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Report to the Congress; by Elmer B. Staats, Comptroller General.

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Authority: Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500). Clean Water Act of 1977 (P.L. 95-217). Flood Control Act of 1936 (P.L. 74-738).

The Tunnel and Reservoir Plan (TARP) and associated projects in the Chicago, Illinois, area are part of a total water cleanup and flood control program estimated to cost about $8 billion. Findings/Conclusions: The Environmental Protection Agency (EPA), which contributes about 75% of project costs, has already funded $667 million for construction of water pollution aspects. EPA funds will probably be available to complete the combined sewer overflow facilities but, with the current authorization, funds may not be available for the remaining wastewater treatment plant improvements. The Congress has not yet approved funding for the Corps of Engineers to construct flood damage reduction features. The Corps prepared a preliminary study to determine appropriate Federal interest in flood control aspects of projects, and the Congress conditionally authorized $12 million for a study of advanced engineering and design. The completion of all segments of the program is in doubt because of delays, high and escalating costs, and funding uncertainty. No one Federal agency has oversight responsibility. Recommendations: If funds are appropriated for the Corps study, the Secretary of the Army should require the Corps to develop alternatives for solving flood control problems and to compare benefits at various

funding levels. The Congress should: establish a national policy defining the extent of Federal assistance to be provided to urban areas for such multipurpose projects; designate one agency to be responsible for the project and similar multiagency projects; require the designated agency to submit to the Congress periodic status reports; and consider whether some reduction or flexibility in water quality goals would be acceptable in the interest of economy. The Administrator, EPA, should coordinate funding from all sources before beginning future construction of projects of this nature. (HTW)

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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Metropolitan Chicago's Combined Water Cleanup And Flood Control Program: Status And Problems

Metropolitan Chicago's program to alleviate water pollution and flood damage could cost about $8 billion. Delays, escalating costs, and serious funding uncertainties cast doubts on realizing full program benefits. Its magnitude and multipurposes raise questions as to the extent of Federal financing, oversight responsibility, coordination, and reporting to the Congress.

The Congress should define the extent of Federal assistance to urban areas for this type of program, consider less ambitious goals in view of the high costs, and designate one agency to be responsible for such activities and to periodically report on the program.

PSAD-78-94
MAY 24, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-166506

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the status and problems of Metropolitan Chicago's combined water cleanup and flood control program, which raises questions of national policy.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretaries of Defense and the Army; the Chief of Engineers, Corps of Engineers; the Administrator, United States Environmental Protection Agency; and the President, The Metropolitan Sanitary District of Greater Chicago.

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

METROPOLITAN CHICAGO'S COMBINED WATER CLEANUP AND FLOOD CONTROL PROGRAM: STATUS AND PROBLEMS

D I G E S T

The Metropolitan Sanitary District of Greater Chicago has undertaken a tunnel and reservoir construction project to control water pollution and reduce flooding in Chicago and more than 50 nearby suburban communities. Associated projects include upgrading local area sewer systems, widening a part of the Chicago Sanitary and Ship Canal, and expanding and upgrading area waste water treatment plants.

When, and if completed, in about 20 years, the tunnel and reservoir system would make up about 131 miles of rock tunnels, together with drop shafts, collecting structures, reservoirs, and pumping stations to capture, convey, and store the combined sanitary and storm sewer flow before treatment and controlled release into the rivers. The total program is estimated to cost about $8 billion (including $1.9 billion for interest during construction). (See pp. 2, 4, and 5.)

Funds for control of water pollution and flooding, as with other elements of the Federal budget, are limited. It is not clear to what extent the Nation can afford to fund individual projects, such as Chicago's tunnel and reservoir project that would cost $8 billion.

The Congress should establish a national policy defining the extent of Federal assistance that can and will be provided to urban areas for multipurpose projects of this type.

With respect to this program, the United States Environmental Protection Agency, which contributes 75 percent of project costs, has already funded $667 million for construction of the water pollution control aspects. Environmental Protection Agency officials believe funds would be available to complete the combined sewer overflow facilities which have the highest State priority; but they are not sure that the Agency will be able to provide, from the current authorization,

funds needed to complete the remaining waste water treatment plant expansions and improvements. (See pp. 7 to 11.)

The Congress has yet to approve funding for the Army Corps of Engineers to construct the program's flood damage reduction features. Under an agreement with the Office of Management and Budget, the Corps cannot participate in flood control for urban areas if manmade structures convey storm runoff to sewage treatment facilities. Also there are no assurances of the willingness or financial ability of State and local communities to fund related projects, particularly the upgrading of local sewer systems. (See pp. 11 to 14.)

The completion of all segments of the program is in doubt because of delays, high and escalating costs, and funding uncertainty. Partial completion will cost a significant amount without realizing all benefits of the installed facilities. (See p. 7.)

However, Environmental Protection Agency and Sanitary District officials believe that construction of the water pollution control aspects would produce benefits when connected to the existing system and that plant construction and improvements are needed regardless of whether the tunnels and pumping stations are constructed.

At the direction of the Senate and House Committees on Public Works, the Corps prepared a preliminary study of the tunnel and reservoir plan and its associated projects to determine the appropriate Federal interest in the flood control aspects. The Congress conditionally authorized, but has not appropriated, $12 million for the Corps to prepare a study of advanced engineering and design. (See p. 11.)

If funds are appropriated for the Corps study, the Secretary of the Army should require the Corps to develop alternatives for solving Chicago's flood control problems and to compare the different benefits to be obtained at various funding levels. The alternatives

should be coordinated with the Environmental Protection Agency and other appropriate agencies.

Estimated costs for the projects have increased from $6.4 billion in 1975 to $7.9 billion as of December 1977. (See p. 15.)

