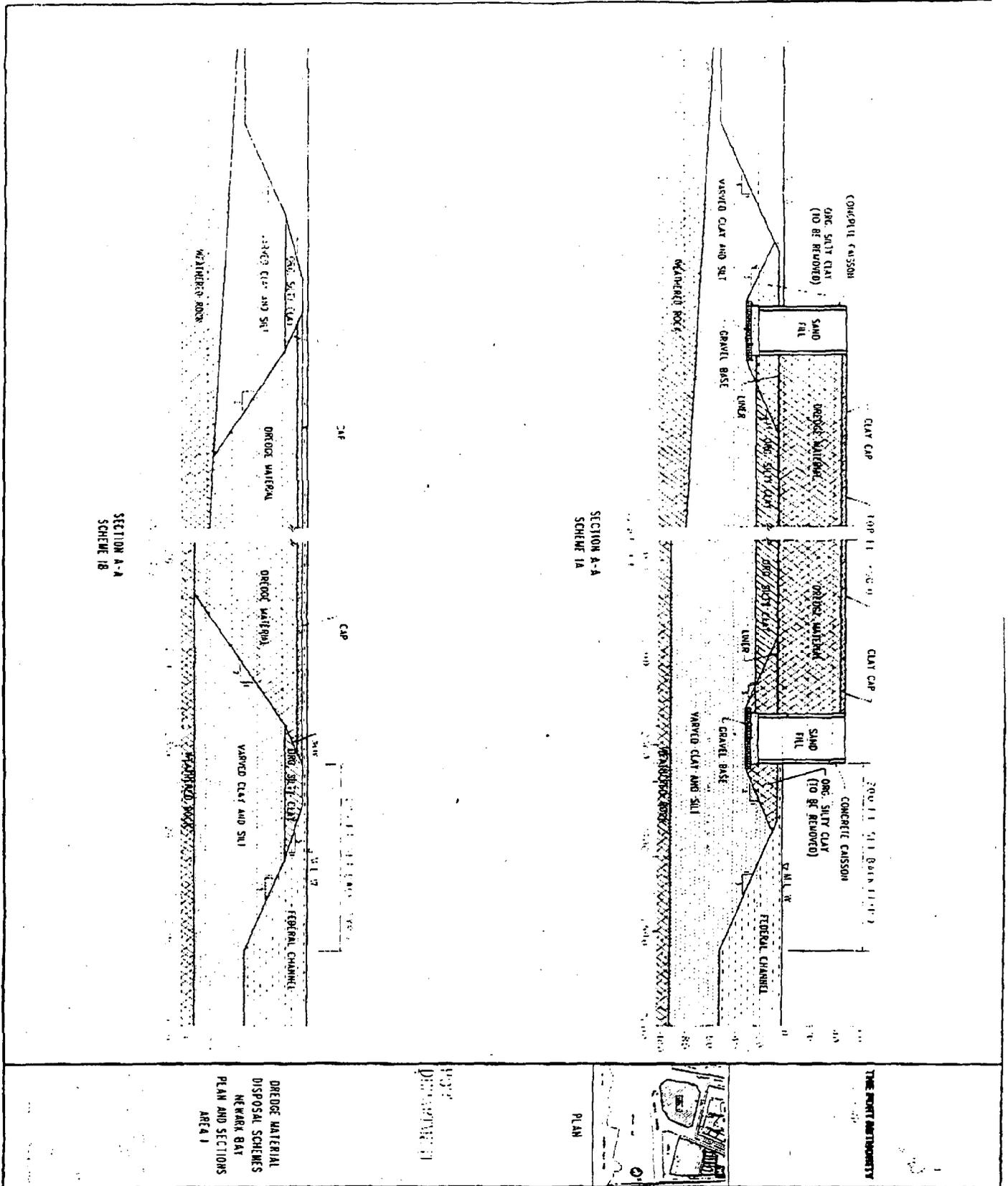
Proven at production scale, USEPA S.I.T.E. Program.

BioGenesis: Sediment Washing with Biosurfactant

Treatment of fines in a washing unit using biosurfactants to remove contaminants.

² See Appendix D-3 for additional proposals reviewed by the team.

Appendix C



The Honorable Steven J. Corodemus
December 21, 1994
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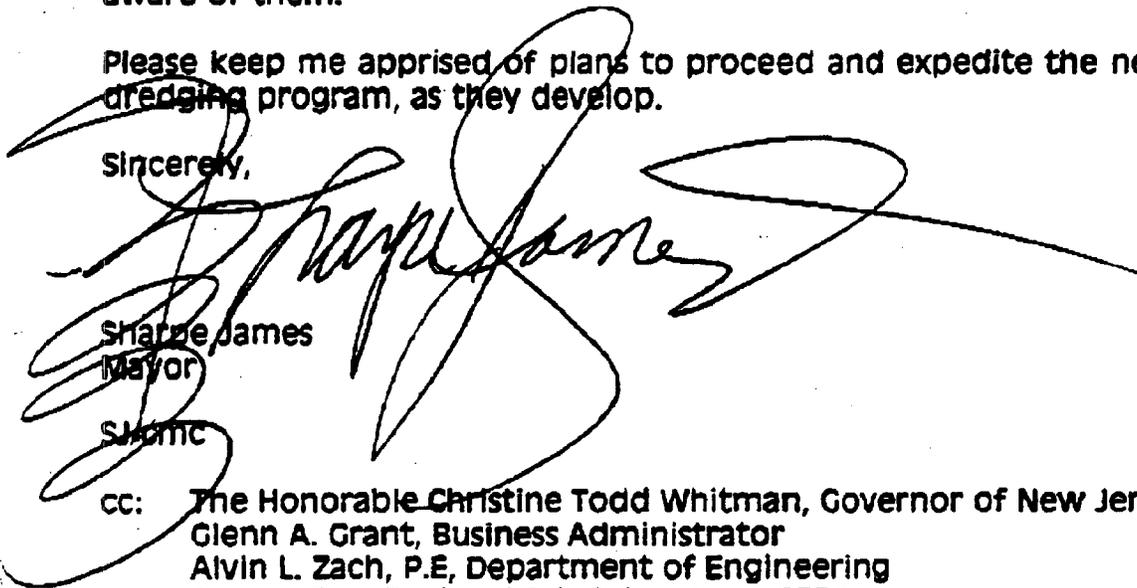
I would like to suggest that the potential to use Federal Superfund or New Jersey Spillfund monies, to offset the cost of dredge spoil decontamination should be looked into. I say this because I am convinced that by this method, responsible parties could be compelled to reimburse these funds expended in the acceleration of the dredged spoil decontamination process.

Needless to say the costs associated with this type of activity cannot be borne by local level government, nor do I believe can we look to the Port Authority of New York and New Jersey to pay the cost. The funds for this project must come from the Corps of Engineers, special Federal legislation or the State since it is obviously a regional problem if not a national issue.

Again in closing, I would like to thank you for your work in this very important issue, and I will continue to support viable options, as I become aware of them.

Please keep me apprised of plans to proceed and expedite the necessary dredging program, as they develop.

Sincerely,



Sharpe James
Mayor

SJ:mc

cc: The Honorable Christine Todd Whitman, Governor of New Jersey
Glenn A. Grant, Business Administrator
Alvin L. Zach, P.E, Department of Engineering
Jeanne Fox, Regional Administrator, USEPA
Colonel Thomas York, U.S. Army Corps of Engineers
Robert Shinn, Commissioner, NJDEP
Lillian Liburdi, Port Authority of New York & New Jersey
Gerard McKenna, NJIT Consortium
Keith Jones, Brookhaven National Laboratory

The Honorable Steven J. Corodemus
December 21, 1994
Page 2

that the efficacy of these technologies can be determined. The Consortium of New Jersey Institute of Technology, Rutgers University and Stevens Institute has already expressed interest in monitoring and evaluating these technologies. This process can also determine what processes might be most cost-effective for cleaning up abandoned industrial sites, such as the Diamond Shamrock site in Newark, in addition to dredged material cleanup. I also believe that some suitable locations for a decontamination facility could be found in some under-utilized areas of Port Newark or some other port locations in the region. This would be ideal, due to the ability to off-load barges and because of the required utility infrastructure. I also strongly support the siting of a research and development facility in Port Newark, in order to implement the existing Interagency Agreement between the Brookhaven National Laboratory and Rensselaer Polytechnic Institute Environmental Partnership with the U.S. Army Corps of Engineers and the Environmental Protection Agency. Since the borrow pits and some of the heaviest contaminant levels are in Newark Bay and the lower Passaic River, which must also be dredged in the near term, I believe the Port Newark location should be the center of research and development activities. Also, this would enable the Consortium I previously mentioned to get involved in the activities which would ensue from this process.

It will be important to find uses for the dredge material that cannot be disposed of in the ocean. Some material may be used for interim and daily cover at landfills. Some of the material could be used to create wetlands and parks, as well as to raise properties, which are located in flood hazard zones, above the 100 year flood elevation. Other uses of the dredged material could be for bricks, cement and possibly asphalt. There are locations in Newark that our Engineering Department is currently evaluating for these purposes, and I hope that other localities in New York and New Jersey will do likewise. I know that one of the key elements of decontamination will be to the ability of any operator of a decontamination facility to expeditiously secure sites for placement of the decontaminated dredge material. A determination must be made by the U.S. Army Corps of Engineers and the Environmental Protection Agency as to what criteria will be utilized for disposal of the dredged materials in the ocean. I would also add, that while some dredged materials may be unsuitable for ocean disposal, the dredged material may contain contaminant levels below the action level for New Jersey soil criteria usage.

APPENDIX B



SHARPE JAMES
MAYOR
NEWARK, NEW JERSEY
07102

December 21, 1994

The Honorable Steven J. Corodemus, Chairman
Dredged Materials Management Team
New Jersey Department of Environmental Protection
401 East State Street
CN 402
Trenton, New Jersey 08625-0402

Dear Chairman Corodemus:

I very much appreciated your meeting with me in Newark to discuss the problem of dredged sediments from the Passaic River basins. As a followup to the presentation you made, I am offering the following comments in support for the efforts you and the Dredged Materials Management Team have made, in what we all hope will be a definitive resolution to the current environmental quagmire on the dredging of harbors in our area.

I would like to set forth some options, which I endorse and wholeheartedly support, that I believe will resolve the decontamination and disposal concerns related to dredging. I believe that sub-aqueous borrow pits are environmentally sound choice for the category three dredged material that cannot go into the ocean disposal site, because of high levels of contaminants. In this regard, I also hope that New York will site a location and not rely solely on Newark Bay or New Jersey locations. I also feel very strongly that a host municipality fee for Newark must be provided in the event the Newark Bay sites are selected. As you are aware, the borrow pits will essentially be an aquatic landfill within the corporate boundaries of the City of Newark and in that regard be no different than an upland landfill which provides a host fee to the municipalities where they are sited. The amount of the fee must be negotiated but should not be less than that provided for other landfills.

I would also support construction and operation of a decontamination facility in Newark. The near term implementation, as well as the technological effectiveness and cost efficiency must of course first be considered. Soil washing, as well as other bio-remediation technologies are methods, which I believe would meet this criteria. I know that your team is actively looking into these and other technologies, and if they meet the criteria, I would support their implementation. My hope in this respect is that a near-term operation for decontamination will commence as expeditiously as possible. Technologies can be tested at such a facility so

15. "Deadly dioxin, dumping of dredge spoils must be stopped", September 21, 1994 (Editorial).

16. "Option offered to ocean dumping", September 28, 1994.

17. "Ban on ocean disposal of harbor sediment won't be advised", October 12, 1994.

18. "Dredge-spoil study group forms to find solutions", October 16, 1994.

19. "Toxic island isn't dredging answer", (Letter to Editor from Ernest L. Oros, Assemblyman, 19th District.)

20. "Seeking common ground on dredging", (Article by Joseph Sapia, Press Freehold Bureau) no date shown.

K. Estuary News: "The Delaware Estuary: Discover its Secrets", Volume 5:1, Summer, 1994.

L. Shepard's, Environmental Liability, Enforcement and Penalties Reports, article entitled "EPA Issues Multimedia Sediment Strategy for Public Comment", November, 1994.

9. "Task force gets a close look at material dredged from Bayway harbor", September 20, 1994.
10. "DEP assailed for stalling dredge plan", September 20, 1994.
11. "State still trawling for long-term solution to dumping of silt", September 25, 1994.
12. "Underwater pits called answer for port dredging woes", October 12, 1994.
13. "P.A. sees dredge delays leaving it stuck in the mud within 18 months", October 28, 1994.

J. Asbury Park Press

1. "9 years of expanded dumping proposed"
2. "Burial pit among options for disposal of dredge spoils", June 26, 1994.
3. "Dredging group assigned to dig up viable solutions", June 28, 1994.
4. "Not dredging ports is risky for state", July 8, 1994 (Viewpoint, by John L. Clearwater.)
5. "Land for dredge site explored by panel", July 21, 1994.
6. "Dredge spoil island considered"
7. "Activists unite in effort to sink continued ocean dumping", August 3, 1994.
8. "Environmentalists, fishermen appeal ocean dumping rulings", August 5, 1994.
9. "Bacteria unlikely cure-all for harbor", August 10, 1994.
10. "Island made of dredge spoils recommended", August 16, 1994.
11. "Dredging work has Sea Bright residents fuming", August 19, 1994.
12. "Shore swimming bans traced to heavy rains", August 26, 1994.
13. "Port dredging needs solutions", September 6, 1994.
14. "Belmar gets mixed news from river dredge tests", September 13, 1994.

