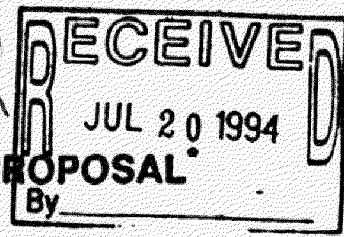


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Dredging Forum



DREDGED MATERIAL MANAGEMENT PLAN STRAW PROPOSAL

July 7, 1994

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THE PROBLEM

The Port of New York and New Jersey ("The Port") plays a vital role in the economy of the NY/NJ Harbor region. It is also part of an estuary of ecological significance. In order to use and maintain the Port, parts of the Harbor need to be dredged regularly. This generates large quantities of dredged material requiring disposal. A significant quantity of this dredged material is contaminated with pollutants which threaten the ecology of the region. This material must be managed in an environmentally sound manner.

The Port is a major international port which handles more general and containerized cargo than any other east coast port. The Harbor is not naturally deep, and rivers continuously transport and deposit sediment, filling in navigational channels and berthing areas in the Harbor. Large quantities of sediment must be dredged to accommodate modern deep-draft vessels. Between 1970 and 1980, an average yearly volume of 12,694,000 cubic yards of material was dredged in the New York District, Corps of Engineers civil works boundaries¹. A majority of this material was, and continues to be, ocean disposed at the Mud Dump Site. Between 1976 and 1994, the yearly average of dredged material disposed at the dump site was 6,731,000 cubic yards based on reported scow volumes. The volumes for the 1991, 1992 and 1993 were 6,217,000, 6,084,000 and 5,715,000 cubic yards, respectively.

The sediments in and around the Harbor and Bight contain a variety of contaminants of concern. The presence of these sediments can cause significant environmental problems, including: bioaccumulation² of contaminants within marine organisms (and up the food chain), disease in marine organisms and degradation of benthic community structure. Dredging contributes to resuspension of these sediments, thereby aggravating these problems. Ocean disposal raises serious concerns about exposing additional marine organisms and habitats to these contaminants of concern.

¹ Corps of Engineers, New York District FSEIS for Use of Subaqueous Borrow Pits for Disposal of Dredged Material from the Port of New York and New Jersey. January 1991.

² Bioaccumulation - the accumulation of contaminants in the tissues of organisms through any route, including respiration, ingestion or direct contact with contaminated sediment or water.

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Scientific concerns over these environmental problems have led to changes in the national testing protocols³. Uncertainties related to the implementation of these revised test protocols in the NY/NJ Harbor region, together with specific concerns about dioxin, and lack of available disposal options have contributed to delays in dredging.

CAUSES

The principle cause of the problem is the presence and movement of contaminants of concern included in the material that needs to be dredged and disposed. Contaminants of concern are heavy metals, PAHs, PCBs, pesticides and dioxin. These contaminants can be found in varying concentrations within the federal navigation channels, commercial berthing areas, private marinas and other areas throughout the Harbor.

In addition to contaminated sediments already in the Harbor and Bight, there are sources of pollutants which continue to contaminate water, sediment, and biota. Major sources include:

- * Industrial discharges
- * Sewage treatment plant discharges
- * Combined sewer overflows
- * Stormwater
- * Non-point sources of pollution (Superfund & RCRA sites, etc.)
- * Atmospheric deposition
- * Chemical and oil spills
- * Sediment transport from rivers and tributaries

Historically, ocean disposal has been the primary disposal option for materials dredged from the NY/NJ Harbor. Other disposal options in the region have generally not been used due to numerous reasons, including: ease of siting and relative low cost of ocean disposal, population density and land use, and environmental concerns regarding contained or upland disposal.

THE PLAN TO SOLVE THE PROBLEM

To explore options to address this problem, a Dredged Material Management Forum was convened in June 1993 under the sponsorship of the U.S. Environmental Protection Agency (USEPA) - Region II, the U.S. Army Corps of Engineers (USACE), and the States of New York and New Jersey. The Forum has brought together a wide spectrum of governmental, environmental, commercial, and public interest groups concerned with issues associated with the dredging and disposal of sediments from the

³ EPA/COE. 1991. "Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual. EPA-503/8-91/001, February 1991.

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Harbor. The Forum acknowledges that it is essential to maintain a viable Port, and this requires dredging and disposal of dredged material, including material containing contaminants of concern. The Forum also maintains that dredging and disposal needs to be managed in an environmentally sound manner. Moreover, the Forum recognizes that actions must be taken to remove contaminants of concern throughout the Harbor to improve the environmental quality of this important resource.

At its first meeting the Forum agreed to create the following work groups: (a) Dredging, Transport, and Disposal Technologies; (b) Disposal Criteria; (c) Mud Dump Site Closure; (d) New Ocean Disposal Site Designation; (e) Containment Facilities (including borrow pits and containment islands); (f) Decontamination Technologies; and (g) Site for Decontamination Facilities. Subsequently, the Decontamination Technologies and Site for Decontamination Facilities Work Groups were combined. In January, 1994, the original conveners (USEPA, USACE, NY, NJ) of the Forum concluded that the most efficient and effective way to continue the work of the Forum is under the auspices of the NY/NJ Harbor Estuary Program (HEP). The National Estuary Program was established by Congress under the Water Quality Act of 1987, and the New York/New Jersey Harbor Estuary was given "priority consideration" under Section 320 of the Act. The New York/New Jersey Harbor Estuary Program (HEP) enables USEPA to convene a Management Conference, a cooperative Federal, State and local planning effort to develop management plans to address estuary problems on a region-wide basis. With the recent addition of USACE, all of the initial Forum co-sponsor agencies (USEPA, USACE, NYSDEC, NJDEP) are now members of the HEP Policy Committee. A HEP Integration Work Group, consisting of the chairs of the six existing Forum Work Groups, has been formed.