The Congress should

--designate one agency to be responsible for this and other similar multiagency projects to coordinate program activities and to ensure effective and efficient project management and

--require the designated agency to submit to the Congress periodic status reports.

Tunnel and reservoir construction and its associated projects require multiagency, Federal, State, and local funding. Despite the magnitude of the program, no one Federal agency has oversight responsibility. Although the Public Works Subcommittees were briefed before funding, the Congress is not being kept apprised of its full cost and status by periodic consolidated reporting. The funding is piecemeal, and the Congress may have little alternative but to provide a special appropriation to complete all the remaining segments for Metropolitan Chicago.

The Administrator, Environmental Protection Agency, should coordinate funding from all sources before beginning future construction of a project of this nature.

The Chicago program is setting a precedent for other large metropolitan areas with similar problems. But sources of funding and/or lines of responsibility for future multiple-purpose projects of this type are not clear. (See pp. 17 to 19.)

The Congress should consider whether some reduction or flexibility in water quality goals for such huge projects would be acceptable in the interest of economy.

Corps of Engineers and Environmental Protection Agency officials recognize the need for a national policy to coordinate Federal assistance to urban areas and define its extent for projects which involve water quality, flood control, and urban drainage aspects. But so far, there is none.

The Congress has recently begun to focus on these problems by requiring the Environmental Protection Agency to report on the status of municipal combined sewer overflows. (See pp. 21 and 22.)

Because of congressional interest generated by this report, GAO has initiated a two-phase followup review to pinpoint where Chicago's flooding is most severe and try to identify alternative small-scale technology that could offer relief. Second, GAO will determine the national impact of pollution and flooding problems caused by combined sewers. (See p. 22.)

AGENCY COMMENTS

The Department of the Army concurs in the basic message of GAO's report and the concerns regarding the high cost and financial feasibility and the potential impact of Federal funding for other metropolitan areas. The Department sees no difficulty in carrying out the recommendations.

The Environmental Protection Agency believed GAO's recommendations should go a long way toward preventing future projects from interagency jurisdictional and funding disputes and becoming burdens to the State and local taxpayers. It supports the establishment of a national policy defining the extent of Federal participation in large multiagency projects. It suggested that the Congress give one Federal agency, rather than the various agencies, the necessary authority and funds to plan, implement, manage, and complete these large multipurpose projects to ensure their continuity and for reporting to the Congress.

The Office of Management and Budget commented that direct Federal management in this project

was not appropriate and did not consider it a Federal construction project. It also said that the project was locally designed and managed and that it was receiving limited grant assistance from one Federal agency. If additional Federal agencies become involved, it believed a lead-agency assignment to monitor the project might be desirable.

GAO does not agree with the comments of the Office of Management and Budget that this project involves only limited grant assistance from the Federal Government. The Environmental Protection Agency has already committed almost $700 million, and its total contribution may exceed $3 billion. The potential for funding by the Corps of Engineers could bring total Federal involvement to as much as $4.5 billion. Other urban areas will have similar problems with programs of this type. Therefore, if the Federal Government becomes involved in such multiagency program areas, the single Federal manager concept is valid for oversight responsibility.

The Sanitary District stated that it generally supported some of the major recommendations of GAO's report, but it believed that GAO's recommendation for some flexibility in water quality goals, where it was deemed to be too expensive, was contrary to the congressional intent and efforts to achieve water pollution control.

The availability of Federal funds is limited. Under such circumstances, consideration should be given to a trade-off or allowing some reduction or flexibility in water quality goals, especially when costly programs such as this are involved. This position is similar to the Office of Management and Budget's views of the huge funding costs and other implications for drainage work included in the tunnel and reservoir project. Also there is no one approach which best suits the need for water cleanup in all cases. For these reasons, GAO believes there is a need for flexibility in the law to allow waivers, deferrals, or modifications to the goals.

Contents

ABBREVIATIONS

EPA	United States Environmental Protection Agency
GAO	General Accounting Office
OMB	Office of Management and Budget
TARP	Tunnel and Reservoir Plan

CHAPTER 1

INTRODUCTION

This report discusses the status of a Tunnel and Reservoir Plan (TARP) and its associated projects in the Chicago, Illinois, area. The plan and its associated projects are part of a total water cleanup and flood control program. The responsibility for its development is primarily shared by the United States Environmental Protection Agency (EPA); the Department of the Army, Corps of Engineers; the State of Illinois; and The Metropolitan Sanitary District of Greater Chicago (Sanitary District).

The Metropolitan Chicago area has a serious water pollution and flooding problem resulting from the extensive growth in population, paving of natural drainage areas, relatively flat topography, and its antiquated combined sewer system. The pollution problem not only affects its waterways but also Lake Michigan, the area's major water supply and recreational source. The pollution of Lake Michigan can affect all Great Lakes States and Canada, and pollution of the river system has an impact on the Illinois River and the Mississippi River downstream from the point where the two rivers join.

PROGRAM AND ESTIMATED COST

The Sanitary District, to expand and improve existing collection and sewage treatment facilities and to reduce flooding problems, has a series of projects for its total 866-square-mile service area.

TARP and its associated projects are intended to stop backflows of polluted water into Lake Michigan, reduce pollution caused by combined sewer overflows in the Chicago area waterways, and provide an outlet for floodwaters. This work is to reduce flooding in a 375-square-mile area containing some 53 communities served by combined sewers. At December 1977 the total costs for TARP and its associated projects were estimated between $4.0 and $7.9 billion as shown in the following table.