2. "Corodemus to convene first meeting of Dredged Materials Management Team", July 21, 1994.

3. "Dredged soil solution cannot be clutching at 'straw proposals'", August 14, 1994.

D. Staten Island Advance - "Proposal to dump sediment draws opposition", November 10, 1994.

E. The Philadelphia Inquirer -

1. "Residents concerned about disposal of silt", July 10, 1994.

2. "New life scuttles up the Delaware River", July 2, 1994.

F. Burlington County (N.J.) Times - "For lake cleanup, dredging woes", July 6, 1994.

G. The Times - "New tactics aimed at tainted tracts", August 18, 1994.

H. The New York Times Metro -

1. "New island is proposed for Harbor", July 13, 1994.

2. "Developers seek profits in polluted land", September 6, 1994.

I. The Star Ledger -

1. "Dredge go-ahead, court rebuffs environmental objections", June 29, 1994.

2. "Several proposals aim at easing dredging crises", July 13, 1994.

3. "Return to power, Salem 2 nuclear plant back in service after river dredging", July 13, 1994.

4. "Dredging plan for port draws mixed reviews", July 15, 1994.

5. "P.A. cites a wide range in cost of harbor dredge disposal plans", August 23, 1994.

6. "Lack of DEP permit postpones plan to dump dredging in Sayreville", August 25, 1994.

7. "Dredging solution stuck in the silt", August 29, 1994. (Letter to the Editor).

8. "Dredging panel examines solutions to contaminated harbor sediment", September 7, 1994.

M. AMERICAN SOCIETY OF CIVIL ENGINEERS. Dredging '94: Proceedings of the Second International Conference on Dredging and Dredged Materials Placement, Volumes 1 & 2, New York.

N. BOPP, R.F., et al. - "Recent Sediment and Contaminant Distributions in the Hudson Shelf Valley". In: NOAA Technical Report, NMFS Manuscript #TR10056-2, Effects of the Cessation of Sewage Sludge Dumping in the 12 mile Site, Proceedings of the 12 Mile Dumpsite Symposium, Long Branch, NJ, June 18-19, 1991.

O. CORBITT, ROBERT A. (Ed.) - Standard Handbook of Environmental Engineering, McGraw Hill, Inc. 1990.

P. MALCOLM PIRNIE, Inc. - Draft Report-Evaluation of Innovative and Fast Track Decontamination Technologies for the NY/NJ Harbor Sediments, August, 1993.

Q. METCALF & EDDY - Hazardous Waste Seminar, 1994. Fiddler's Elbow, Bedminster, New Jersey.

R. SCHUBEL, J.R., P.A. CHIN & A. POLLICE - Report of the Not Just Another Dredging and Disposal of Contaminated Sediments Workshop, State University of New York at Stony Brook Marine Sciences Research Center, COAST Institute and the Institute for Urban Ports and Harbors, and Rutgers' University Institute of Marine and Coastal Sciences, May, 1994.

S. TETRA TECH - Options for Treatment and Disposal of Contaminated Sediments from the New York/New Jersey Harbor, Final Report prepared for the Department of the Army, New York District.

T. AMERICAN ASSOCIATION OF PORT AUTHORITIES - "1992 Dredging and Disposal Survey", Joseph J. Birgeles, Chairman, Harbors, Navigation and Environment Committee, dated September, 1992.

U. "Contaminated Dredged Material Disposal: A Short-term, Non-Structural Alternative", presented December 13, 1994.

V. NEWSPAPER/MAGAZINE ARTICLES

A. The Record, "Bill pushes Newark Bay Dredging", September 13, 1994.

B. The Home News, "Dredging company fighting dumping ban", September 23, 1994.

C. Courior-Post -

1. "Township Dredging Area Lake", July 8, 1994.

2. Memo on testimony given by President of NY Shipping Association with attached testimony.

3. Memo to Governor concerning needed dredging at NWS Earle.

B. MAXUS ENERGY CORPORATION - Presentation given by Richard McNutt, President, September 19, 1994.

C. NEW YORK SHIPPING ASSOCIATION, INC. - Letter from James Capo, President requesting full review of issues of dredging and dredged material disposal.

D. NEW JERSEY MOTOR TRUCK ASSOCIATION - Letter from Administrator expressing views of Association, dated August 12, 1994.

E. GIORDANO, HALLERAN & CIESLA - Letter from S. Thomas Gagliano expressing views of firm.

F. CHRIS' LANDING - Notice concerning dredging at Gunning Island.

G. CONCERNED CITIZENS OF BENSONHURST - Copy of "Locations of Existing Borrow Pits" with attached letter from The Assembly of the State of New York and Petition against dumping toxic material in the borrow pits off of Coney Island.

H. NJ POLLUTION RESPONSE - Nonpoint Source Pollution and Stormwater Utilities - Workshop offering and attached report on Storm Water Utilities and the Public Education Process, Robert F. Grimes, September 27, 1994.

I. TRANSPORTATION PLANNING AUTHORITY, INC. - Cover letter and Report entitled - Intermodal Coordination Study: A Survey and Consultant Recommendations on Containerized Transportation in Northern New Jersey.

J. INTERNATIONAL UNION OF OPERATING ENGINEERS - Collection of letters, news articles, etc. pertaining to dredging needs of the Port of New York and New Jersey, from William F. Zenga, Business Manager, Local 25, Marine Division, AFL-CIO.

K. NEW JERSEY ALLIANCE FOR ACTION - Presentation to the Governor's Dredged Materials Management Team, October 11, 1994.

L. FRANK M. McDONOUGH - Memorandum and presentation to Dredged Materials Management Team entitled "Agencies/Commissions/Authorities with Jurisdiction over Port Newark/Elizabeth-New York/New Jersey Harbor", dated December 1, 1994.

III. BI-STATE INDEPENDENT AUTHORITIES/AGENCIES

A. THE PORT AUTHORITY OF NEW YORK & NEW JERSEY -

1. Letter from the Director of PANY/NJ with attachment concerning their knowledge of Port operations, dated September 21, 1994.
2. Comprehensive Annual Financial Report for the Year Ended December 31, 1993.
3. Regional Economy: Review 1993, Outlook 1994 for the New York-New Jersey Metropolitan Region.
4. Proceedings of the Regional Policy Roundtables: Prospects and Strategies for the Twenty-First Century, The World Trade Center, New York City, 1994.
5. "Port Authority Update on the Use of Geocontainers for Isolating Dredged Materials", October 6, 1994.
6. Dredging: What is the Best Approach for New Jersey?, Presented at the October 27, 1994 meeting of the Dredged Materials Management Team, Honorable Steven Corodemus, Chairman.
7. "Preliminary Evaluation of the Regulatory Permitting Requirements for an Upland Confined Disposal Facility to be Located in Sayreville, Middlesex County", Report with attached diagrams, undated.
8. Draft Report - Newark Bay Subaqueous Borrow Pit Demonstration Project, July, 1994.
9. Review of current dredging projects, undated.
10. Review of "Potential for Upland Disposal Options in the New York Harbor Region", undated.
11. "Estimate of Dredged Material Quantities by Category", current dredging project requirements and permits, August 22, 1994.
12. Location Plan, Pier Facilities, undated.

IV. OTHER SOURCES

A. MARITIME RESOURCES COUNCIL -

1. Memo on Media Coverage of Dredging Issues to members of the Maritime Advisory Council, dated June 16, 1994.

9. "Development and Demonstration of Dredged Material Containment Systems Using Geotextiles", undated.

II. STATE GOVERNMENT

A. NEW JERSEY SENATE

1. Senator James McGreevey, draft legislation on dredging, dated September 6, 1994.

2. Senator Robert Singer, "A Supplemental Act for the Institute of Marine and Coastal Sciences: Harbor Mapping Project", introduced October 17, 1994.

B. NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION 1995 Project Priority List-New Jersey Wastewater Treatment Financing Program

C. NEW JERSEY STATE DEPARTMENT OF LABOR - Letter to Assemblyman Steven J. Corodemus from Commissioner Calderone on employment impacts of dredging impasse on the State's economy. 1994.

D. RUTGERS UNIVERSITY -

1. Conference on the Remediation of Sediments, Guidance Document, sponsored by the Institute of Marine and Coastal Sciences at Rutgers - The State University of New Jersey and the Port Authority of New York/New Jersey, September 14, 1992.

2. Conference on the Remediation of Sediments, Summary Document, sponsored by the Institute of Marine and Coastal Sciences at Rutgers - The State University of New Jersey and the Port Authority of New York/New Jersey, May 4-6, 1992.

3. Conference on the Remediation of Sediments, Summary Document, sponsored by the Institute of Marine and Coastal Sciences at Rutgers - The State University of New Jersey and the Port Authority of New York/New Jersey, November 17-18, 1992 conference.

E. STATE UNIVERSITY OF NEW YORK AT OSWEGO, THE ENVIRONMENTAL RESEARCH CENTER - "Photocatalytic Degradation of Contaminated Solids, an Update", August, 1994.

F. GREEN PORT PROPOSAL IN DOD AUTHORIZATION - Summary and Modification to the Amendment Offered by Mr. Menendez of New Jersey.

C. NEW JERSEY WASTEWATER TREATMENT TRUST

1. Annual Report - 1993.
2. Project Priority Lists: New Jersey Wastewater Treatment Financing Program, 1994.
3. NEW JERSEY WASTEWATER TREATMENT TRUST - Memoranda on availability of funds through Trust and steps to show eligibility of financing.

D. DEPARTMENT OF THE NAVY

Letter from W.E. Franson, Capt. U.S. Navy, dated September 21, 1994 concerning dredging at NWS Earle.

E. U.S. ARMY CORPS OF ENGINEERS

1. Managing Dredged Material, an Evaluation of Disposal Alternatives in the New York-New Jersey Metropolitan Region, Dr. Joseph O'Connor, New York University, Institute of Environmental Medicine, Laboratory of Aquatic Toxicology, Tuxedo, New York, December, 1989.
2. Final Supplemental Environmental Impact Statement: Use of Subaqueous Borrow Pits for the Disposal of Dredged Material from the Port of New York - New Jersey, January, 1991.
3. Draft Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal, New York District, US Army Corps of Engineers, December 18, 1992.
4. Chart and Synopsis entitled "Federal Channel Maintenance Dredging History from 1984 through 1993", undated.
5. Summary entitled "Section 405 of WRDA 1992 Sediment Decontamination Technology", undated.
6. Maps entitled "Delaware River Dredging Disposal Study", dated June, 1984.
7. Letter dated November 14, 1994 concerning PANY/NJ's presentation on October 27, 1994.
8. "Fact Sheet", from Thomas A. York, Col. En. Commanding.

APPENDIX A

REFERENCES

I. FEDERAL GOVERNMENT

A. Draft legislation providing for dredging alternatives and decontamination technology funding in the Harbor Maintenance Trust Fund, by Franks, Robert A. 1993.

B. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

1. Straw Proposal, Dredged Materials Management Forum, July 7, 1994.

2. Revised Straw Proposal, Dredged Material Management Forum, September 20, 1994.

3. Comments to Straw Proposal.

4. Evaluation of Dredged Material Proposed for Ocean Disposal: Testing Manual, USEPA-053/9-91/001, 1991.

5. Assessment and Remediation of Contaminated Sediments (ARCS) Program: Final Summary Report, USEPA 905-S-94-001, 1994.

6. "EPA Calls for New Dioxin Data to Complete Reassessment Process", Environmental News, September 13, 1994.

7. "Dioxin Facts, New Initiatives", September, 1994.

8. "Health Effects of Dioxin and Dioxin-like Compounds", undated.

9. Office of Wetlands, Oceans and Watersheds, Wetlands Division, Regulatory Branch - Excerpts from Guidelines and Draft Inland Testing Manual, undated.

10. "Application Evaluation Process", diagram of Process, undated.

DREDGED MATERIALS MANAGEMENT TEAM

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MEETING MINUTES

MEETING #5

DREDGED MATERIAL MANAGEMENT TEAM

SEPTEMBER 19, 1994

BAYWAY REFINING COMPANY, LINDEN, NJ

Chairman Corodemus opened the meeting at 10:05 a.m. The Chairman remarked that this meeting would focus on sediment decontamination, borrow pit construction, and dioxin studies. He also announced that the draft interim report was being sent to all Team members for their review. Minutes of the September 6th, 1994 meeting were approved.

Dr. Michael DeLuca (Rutgers University) made a presentation on two conferences that were held in 1992 on the remediation of contaminated sediments. These were sponsored by Rutgers Univ., the State University of New York at Stony Brook, and the Port Authority of New York/New Jersey. Copies of conference proceedings had previously been provided to all Team members.

The first conference focused on Bioremediation. It was determined that the cost effectiveness of bioremediation is limited. Processes are very expensive. Some examples show that PAH's can be successfully broken down in the labs and that there are comparable remediation time frames in both the lab and the field. Bioremediation is not a panacea for all contaminated sediment problems. There are specific treatments for specific compounds.

The second conference focused, on physical and chemical remediation of sediments. EPA's ARCS program (Assessment and Remediation of Contaminated Sediments) involves bench scale tests of solvent extraction, thermal desorption, and wet-air oxidation techniques--primarily for PCB and PAH remediation. BCD--Base Catalyzed Dechlorination seems to be a promising technique. In Europe, flotation is used to separate sand from silt prior to treatment. In Great Britain, microorganisms are used to immobilize and localize metal ions from solution which are then separated with a high gradient magnetic separation technique.