It is from the interaction of the participants of the Forum that the USEPA-Region II, USACE-New York District, NJDEP, and NYSDEC have developed this comprehensive plan for the management of dredged materials⁶. Table 1 provides the actions associated with the following components which are included in this plan:

- * control continuing inputs of contaminants;
- * characterize, categorize, and quantify material to be dredged;
- * identify, evaluate, and select disposal and decontamination alternatives;
- * develop plans for closure of the Mud Dump Site;

⁶ While the Forum did not develop this plan, it has been developed as a "straw" proposal by USEPA, USACE, NYSDEC and NJDEP based on the deliberations and recommendations of the Forum participants. It will be modified, as appropriate, in response to comments by the Forum for inclusion in the HEP Management Conference draft of the HEP CCMP.

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- improve dredging, transport, and disposal operations;
- expedite permit decisions and;
- develop a future dredged material management structure.

Control Continuing Inputs of Contaminants and Sediments

Without reducing the existing point and non-point source inputs, Harbor sediments that require dredging will continuously be replenished with contaminants. Sources of contamination must be addressed in order to fully garner the benefits of localized cleanups. There is also a need to address the potential for continuous contamination of channels and berths by in-place "hot spots" located outside of the areas that normally require dredging for navigational purposes. Reducing the amount of clean sediment entering the waterways from the upland watershed will reduce the volume of material requiring dredging.

- USEPA, NYSDEC, NJDEP, and other agencies will, by (to be determined), implement pilot programs to control continuing inputs of pollutants and to remediate contaminated in-place sediments (see Toxics Module of the HEP CCMP).
- USEPA, NYSDEC, NJDEP, and other agencies will, by (to be determined), implement a comprehensive program to control continuing inputs of clean sediments from upland areas (see Habitat Module of the HEP CCMP).
- The USACE will review options, such as sediment traps and bypass systems, that prevent sediments from entering navigational areas through engineering solutions. USACE will report on these options, and the regulatory issues associated with them, by September 30, 1994.

Characterize, Categorize, and Quantify Material to be Dredged

There is no single "best" disposal or management option for all dredged material; a combination of alternatives is needed. Identifying, evaluating, and implementing regional dredged material disposal alternatives will depend on the quality and quantity of sediments requiring dredging on both a short-term and long-term basis. In order to fully assess the practical management of dredged material, including alternatives to ocean disposal, it will be necessary to determine the actual proportions and quantities of dredged material which cannot be disposed in the ocean.

Dredged material is presently characterized through a series of physical, chemical, and biological tests which determine the suitability of the material for disposal in the ocean. The national "Green Book" for testing and evaluation of dredged material proposed for ocean disposal was first issued in 1978. A revised national Green Book entitled, "Evaluation of Dredged Material Proposed for Ocean Disposal", was issued by the Corps

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and USEPA in April 1991. The Region II/NYD Corps Regional Testing Manual was implemented on December 18, 1992.

In the tiered testing approach employed in these manuals, testing is conducted in increasing levels of complexity (and expense) to generate the information necessary to make a decision on the materials suitability for ocean disposal. Based on the results of these tests, Region II of USEPA and the New York District of the USACE have historically classified material within the NY/NJ Harbor area according to its suitability for ocean disposal. Table 2 describes the existing categories as described in the 1989 Corps of Engineers, New York District Subaqueous Borrow Pit Final Supplemental Environmental Impact Statement and an expanded, more comprehensive, description of these categories. Table 3 is a description of the dredged material categories, their test result characteristics and disposal implications.

As described on Table 2, USEPA and USACE are adding additional bioaccumulative chemicals of concern to the testing program and will integrate the data from these contaminants into decisions when categorizing dredged materials. The expanded descriptions focus on bioaccumulative substances especially bioaccumulative chemicals of concern (BCCs)⁵. BCCs are of the greatest concern because of their human and ecological health risks. Table 2 explains the refined method to assess bioaccumulation (toxicity evaluation is not being changed in the expanded descriptions of the dredged material categories).

Provided that the impacts are limited to the site, it is believed that these impacts can be managed through technologies such as capping. Any sediments which are dispersed from the dredging/disposal site are a small percentage of the material dredged.

In-place contaminated sediments are contributing to toxicity and bioaccumulation within the Harbor. The process of dredging and disposal allows us to move contaminated sediments into a management area. It is believed that through management practices, contaminants of concern can be physically, chemically and biologically isolated at ocean and open-water disposal sites. For example, capping is used to isolate dredged material.

⁵ Bioaccumulative Chemical of Concern (BCC) - a chemical with a potential to appreciably bioaccumulate in animal tissues from exposure to aquatic sediments (in the case of sediment BCCs). Two important factors in determining potential for bioaccumulation is hydrophobicity (water insoluble) and lipophilicity (affinity for organism fat, or lipids).

For practical applications, it will be necessary to estimate immediate, short-, and long-term proportions and quantities of dredged material falling within the expanded descriptions of the dredged material categories. The estimates should initially be used to establish the implementability of alternatives to ocean disposal.

When quantifying future volumes of dredged material, it will be necessary to address the fundamental concept of "the need to dredge." Port interests may voluntarily reduce dredging due to increased disposal cost. Port reconfiguration may reduce the need to dredge. The potential exists for the establishment of tipping fees for disposal areas, ocean and non-ocean sites. These fees will be recycled into the dredging program to offset general management and operational costs. They will provide additional incentive to minimize dredging. It is envisioned that there could be a trust fund via an amendment to the Clean Water Act or the Marine Protection, Research and Sanctuaries Act.