Project type	Total estimated capital costs December 1977	
	Corps	Sanitary District
	(000,000 omitted)	
Tunnel and reservoir	$2,232	a/$2,800
Plant expansions and improvements	1,091	915
Instream aeration	23	32
Solids utilization	156	62
Upgrading local sewers	1,583	(b)
Dredging, channel widening, and associated works	248	(c)
Engineering, design, supervision, and review	640	219
	5,973	4,028
Interest during construction	d/ 1,892	(e)
Total investment cost	$7,865	f/$4,028

a/Includes $898 million for flood control work by the Corps which the Sanitary District does not consider in its funding program.

b/The Sanitary District estimated $600 million in 1975 on the basis of data from local communities. Adjusted for price level changes it would be about $786 million at 12/31/77. Since local sewers are not the Sanitary District's responsibility, it does not consider this as part of its funding program.

c/The Sanitary District does not have an estimate for this item and does not consider this item as part of its program for funding purposes.

d/Interest during construction represents cost of funds provided by agencies during the construction period. Interest is a real cost, even though the agencies may not actually borrow the construction funds. The use of the funds for this activity precludes their use for reducing, borrowing, or retiring existing debt. It was calculated at a 6-5/8 percent rate, approximately equivalent to the Federal borrowing rate. Some construction costs will be financed by the Sanitary District and the local communities. Their interest costs may vary from the rate used.

e/The Sanitary District does not calculate interest during construction in its cost estimates. It believes such interest is not a capital outlay or a funding requirement for which appropriations are necessary.

f/About $942 million has been awarded for construction.

EXISTING SEWER SYSTEM

Chicago's combined sewer system is typical of many large communities over 50 years old. One sewer system carries wastes from residences, commercial buildings, and industrial plants, along with captured rainwater. Most newer communities have separate sanitary and storm sewer systems. These basic differences are shown in appendix I.

Combined sewers create special problems, because both sanitary waste and storm water runoff (about 99 percent water and 1 percent waste) must be processed by waste water treatment plants. In cities with separate systems, only the sanitary wastes are processed, thus reducing the load on the treatment plants. In Chicago, under dry weather conditions, treatment plant capacities can handle the waste load, but when it rains, sewer and treatment capacities are often exceeded and the excess untreated wastes overflow into local area waterways. (See app. I.)

Even a nominal rainfall of one-tenth inch results in overloading the system and causes untreated waste water to overflow through outlet pipes into the area's waterways. These discharges, at some 640 outlets along the waterways, happen about 100 times a year and are responsible for an estimated 45 percent of the area's water pollution. The remaining water pollution is caused by discharges from the area's waste water treatment facilities, industrial plants, and runoffs from outlying areas. While the treatmert plant discharges meet and generally exceed the secondary level of treatment of the Federal water quality standards, they are also a major cause of pollution. Even though this discharge is relatively clean--from 85 to 95 percent of most pollutants removed--the sheer volume and nutrient content still causes water pollution. This situation, coupled with the polluted water from combined sewer overflows, drastically affects the area's water quality.

Furthermore, in larger rainstorms, combined sewer waste loads back up through the sewers into some basements and flood some streets and underpasses. More intense widespread rain at times causes the area's rivers to overflow their banks, adding to the flood damage. When Chicago area rivers are near overflowing, control locks are opened to reduce the flooding and polluted waters flow into Lake Michigan. These backflows into Lake Michigan, which are occurring with increased frequency, seriously degrade the lake water. Also Sanitary District officials said that the backflows jeopardized the major water supply for the area.

DESCRIPTION OF TARP

When fully developed, TARP would make up about 131 miles of rock tunnels, together with drop shafts, collecting structures, pumping stations, and reservoirs. The tunnels will be under existing waterways or public rights-of-way at depths ranging from 150 to 290 feet below ground. Tunnel diameters will range from 9 to 36 feet and will be concrete lined in certain areas.

Collecting structures will be built at existing combined sewer overflow points to intercept and divert the overflows through vertical drop shafts to the tunnels for conveyance to storage reservoirs. (See app. II.) Underground pumping stations near the reservoirs are to be used to convey the waste water to existing sewage treatment plants during periods of nonpeak sewage flows to maintain optimum use of the facilities.

TARP is made up of four systems, as shown in appendix III. Each system will include conveyance tunnels, collecting structures, and drop shafts. The Mainstream and Lower Des Plaines tunnel systems are interconnected and served by a single reservoir and pumping station, whereas the O'Hare and Calumet systems operate independently and are to have their own reservoirs and pumping stations. Appendix IV illustrates how a tunnel system would work.

ASSOCIATED PROJECTS

Other projects, as listed on page 2, must also be undertaken to obtain the full benefits associated with TARP, to meet water quality standards, and to control flooding. The Sanitary District is constructing one new waste water treatment plant to relieve an existing treatment plant and plans to increase the operating capacity at two others which basically serve the combined sewer area. The water treatment processes are to be upgraded at all plants, and the treatment residue (sludge) processing programs will have to be expanded to handle the increased volume. In addition, instream aeration facilities to enhance the dissolved oxygen levels of the rivers are included in the Sanitary District program to meet water quality standards.

Other associated projects not included under the Sanitary District program are:

--Increasing the capacity of 53 communities' local sewers so that they can convey the worst rainfall expected in a 5-year period without overloading.

--Widening a portion of the Chicago Sanitary and Ship Canal from 160 to 225 feet to increase the river storage and conveyance capacity (originally authorized by the Congress in 1946 but never funded).

When completed, in about 20 years, TARP and its associated projects will have the capacity to capture about 44 billion gallons of combined sewer waste water. The eventual total design capacity of the Sanitary District's four sewage treatment plants, serving the combined sewer area of 375 square miles and a separate sewer area of 387 square miles, will be increased to process over 2 billion gallons a day. Water discharged from the plants will contain less than 2 percent pollutants.