In Europe, some nations have developed long-term management plans with a partnership between government, private industry, and public/environmental groups. Short-term tradeoffs include borrow pits, lined

land containment areas, or undersea confined disposal facilities (CDFs). There have also been some limited successful beneficial use projects using dredged materials for growing trees and shrubs.

Dr. DeLuca put forth some recommendations to the Team. These included funding the Undersea Research Program at Rutgers, which is studying the Mid-Atlantic Bight. He also recommended that the COAST committee begin working to coordinate programs between New York and New Jersey to prevent contamination. He also announced that a consortium, between Rutgers Univ., Stevens Institute of Technology, and NJIT, has been forced to find innovative techniques to remediate contaminated sediments. He also supported legislation by Senator Singer, which would provide \$300,000 for supplemental sampling and identification of sources and sinks of contaminants in New York Harbor. A comprehensive survey of sediments can be accomplished by sharing costs with the U.S. Geological Survey.

Key to resolving the contaminated sediment issues in Europe was the setting of a plan with specific dates for milestones of achievement. This ensured progress while still allowing continued use of a dumpsite. Bioremediation funding was also an important component of the long-term management plan.

Michael Beversluis from ABE Environmental presented information on the soil washing technique that is available from his company. The process involves using a clam shell dredge to remove contaminated sediment at a rate of 150 cubic yards/hour. The remediation will be done on barges; this precludes the need for a land site. The sediment is cleaned by an ion exchange system and carbon filtering and treatment with company-developed chemical solutions. To speed up the process, 1-6 barges could be used. Ultimate disposal is in a containment island or ocean, depending on state and federal guidelines. The capacity is 500-2500 gallons/minute. Offloading is included. There is the potential for containment in geotubes.

The cost for this process is \$38-\$53/ton depending on levels of contaminants. This cost includes the dredging process and disposal. Data on performance is not currently available. The process is patented and the process data shows that removal is at 99.999% of cleanup standard. Mr. Beversluis proposed a six month pilot study and provided a copy of ABE's proposal.

Mr. Brad Simek, from Amboy Aggregates, a sand and gravel mining company established in the mid 1930's, made a proposal to mine sand from New York Harbor for borrow pits to hold contaminated sediments.

Sand is mined using a hopper dredge, and transported to the South Amboy facility. From there, trucks and barges are used to send sand to construction industries. The pits dug could be used for contaminated sediments. The company currently holds state and federal permits to mine federal channels and the Ambrose Channel for sand.

Amboy Aggregates pays \$1 million in royalties to the state of New Jersey to mine sand. This money is used by the state for education purposes. Sand is a valuable resource and construction costs of the pits is kept down since the company sells sand. There is no cost to taxpayers.

Ellis Vieser asked about the volume of sediments handled and the depth to which the company could dig. Mr. Simek replied that 2 million cubic yards of sand are dredged

per year and that the depth of dredging is from 100-110 feet deep. Cindy Zipf asked about a market for clay. Mr. Simek replied that there is currently no market for clays.

Mr. Hank VanHandle-Manager of Environmental and Engineering Services at the Bayway Refining Company in Linden, described actions that the company has taken to contain contaminated sediments on its property. The company created a lined 6-foot deep confinement area to temporarily contain materials dredged from their berths in 1993.

DEP required the company to do a study on sediment resuspension. The study revealed that the resuspension of sediments caused by the movement of vessels was equal to the resuspension by dredging operations. In addition, it revealed that water quality in the Kill Van Kull has improved greatly, and that there is a wide variety of marine life now. The company has an application pending with the U.S. Corps of Engineers and NJDEP to address redeposition of silt within current docking berths.

The depth at Bayway berths is 36 feet; 42 feet is needed for their vessels. Lightering is now being done at the Verrazano; dredging would eliminate the need for lightering.

Mr. VanHandle said that the facility needs to know what the end points are going to be for decontamination technology before they proceed with this option. The sediment testing at Bayway revealed that there was 100 ppm of arsenic, and the standard is 26 ppm. There was 25pptr dioxin, the standard is 10pptr. (However there is really no NJ State standard for dioxin.) Decontamination standards should be set based on comprehensive risk assessments.

Dennis Suszkowski questioned Bayway as to their strategy for source reduction for oil products. Mr. VanHandle indicated that there was an audit, a Bi-State Audit of oil products in the Harbor from air sources and stormwater runoff. This revealed that non point source pollution was the most significant cause of oil products to the Harbor. Sources such as 2 cycle outboard motors, which put oil in the water must be abated.

Mr. VanHandle said that all sheens on the Kill must be reported to DEP and the Coast Guard. Bayway has a permit pending for surface water runoff. Moses Creek is dammed and 99% of the facility stormwater is discharged there.

Assemblyman Corodemus questioned the frequency of soundings taken at berths and the costs. Mr. VanHandle replied that soundings are taken quarterly using Sonar and that the costs are several thousand dollars. The soundings are taken in one day.

Rick McNutt, from Maxxus Energy made a presentation on the status of cleanup at the Diamond Alkali plant. Carol Dinkins, Esq. provided background information on the site. Diamond Alkali incorporated in the 1920's in Delaware and until the 1960's, operated the 80 Lister Avenue site in Newark. In the late 60's, the name was changed to Diamond Shamrock. In the late 80's, the name changed again to Diamond Chemical. Then the company was bought by Occidental. Occidental is the signatory for the Superfund cleanup consent decree with the U.S. EPA. Occidental is also the signatory for the consent decree on studies required on the Passaic River. Maxxus Energy conducts these studies for Occidental, including workplan and remediation studies.

Rick McNutt explained that all activities on the site are governed by consent decree. The site has been environmentally secure since 1983. The site is covered with geotextile material, fenced, and guarded. Surface water runoff is controlled. Dioxin is insoluble, therefore, there is no groundwater contamination nor migration. EPA monitors the site each week.

Maxxus has conducted extensive testing for Occidental. Sediment sampling, radio dating, and bathymetric studies have been conducted. Samples have been taken at 92 locations and 73 cores have been taken ranging from 5 to 20 feet in depth. Analysis was done on sediment chemistry. There were 348 chemical samples taken and analyzed for 192 different chemicals and metals, including PAHs, PCBs, Hg, Pb, Cd, dioxin, DDT, Chlordane, and Dieldrin. This information has been published in 19 manuscripts, and is the most comprehensive chemical analysis of the estuary to date.

The results show that lead has dropped off significantly in sediments over the past several years. Arochlor 1254 dropped off in the 90's.

Bathymetry information has revealed which areas of the Passaic are sites of accumulation and scouring. The Lower Passaic River has not been dredged since 1949; therefore, contaminants from Diamond Alkali are covered and not available to biota. Natural siltation in the river creates a cap to contain contaminants.

Chemical analysis reveals that dioxins come from a variety of sources in the Harbor. Dioxin is created in combustion and industrial processes. It is present in sewage sludge. It is also generated by burning wood, metallurgical processes, and at petroleum refineries. EPA has reports on dioxin generating sources.

Maxxus has identified 300 facilities on the Passaic that may produce dioxin. Congeners from the different sources are identifiable in the River. All information that Maxxus has collected has been released to EPA.

The consent order requires investigation of sediment contamination in the Lower Passaic, risk assessments, and a workplan for remediation. The Workplan has been submitted to EPA. Cleanup at the 80 Lister site is on schedule.

A summary of Mr. McNutt's presentation is attached to these minutes.

Mr. William Muszynski, described EPA's new draft report on dioxin. After 3 years of study, it reaffirms the link between dioxin and cancer. There are also non-cancerous adverse effects.

Copies of general information were provided to Team members as well as a form to receive full copies of the dioxin report.

Dr. Cristini questioned when the ecology report would be ready? Mr. Muszynski replied that the report would be ready within one year.

A hearing will be held in Newark and New York to provide information to the public and to gather technical information on dioxin.

Chairman Corodemus set the next meeting date as, Tuesday, October 11, 1994 at 10:00 am in Newark, at the Governor's Office. Following lunch, the Team was taken on a Tour of the Bayway Refinery/Containment Facility. The Tour concluded at 2:30pm.

AGENDA

MEETING #5

DREDGED MATERIALS MANAGEMENT TEAM

SEPTEMBER 19, 1994

10:00 AM

**BAYWAY REFINING COMPANY
1100 ROUTES 1 and 9 NORTHBOUND**

1. Opening Remarks-Chairman Corodemus
2. Approval of Minutes from the September 6, 1994 meeting
3. Presentations on Decontamination Technology
 - a. Report on Conferences on Remediation of Sediments
Dr. Michael De Luca, Rutgers Univ.
 - b. ABE Environmental - Michael Beversluis
4. Presentation of Borrow Pit Construction
Amboy Aggregates - Brad Simek, Vice President
5. Dredging Strategies at Bayway Refinery
Hank VanHandle
6. Presentation of Dioxin Studies
 - a. Maxus Energy, Rick McNutt
 - b. U.S. EPA, William Muszynski
New Report on Dioxin
7. Next Meeting Date
Focus on Source Reduction of Contaminants
8. Tour of the Bayway Refinery/Containment Facilities.

Please note lunch will be served during the meeting. Coffee and tea will also be available before and during the meeting.

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MEETING MINUTES

MEETING #6 DREDGED MATERIALS MANAGEMENT TEAM

OCTOBER 11, 1994

GOVERNOR'S OFFICE, NEWARK, NJ

Assemblyman Corodemus opened the meeting at 10:10 a.m.
Meeting minutes were approved.

Dr. George Korfiatis, Director, Center for Environmental Engineering, Stevens Institute of Technology spoke about a proposed Sediment & Dredged Materials Technology Institute consisting of the Steven's Institute, NJIT, and Rutgers University. The purpose of this Institute would be to conduct studies to facilitate development and implementation of sediment and dredged material technologies and management strategies.

The objectives for this Academic Research Consortium would be to provide resources and technical support and advice to the State of New Jersey on dredging and dredging technology and remediation. It would also conduct public outreach and education programs, foster collaboration between industry, government, the private sector and public interest groups for the development of cooperative solutions for dredging issues. It would also become a clearinghouse of information on dredged materials management and technology.

The need for this Institute is apparent. The Environmental impact of contaminated sediments cannot be ignored. Research/technology/development/evaluation/ demonstration can be conducted through the institute. Right now there is no focused science/engineering research on dredging issues. New Jersey's economy is threatened if we don't formulate and implement environmentally sustainable practices.

Benefits of a Research Institute include:

1. A focused institute on dredging as a New Jersey resource and nationally recognized authority on remediation.
2. A vehicle to attract federal research funds to New Jersey
3. Foster government/industry collaboration.
4. Promote environmental technology development in New Jersey.
5. Provides fast track deployment of new technologies.

Each Division will be responsible for the following:

Environmental Technologies Division - Stevens
Fate and Transport of Pollutants - Rutgers
Characterization and Environmental Effects of Contaminants -
NJIT

Resources from each division include:

Center for Environmental Engineering - Stevens
Center for Marine and Coastal Sciences - Rutgers
Hazardous Substance Management Research Center - NJIT

Costs:

Start up costs for each division will be \$200,000 for a total of \$600,000.
Additional funding will be provided through research grants.

Dr. Dennis Suszkowski discussed sources of contaminants and controls to the Harbor Estuary. Source reduction is key to avoiding contamination of harbor sediments in the long term. Dr. Suszkowski is chairing a work group of the Harbor Estuary Program to explore source reduction.

SEDIMENT CONTAMINATION REDUCTION PLAN

1. IDENTIFY CONTAMINANTS OF CONCERN
2. IDENTIFY AND QUANTITY SOURCES
3. IDENTIFY SOURCE REDUCTION

The plan would include the development and application of simple models as a preliminary assessment of Harbor-wide reductions in contamination in relation to the Long-term Dredging Plan. A Full assessment of the plan would involve a long-term modelling effort. After estimating chemical load reductions, a program would be developed to track and cleanup contaminants, abate combined sewer overflows, institute pollution prevention programs, and inventory waste sites. Finally, the source reduction plan would need to be implemented.

The USACE has a system-wide model in development that explores toxics. The model will help identify which sources can be reduced and the expected resulting reduction of contaminants in sediments.

Sources of contaminants included PCB's from municipal sewage treatment plants - a high percentage. Sources of mercury need to be identified. There has been no quantification of PAH's in the estuary. Dioxin is not even tested for at sewage treatment plants. EPA has identified PCB's at the outfall.

There is a limited data base due to problems with data collection techniques.

Larry Schmidt asked about quantification of atmospheric deposition. Dennis responded by saying that the surface area of the harbor is small when compared with the drainage area. Therefore contaminants from drainage areas are more significant. Mario DelVicario mentioned that EPA will be able to provide atmospheric deposition information for the modeling effort. Andy Strauss suggested that significant sources should be identified and litigated - such as the Kimbuc Landfill.

Rick McNutt (Maxxus) and Tony Wolfskill (Wood-Clyde) provided information on point and non-point sources of contaminants to Newark Bay. Newark Bay acts as a collection basin for non-point sources of pollution. Sedimentology of Newark Bay is identified in a publication entitled, "An Urban Estuarine Bay."

Dioxins/metals/organics are generated as follows:

1. Combustion Sources of Dioxin by Volume of dioxin generated.

Hospital Waste Incineration - 59%
Municipal Waste Incineration - 35%
Non-ferrous metals smelting/refining - 15%

2. Number of Facilities:

Hospitals - 36
Coal Combustion - 42
Smelting - 16

Fuel combustion: Sources of dioxin include:

403,979 airplanes burning fuel through Newark since 1992

400,000 homes burning home heating fuel

2,240,670 cars registered burning fuel.