- o USEPA-Region II and USACE will modify, by December 31, 1994, the Mud Dump monitoring and management plan to incorporate the expanded descriptions of the dredged material categories.
- o USEPA-Region II, in consultation with the Dredged Material Management Forum, will, by December 31, 1994, define bioaccumulation threshold values in a modified monitoring and management plan for all bioaccumulative substances of concern for which there are FDA action levels.
- o The HEP recommends that USEPA-HQ develop, by June 30, 1997, bioaccumulation threshold values for all Harbor/Bight BCCs using a rigorous risk assessment methodology.
- o USEPA, Region II and USACE will, by December 31, 1994, revise the Regional Testing Manual, as necessary, to fully support the expanded descriptions of the dredged material categories.
- o USACE will, by March 31, 1995, compile all available data, and supplement data as necessary, to categorize sediments based on the expanded descriptions of the dredged material categories. USACE will then estimate, for each expanded descriptions of dredged material category, the quantities of dredged material currently pending and for the next nine years (including all private and federal navigation projects).
- o USACE, USEPA, NYSDEC, NJDEP, et al. will seek authority to institute tipping fees at disposal sites.
- o NJDEP and NYSDEC will, by December 31, 1994, identify criteria for upland disposal.

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- o USEPA, USACE, NYSDEC and NJDEP will, by March 31, 1995 develop a table which matches ocean disposal (contained and uncontained) and non-ocean disposal dredged material disposal alternatives with the expanded descriptions of the dredged material categories.

Identify and Select Dredged Material Disposal Alternatives

The Mud Dump Site is quickly reaching capacity, and the revised testing is expected to significantly increase the quantities of Category II and III dredged materials. Therefore, it is imperative that the remaining capacity of the site be carefully managed while readily implementable, environmentally sound disposal alternatives are identified for all categories of dredged material. Equally important is the selection and implementation of suitable mid-term and long-term disposal options. In addition, the site, its adjacent impacted environs and perhaps historical disposal areas must be closed.

Mud Dump Site, Adjacent Areas and Historical Disposal Sites

At Forum I, it was decided by USEPA and USACE that a new ocean site for Category II material would not be sought. Forum participants were charged with establishing alternatives to ocean disposal for Category II and III dredged materials and with reviewing options for the closure of the existing Mud Dump Site and the surrounding ocean areas which have historically been used for disposal since the 1890's. Subsequent to the initial Forum, the majority of participants recommended ocean disposal of both Category I and II materials (but not Category III materials) until non-ocean disposal alternatives were operational. It was also recommended that consideration be given to capping/covering areas adjacent to, and impacted by, the Mud dump Site and historical disposal areas.

Based on recommendations of the Forum, the following proposed approach has been developed:

- no new ocean disposal site will be designated.
- the historical disposal areas, Mud Dump Site and areas impacted by the Mud Dump Site are covered and capped at no additional cost.
- a dredged material disposal alternative for Category II materials is available for the next 9 years until non-ocean alternatives are available.
- that Category I materials can indefinitely continue to be ocean disposed while always being used for beneficial purposes.

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Previous monitoring efforts at the Mud Dump Site indicate that dredged material extends beyond the Mud Dump Site boundaries. Surveys performed for USACE show an accumulation of dredged material along the northern, eastern and western boundaries⁶. REMOTS[®] photographs from approximately 1000 meters east of the Mud Dump Site provide evidence of long-term accumulation resulting from frequent resuspension and transport of small volumes of dredged material eastward from the Mud Dump site.

The Mud Dump Site, adjacent impacted areas, and historical disposal areas should be covered and capped. Currently, USACE-Waterways Experiment Station is evaluating the risks associated with creating mounds at the Mud Dump Site if water depths, capping thickness, and storm event magnitudes are varied. (Survey data provided to USACE after one storm event indicated that erosion of fine-grained sediments did not occur below -75' MLW in a specific area of the Mud Dump Site. Based on this limited data, a conservative determination was made to limit disposal of dredged material and cap from one project to the -75' MLW level). USACE will, by no later than December 31, 1994, provide design criteria for various mound placement and capping options as well as a recommendation for modification to USEPA, et al.

In order to allow for continued ocean disposal while alternatives for Category II materials are implemented, areas with depths greater than the recommended depth will be used for disposal of Category II sediments with subsequent expeditious capping. These areas will be filled until they reach the recommended depth⁷. Areas with depths between the recommended depth and a controlling depth of -45' MLW will be used for the disposal of Category I only materials. This scenario allows for Category I de facto capping of the Mud Dump Site, adjacent impacted areas and historical disposal sites.

It is recommended that an expedited supplemental EIS and appropriate rulemakings be prepared by USEPA-Region II, in cooperation with the New Ocean Disposal Site workgroup, to extend the existing Mud Dump Site to include adjacent areas and historical disposal sites. The benefits of this proposal are

⁶ Science Applications International Corporation. 1990. "Monitoring and Reconnaissance Cruise of the New York Mud Dump Site and Eastern Adjacent Area", Report # SAIC-91/7607&255, submitted to U.S. Army Corps of Engineers, New York District.

⁷ The historical disposal areas north and west of the existing dump site are generally shallow and therefore, Category II material would not be disposed in these areas. In effect, all historical disposal areas would receive Category I materials (i.e. - cap) only.

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two-fold: 1) it allows for short-term⁸ disposal of Category II material below the recommended depth while alternatives are implemented and 2) it allows Category I disposal to continue indefinitely (until closure requirements are met) with a beneficial use as a cover or cap.

USEPA has estimated that, for Category II materials, there is a remaining capacity at the existing Mud Dump Site, exclusive of cap, of a maximum of 6.7 million cubic yards based on a controlling depth of -75' MLW. It is estimated that, for Category II materials, again, assuming a controlling depth of -75' MLW, there is a potential capacity in immediately adjacent impacted areas of roughly 25 million cubic yards. Furthermore, there is a very large capacity for the beneficial use of Category I material as cap for the existing Mud Dump Site and as cap and cover for adjacent impacted areas and for historical disposal areas.