ALTERNATIVE SOLUTIONS REVIEWED

Over the years, a number of plans were proposed to alleviate the pollution and flooding problems associated with the combined sewer overflows. In 1965 the Governor of Illinois formed a Flood Control Coordinating Committee made up of representatives from the State, the Sanitary District, and several other local governmental bodies to study the problems. They were unable to reach agreement on a solution, however, and the committee became dormant.

In November 1970 this committee was reactivated to review and evaluate all of the existing plans and to formulate additional plans to address both the flooding and water pollution problems. The committee evaluated 23 plans with a view toward meeting three objectives:

--Prevent all backflows from the rivers to Lake Michigan.

--Reduce pollutant discharges caused by combined sewer overflows to the rivers.

--Reduce flooding in the combined sewer and downstream areas.

All 23 plans involved large-scale construction efforts, such as tunnels, reservoirs, or waterway improvements. Sanitary District officials told us that they had also considered many other possibilities which were dismissed without formal followup because they simply lacked feasibility or did not meet the three basic objectives.

The committee rejected 6 of the 23 plans because they failed to satisfy all three objectives. Sixteen of the

remaining plans were tunnel and reservoir variations, and the 17th plan was a waterway improvement plan, which included channel improvements and treatment of combined sewer overflows.

The committee concluded that a tunnel and reservoir system was less costly and more environmentally acceptable than any of the other plans. The final plan recommended in 1972 was a composite of several alternatives and would capture all but the peak of the three worst recorded area storms from 1949 to 1969.

Sanitary District officials told us that the no-action alternative to the TARP project by their agency would result in violation of the State and Federal mandate regarding elimination of combined sewer overflows.

CHAPTER 2

FUNDING PROBLEMS

TARP and its associated projects, as currently planned, represent one of the largest and most expensive public works programs in the country. Although construction has started, serious questions exist concerning the funding, economic feasibility, and increasing costs. Some problems must be resolved if the water cleanup and flood control program is to be completed and achieve its full objectives.

SOURCES AND UNCERTAINTY OF FUNDING

The Sanitary District is proceeding with the construction of TARP pollution control aspects and its associated projects on the basis that the various components have been or will be funded by Federal, State, and local agencies. Because the program is designed to solve both water pollution and flooding, different funding sources are available to the Sanitary District. EPA and the Corps of Engineers are expected to finance the bulk of the work. EPA provides grant funds, while the Corps would be responsible for conducting or contracting for its part of the work. Local communities will have to provide funding to upgrade their sewer systems either from their own resources or through other available Federal funding activities. Also some aspects of the projects are funded by State sources.

TARP will have two distinct phases: phase 1 consists of tunnels, pumping stations, drop shafts, and collecting structures whose costs are allocated to pollution control; phase 2 consists of additional conveyance parallel tunnels, increased pumping capacity, and reservoirs whose costs are allocated primarily to water damage (flood) control. EPA is funding the pollution control phase--at a cost-sharing rate of 75 percent--while the Corps is considering constructing the water damage control aspects, phase 2, at a rate of 100 percent, compatible with the local protection projects, as shown in the table on page 8.

In summary, the Sanitary District anticipates TARP and its associated projects will be funded as follows:

Project	Organization				
	EPA	Corps of Engineers	Sanitary District	Local communities (note a)	State of Illinois (note a)
	(percent)				
Tunnel and reservoir:					
First phase	b/75	-	25	-	-
Second phase	-	c/100	-	(c)	-
Plant expansions and improvements	75	-	25	-	-
Instream aeration	-	-	25	-	75
Solids utilization	75	-	25	-	-
Upgrading local sewers	-	-	-	d/100	-
Dredging, channel widening	-	100	-	-	-

a/The State and/or local communities must provide the necessary land, easements, and rights-of-way for all projects.

b/Current EPA grants have been slightly less, about 73 percent of the total project costs, excluding land, easements, and rights-of-way, because phase 1 projects contain some flood control sizing in the drop shafts.

c/Local communities may also be required to share in the cost of the water damage control features.

d/Local communities have access to funding sources, such as the State of Illinois, and Federal agencies, such as the Department of Housing and Urban Development and Commerce's Economic Development Administration, which are not accessible to the Sanitary District.

On the basis of the above assumed-funding percentages and Sanitary District and Corps cost estimates, the funding shares would be as follows:

Organization	Estimated funding shares at 12/31/77			
	Corps of Engineers		Sanitary District	
	Estimate	Percent	Estimate	Percent
	(billions)		(billions)	
EPA	a/$3.06	39	$2.28	57
Army Corps of Engineers	1.42	18	.95	23
Sanitary District	1.03	13	.77	19
Local communities	2.33	30	-	-
Illinois EPA	.03	-	.03	1
	$7.87	100	$4.03	100

a/Of this amount, the combined sewer overflow facilities (phase 1 tunnels and pumping stations, etc.) were estimated at $1.14 billion and plant expansions and improvements at $0.82 billion.

EPA

In accordance with the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), EPA is making funds available to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To achieve this objective, the amendments established two goals: (1) eliminate the discharge of pollutants into navigable waters of the United States by 1985 and (2) an interim goal, wherever attainable, to obtain water quality sufficient for the protection and propagation of fish, shellfish, and wildlife and for recreation by July 1, 1983.

To reach these goals, the amendments required that by July 1, 1977, as a minimum, secondary treatment was to be used by publicly owned waste treatment facilities and that by July 1, 1983, publicly owned waste treatment facilities would be required to apply the best practical waste treatment technology. These deadlines for achieving the treatment levels by municipalities were extended in December 1977 with the passage of the Clean Water Act of 1977 (Public Law 95-217). If the minimum required levels of treatment do not meet the water quality standards established by the States, the States can require higher levels of treatment so that the water quality standards can be met.