Dioxin is generated by traffic around the Bay:

1,118 ng of dioxin/day is generated over a 10-mile stretch of Turnpike. This is a calculation for cars typically passing Interchange 14A (East & West) on NJTPKE.

Quantification of sources is needed to input into models -

Metals -

TMDL's - 47,240 lbs/year are loaded to Newark Bay and its tributaries:

Metal:	Cu	Hg	Ni	Pb
lbs/day	61	12	21	35

Atmospheric deposition and stormwater runoff included:

Organics represent the weakest data base. (584 sources have been identified in a five-county area surrounding Newark Bay). Reported accidental spills are high variable. Consistent releases are probably more significant in terms of impacts on biota than catastrophic spills.

Point sources of discharges to Newark Bay include - publicly owned treatment works - POTW's. Loads to the New York/NJ Harbor are:

Cu - greater than 1 ton/day
Pb - 327.81 kg/day

CSO Loads:

NJ - 26 billion gallons per year.
New York - 74 billion gallons/year

Total: 100 Billion gallons/year.

EPA's CSO control policy should be implemented by 1997.

Ellis Vieser and Dirk Hoffman provided information on federal funding available through the Waste Water Treatment Trust. This organization has funded 296 projects totalling \$2,900,000 as the financing arm of the federal government since 1985. \$100 million was turned back to the federal government this year due to a lack of participation by municipalities.

Andy Willner - provided information on mitigation for proposed dredging containment facilities. Criteria and methodology for mitigation projects needs to be established. A mitigation fund needs to be developed to purchase significant sites. The acreage recommended is 2:1 or 3:1 formula.

The fund should consist of monies that applicants contribute to polluters fine monies. This could be similar to the NJ Environmental Endowment Fund.

Tucker Lambkin of Multi-Modal Technologies and the Wrench Transportation System Companies provided a proposal to ship Category 3 materials to a triple lined landfill in Virginia.

The meeting concluded at 2:00 p.m., prior to discuss of the interim report due to a fire drill.

The next meeting will be held on October 27, 1994, at 9:00 a.m. at MOTBY.

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AGENDA MEETING #6 DREDGED MATERIALS MANAGEMENT TEAM OCTOBER 11, 1994

GOVERNOR'S OFFICE, NEWARK, NEW JERSEY

1. Opening Remarks--Chairman Corodemus
2. Approval of Minutes from the September 19, 1994 meeting
3. Presentations on Contaminant Source Reduction
 - a. Dennis Suszkowski, Ph.D., Hudson River Foundation-Sources of Contaminants and Controls/Harbor Estuary Program
 - b. Rick McNutt, Maxxus-Chemical fingerprinting and industrial/other sources
 - c. Ellis S. Vieser, Pres. NJ Alliance for Action and Michael Barrett, Chair, NJ Pollution RESPONSE-wastewater treatment and non-point source pollution control
4. Potential mitigation sites within the Harbor--Andy Wilner, BayKeeper.
5. Discussion and comments on interim report.
6. Next meeting date--October ?, 1994-MOTBY

Focus on capping and cap integrity

****Please Note: Only team members or their official representatives will be seated at the table. Non-team members will be recognized at the discretion of the chair.

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MEETING MINUTES

DREDGED MATERIALS MANAGEMENT TEAM

OCTOBER 27, 1994

MILITARY OCEAN TERMINAL, BAYONNE, NJ

Assemblyman Corodemus began the meeting at 9:25 a.m. Minutes of the October 11, 1994 meeting were approved. MOTBY Brigadier General Boyd King welcomed Team members to MOTBY and spoke about the containment of dredged material from MOTBY facilities. Assemblyman Corodemus thanked Colonel York for his efforts to host the team at MOTBY.

The focus of the meeting was on capping. Mario DelVicario (USEPA) discussed capping at the mud dump site. Approximately 465,000 cubic yards of fine grained dredged material (equal to 149 barge loads) were dredged from the Port of Newark/Elizabeth terminal facility. The duration of disposal activities for this project was 34 days.

The disposal strategy selects locations having water depth greater than 75 feet. Dredge barges dispose of material in set lanes. A bathymetry survey is underway to identify capping areas at the mud dump.

The permit by USACE and EPA for the Port Newark/Elizabeth project required a cap 5 times the volume of material dredged on a 1 x 2 mile area. Barges placed materials in the middle of the lane for a general spread of materials. The highest peak was 9 feet. The USEPA and USACE are doing a follow up study of dioxin at the mud dump through sampling.

Over the past 10 years several bathymetry studies, remote surveys and tissue analyses have been conducted at the mud dump. Lessons to be learned include: not using a widespread mound, greater control over transits of scows, increased law enforcement efforts, and use of borrow pits would better contain contaminants.

The volume of material needed for capping must be more clearly defined. The cap required is usually 2:1; however, the last project (Port Elizabeth/Newark) required a 5:1 cap. Sand caps usually cost \$5.00 per cubic yard.

Lillian Liburdi commented that the process and practices vary between dredging projects. Complications arise due to a lack of coordination between different agencies. A management coordinator is needed. The Port Newark/Elizabeth project dredged Reaches B, C, and D to the face of the berth. Sand was required for capping this project.

Dr. Angela Cristini of Ramapo College reviewed data pertaining to dioxin contamination at the mud dump. Samples at the mud dump showed high levels of dioxin. The data indicated that there were 229 samples having 41 ppt dioxin and 63 samples having dioxin levels of 45 ppt.

Despite capping, dioxin is still bioaccumulating. Bioaccumulation factors are up to about 24. Data indicates that dioxin in the plume from the Passaic is responsible for some of the bioaccumulation. Defacto capping may not be efficient enough to prevent bioaccumulation. Storm events, barging and capping errors allow dioxin to be available in the biota. The highest values of dioxin in the samples were found outside the mud dump especially outside capped areas. The capping procedure smothers biota. Expansion of the mud dump using category 1 materials will allow the capping of hot spots of contaminants.

Questions arose from Team members as to migration of dioxin through the cap. Data presented by EPA indicated that this is not a concern. Dispersion is not an immediate water quality concern.

Lillian Liburdi of the Port Authority provided information on projected dredging needs of the Port until the year 2000. The Port Authority estimates that 42.6 million cubic yards of material will need to be dredged between the years 1994 to 2000. The cost per cubic yard for the Port Newark/Elizabeth project was \$35. Earlier dredging projects cost \$4-8 cubic yards.

Tom Wesson and Ray King of BioCops, Inc. have a microbial degradation process to treat sediments contaminated with dioxin and hydrocarbons. The treatment would be done as barges are loaded. In 24 hours, contaminants are at a non-detectable level. The process uses oxygenated water to increase the microbial degradation rate. Samples of the microbes will be provided to the Port Authority for independent testing on contaminated sediment dredged from the Port.

Representatives of Metcalf and Eddy provided a technical overview of their dredging and soil remediation processes. Metcalf and Eddy have considerable experience with dewatering sediments and treating various contaminants. In addition, their wastewater engineering capability allows them to treat any waste stream from any processes that they may use to decontaminate sediment. The costs for treatment range from \$20 to \$40 per ton. Volumes of sediment that can be treated range from 100 - 200,000 tons.

Lillian Liburdi commented that there must be a cataloging and characterizing of sediments. Priorities need to be set in terms of investing in alternative containment facilities. Priorities also need to be set for decontamination processes; possible funding for these sources can be from Economic Development Agency funds.

Following the meeting, Team members toured MOTBY to view the containment of dredged materials from ship berths. This project involved dredging and disposal of sediments behind a retaining wall.

The next meeting is scheduled for November 22, 1994, 10 a.m., at the National Marine Fisheries Service in Sandy Hook.

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Governor, State of New Jersey

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MEETING MINUTES

DREDGED MATERIALS MANAGEMENT TEAM

OCTOBER 27, 1994

MILITARY OCEAN TERMINAL, BAYONNE, NJ

Assemblyman Corodemus began the meeting at 9:25 a.m. Minutes of the October 11, 1994 meeting were approved. MOTBY Brigadier General Boyd King welcomed Team members to MOTBY and spoke about the containment of dredged material from MOTBY facilities. Assemblyman Corodemus thanked Colonel York for his efforts to host the team at MOTBY.

The focus of the meeting was on capping. Mario DelVicario (USEPA) discussed capping at the mud dump site. Approximately 465,000 cubic yards of fine grained dredged material (equal to 149 barge loads) were dredged from the Port of Newark/Elizabeth terminal facility. The duration of disposal activities for this project was 34 days.

The disposal strategy selects locations having water depth greater than 75 feet. Dredge barges dispose of material in set lanes. A bathymetry survey is underway to identify capping areas at the mud dump.

The permit by USACE and EPA for the Port Newark/Elizabeth project required a cap 5 times the volume of material dredged on a 1 x 2 mile area. Barges placed materials in the middle of the lane for a general spread of materials. The highest peak was 9 feet. The USEPA and USACE are doing a follow up study of dioxin at the mud dump through sampling.

Over the past 10 years several bathymetry studies, remote surveys and tissue analyses have been conducted at the mud dump. Lessons to be learned include: not using a widespread mound, greater control over transits of scows, increased law enforcement efforts, and use of borrow pits would better contain contaminants.

The volume of material needed for capping must be more clearly defined. The cap required is usually 2:1; however, the last project (Port Elizabeth/Newark) required a 5:1 cap. Sand caps usually cost \$5.00 per cubic yard.

Lillian Liburdi commented that the process and practices vary between dredging projects. Complications arise due to a lack of coordination between different agencies. A management coordinator is needed. The Port Newark/Elizabeth project dredged Reaches B, C, and D to the face of the berth, within 25 feet. Sand was required for capping this project.

Dr. Angela Cristini of Ramapo College reviewed data pertaining to dioxin contamination at the mud dump. Samples at the mud dump showed high levels of dioxin. The data indicated that there were 229 samples having 41 pptr dioxin and 63 samples having dioxin levels of 45 pptr.

Despite capping, dioxin is still bioaccumulating. Bioaccumulation factors are up to about 24. Data indicates that dioxin in the plume from the Passaic is responsible for some of the bioaccumulation. Defacto capping may not be efficient enough to prevent bioaccumulation. Storm events, barging and capping errors allow dioxin to be available in the biota. The highest values of dioxin in the samples were found outside the mud dump especially outside capped areas. The capping procedure smothers biota. Expansion of the mud dump using category 1 materials will allow the capping of hot spots of contaminants.

Questions arose from Team members as to migration of dioxin through the cap. Data presented by EPA indicated that this is not a concern. Dispersion is not an immediate water quality concern.

Lillian Liburdi of the Port Authority provided information on projected dredging needs of the Port until the year 2000. The Port Authority estimates that 42.6 million cubic yards of material will need to be dredged between the years 1994 to 2000. The cost per cubic yard for the Port Newark/Elizabeth project was \$35. Earlier dredging projects cost \$4-8 cubic yards. The most important point was that there would be a shortfall in the capacity of the proposed borrow pit and containment facilities that have been discussed by the team to date. Therefore, there is a need to move as expeditiously as possible to implement alternatives.

Tom Wesson and Ray King of BioCops, Inc. have a microbial degradation process to treat sediments contaminated with dioxin and hydrocarbons. The treatment would be done as barges are loaded. In 24 hours, contaminants are at a non-detectable level. The process uses oxygenated water to increase the microbial degradation rate. Samples of the microbes will be provided to the Port Authority for independent testing on contaminated sediment dredged from the Port.

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Following the meeting, Team members toured MOTBY to view the containment of dredged materials from ship berths. This project involved dredging and disposal of sediments behind a retaining wall.

The next meeting is scheduled for November 22, 1994, 10 a.m., at the National Marine Fisheries Service in Sandy Hook.

AGENDA
MEETING #7
DREDGED MATERIALS MANAGEMENT TEAM

OCTOBER 27, 1994

9:00 AM

MILITARY OCEAN TERMINAL BAYONNE, NJ

1. Opening Remarks--Chairman Corodemus
 - a. Welcome by MOTBY
2. Approval of Minutes from the October 11, 1994 meeting
3. Focus On Capping Integrity
 - a. Status of CAP at Mud Dump--Bill Muszynski-US EPA
 - b. Contamination at the Mud Dump--Dr. Angela Cristini Ramapo College
 - c. Research on Capping--Dr. Michael DeLuca Rutgers University
4. Port Authority Presentation on Future Port Dredging Needs--Sediment Quantity /Quality--Lillian Liburdi
5. Sediment Remediation--Ray King--BIOCOPS, Inc.
6. Sediment Remediation--Michael W. Warminsky--Metcalf and Eddy
7. Next Meeting Date
8. Lunch--Buy your own at the Officer's Club
9. Boat Tour of the MOTBY

PLEASE NOTE TIME CHANGE!!

Please Dress Accordingly!

DREDGED MATERIALS MANAGEMENT TEAM

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MEETING MINUTES

DREDGED MATERIALS MANAGEMENT TEAM

NOVEMBER 22, 1994

NATIONAL MARINE FISHERIES SERVICE, SANDY HOOK

Chairman Corodemus began the meeting at 10:00 a.m. Anne Studholme, Lab Officer for the National Marine Fisheries Service (NMFS) welcomed Team members. The new lab building on federal property is state-owned space and is shared between the state and NMFS. The Port Authority has also provided funding for the new facilities. A research program document was made available to Team members. A NMFS program focuses on fish ecology and habitat restoration.