The proposed approach ensures that no new ocean disposal site will need to be designated. It allows, for a limited time, the use of the Mud Dump Site, adjacent impacted areas, and historical disposal areas for the disposal of Category II material and, in the long-term, Category I material. However, it also ensures, that the Mud Dump Site and adjacent areas are capped and covered at no additional cost.

Non-Ocean Disposal Alternatives

Because of the potential environmental impacts posed by Category III sediments, only alternatives with an acceptable degree of protection will be considered. This will include immediate, short and long-term alternatives such as on-site containment, site-adjacent borrow pits, existing Lower Bay Pits, interpier disposal, upland disposal and treatment prior to disposal.

There is no single "best" disposal or management option for all dredged material. The USACE is pursuing the use of multiple disposal alternatives, including:

- pits excavated in adjacent to highly contaminated sediments,
- pits excavated in the process of sandmining,
- existing subaqueous borrow pits,
- confined disposal facilities (CDFs),
- containment islands,

⁸ A specific time limit (9 years) will be imposed based on capacity and time necessary for implementing alternatives to ocean disposal. This time restriction, and restrictions and conditions, for disposal of Category II materials would be established during the EIS process.

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- interpier disposal,
- on-site containment, and
- upland disposal.

The other co-sponsors of the Dredged Material Management Forum (USEPA, NJDEP, NYSDEC) agree to participate in the USACE efforts via coordinated workplans, concurrent EIS processes, siting and permitting.

The Containment Facilities Work Group has recommended that a pilot subaqueous disposal pit be constructed in Newark Bay. The USACE will develop options for implementation of this recommendation. We recommend the Port Authority of New York and New Jersey be the project sponsor and determine the technical practicality of this plan; conduct site studies; and design, construct, and monitor the effectiveness of this disposal alternative. USACE and USEPA will actively participate and expedite Federal reviews and permitting processes, as necessary. The States of New York and New Jersey will do the same for reviews and permits within their legal purview.

The USACE has issued a Record of Decision on its Final Environmental Impact Statement for operational scale borrow pits and has requested water-quality certification from New York State for the existing borrow pits in the Lower Harbor. In response, NY State has expressed a number of concerns including the potential conflict between the USACE proposal and a sand mining proposal by the NY State Office of General Services. It is recommended that NY State expedite its WQC determination and consider that USACE implement a demonstration scale study of subaqueous borrow pit disposal using an existing pit, preferably the Lower East Bank Pit. With satisfactory monitoring and conclusive results, this could be implemented as a short-term disposal alternative.

Presently, sand mining operations are taking place in Ambrose Channel under a Department of the Army permit. Other sand mining proposals exist for other areas of the Lower Bay. It is recommended that USACE, NYSDEC and NJDEP study and pilot the feasibility of modifying sandmining proposals to facilitate the creation of suitable borrow pits outside of the navigation channels. The pits created through modified sand mining proposals should be designed to provide the greatest level of environmental protection. USEPA agrees to participate in these efforts via coordinated scopes of work, workplans, siting, permitting, etc.

USACE is developing a long-term management plan for dredged material that evaluates all disposal alternatives with the aim of permanently isolating large quantities of Category II and III materials from the marine environment, including borrow pits, containment islands, CDFs, and upland disposal. This has begun and the target date for completion is December 31, 1996. As part

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of this effort, USACE is beginning to scope a containment island study. Containment islands can accommodate Categories II and III materials. Containment islands accommodate large volumes of material, they are permanent, and, when properly managed, isolate contaminants from the marine and terrestrial environment. The other co-sponsors of the Dredged Material Management Forum (USEPA, NJDEP, NYSDEC) agree to participate in the USACE efforts via coordinated scopes of work, workplans, EIS processes, siting, permitting, etc. All participating agencies recognize the need for federal and non-federal financial and regulatory commitments necessary to implement construction, management and monitoring of selected alternatives.

New Jersey Governor Christine Todd Whitman recently announced the formation of a State Task Force to recommend interim plans for dredging and disposal. The task force will complete its work within 6 months of its formation. This State task force should concentrate its efforts on State actions such as the identification of upland disposal sites, sites for demonstration of decontamination technologies and near-shore borrow pits for interim disposal. The Task Force recommendations will be given consideration by the Forum at large.

The Port Authority of New York and New Jersey is studying the possible use of upland disposal sites within the region. This should continue with active State participation.

- o USEPA and USACE will, by December 31, 1994, confirm a controlling depth for Category II materials at the Mud Dump Site and surrounding environs.

- o USACE will use existing high resolution bathymetry, and the controlling depth scenario, to define the capacity, by category of material, remaining at the Mud Dump Site and adjacent environs. This should be presented in grid fashion.

- o USEPA, in cooperation with USACE and the New Ocean Disposal Site and Mud Dump Closure workgroups, will begin preparing a supplemental EIS, and appropriate rulemakings, for the expansion of the Mud Dump Site for the disposal of Category I and II materials. This will include defining the areas previously impacted by dredged material disposal. This will begin immediately upon receipt of appropriate funds from USACE and have an expedited timeframe of 18 months. Workplans will be made available for comment from the public at large and Forum participants.

- o USACE, USEPA, NYSDEC and NJDEP (USACE lead) will, by December 31, 1996, prepare a comprehensive long-term management plan for dredged material evaluating alternatives such as the containment islands, CDFs, and upland disposal.