Under the 1972 amendments, EPA's Administrator has authority to allocate $18 billion in grants to the States for 75 percent of the eligible pollution control costs to construct publicly owned waste treatment facilities for fiscal years 1973 through 1975. The Congress also provided EPA with an additional $1.5 billion in 1977. Under the Clean Water Act of 1977, the Congress authorized EPA $24.5 billion of additional construction grant funds for fiscal years 1978 through 1982. Of this authorized amount, $4.5 billion was appropriated in 1978.

EPA allocates funds to each State on the basis of a statutory formula. State water pollution control agencies are then responsible for determining which projects will be funded and the priority of funding.

Illinois was allocated about $1.1 billion of the $18 billion provided by the Congress in 1972 for construction grants. It is anticipated that, because of the State's priority system, about half of those funds will be allocated for the Sanitary District's water pollution control projects. As of December 31, 1977, EPA had awarded about $667 million in construction grants to the Sanitary District--$573 million for combined sewer overflow facilities and $94 million for treatment facilities.

Even though EPA is funding construction work, the Corps of Engineers may not receive congressional authorization to construct the phase 2 tunnels and reservoirs necessary for flood control. According to both EPA and Sanitary District officials, their projects (phase 1) are justified because they would produce water pollution control benefits and will be made operable by connecting them to the existing system, even if other Federal funding is not available.

Sanitary District officials said that the construction of TARP and its associated projects would negate the need to spend about $1.5 billion--for relief interceptor sewers ($300 to $500 million) and plant expansions of about $1 billion. TARP would regulate the waterflows, thus reducing the hydraulic peak loads that would be handled at the plants.

With the 5-year funding authorized by the Clean Water Act of 1977, EPA officials believe their agency should be able to provide its full share of funds needed to complete the combined sewer overflow facilities of TARP, which have the highest priority as set by the State and the Sanitary District. But EPA officials are not sure that EPA will be

able to provide, from the current authorization, its full share of the funds needed to complete the remaining waste water treatment plant expansions and improvements.

EPA calculated that, with a multiyear appropriation of $5 billion annually over 6 fiscal years, the Illinois allotment to the Sanitary District would be about $780 million. It further determined that the $780 million, while permitting completion of the tunnels and pumping stations necessary to make TARP function for pollution control, would not be sufficient to permit EPA to also fund its share of the scheduled treatment plant improvements. But we were told that this amount, which was one-half of the Illinois annual allocations, was calculated as a minimum expectation of funds to be received.

Corps of Engineers

In 1973 and 1974 the Senate and House Committees on Public Works directed the Corps of Engineers, as part of its responsibility over flood control, to investigate and determine the appropriate Federal interest in the proposed Chicago Flood and Pollution Control Plan to control storm-caused overflow of combined sewers and other urban flooding in Cook County, Illinois.

In response, the Corps' Chicago District office studied TARP and its associated projects and completed its report in December 1975. The report included a benefit-cost analysis showing a benefit-to-cost ratio of 1.57 to 1 supporting the economic feasibility of the plan, including water quality improvements. We found that this analysis, however, contained numerous inaccuracies, omissions, and unsupported assumptions, which resulted in overstated benefits and questionable costs. Some of these items were later adjusted when the Corps, in October 1976, revised its data and reduced its benefit-to-cost ratio to 1.4 to 1. Corps officials recognized weaknesses in their study and agreed with us that a more detailed study would be needed.

In October 1976 the Congress conditionally authorized $12 million for the Corps to undertake an additional TARP study (phase I design memorandum stage of advanced engineering and design) of the plan for flood control (phase 2 of TARP) and other purposes. But this authority is to take effect upon submittal of the Chief of Engineers' original study to the Secretary of the Army and upon notification to the Congress of the Chief of Engineers' approval.

On the basis of the Corps' Chicago District office study and findings of its board, the Chief of Engineers determined in February 1977 that certain tunnels, the reservoirs, and channel-widening components would alleviate flood damages and should be accomplished by the Corps. He concluded, however, that the local sewer upgrading should be accomplished by each of the 53 communities in the combined sewer area. Also he endorsed the board's recommendation that the Corps be authorized to make supplemental studies to establish final cost apportionment and local cooperation requirements.

We were told that a detailed Corps study would take from 4 to 6 years to complete. Funds for this study were not appropriated in fiscal years 1977 and 1978, and Corps officials said that a decision had not been made as to whether fiscal year 1979 funding would be requested for the follow-on study. Without the study it is questionable whether the Corps will have adequate information with which to make a meaningful recommendation to the Congress.

In mid-January 1978 the Chief of Engineers' report was under review by the Office of the Assistant Secretary of the Army, but the Congress had not been notified of the approval. Therefore, the advanced engineering and design study was not authorized to begin.

Whether the Corps ultimately constructs all or a part of phase 2 of TARP depends on the extent to which it meets the definition of flood control as opposed to urban drainage. The Federal Government assumed responsibility for construction of flood control works in the Flood Control Act of 1936. However, there has been no similar assumption of Federal responsibility for urban drainage, such as storm sewers and associated facilities. In October 1976 the Department of the Army proposed to the Office of Management and Budget (OMB) the use of the following project criteria as conditions to be met for Corps involvement in flood control in an urban area.

--The work is designed to solve water damage caused by water runoff or rainfall.

--The project can be justified using existing Corps evaluation procedures.

--If there is a rainfall within an urban area, the drainage area must be greater than 1 square mile and the flow of water must be greater than 500 cubic feet per second for the 10-percent flood--1 chance in 10 of being exceeded in any given year.