Assemblyman Corodemus gave preliminary remarks and then began a discussion of a local dredging problem in the Shrewsbury River. Mayor Charles Rooney of Sea Bright discussed problems with the dredged disposal site on Gunning Island, and resulting noise and odor problems. The site is used for dredged spoils from local marinas and permits have been issued by the state. Mr. Bernie Moore and Mr. Kurt Kalb of NJ DEP indicated that an inspection of the Gunning Island site had been undertaken by the Department's Division of Law Enforcement. The inspection indicated that this information would be available to the Team by the next meeting. Mayor Rooney indicated that the island is now a commercial site that is causing problems for Sea Bright residents. Assemblyman Corodemus indicated that he would hold a meeting with Mayor Kuhlman of Rumson, Mayor Rooney, and Mayor Sodano, of Monmouth Beach; residents, and the state DEP to resolve the problems associated with this dredged materials disposal site.

Chairman Corodemus, Assistant Commissioner Lew Nagy, and Mr. John Tavalero, US Army Corps of Engineers discussed the Dredging '94 conference that was held in Florida from November 13-16. The meeting was sponsored by the American Society of Civil Engineers. They spoke about the nation-wide and world-wide issues surrounding dredging practices. There needs to be a greater sharing of information so that there is no duplication of research efforts so that there is better technology transfer. In the U.S., 95% of the dredged material is clean and 5% is contaminated. The Port of New York and New Jersey have the most severe contamination problems, having 2-3% of the contaminated sediments in the Port. The conference proceedings are covered in two volumes, "Dredging '94." John Tavalero indicated that the Corps has \$50,000 for the dissemination of public education information regarding dredging.

Next, the minutes of the October 27, 1994 meeting were approved with revision. The interim report was released to all committee members. Additional copies are available upon request.

The firm of Dames & Moore made a presentation to the committee on an alternative plan for the disposal of dredged material. Mr Richard Cobb described the urgency for a dredged disposal alternative. Jack Koczan, P.E. presented information on Dames & Moore's proposal to determine the feasibility of a dredged sediment treatment facility at their LNG tank site in western Staten Island. An 85-acre bermed area is available for storage, dewatering, or materials handling.

After decontamination, the sediment would be used for landfill grade change and cover at the Fresh Kills landfill. The firm anticipates that a full scale operation could handle 300,000 to 500,000 cubic yards of dredged material unsuitable for ocean disposal. This proposal would cost about \$68-\$70 per cubic yard. Implementation of this project would have a two year time frame.

Chairman Corodemus then introduced Mr. William Zenga, Business Manager for the International Union of Operating Engineers; Allen Francis, Local Union 25; and Mr. Brian Lindholm, Executive Vice President of Weeks Marine. They discussed dredging and dredging technology. Mr. Zenga indicated that the Port is losing business due to the inability to dredge. Shoaling in the Port causes dangerous groundings. He believes that a resolution of this problem is needed immediately.

Brian Lindholm described current dredging projects that are now being undertaken by Weeks Marine. They are conducting the beach replenishment project along Monmouth Beach and the northern New Jersey Shore. Mr. Lindholm described current dredging equipment and locations around the country where they are now in use. Technology to pump dredged materials down to the bottom on a borrow pit is currently available.

Mr. Dennis Suszkowski questioned the depth to which dredging could take place. Mr. Lindholm responded by indicating that there is no limit to the depth which can be dredged by mechanical means. Hydraulic dredging is limited to depths of 110 feet. The use of an air lift makes dredging easier at greater depths.

Other types of dredges that can be used are the Grab dredge which is used in England and Holland, and the sled dredge which is operated by divers underwater. Cameras can be mounted on this equipment.

Mr. Ray King of BioCops, Inc. indicated that they have provided samples of their microbes to the Port Authority for testing on Port sediments. They would be ready to start a decontamination project on barges in thirty days. The cost would be \$30 to \$40/ton. Chris Zeppie at the Port Authority is overseeing the testing work.

Mr. Roy Stoecker from EPA provided information to the Team on siting methodology for containment islands. Their system has been done for the Port to locate candidate sites. This study must be updated. The siting process excluded existing disposal sites and recreational fishing grounds. The study takes into consideration surficial sediments and atmospheric dispersion. The maximum depth considered was 60 feet. Cindy Zipf questioned whether storm conditions were taken into account. Mr. Stoecker responded by saying that a 100 year storm was considered.

Dr. Angela Cristini provided a plan of action for the disposal of contaminated sediments. This plan calls for complete containment of category I and II sediments by the year 2000.

Ciny Zipf made the point that there is currently no hold up of permits for dredging in the Harbor. The Clean Ocean Action lawsuit was lost, although it is being appealed. Therefore, applications should be processed by the USACE and USEPA. There is no holdup on permits for dredging for the Town of Belmar.

Lillian Liburdi indicated that the sediments from Howland Hook have failed toxicity tests due to PAH contamination.

The Chairman concluded the meeting at 12:30 p.m. The next meetings dates were set for December 6th, December 13th, and December 20th. The meeting on December 6th will be held in the Port and focus on funding for alternatives.

Following the meeting, Anne Studholme conducted a tour of the new Sandy Hook Lab facilities.

DREDGED MATERIALS MANAGEMENT TEAM

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MEETING MINUTES REVISED

DREDGED MATERIALS MANAGEMENT TEAM

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Dr. Angela Cristini provided a plan of action for the disposal of contaminated sediments. This plan calls for complete containment of category II and III sediments by the year 2000.

Cindy Zipf made the point that there is currently no hold up of permits for dredging in the Harbor. The Clean Ocean Action lawsuit was lost, although it is being appealed. Therefore, applications should be processed by the USACE and USEPA. There is no holdup on permits for dredging for the Town of Belmar.

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Following the meeting, Anne Studholme conducted a tour of the new Sandy Hook Lab facilities.

AGENDA

MEETING #8

DREDGED MATERIALS MANAGEMENT TEAM

NOVEMBER 22, 1994

10:00 AM

NATIONAL MARINE FISHERIES LABORATORY

Sandy Hook, NJ

Welcome - Anne Studholme, National Marine Fisheries Service

1. Opening Remarks - Chairman Corodemus
2. Minutes approval
3. Discussion of Dredging '94 Conference
Chairman Corodemus
John Tavalero
Lew Nagy
4. Discussion of Gunning Island Dredging
NJDEP - Bernie Moore
5. Focus on Dredging & Dredging Technology
Jack Koczan - Dames & Moore
Brain Lindholm - Weeks Marine
6. SAREX System - Joseph DeFranco
7. Next Meeting Date
8. Tour of National Marine Fisheries Service Laboratory

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MEETING MINUTES

DREDGED MATERIALS MANAGEMENT TEAM

DECEMBER 6, 1994

SEAMEN'S TRAINING INSTITUTE, PORT NEWARK

Chairman Corodemus began the meeting at 9:50 am with opening remarks. Reverend Jean Smith welcomed Team members to the Seamen's Church Institute.

Minutes of the November 22, 1994 meeting were approved with revisions.

Team Member Frank McDonough, Esq reviewed agencies, commissioner, and authorities with jurisdiction over Port Newark/Elizabeth and the New York/New Jersey Harbor. A copy of his review is attached of particular interest is the COAST (Clean Ocean and Shore Trust) Committee. COAST has a broad mandate over the natural resources of the New York/New Jersey Harbor and would have the authority to oversee implementation of the final recommendations of the Governor's Dredged Materials Management Team.

The Tidelands Resource Council is an independent body under the Department of Education. The Council's primary function is the administration of riparian lands of the State. From the Team's perspective, any construction of alternative disposal facilities may require an application to this Council for a grant or lease of the riparian rights.

Bernie Moore, NJ DEP provided an update on dredging activities at Gunning Island in the Shrewsbury River. He concluded that the dredged materials placed on Gunning Island are not contaminated. In addition, the dredging operation was carried out in compliance with permits issued by the Department's Bureau of Coastal Regulations. Lastly, all dredging covered under the issued permits has been completed. There are not permits pending that will be acted upon on 1995.

The Team then turned towards funding options for disposal alternatives. Jennifer DiLorenzo of Assemblyman Corodemus' staff provided information on federal legislation being sponsored by Congressman Bob Franks (attached) that would provide \$175 million for decontamination technology and non-ocean disposal alternatives for contaminated sediments. The funding results from redirection of ethanol farmers fuel subsidies.

Another bill (S. 1532), sponsored by Senators Singer and Kyrillos, provides \$81,000 as the state matching funds for US. Geological Survey funding for mapping and profiling of harbor sediments by depth. The research program will be undertaken by Rutgers University. The bill statement will be reviewed by Dr. Michael DeLuca to clarify the scope of the research that will be undertaken

Lillian Liburdi (PANY/NJ) discussed the possibility of fees that could be implemented to fund alternatives for disposal of contaminated sediments. Direct taxes, payments in lieu of taxes, and tipping fees might be implemented. First, basic questions must be answered as to the availability of federal funds, ownership of the alternative disposal site, and liability. No fees should be implemented without consideration as to potential negative impacts on the ability of port businesses to stay competitive.

The Port Authority has, in coordination with the American Association of Port Authorities, conducted a survey of fees for dredging around the country. A new fee structure is being proposed by the State of Massachusetts that is under review by PANY/NJ. Some states use general fund monies for port dredging, while others have a dedicated fund. In addition, some states assess fees for all port users for maintenance dredging. There may be potential for a trust fund for dredging purposes.

With respect to contaminated sediments, penalties for polluters are assessed for natural resources damages. Fines can be used for mitigation of impacts. The Dutch use this approach. The federal Superfund program assesses cleanup costs, not fines to polluters, Lillian further stated that legislation would be necessary to designate the Port Authority as a Natural Resource Agency Trustee by the state

Brian Maher stated that tax dollars, rather than fees, should be used for dredging needs. In Baltimore, the Port Authority is under the control of the state and receives tax dollars for dredging.

There may also be potential for redirecting state dollars collected for law enforcement purposes back to dredging needs. There is a trend to move to direct funding of the NJDEP rather than fund programs through fees and fines.

Andy Strauss commented that there is a lack of predictability and reliability of funding flow when using fines to fund dredging needs without reliable funding it is difficult to back revenue bonds. For example, the Trust for Public Lands has been a Natural Resources Agency Trustee and waited for 10 years of litigation and two years of paperwork before receiving any monies under this program for land preservation purchases.

Jim Capo indicated that there may be funding under the Intermodal System for dredging. The need to dredge is critical for the Port of New York and New Jersey. Because the profit margin for each container is small, real profits are realized through volume.

Chairman Corodemus called upon Ellis Vieser, Chairman of the New Jersey Wastewater Treatment Trust to discuss the potential use of State Revolving Fund monies for dredging purposes. A memo from Dirk Hoffman, PE. indicated SRF funds have been used by the State of Washington for dredging and/or disposal of dredged materials on the West Coast. The statute controlling Trust operations must be amended to permit the financing of dredging and dredge disposal projects.

The discussion then turned toward prioritization of sites that need to be dredged. A rating formula may need to be developed. Jim Capo stated that as a practical matter, it is difficult to set a rating system. The first industry that can't get a ship in, is the first to leave.

John Tavalero indicated that this is not a prioritization process, but a rationing of the use of a disposal site. Delaying dredging increases the risks of danger and ultimately increases the volume of material that needs to be dredged. There isn't much to be gained by delaying dredging. In a sense, the permit application process serves as a prioritization process.

Dr. Cristini pointed out that if you have many applicants, some system must be used to determine which dredging projects can be deferred with the least risk.

Lillian Liburdi said that there are many port users/interests that are dependent upon a viable port. Economic priorities are difficult to assess. Disposal options are not available at this time. There is not a real time option for Reach A nor for Howland Hook. There is a need to find an acceptable upland site.

Cindy Zipf questioned the critical nature of dredging. In the time since the 7 permits were issued to applicants, only 3 have been dredged. What is the reason for this?

John Travalero indicated that there were environmental constraints for dredging on the Hudson River. For example, dredging could not be done during striped bass spawning and migration periods. Therefore, the applicants had to wait before beginning dredging operations.

Next, a presentation was made to the Team on the SAREX decontamination technology system. The presentation was made by William J. Sheehan and Coleman King of Separation and Recovery Systems, Inc. A package of informational materials was provided to each Team member. The company can provide a system of dredged materials recycling. Technologies available include thermal desorption, soil washing, and Base-Catalyzed Dechlorination (BCD). The processes can be linked to provide the best treatment possible. The system has been used around the country and worldwide.

The next meeting of the Team will be held on December 13, 1994 at 10:00 am at the Governor's Office in Newark. The Team will begin to make its final recommendations to the Governor.

AGENDA

MEETING #9

DREDGED MATERIALS MANAGEMENT TEAM

DECEMBER 6, 1994

SEAMAN'S TRAINING INSTITUTE, PORT NEWARK/ELIZABETH

9:30 AM

1. Opening Remarks -- Chairman Corodemus
2. Approval of Minutes from the November 22, 1994 meeting
3. Authorities having jurisdiction over the Port of NY/NJ--Frank McDonough, Esq.
4. Funding -- Chairman Corodemus
 - a. Federal--Congressman Franks
 - b. State--Senator Kryillos/Assemblyman Corodemus
 - c. Tipping fees--Port Authority
5. Prioritization of dredging sites
6. SARAX Process system--Separation and Recovery Systems, Inc.
7. Boat trip for committee members only.