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This plan will be coordinated with the Dredged Materials Management Forum.

o The Port Authority of New York and New Jersey will be the lead to determine the technical practicality of a subaqueous borrow pit in Newark Bay with support from USEPA and USACE, as requested. They will conduct site studies to support and demonstrate environmental compliance with all applicable laws, design, construct, and monitor the effectiveness of this disposal alternative. A final feasibility report, including plans and specifications, will be presented to USACE no later than May 31, 1995.

o NY State will expedite its WQC determination and consider requiring that USACE plan a demonstration program for existing borrow pits in the Lower Harbor. Should the project be approved, USACE will implement the project within three months.

o Should a conditional WQC allow for a demonstration project (see above paragraph), then within 6 months of demonstration project completion and data submittal and review, the State of New York will review the demonstration project and make a determination on whether the WQC conditions were satisfied to allow for an operational scale borrow pit program.

o USACE, NYSDEC, and NJDEP will assess the feasibility of modifying existing sandmining proposals so that suitable borrow pits, outside of navigation channels, might be created through sand mining practices. This will be done by September 30, 1994.

o The State of New Jersey will implement, and the State of New York will attempt to implement, pilot scale upland disposal facilities by December 31, 1995.

Treatment Methods

The Water Resources Development Act (WRDA) of 1992 mandated that the USACE and USEPA jointly select decontamination technologies for contaminated sediments. Treatment is not a disposal alternative although it may expand the potential disposal alternatives. The funding from WRDA is limited to studying only decontamination, not disposal alternatives. USEPA and USACE recommends that congressional authorization be requested to utilize a portion of the WRDA funding to implement the CCMP and disposal alternatives. In addition, a site for an operational decontamination facility is needed.

o USEPA, in consultation with the USACE and the Decontamination Work Group, will conduct bench-scale studies (and if promising, pilot-scale ones) of the Base-Catalyzed

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Dechlorination (BCD) technology on Harbor sediments. This will be completed by December 31, 1994.

- o The USACE, in consultation with USEPA and the Decontamination Work Group, will arrange for bench- and pilot-scale studies of viable technologies for treating sediments. This will be completed by June 1996.

- o USEPA and USACE will seek congressional authorization to use a portion of additional WRDA funds to implement the dredged materials portion of the CCMP and disposal alternatives. This will be done by December 31, 1994.

Develop Plans for Closure of the Existing Mud Dump Site, Adjacent Areas and Historical Disposal Areas.

As previously discussed, the Mud Dump Site, adjacent areas and historical disposal areas need to be closed. A work group has been formed to develop pre- and post-closure monitoring and management plans for the Mud Dump Site. Its charge is now changed to include adjacent and historical disposal areas. Pre- and post-closure monitoring plans will include physical, chemical, and biological sampling. The following issues will be addressed: remaining capacity, frequency of post-closure surveys, costs and funding, and the erosion potential of the existing mounds.

- o USEPA, in consultation with the USACE and the Closure Work Group, will develop a closure management and monitoring plans for the Mud Dump Site, adjacent areas and historical disposal sites. This will incorporate the controlling depth strategy for Category I and II materials as previously described in the "Identify and Select Disposal Alternatives" section.

- o USEPA, in consultation with the USACE, will implement the Closure Monitoring and Management plan when appropriate.

Improve Dredging, Transport and Disposal Operations

The dredging operation, subsequent disposal and final management of the sediment must be compatible. Dredging contaminated sediments for navigation and cleanup involves many of the considerations discussed above.

Information on the selection of dredging equipment and on the advantages and limitations of various types of dredges is available. However, its applicability to the NY/NJ Harbor Region is uncertain. With respect to dredging operation, there are two main concerns: resuspension of sediments and removal precision. Resuspension during the dredging operation can be caused by excavation, barge/hopper overflow, spillage, leakage, spud movement, barge movement, etc. Removal precision refers to how

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accurately a given dredge can remove desired areas and thicknesses of contaminated sediment. Precision is important from the standpoint of the ability to segregate contaminated and uncontaminated materials so that they may each be handled in the most appropriate manner possible.

This issue of using improved or innovative disposal techniques depends on the disposal site selected. Confined disposal may involve the use of flocculents, treatments, liners, hydraulic pumps, etc. In open-water disposal of contaminated sediments, options may include modifications of operations, use of subaqueous discharge points, diffusers, subaqueous lateral confinement of the material and/or capping.

The Dredging, Transport, and Disposal Work Group of the Dredged Material Management Forum, with input from the Waterways Experiment Station of the USACE, has reviewed existing and near-future technologies and evaluated their suitability for use in the Harbor, including their cost effectiveness. The group is also studying the advantages and disadvantages of "no barge overflow" restrictions and will, in conjunction with this effort, coordinate with the State of New Jersey and the Port Authority of New York in reviewing the barge overflow study recently performed by the Port Authority for the Port Newark/Elizabeth dredging. The workgroup will develop a map of the Harbor which identifies the best dredging technologies (based on depths, sediment types, contaminants, and disposal alternatives) for the different Harbor locations. In addition, the group is recommending a pilot scale demonstration of the use of geotextile bags or tubes for containing dredged material.

Containment of dredged material in geotextile bags, tubes and containers, filled in-place or filled in large bottom dump scows and dumped below the water level, has helped solve several difficult construction problems in the past few years. Dike subdivision and perimeter dikes in dredged material disposal areas, underwater stability berms, containment of contaminated materials, island construction, barrier island breach repair and structural scour protection are examples of projects that have been completed using geotextile containment systems. More recently, with many commercial harbors facing delays in dredging due to contaminated sediments, the focus has turned to large scale contaminated dredged material disposal in geotextile bags and containers. In response to this expressed national interest (Boston, Oakland, NY, Navy-San Diego, Marina Del Rey), USACE-WES and Nicolon Corps have initiated an \$800,000 engineering and environmental study of geotextile containment. The purpose of the study is to develop and demonstrate dredged material containment systems that are technically feasible, environmentally sensitive and cost effective.