OMB has taken the position previously held by the Corps that rainfall which falls on an urban area should not be considered for flood control projects, unless surface inundation caused by heavy rainfall occurs less frequently than once in 10 years. We understand that, in taking this position, OMB has considered (1) the huge funding costs for drainage work included in the TARP project, (2) the implication of Federal responsibility for other urban areas, (3) the direct responsibilities imposed upon the Federal Government for the work as opposed to a more limited role when the grant process is used, and (4) the availability of grant funding for such work from other agencies, namely the Department of Housing and Urban Development.

A further complication in making a decision is the formulation of a water resource policy, mandated by the President, which is being developed by the Council on Environmental Quality, OMB, and Water Resources Council and scheduled for completion in the spring of 1978.

In January 1978 the Department of the Army and OMB agreed to criteria for Corps participation in flood control for urban areas. These guidelines include (1) a drainage area of 1.5 square miles or greater, (2) a water flow greater than 800 cubic feet per second for the 10-percent flood previously mentioned, and (3) that sanitary sewage or storm runoff, or a combination of sanitary and storm sewage, being conveyed in manmade structures would not be classified as flood control if going to a treatment facility.

The Metropolitan Sanitary District of Greater Chicago

The Sanitary District must provide 25 percent matching funds for TARP's first phase, treatment plant expansions and improvements, and an increased solids utilization program.

In 1971 the Illinois Legislature authorized the Sanitary District to issue up to $380 million in general obligation construction bonds without referendum to fund water treatment projects. In 1976 the legislature increased the Sanitary District's bond debt limit to about $734 million. By February 1978 the Sanitary District had unissued capital improvement bonds totaling $486 million and $134 million had been paid out by the Sanitary District for work performed on phase 1 of TARP.

Illinois Environmental Protection Agency

In addition to the Federal grant funds available to the Sanitary District, the Illinois EPA has funds set aside for pollution control projects. As of December 31, 1977, the Illinois EPA was providing about $20.3 million for instream aeration projects and had provided about $14 million for the design of TARP projects.

Local communities

On the basis of Sanitary District and Corps studies, local communities will be responsible for upgrading their sewer systems to reduce sewer backup flooding. Pollution caused by the backup of local sewer systems into basements was not addressed in the phase 1 projects. Sanitary District officials said that local communities had been reluctant to upgrade their sewers until the Sanitary District could provide a larger outlet to properly handle the greater flow--TARP is such an outlet.

Some communities may face difficulties in raising funds for sewer upgrading estimated between $790 million and $2.3 billion (including interest during construction). Local officials told us that they had not yet identified funding sources but that Federal funds would be needed before they could upgrade the projects. It is questionable whether local communities will fully realize project benefits since there is no assurance that they are willing and able to pay for the needed improvements.

As of December 31, 1977, of the 53 local communities, 30 had received grants from EPA to prepare studies to analyze existing local sewer systems, identify problem areas, and develop cost-effective solutions. Further, EPA was processing applications for grants from 10 additional communities early in 1978. No EPA construction money, however, will be available to the communities for local combined sewer improvements under an EPA-Sanitary District grant understanding for funding phase 1 of TARP. Sanitary District officials stated that was so because the agency does not have responsibility since it does not own or operate the community systems.

Other Federal agencies

Funds are made available to local communities by the Department of Housing and Urban Development under its Community Development Block Grant Assistance program for developing viable urban communities. Under this program local

communities are permitted, on the basis of their priorities, to use these grant funds to upgrade their sewers, if they so desire. For example, we were told that the city of Chicago set aside $1.5 million in fiscal year 1976 and $0.9 million in fiscal year 1977 from these available grant funds to upgrade its sewer system in certain sections of the city. We also learned that one urban county allocated $2.7 million in fiscal year 1977 out of its community development grants to improve its sewer system in certain areas.

In addition, we understand that grant funds of the Economic Development Administration, Department of Commerce, has been and can be used by local communities to upgrade sewers on specific projects.

PROJECT COSTS ARE INCREASING

The costs for TARP and its associated projects have increased substantially from initial estimates. The Corps of Engineers' December 1975 study estimated the total cost for TARP and its associated projects at about $6.4 billion, but when adjusted for price level changes, the figure was about $7.9 billion as of December 1977. Also the Sanitary District's 1972 estimate of $2.6 billion for part of the work has increased to over $4 billion as of December 1977.

Differences in the Corps' and the Sanitary District's total cost estimates are attributable to several factors. The Corps used a 25-percent contingency factor, whereas the District used 10 percent. The Corps included cost estimates for local sewer upgradings, dredging, channel widening with associated works, and interest during construction--items which the Sanitary District excluded from its estimates. (See p. 2.) Finally, the scope of some projects have been changed since the Corps estimate was made.

According to Sanitary District officials, the major reasons for TARP cost increases are delays and inflation. They estimate that every month's delay in completing the program will increase costs about $28 million.

Actual experience with TARP construction, to date, further illustrates the increasing costs of this project. For example, in February 1977 the Sanitary District advertised for bids on about 20 miles of tunnels. Its estimate of $365 million for this work was later raised to $410 million to reflect additional work, delay, and inflation.

In April 1977 a consortium of four construction companies submitted the only bid, which was rejected, of $811 million--almost twice the revised engineering estimates. Although EPA officials indicated that a substantial portion of the increase was due to the risk factors involved, one construction company official stated that the high bid was necessary to protect the company against inflation over the long construction period. According to Sanitary District officials, they had already estimated the project would take 6 years, and their estimate contained a rate of 6 percent for inflation.

In May 1977 the Sanitary District divided this work into 5 tunnel and drop shaft contracts and 31 connecting structure contracts and increased its estimate to $521 million to reflect further delays, increases in insurance rates, and inflation. By February 1978 construction contracts totaling $510 million had been awarded. In February 1978 Sanitary District officials told us that, with the construction awards and the remaining work to be contracted for on this 20-mile segment, they estimated that the cost for this work would total about $527 million. Thus the estimated cost for this tunnel segment increased in a year's time by 44 percent from the February 1977 estimate.