AGENDA

MEETING #10

DREDGED MATERIALS MANAGEMENT TEAM

December 13, 1994

10:00 AM

GOVERNOR'S OFFICE, NEWARK, NJ,

1. Opening Remarks-Chairman Corodemus
2. Approval of Minutes from the December 6, 1994 Meeting
3. Amercian Association of Port Authorities Survey
Lillian Liburdi
4. Team Recommendations for the Final Report
Chairman Corodemus
5. Other Issues
6. Next Meeting

DREDGED MATERIALS MANAGEMENT TEAM

401 East State Street, CN 402, Trenton, NJ 08625-0402 • (609) 292-2885

Christine Todd Whitman
Governor, State of New Jersey

Steven J. Corodemus, Chairman
Assemblyman, District 11

James A. Capo
NY Shipping Assoc., Inc.

Albert Cernadas
InIL Longshoremen's Association

Dr. Angela Cristini
Ramapo College of NJ

Joseph M. Kyrillos, Jr.
Senator, District 13

Lillian Liburdi
Port Authority of NY & NJ

Frank M. McDonough, Esq.
Kenney, Gross, McDonough & Stevens

Harry A. McEnroe
Assemblyman, District 28

M. Brian Maher
Maher Terminals, Inc.

Lewis J. Nagy
NJ Dept. of Environmental Protection

Edward T. O'Connor, Jr.
Senator, District 31

Andrew L. Strauss
Trust for Public Land

Dennis J. Suszkowski, Ph.D.
Hudson River Foundation for Science &
Environmental Research, Inc.

James T. B. Tripp
Environmental Defense Fund, Inc.

Cynthia A. Zipf
Clean Ocean Action

Meeting Minutes

Governor Whitman's Dredged Materials Management Team

December 10, 1994

10:00 am

Governor's Office, Newark, New Jersey

Chairman Corodemus began the meeting at 10:15 am. After the Chairman's brief remarks, the minutes of the December 6th meeting were approved with minor revisions.

Joe Birgles, PANY/NJ, provided Team members with copies of a report by the American Association of Port Authorities, entitled the "1992 Dredging and Disposal Survey." The report revealed the dredging practices and dredged materials disposal costs around the nation.

The state of Massachusetts has a tax rebate plan to offset the federal tax collected as a harbor maintenance fee. Approximately \$55 million annually is collected by the federal government, under the Harbor Maintenance Act; approximately \$25 million is received from New York and New Jersey. Yet only \$15 million is received back in our Port for Harbor maintenance. Thus PANY/NJ only gets half of what is paid into federal Harbor Maintenance Fund.

There is approximately \$300 million excess in federal coffers. However, it is already committed for certain projects. In 1993, the dredging projects that were paid for by the Port Authority caused a \$34 million loss in the Port's budget.

Ellis Vieser, representing Jim Capo, indicated that what is needed is a Director of Ports and Terminal within the state of New Jersey. Some states have this position in their Departments of Transportation. Other states have free sediment disposal sites--provided by the federal government.

In Maryland, the State Treasury funds ports and dredging projects. In Seattle, tax revenues provide for dredging and Port development projects. There is no legal mechanism that allows the PANY/NJ to recoup dredging costs. The Port Authority no longer has the

financial means to pay for dredging. The state and federal government will have to pay. The Port Authority has been seeking funding for dredging through the reauthorization of the Water Resources and Development Act. There is also potential for funding for dredging through ISTEA.

The Team then turned toward a discussion of the final recommendations for the Team Report:

The Team favored the creation of borrow pits, in Newark Bay as a viable short-term solution for the containment of contaminated dredged materials. In addition, there was a proposal for the use of geo textiles to contain contaminants in natural depressions in the Bay. These geotextile bags would then be capped.

There was considerable discussion on whether or not a full Environmental Impact Statement would need to be undertaken to construct these borrow pits. Workshops with community leaders on dredging would help to determine potential opposition to these proposed pits in Newark Bay.

A discussion on upland sites revealed that most Team members would like to see upland sites listed as potential short-term solutions for sediment containment. Sites suggested included the LNG site. In addition, innovative projects like the Bayway project and MOTBY should be encouraged in the final report.

The Team's consensus also included a designation of the Port Authority as the lead agency in pursuing permitting of the borrow pits.

Funding options should include potential use of ISTEA funding, direct appropriations by the state, and the Wastewater Treatment Trust Fund. It was agreed that federal funding should be vigorously pursued.

A discussion of volume reduction indicated that there needs to be a modelling of the watershed. Dennis Suskowski said that control of sediments from agricultural areas by reforestation reduces sediment runoff. In Port Newark, the Hudson River is a source of Port sedimentation. In addition, hydraulic studies and channel realignments will help with reducing the volume of materials that must be dredged.

The final report should also include a discussion on reduction of sources of toxics to the estuary. Point and non-point sources of pollution to the Harbor need to be better controlled. The Harbor Estuary Program's CCMP needs to be implemented. Ellis Vieser indicated that a survey he conducted revealed that most households would be willing to pay \$50 to control non-point sources of pollution.

Decontamination technology also needs to be pursued. Funding and resources should be dedicated to decontamination technology. The Team decided to list available technologies and information on technologies that have been presented to the Team in the final report. Decontamination technology was generally considered to be part of a long-term, rather than a short-term solution.

There is a series of steps in decontamination technologies:

1. volume reduction
2. treatment
3. residuals handling

There is a potential for treatment trains to be linked. There should be an end product that is clean enough for ocean disposal. The term "treated waste" should not be applied to decontaminated sediment. The disposal of decontaminated sediment should not be limited. It should be considered a recycled material. In Pennsylvania, regulations allow for the reuse of dredged materials. Bioremediation doesn't change the characteristics of sediment.

Cindy Zipf indicated that the Forum has \$6 million for decontamination technology. The state should play a greater role in the Forum's Decontamination Technology Work Group. Contractual problems should be avoided in funding decontamination projects.

Further discussion ensued on upland disposal. The Hackensack/Meadowlands Development Center has an immediate need for final landfill cover. Liberty State Park is currently trucking in fill at a cost of \$20 - \$30/cubic yard. There is a need for a land use standard for dredged materials. Some dredged spoils could meet landfill cover criteria.

Other potential upland sites include the Newark Arts Center and Allied Junction. These dredged materials are not phytotoxic so it can be used on land and revegetated, although not for farmland.

Dennis Suskowski indicated that a study undertaken by the USACE indicated that upland disposal is costly and that there are a very limited number of landfills available. The biggest problem with dredged sediment is salt content. The daily and interim covers in landfills could be dredged sediment, but the final cover must be vegetated.

New York City used dredged materials mixed with soil for cover at the Staten Island Landfill. However, New York State DEC changed regulations so that the City could no longer exercise this practice.

There may be the potential for use of dredged materials in highway construction. The State DEP is looking at soil standards for agricultural purposes. DEP will also be issuing a report on roadways and waste reuse.

Research needs were then discussed. The Rutgers/Stevens/NJIT consortium on dredging and dredging technology needs to be funded. A special fund should be established for research needs. Waste materials funds could provide a challenge and matching monies for research.

The Coast (CLEAN OCEAN AND SHORE TRUST) Committee should be the vehicle by which to implement the Team's recommendations. The COAST committee could also assist with regulatory barriers between state, federal and local agencies.

The final report should also indicate a need for leadership on dredging issues. A project manager needs to be designated to ensure that dredging projects proceed in a timely manner. Perhaps a dredging entity within the Executive Branch could be established.

The Team's meeting concluded at 12:30 pm. The next meeting will be held in January. The draft final report will be circulated to all members before the next meeting.

**FINAL REPORT OF THE
GOVERNOR'S
DREDGED MATERIAL MANAGEMENT TEAM**

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APPENDICES

- Appendix A - Reference List and Documents Reviewed
- Appendix B - Letters From Local Officials In Support Of Recommendations
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Final Report of

The Governor's Dredged Material Management Team

Introduction

The Dredged Materials Management Team (the Team) was a Task Force established by Governor Christine Todd Whitman in June of 1994 to identify short-term (0-3 years) solutions for the disposal of contaminated dredged material from the New Jersey side of the Port of New York and New Jersey. Historically, dredged material (both contaminated and uncontaminated) has been disposed of at the federally designated Mud-Dump Site, located 5.5 miles off Sandy Hook, New Jersey (Figure 1). Levels of contaminants in dredged material, such as PCB's, PAH's, heavy metals, and in particular, dioxin, have precluded continued dumping of certain Port sediments at the Mud-Dump Site.

The Governor appointed Dredged Materials Management Team members representing a broad spectrum of business, environmental, legislative, and scientific interests to meet in an effort to foster public involvement in identifying short-term solutions; team members served without compensation. (See Figure 6)

The Team held 10 meetings between July, 1994 and December, 1994 and has completed recommendations within the six month time frame set by the Governor. The Team's mission, to help the Port continue to function while protecting the ocean, has been fulfilled, over the short-term, by identifying potential non-ocean disposal alternatives. The final recommendations of the Team are summarized in this report. The Team's mission is consistent with the Governor's commitment to maintaining and expanding New Jersey's economy, which hinges on the continued viability of maritime shipping of dry goods and petroleum products and preservation of the fishing and tourism industries.

It is the intent of the Team that these alternatives, coupled with measures to meet immediate needs, will allow the Port to continue to operate safely and efficiently during the time it will take to identify and implement longer-term dredged material disposal alternatives. The Port is vital to our region's economy and must be kept open through necessary dredging projects. Figure 2 shows that container ships have a great capacity for carrying cargo; one ship replaces 1,000 railroad cars or 2,000 trucks.

The Team's earlier, Interim Report (included in the Appendix), entitled, "Dredging -- What is the Best Approach for New Jersey?" provides information on the scope of dredging needs in the Port of New York/New Jersey. It also states the rationale for dredging, including job protection and economic development, as well as environmental, health, and safety considerations. The Interim Report summarizes the findings of the first four Team meetings; this final report summarizes the last six Team meetings.

Chairman Corodemus and Team members have also participated in a number of unfunded research activities during the course of their deliberations, which included tours of the following facilities:

1. Hart-Miller Dredged Materials Containment Island in Baltimore;
2. Military Ocean Terminal in Bayonne (MOTBY) near-shore contaminated sediment containment facility;
3. Port Newark/Elizabeth industries and container ships;
4. Tosco-Bayway Refining Company's upland disposal site;
5. National Marine Fisheries Service Lab in Sandy Hook;
6. Marine Spill Response Corporation vessel Responder; and
7. Buzzelli Catch Basin, Jersey City, used to control non-point source pollution to Port waterways and sediments.

In addition, several Team members traveled to the American Society of Civil Engineer's "Dredging '94" conference in Florida to learn about state-of-the art dredging technology and sediment remediation techniques.

The Dredged Materials Management Team has succeeded in reaching a consensus that underwater borrow pits, constructed in the Port of Newark, are the best non-ocean short-term solution for the disposal of contaminated dredged material from the Port. In addition, the Team has identified other short-term solutions, including upland disposal and geotextile bags, that should be utilized. Several sediment decontamination technologies appear promising, and should be part of the State's long-term management plan for dredged material.

The next phase in dredged material management will be implementation of the Team's recommendations. Permitting the proposed facilities should be a priority among State and federal agencies. Funding for implementing these recommendations should be provided under State/federal cost sharing agreements.

Recommendations

The Governor's Dredged Material Management Team

Background

This Report presents the conclusions and recommendations of the Dredged Material Management Team. The Team's mission, was to identify short term, environmentally sound, and economically viable management options for the disposal of contaminated (Category II and Category III) dredged material from the New Jersey side of the Port of New York and New Jersey to help the Port to continue to function.

The Team arrived at its recommendations after considering almost two dozen separate and distinct, but inter-related issues. The review focused on non-ocean disposal alternatives and included the requirements for further evaluation of dredged material, the necessity for the funding of research concerning the classification of sediments and potential sediment decontamination technologies, the quantity of material to be dredged in the designated time frame, reduction of volumes and methods to achieve reduction.

The Team also examined the prioritization of sites that require dredging, innovative on-site containment technologies at applicant-owned facilities, continued development of the necessary criteria for water-based and land-based solutions, and decontamination technologies designed to reduce sediment contamination, the volume of dredged material, and the waste streams resulting from sediment treatment processes.

The Team reviewed legislative and regulatory requirements, waivers and/or legislative relief necessary to implement the Team's recommendations, funding for the construction of disposal options, operations and maintenance (O&M) of disposal operations, the role of tipping fees and private sector contributions as relates to construction and O&M costs, and the process to secure funding.

The Management Team also reviewed pollution prevention and clean-up programs, point and non-point source discharges, and various Harbor Estuary Program projects that may be affected by the Team's recommendations. Finally, the Team examined the jurisdiction of the various agencies, commissions and authorities in and around the Harbor area; and reviewed which agency or agencies, new or established, should be charged with a leadership role in implementing the Team's recommendations.

A complete reference list of documents reviewed are contained in Appendix A.

Recommendations of the Governor's

Dredged Materials Management Team

I. DISPOSAL ALTERNATIVES

The Governor's Dredged Material Management Team recommends the following short-term non-ocean alternatives for the management and disposal of Category II and III dredged material. The alternatives as well as the other recommendations contained herein should be treated as a comprehensive approach, each element of which, while distinct, enjoys co-equal status with the others and is to be pursued simultaneously on parallel tracks. (It should be noted that the various recommendations enjoy the support of the local officials most directly affected. See Appendix B.) The recommendations are:

A. BORROW PITS

The Team recommends the immediate construction and utilization of underwater borrow pits in Newark Bay for the disposal of contaminated sediments taken from the Port of New York and New Jersey. Figures 3 and 4 show the recommended borrow pit sites off the Port of Newark/Elizabeth, cost estimates are rounded. Site 1 could accommodate approximately 9 million cubic yards of contaminated dredged material at a cost of \$77 million; Site 2 could accommodate approximately 5 million cubic yards of contaminated dredged material at a cost of \$42.8 million.