A demonstration project in Mobile Harbor involved filling 500 cubic yard capacity geotextile bulk bags. The bags were

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filled by mechanical clamshell inside a large bottom dump hopper barge. The bags were then sewn shut and bottom dumped through the split hull. The geotextile material has been tested and proven to withstand the stresses of being filled and dumped in this manner. The bags are not known to break down in the marine environment. The bags can be modified to fit any size barge and can be lined with filter material to insure that little, if any, particles are discharged. The only impact on the dredging operations is the need for additional personnel to close the bags and sew them shut prior to disposal. The bags are inexpensive. The 500 cy geotextile bulk bags added ≈\$3.00/cy to the project cost at Mobil Harbor. The internal filter lining will add ≈\$1.50/cy to the project cost. The current cost of capping may be greatly reduced by using the geotextile containers since they will limit the amount of spreading that occurs when the containerized dredged material impacts the seafloor. There will be less seafloor surficially impacted by disposal and therefore, less area to be capped. This will reduce the volume of cap needing placement.

- o The Dredging, Transport, and Disposal Work Group will, by August 31, 1994, recommend specific improvements for equipment and methods used in dredging, transport and disposal operations. (Separate recommendations will be developed for each disposal option, for each relevant category of material using the expanded descriptions of the dredged material categories).

- o The Port Authority of New York and New Jersey will select a dredging project for a pilot disposal utilizing dredged material placed in the geotextile bags. The Port Authority will provide funding to a USEPA or independent contractor for monitoring of the disposal.

Volume Reduction/Selective Dredging

As previously stated, it is necessary to address the fundamental concept of minimization of the quantities of material needing to be dredged. Alternatives to dredging must continue to be considered. It may be feasible to dredge only limited areas of a facility and still not effect a marine facility's operations. For federal projects containing Category III sediments, the USACE will continue to ensure that there is sufficient commerce to justify dredging. Innovative dredging technologies utilizing precision equipment need to be developed and evaluated to reduce the amount of dredged materials generated. It is important to note that disposal alternatives are still necessary. A reduction in the volume of material to be dredged provides greater flexibility for management of disposal alternatives because of limited capacity for disposal of dredged materials.

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o USACE will, in coordination with the applicable State jurisdiction, review each permit application and federal projects, before USACE and the State, to ensure that volume reduction and dredging techniques have been reviewed in an effort to reduce the quantities of material requiring disposal. This may include limiting the extent and depth of dredging. Annual reports on efforts to reduce volumes from both federal and private projects will be compiled and provided to the public on request. Reports will be available in January beginning 1995.

Expedite Permit Decisions

The key to expediting permit processing is having appropriate disposal sites available for the category of material to be dredged. In order to reduce the delays associated with determining the suitability of dredged material for disposal at the Mud Dump Site, USACE-NYD and USEPA, Region II are finalizing a Memorandum of Understanding (MOU) which sets forth the agencies' responsibilities for ocean disposal site designation and management. Included in the MOU are procedures (including conflict resolution) and timeframes for coordination of 1) permit application and federal navigation project review, 2) enforcement actions, 3) ocean disposal site management including site monitoring, 4) ocean disposal site designation and, 5) administrative responsibilities. The establishment of joint permit application packages for federal and state regulatory agencies and development of unified testing requirements are necessary to expedite permit processing and regulatory decisions.

Since there are many federal agencies involved in the protection of marine resources, there must be an effort to clearly and concisely understand all agency concerns (seasonal dredging windows, habitat conservation, endangered species) and resolve these concerns within a unified regional Regulatory Guidance document including generic special conditions for permits. (NOTE: this would not obviate the need for individual permit reviews but would be used as guidance by staff). USACE, in cooperation with the federal resource agencies, will develop such a document. This document will ensure that there is general agreement between federal agencies with respect to dredging and disposal permits.

o USACE and USEPA, Region II will, by July 30, 1994 finalize a draft MOU for ocean disposal site management and site designation. In accordance with WRDA, the ocean disposal site management plans will be subject to full public review and comment.

o USACE, NJDEP and NYSDEC will, by December 31, 1994, develop joint permit application packages for both ocean and non-ocean disposal alternatives.

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o USACE, in cooperation with USEPA, NOAA-NMFS, USFWS, NYSDEC, NJDEP, et. al. will, by December 31, 1994 develop a regional Regulatory Guidance document which addresses the concerns of the federal and state resource agencies with appropriate generic, and recommended specific, special permit conditions.

o USEPA, USACE, NJDEP and NYSDEC will by, March 31, 1995, develop unified testing requirements for dredged material disposal for both ocean and non-ocean disposal alternatives. This will be coordinated with the Criteria Workgroup and the Dredged Material Management Forum.

Future Dredged Material Management Structure

o The HEP, through the CCMP, will identify responsible parties for all actions and obtain commitments.

o The Dredged Material Management Forum will assist in the development of implementation programs for these recommendations through its workgroups.

o The HEP will continue to use the Dredged Material Management Forum to review and comment on workplans, scopes of works, products, etc.

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TABLE 1 - ACTIONS ASSOCIATED WITH THE DREDGED MATERIAL MANAGEMENT PLAN STRAW PROPOSAL

ACTION	WHO	WHEN	HOW MUCH <small>(Note: Does not yet include cost to parallelism)</small>	R or C ¹
CONTROL CONTINUING INPUTS OF CONTAMINANTS				
Implement a comprehensive program to control continuing inputs of toxics and to remediate contaminated in-place sediments.	See Toxics Module	----	-----	----
Implement a comprehensive program to control continuing inputs of clean sediments.	See Habitat Module	----	-----	----
Propose program of options such as sediment traps and bypass systems that prevent sediments from entering navigational areas through engineering solutions.	USACE	9/30/94	Base program	C
CHARACTERIZE, CATEGORIZE AND QUANTIFY MATERIAL TO BE DREDGED				
Modify the Mud Dump monitoring and management plan to incorporate the expanded descriptions of the dredged material categories.	USEPA-RII USACE	12/31/94	Base program	C