CHAPTER 3

FUNDAMENTAL ISSUES OF FEDERAL INVOLVEMENT NEED TO BE CONSIDERED

If TARP and its associated projects are expected to achieve all of their intended objectives, the Congress will be required to provide several billion dollars more. Without this contribution, the program has little hope of being completed. To some extent the program has been sanctioned by the Congress through the provisions of Public Law 92-500, which establishes the goal of eliminating all discharges of pollutants into navigable waterways by 1985, and the Flood Control Act of 1936, Public Law 74-738, which permits Federal involvement in flood control.

Certain fundamental issues concerning Federal control and involvement, however, have arisen as a result of this large multiple-purpose project. These issues are basic to all similar projects and need to be addressed. Communities with comparable pollution and flooding problems are watching with interest, because, if this project is successful, similar projects may be requested to solve their combined sewer problems.

SHOULD ONE FEDERAL AGENCY BE GIVEN OVERSIGHT RESPONSIBILITY?

The Sanitary District has begun construction of this combined water pollution and flood control system. EPA has begun funding the pollution control portion, while the Corps of Engineers has been studying whether it should work on the flood control portion of this project. State and local governmental units also have to provide funds for their respective portions to ensure project completion.

EPA funding is channeled to local governments through the State pollution control agency. The Congress authorized a sum of money for pollution control on a national basis, and EPA, in turn, allocated a portion of this to each State on the basis of the State's need in relation to total national requirements. The State agency controls the funding of local projects through its priority and approval process.

A large program such as TARP is usually funded in segments. The Congress provides multiyear pollution control grant funds without knowing which specific projects and which major projects receive EPA funds piecemeal. Thus

the total EPA cost for such projects does not surface in any EPA appropriation request or financial reports to the Congress. We were told that the authorizing Public Works Subcommittee staffs of both houses of the Congress were briefed before TARP funding was initiated by EPA.

Corps of Engineers flood control projects, on the other hand, are funded directly to the Corps under specific congressional authorization, and project status is reported to the Congress annually. Furthermore, the Corps must study project cost-benefit relationships to ensure that benefits will have a payback in excess of costs over the project's useful life.

TARP, with its associated projects, is a combined water pollution and flood control program. Portions are expected to be funded by Federal agencies.

State and local organizations must also fund their portions to ensure total project completion. Yet, neither EPA nor the Corps has total oversight responsibility or reporting requirements. As a result, the full cost and status of the projects, Federal and non-Federal, are not consolidated and reported to the Congress.

In a report issued in December 1976 1/, we recommended that more complete information on selected major projects be submitted to the Congress. This information was to be similar to the information which the Department of Defense provides to the Congress in selected acquisition reports on major weapons systems.

OMB has been active in seeking to improve major system acquisitions, but it has much more to do. Under its Circular A-109 dated April 1976, procedures are to be developed to inform the Congress in the normal budget process about agency acquisition programs of major systems. Elements may include hardware, equipment, software, construction, or other improvements or real property on programs that are to fulfill an agency mission, with relatively large resources which warrant special management attention. According to OMB officials, the circular was intended to exclude grants and grant

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1/"Reporting of Selected Major Civil Projects Needs Improvement" (PSAD-77-5, Dec. 29, 1976).

programs. Also an EPA official said that EPA did not interpret the circular to include grants because the actual procurements are made by the grantee. Accordingly, huge multipurpose projects, such as TARP and its associated projects, will not be reported to the Congress under this circular.

SHOULD FEDERAL FUNDS BE PLACED IN LARGE LOCAL PUBLIC WORKS PROJECTS WITHOUT SPECIFIC CONGRESSIONAL APPROVAL?

Although EPA had provided about $667 million in construction grants for the water pollution aspects of this cleanup and flood control program, much more Federal funding is required if the total program benefits are to be realized in Metropolitan Chicago. The House and Senate Public Works Committees have been made aware of the amount of Federal funds needed for this huge interrelated undertaking. But the Congress may not be fully aware of the full costs of this large multiagency program.

Programs of this nature could be funded piecemeal up to a point of no return, that is, so much would be spent that the Congress is almost forced to fund completion of all remaining segments to achieve the full program benefits. Should the Congress be forced into such a position or should the Congress have the opportunity to specifically authorize major multiagency civil projects?

CAN THE NATION AFFORD THE PRECEDENT OF A MULTIBILLION-DOLLAR COMBINED WATER POLLUTION AND FLOOD CONTROL PROGRAM?

According to EPA officials, about 1,600 urban areas throughout the Nation are faced with serious combined sewer problems. These communities will be unable to meet water quality goals established by the Congress unless sufficient funds are made available. The 1976 EPA Needs Survey estimated that about $18 billion would be needed to solve only the water quality problems in these areas. EPA officials said that the flood control protection provided for in this $18 billion could handle all storms except about two per year. Corps officials did not have comparable flood damage control figures which should be added to this amount.

Other communities are watching this program as a possible precedent under which they may be able to obtain similar funding. Can the Nation afford to fund many of these types of projects? Serious consideration has to be given to the scope of this project in the light of the implications for future Federal funding.

SHOULD FEDERAL AND STATE WATER QUALITY STANDARDS PERMIT FLEXIBILITY?

TARP represents one large metropolitan area's attempt to meet the stringent water quality goals and reduce flooding. Less costly alternatives might be available if some lesser and/or flexible goals were established.