Appendix C presents the preliminary engineering data prepared by the Port Authority of New York and New Jersey for the construction of these pits. Conceptually, the borrow pits would be dug through the top silt and underlying clay layers down to a bedrock depth of approximately 80 feet; the bedrock and clay sides of the pits would contain the contaminated sediments. The top silt layer may contain contaminants, and therefore would be temporarily stored until the pits are dug. This contaminated layer would then be the first contaminated sediments placed in the borrow pit. The underlying clay sediments are clean and could be disposed of in the ocean or at an upland site, possibly used for landfill cover, or stored and used as capping material once the pits are filled with contaminated sediment.

Design and construction of the recommended borrow pits should be implemented on an expedited basis, through cooperative efforts by State and federal agencies during the permit application process. Members of the Team generally

available to complete the project review process within a year.

The recommended borrow pits in Newark Bay will be capped with clean material, thus restoring the bay to its original depth and natural conditions. Team member Dr. Angela Cristini estimates that containing contaminants within these pits will result in a significant decrease in the toxics body burden in blue claw crabs within the life cycle (approximately 5 years) of these marine crustaceans. The proximity of these borrow pits to Port Authority property will allow ease of accessibility for monitoring purposes. The Team encourages the State of New York to pursue construction of borrow pits in areas where sediments are already contaminated with Category II and Category III material.

B. GEOTEXTILE BAGS WITH CAPS

The Team recommends the utilization of geotextile bags (with capping) at selected, environmentally secure sites in the Port such as the natural depression site located near the southern terminus of the South Reach shipping channel in Newark Bay. The geotextile containers would isolate the contaminated dredged material; the containers will be capped with a layer of Category I sediments.

C. UPLAND CONTAINMENT

The Team recommends utilization of upland disposal sites for contaminated dredged material. Such sites may be used as permanent containment, temporary storage, or storage and decontamination sites. Individual permit applicants should be encouraged to seek upland alternatives pending longer term decontamination and disposal options. Suggested sites reviewed by the Team are listed in Appendix A and include the Liquid Natural Gas tanks on Staten Island, the Standard Oil Tanks in Linden, and the Allied Signal site in Elizabeth.

D. INNOVATIVE SHORT TERM OPTIONS

The Team recommends the continuation and encouragement of innovative short term options by individual permittees, such as those employed by the Bayway Refinery Company (upland temporary disposal on impermeable liners in diked lagoons) and the Military Ocean Terminal, Bayonne (near-shore containment).

E. RECYCLING

The Team recommends continued beneficial use of suitable dredged material for landfill cover and construction materials.

II. PERMITTING PROCESS

The Team recommends that permitting of the proposed options be effectuated on an expedited basis utilizing existing data where available, adequate, and appropriate. The regulatory agencies and the Lead Agency must develop a system to prioritize permits, determine minimum volumes for berth usage, reduce volumes with improved dredging techniques, and evaluate and implement additional beneficial use, upland, and in-water options.

III. COMPLEMENTARY AND SUPPLEMENTAL MANAGEMENT TECHNIQUES

The following programs, processes, and approaches should be integrated into the overall disposal plan.

- **PRIORITIZATION** shall maximize the capacity of short-term, non-ocean alternatives of dredged material;
- **VOLUME REDUCTION** that may include a combination of **SEDIMENT REDUCTION, REVISED CHANNEL CONFIGURATIONS**, and abandonment of areas formerly dredged but no longer deemed critical;
- **POLLUTION PREVENTION** (Point and Non-Point sources) through existing initiatives and future programs; and
- Continued development of **DECONTAMINATION TECHNOLOGIES** including the implementation of pilot scale projects and operational facilities as outlined in Appendix D.

Implementation of the Dredged

Material Management Team Recommendations

The following agencies/authorities should be charged with the implementation, management, and oversight of the Team's recommendations:

I. Port Authority of New York and New Jersey

The Port Authority's staff, expertise, and interests dictate that this agency is the most appropriate quasi-governmental authority to serve as lead agency for the implementation the Governor's Dredged Materials Management Team recommendations, in consultation with the New Jersey Departments of Environmental Protection and Commerce. The Port Authority would be the Lead Agency in the dredging operations, the modeling and determinations necessary to reduce the volume of dredging, and the implementation, testing, and development of potential decontamination technologies.

II. New Jersey-New York Clean Ocean and Shore Trust Committee

This committee, informally known as COAST, is a bi-state (NJ/NY) group with a broad mandate to protect the natural resources of the Hudson-Raritan Estuary and the New York Bight area. The Committee has the authority to assess for priority consideration research agendas and action plans recommended by the New York-New Jersey Harbor Estuary Program, initiate special studies and research, coordinate and recommend standardization of laws affecting its jurisdictional area, communicate with Congress and the federal government on the two States' common concerns, and "take such other action that may be necessary to further the purposes of the Act". The Committee has appointed a Dredged Materials Management Subcommittee and has named Assemblyman Steven J. Corodemus and Dr. George Korfiatis as Co-chairmen.

The Governor's Dredged Materials Management Team recommends that the COAST Committee and its various subcommittees be directed to assist the Lead Agency in the following areas:

- securing federal and State funding through various federal and State programs, including the federal Water Resources Development Act, and State and Congressional appropriations;
- initiating, instituting, and encouraging further research on the part of the Stevens Institute of Technology/Rutgers University/New Jersey Institute of

Technology Consortium, as well as securing additional funding sources for the Consortium;

- pursuing legislative and regulatory relief to encourage the beneficial re-use of dredged materials and establish criteria for land-based and water-based disposal options;
- pursuing financial contributions from polluters of the harbor to assist in providing either short term or long term solutions to the contaminated sediment problem;
- amending current statutory authority for wastewater treatment financing programs to facilitate the funding of dredged material disposal, and adoption of legislation which indemnifies the Lead Agency from certain liabilities arising out of its responsibilities in implementing the Team's recommendations; and
- implementing, in coordination with the recommendations of the New York-New Jersey Harbor Estuary Program Comprehensive Conservation and Management Plan, the cleanup of Port water and sediments.

Finally, the Team recommends charging the COAST Committee with monitoring the implementation of the Team's recommendations, and reporting to the Governor and/or her designee, on a scheduled basis.

III. Port Dredging Projects Officer

The Team recommends that a single individual, appointed by the Governor within the Administration, be designated as the main contact point for all parties interested in or affected by the implementation of the Dredged Materials Management Team's recommendations and the conduct of dredging operations in and around the Port. This individual shall serve primarily as the day-to-day contact between State and federal agencies and authorities, shipping and transportation concerns, Port activities, the scientific community, longshoreman's organization, and the environmental community.

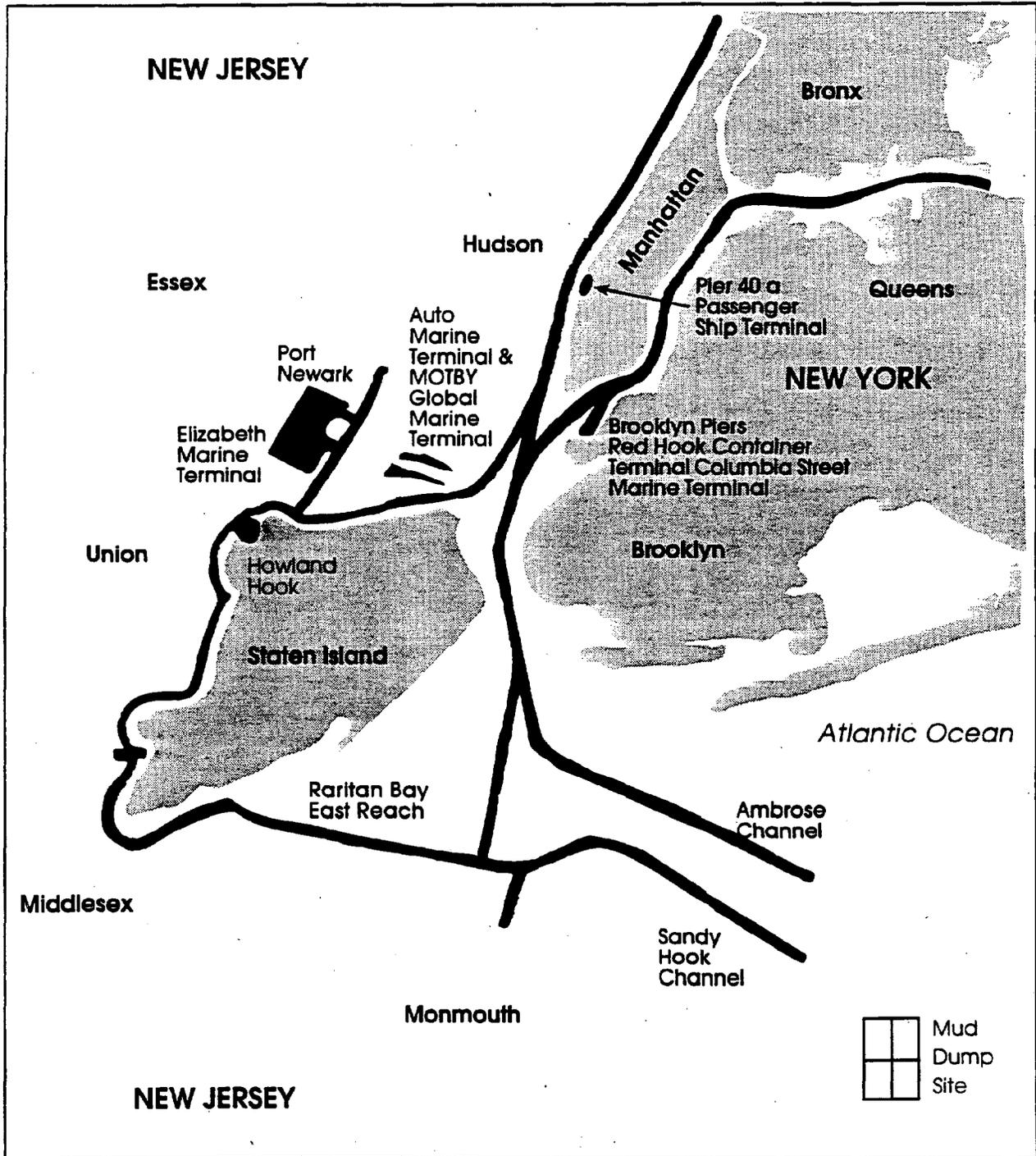
IV. Conclusion

The Team recognizes that this report constitutes only the first step, but one which should be the basis of future endeavors to provide environmentally sound approaches to address dredging needs in the Port. Therefore, the Team recommends that the members individually, and as representatives of their respective organizations, continue to pursue the basic goals of the Team with particular emphasis on

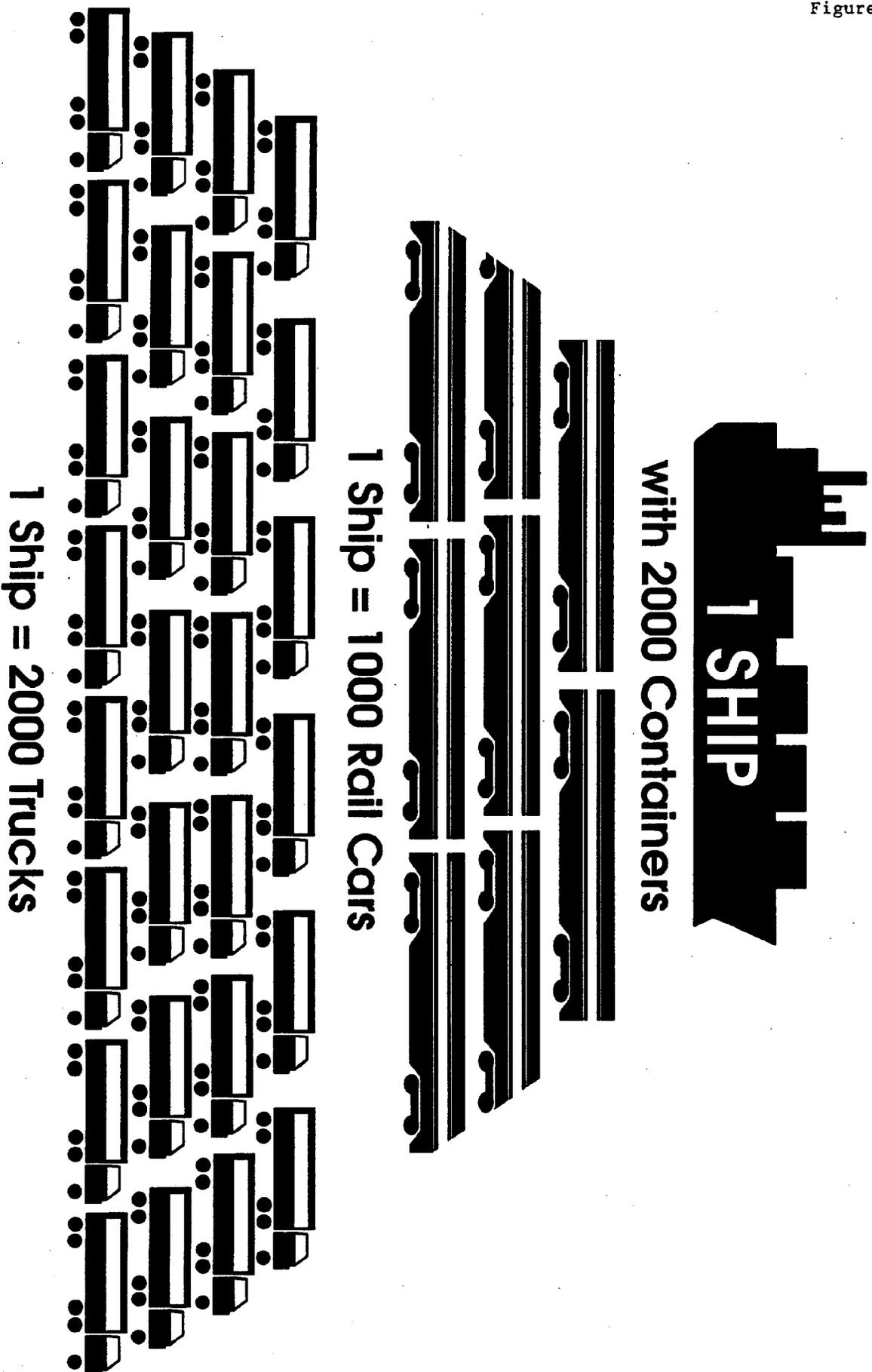
decontamination technologies that appear to be economically competitive in the near future. Team members should identify those technologies that can be readily implemented, expedite permitting, and assist in securing funding. Additionally, legislative initiatives should be pursued to:

1. Implement the Team's recommendations;
2. Provide indemnification for the Lead Agency; and
3. Acquire funding for the recommended short-term non-ocean disposal alternatives.