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ACTION	WHO	WHEN	HOW MUCH <small>(Status: Done not yet included sent to parent/branch)</small>	R or C ¹
Define bioaccumulation threshold values 1. <u>Interim</u> - In the modified monitoring and management plan for all BCCs ¹ for which there are FDA action levels. 2. <u>Final</u> - In regulation or guidance, for all BCCs based on rigorous risk assessment.	USEPA-RII USEPA-HQ	12/31/94 6/30/97	Base program Base program	C R
Revise Regional Testing Manual to fully support the expanded descriptions of the dredged material categories.	USEPA-RII USACE	12/31/94	Base Program	C
Compile all available data, and supplement as necessary with new data; categorize sediments using expanded descriptions; estimate quantities for currently pending projects and proposed annually for eight years.	USACE	3/31/95	Base Program + \$\$\$\$\$	C
Institute program to minimize quantities of materials to be dredged for port maintenance - seek authority to institute tipping fees.	USACE, USEPA NYSDEC NJDEP		Base program	R

¹ Bioaccumulative Chemical of Concern (BCC) - a contaminant with a potential to appreciably bioaccumulate in animal tissues from exposure to aquatic sediments (in the case of sediment BCCs). Two important factors in determining potential for bioaccumulation is hydrophobicity (water insoluble) and lipophilicity (affinity for organism fat, or lipids).

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ACTION	WHO	WHEN	HOW MUCH (Note: Does not yet include cost to permittees)	R or C ¹
Apply expanded descriptions of dredged material categories to non-ocean disposal alternatives.	USEPA USACE NYSDEC NJDEPE	3/31/95	Base program	C
Identify Upland Criteria	USEPA NYSDEC NJDEPE	3/31/95	Base program	C
IDENTIFY AND SELECT DISPOSAL ALTERNATIVES -- NEW OCEAN DISPOSAL SITE				
Determine controlling depths for categories of dredged material both at the Mud Dump Site (MDS) and adjacent areas ² .	USEPA USACE	12/31/94	Base program	C
Define capacity of the existing MDS and adjacent environs. Perform additional surveys as necessary. Develop grid.	USACE	Immediate	Base program	C
Prepare Supplemental EIS for disposal in areas adjacent to the Mud Dump Site and historical disposal areas.	USEPA	6/30/96	Base program	C
Prepare comprehensive long-term management plan for dredged material including CDFs, upland disposal, interpier disposal, etc.	USACE	12/31/96	Base program	C
Develop Newark Bay subaqueous borrow pit feasibility report including plans and specs.	Port Authority	5/31/95	Base program	C

² Based on the USACOE-WES, -75' MLW will be used unless a technically defensible alternative depth is agreed upon.

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ACTION	WHO	WHEN	HOW MUCH (Note: Does not yet include cost to permittees)	R or C ¹
Implement Lower Bay Demonstration Scale Borrow Pit (see text) - State regulatory decisions - Implementation	NYSDEC USACE	3/31/95 6/30/95	Base program Base program	C C
Implement Lower Bay Operational Scale Borrow Pit ³ - State regulatory decisions - Implementation	NYSDEC USACE	within 6 months of demo. project completion TBD	Base program \$\$\$\$\$\$\$\$\$\$	C C
Assess feasibility of modifying existing sandmining practices for the purpose of creating new borrow pits	USACE NJDEP NYSDEC	9/30/94	Base program	R
Attempt to implement an upland disposal pilot program	NJDEPE NYSDEC	12/31/95 12/31/95	Base program	C
TREATMENT METHODS				
Conduct bench-scale studies of the Base-Catalyzed Dechlorination (BCD) technology on harbor sediments	USEPA, in consultation with the USACE	12/31/94	WRDA 1992	C
Arrange for bench- and pilot-scale studies of viable technologies for treating sediments	USEPA USACE	6/96	WRDA 1992	C

³ NY State will expedite its WQC determination and consider requiring that USACE plan a demonstration program for existing borrow pits in the Lower Harbor. Should the project be approved, USACE will implement the project within three months.

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ACTION	WHO	WHEN	HOW MUCH <small>(Please: Does not yet include cost to permitting)</small>	R or C ¹
Seek congressional authorization to utilize a portion of WRDA funds for implementation of CCMP	USEPA USACE	12/31/94	Base program	C
DEVELOP PLANS FOR CLOSURE OF EXISTING MUD DUMP SITE AND POTENTIAL REMEDIATION OF ADJACENT AREAS				
Develop a closure management and monitoring plan	USEPA USACE and the Closure Work Group	10/31/95	Base program	C
Implement the closure monitoring and management plan	USEPA USACE	post- 10/31/95	\$\$\$\$	C
IMPROVE DREDGING, TRANSPORT AND DISPOSAL OPERATIONS				
Recommend specific improvements for equipment and methods used in dredging, transport and disposal operations. (Separate recommendations will be developed for each disposal option, for each relevant category of material, using the expanded descriptions of the categories).	The Dredging, Transport and Disposal Work Group	8/31/94	Base program	C
Implement a pilot disposal operation using geotextile bags/tubes.	PA of NY/NJ	Immediate	\$\$\$\$\$\$	R
Examine dredging alternatives available to reduce the amount of dredged material requiring disposal. Prepare annual report.	USACE	Immediate	Base program	C
EXPEDITE PERMIT DECISIONS				
Finalize a draft MOU for ocean disposal site management and site designation.	USEPA-RII USACE	7/31/94	Base program	C

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ACTION	WHO	WHEN	HOW MUCH <small>(Dollar Dollars and not include cost to participants)</small>	R or C ¹
Develop joint permit applications for both ocean and non-ocean disposal alternatives.	USACE NJDEPE NYSDEC	12/31/94	Base program	C
Develop unified testing requirements for both ocean and non-ocean disposal alternatives.	USEPA-RII USACE NYSDEC NJDEPE	3/31/95	Base program	C
Develop a Regional Regulatory Guidance which addresses the concerns of the federal resource agencies.	USACE, et. al.	12/31/94	Base program	C
FUTURE DREDGED MATERIAL MANAGEMENT STRUCTURE				
Identify responsible parties for all actions; obtain commitments.				
Draft	HEP/Forum	8/15/94	Base program	C
Final	HEP/Forum	9/30/95	Base program	C
Assist in the development of implementation programs for the above recommendations and commitments.	Forum	Ongoing	Base program	C
Continue to use the Dredged Material Management Forum to ensure accountability.	HEP/Forum	Ongoing	Base program	C

1. R = recommendation
C = commitment

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**TABLE 2 - PRESENT AND EXPANDED DESCRIPTIONS OF
DREDGED MATERIAL DISPOSAL CATEGORIES**

<p>CATEGORY I - PRESENT</p>	<p>sediments are those which do not cause unacceptable toxicity or bioaccumulation in biological test systems. They are acceptable for "unrestricted" disposal. They offer no potential short-term (acute) impacts or long-term (chronic) impacts to the marine system, and therefore would require no special precautionary measures during disposal.</p>
<p>CATEGORY I - EXPANDED</p>	<p>sediments are those which do not cause unacceptable toxicity or bioaccumulation in biological test systems. They are acceptable for "unrestricted" disposal. They offer no potential short-term (acute) impacts or long-term (chronic) impacts to the marine system, and therefore would require no special precautionary measures during disposal. All bioaccumulative¹ substances in test organisms exposed to the project sediments must not show statistically higher bioaccumulation levels than in organisms exposed to reference sediments. In the event that they do show statistically higher bioaccumulation levels, then they must show less than a factor of 10 below the bioaccumulation threshold level (BTL) established using Federal FDA fish tissue standards to be considered Category I. In the longer-term, USEPA-HQ will develop BTLs for all Harbor/Bight BCCs² using a rigorous risk assessment methodology; priority will be given to those BCCs without FDA-based BTLs. Water quality standards cannot be exceeded at the site.</p>

¹ Bioaccumulation - the accumulation of contaminants in the tissues of organisms through any route, including respiration, ingestion, or direct contact with contaminated sediment or water.

² Bioaccumulative Chemical of Concern (BCC) - a contaminant with a potential to appreciably bioaccumulate in animal tissue from exposure to aquatic sediments (in the case of sediment BCC)s. Two important factors in determining potential for bioaccumulation are hydrophobicity (water insoluble) and lipophilicity (affinity for organism fat, or lipids).

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CATEGORY II - PRESENT	sediments have test results which indicate a potential for bioaccumulation and no significant toxicity, but are considered by Region 2 and the New York District to be capable of meeting the ocean dumping criteria with appropriate management practices. For instance, capping is used to isolate the sediments from organisms that could otherwise accumulate contaminants from exposed sediments. This is referred to as "restricted" ocean disposal.
CATEGORY II - EXPANDED	sediments have test results which indicate a potential for bioaccumulation and no significant toxicity, but are considered by Region 2 and the New York District to be capable of meeting the ocean dumping criteria with appropriate management practices such as capping. Bioaccumulative substances in test organisms exposed to the project sediments show statistically greater bioaccumulation than in test organisms exposed to reference sediments and greater than or equal to a factor of 10 below the BTLs established using Federal FDA fish tissue standards (but less than the BTL). In the longer-term, USEPA-HQ will develop BTLs for all Harbor/Bight BCCs using a rigorous risk assessment methodology; priority will be given to those BCCs without FDA-based BTLs. Water quality standards cannot be exceeded at the site.
CATEGORY III - PRESENT	sediments are those that fail acute toxicity testing or pose a threat of significant bioaccumulation that cannot be addressed through available biological and chemical management practices. These sediments cannot be disposed in the ocean. Dioxin action level is >10 pptr in worm tissue.

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CATEGORY III - EXPANDED

sediments are those that fail acute toxicity testing or pose a threat of significant bioaccumulation that cannot be addressed through available biological and chemical management practices. Bioaccumulative substances in test organisms exposed to the project sediments show statistically greater bioaccumulation than in test organisms exposed to reference sediments and above the bioaccumulation threshold level (BTL) established using Federal FDA fish tissue standards. In the longer-term, USEPA-HQ will develop BTLs for all Harbor/Bight BCCs using a rigorous risk assessment methodology; priority will be given to those BCCs without FDA-based BTLs. Until USEPA-HQ completes this task, test results for contaminants without FDA-based BTL values will be used to establish baseline conditions. Water quality standards cannot be exceeded at the site. Dioxin action level will remain >10 ppt. in worm tissue. These sediments cannot be disposed in the ocean.

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TABLE 3 - DREDGED MATERIAL DISPOSAL CATEGORIES, CHARACTERISTICS AND DISPOSAL IMPLICATIONS

CATEGORY	TEST RESULT CHARACTERISTICS	DISPOSAL IMPLICATIONS
I	Does not cause unacceptable toxicity or bioaccumulation in test systems.	Should always be used for beneficial purposes. Suitable for unrestricted ocean disposal. Course-grained sand may be used for beach nourishment; Coarse grain and fine grained material may be used as interim or final cap for borrow pits or Mud Dump Site. May be used for cover of historical disposal area.
II	Does not meet criteria for unrestricted ocean disposal but does not pose a definite threat of mortality.	Suitable for ocean dumping with capping; suitable for disposal at landfills or as daily or interim landfill cover, disposal in containment facilities; disposal in borrow pits or contained facilities.
III	Fails to meet ocean dumping criteria.	Not suitable for ocean disposal; suitable for disposal at confined facilities; suitable as sanitary landfill cover, borrow pit disposal.

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