Location Of Federal Channels & Port Facilities



Transportation Modes Into Region



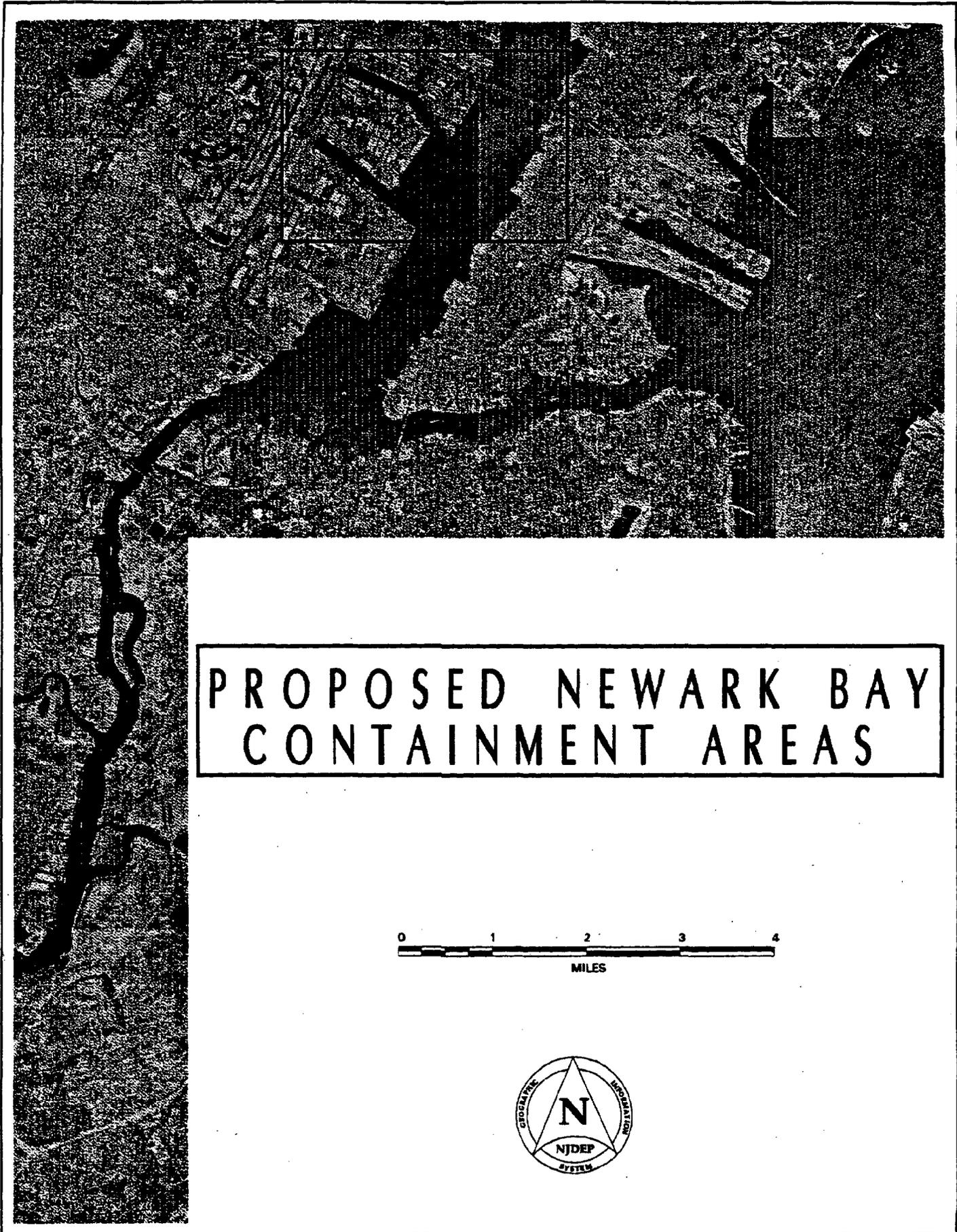
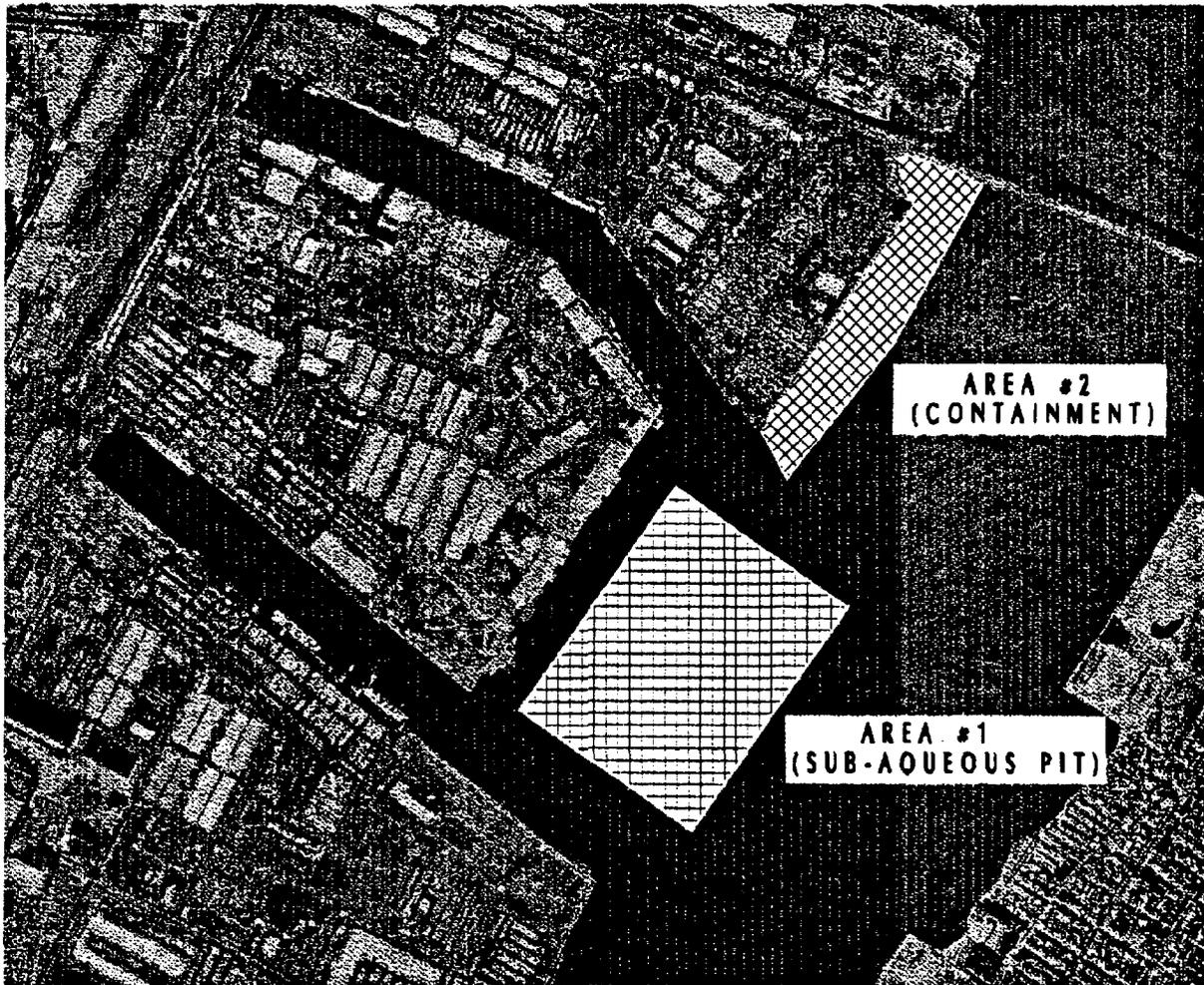


Figure # 3
Figure # 4

PROPOSED NEWARK BAY CONTAINMENT AREAS



FILL SUBAQUEOUS PIT ONLY:
ENGINEERING DEPARTMENT'S EVALUATION OF PROPOSAL -
CONTAMINATED DREDGED MATERIAL PROPOSAL
NEWARK BAY

Excavate Pit

0.5 MCY ⁽¹⁾ Contaminated @ \$5/cy	\$ 2.5 M
9.1 MCY Uncontaminated @ \$5/cy	\$45.5 M

Place Material Above Present Bottom

10' Dredge Material (1,000,000 cy) Extra Pumping Cost @ \$2/cy	\$ 2.0 M
3.5' Sand Cap (hydraulic) 0.6 MCY @ \$12/cy ⁽²⁾	<u>\$ 7.2 M</u>
TOTAL	\$57.2 M

Total Est. Project Cost (+35%)	<u>\$20.0 M</u>
	\$77.2 M

TOTAL DREDGED MATERIAL DISPOSAL 9.6 MCYPit Only

<u>\$ 77.2 M</u>	= \$ 8.59/cy
9.6 MCY - 0.6 MCY	

W/out 3.5' sand cap

<u>\$ 67.5 M</u>	= \$7.03/cy
9.6 MCY	

NOTES:

- 1) Based on 3 ft. of contaminated material to be excavated and capped with 'clean' spoil from project.
- 2) Cost/cy based on price obtained on LGA.

ASSUMPTIONS:

- * Capping only req'd at completion of burrow pit filling.
- * No water treatment req'd.

COMMENTS:

The interior volume of either of the alternates does not truly reflect an equivalent volume of maintenance dredging due to these counteracting factors:

- Bulking of dredge spoil due to dredging process, transport and rehandling onto island.
- Consolidation of spoil after placement within the island.

These factors will be researched in the next phase of this study.

FILL SUBAQUEOUS PIT ONLY:
ENGINEERING DEPARTMENT'S EVALUATION OF PROPOSAL -
SUBAQUEOUS PIT/NEARSHORE CONTAINMENT AREA - NEWARK BAY



Excavate Pit

0.4 MCY ⁽¹⁾ Contaminated @ \$5/cy	\$ 2.0 M
4.7 MCY ⁽²⁾ cy Uncontaminated @ \$5/cy	\$23.5 M
Estimated Construction Cost	\$25.5 M
SAY	\$25.5 M

Place Material Above Present Bottom

10' Dredge Material (1,000,000 cy) Extra Pumping Cost @ \$2/cy	\$ 2 M
3.5' Sand Blanket ⁽³⁾ (hydraulic) 350,000 cy @ \$12/cy ⁽⁴⁾	\$ 4.2 M
Subtotal	\$31.7 M

Total Est. Project Cost (+35%)	\$11.1 M
	\$42.8 M

TOTAL DREDGED MATERIAL DISPOSAL 4.75 MCY

Pit Only (5.1 MCY-w/3.5' cap*)
 $\frac{\$ 42.8 M}{5.1 MCY - 0.35 MCY} = \$ 9.0/cy$

W/out 3.5' sand cap = \$ 7.5/cy

NOTES:

- 1) Based on 3 ft. of contaminated material to be excavated.
- 2) Quantity adjusted accordingly to reflect changes made for contaminated material, assume capped at mud dump by subsequent borrow materials.
- 3) Thickness of sand blanket assumed to be 3.5 ft. instead of 7.0 ft.
- 4) Cost/cy based on price obtained on LGA.

ASSUMPTION:

- * Capping only req'd at completion of burrow pit filling.
- * No water treatment req'd.

COMMENTS:

The interior volume of either of the alternates does not truly reflect an equivalent volume of maintenance dredging due to these counteracting factors:

- Bulking of dredge spoil due to dredging process, transport and rehandling onto island.
- Consolidation of spoil after placement within the island.

These factors will be researched in the next phase of this study.

US Department of Commerce
 NOAA Coastal Services Center
 Charleston, SC 29405-2413