TARP proceeded on the basis of eliminating all backflow into Lake Michigan, reducing flooding, and eliminating pollution from combined sewer overflows. It was selected as a cost-effective and environmentally acceptable plan to provide for flood control, comply with the Illinois water quality standards, and later adapted to meet the water pollution control goals of Public Law 92-500. Currently, EPA is providing funds to eliminate 80 to 90 percent of the annual pollutant loading. The Corps' construction of the reservoirs and tunnels would not only serve for flood control purposes but also capture the remaining pollutant loading.

Even with EPA funding its share of the first phase of the tunnel projects and the upgrading and expansion of treatment plants, the water use standards will still not be met during some rainy periods. According to EPA estimates, combined sewer overflows would be reduced from 100 to 10 per year and 80 to 90 percent of the pollution load would be captured and treated. But the interim goals of Public Law 92-500, as amended, would not be met.

The water uses would not be improved enough to support a diversity of fish and other aquatic life and water contact recreation. Instream aeration is being installed and funded by the Illinois EPA, but we understand that the reservoirs must be built before the Illinois water use standards can be met. Even with these latter facilities, the rivers will only meet the minimum State standards and do not allow for human contact with the water.

Advanced treatment processes are generally expensive. 1/ To remove additional oxygen-consuming materials after the secondary treatment level, which removes 80 to 90 percent of the pollutants, would increase the cost dramatically. As a result, the incremental water quality improvements due to advanced waste treatment are likely to be modest, compared to the increased costs.

1/See our report entitled "Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction" (Dec. 21, 1976, CED-77-12).

The requirements for effluent limitations at municipal treatment plants as stated in section 301(b) of Public Law 92-500 are, however, far less stringent and permit EPA to exercise considerable flexibility, compared to the goals in section 101(a) of the act which provide for eliminating all discharges of pollutants by 1985. The law does require, within the boundaries of available technology and funds, the use of those techniques best designated to eliminate such problems. This issue, therefore, is whether the Congress intended the stringent goals in all instances or if objectives should be relaxed under certain circumstances and exceptions be permitted when substantial savings may be possible.

The pollution and flooding problem in Chicago is significant. However, the cost of the proposed solution is expensive. Should we seek less costly alternatives that will permit some flexibility resulting in a greater degree of water pollution rather than strive for the ultimate solution?

AGENCY VIEWS TOWARD THE PROJECT

Both the Corps of Engineers and EPA officials recognize the need for a national policy to coordinate Federal assistance to urban areas and the exent of such assistance for multipurpose projects which involve water quality, flood control, and urban drainage aspects. They have looked to OMB for such guidance, but no executive branch policies have been delineated for this or similar undertakings. For example, OMB representatives told us that they initially became aware of this huge project when EPA and Corps officials asked for their assistance in deciding on the basis for agency funding of the components of TARP and its associated projects, which have an interwoven relationship of both water pollution and flood control aspects.

Although OMB acted as arbiter in resolving this matter, agency officials recognize that it is still questionable as to what aspects each agency is and should be responsible for funding. Perhaps one appropriation with one agency being responsible, regardless of who should fund what, would have been a better and more practical policy to follow in solving a huge multiagency problem of this nature.

RECENT CONGRESSIONAL INTEREST

The Congress has begun to focus on the problems of combined sewer overflows by enacting section 70 of the Clean

Water Act of 1977. This section of the act requires EPA to report by October 1, 1978, on the status of such municipal treatment works operations. It amends section 516 of the Federal Water Pollution Control Act by adding a new subsection c, which requires that the following information relating to combined sewer overflows be included in the report.

--The status of any funded projects which address these overflows.

--A list, by State, of such needs identified in the 1977 State priority lists.

--An estimate for each applicable municipality of the number of years necessary, assuming the annual availability of $5 billion in the construction grants program, to correct these problems.

--An analysis of these annual discharges of pollutants from overflows in comparison to treated effluent discharges.

--An analysis of the technological alternatives available to municipalities to correct such major problems.

--Any recommendations for legislation to address these problems, including whether a separate authorization and grant program should be established by the Congress to address combined sewer overflows.

Combined sewer overflows are, depending on a municipality's condition, interwoven to varying extents with flood and/or urban drainage problems. Accordingly, before reporting, EPA should consult and coordinate its findings with the Corps of Engineers and/or with other concerned agencies.

Because of congressional interest generated by this report, we have initiated a two-phase followup review. First, we will attempt to pinpoint within the Chicago area where residential and street flooding is most severe and where relief is most needed. Specifically, we will try to identify alternative small-scale technology that could offer relief to Chicago's flooding problem. Second, we will determine the impact of pollution and flooding problems caused by combined sewers nationally and evaluate alternatives to deal with these problems.

CHAPTER 4

CONCLUSIONS, RECOMMENDATIONS, AND AGENCY COMMENTS

CONCLUSIONS

The TARP and its associated projects could cost about $8 billion and involve Federal, State, and local government participation. The Sanitary District is trying to solve its combined sewer overflow problems by constructing a series of projects that will "bottle a rainstorm."

To some extent the projects are an outgrowth of the congressional mandate that something must be done to eliminate water pollution. The program is innovative, multifaceted, and precedent setting in that it attempts to resolve both pollution and flood control problems at one time. TARP, for example, is the result of much study and a narrowing of numerous alternatives to arrive at a viable solution to the lingering problems of combined sewers prevalent in many urban areas. Communities with similar problems are awaiting the outcome and funding to see if they can duplicate the benefits to be derived.

TARP and its associated projects have some problems and raise fundamental issues that require congressional consideration. The costs are huge and have been escalating rapidly due to inflation. In addition, there are funding uncertainties, all of which cast doubt on the program's completion. A considerable portion of EPA's allotted funds to Illinois are being used for current TARP construction. But the demands for pollution control funds by other local units of government in Illinois exceed available funds. Also the benefit-cost analysis supporting the program's feasibility was not realistically addressed, but its reliability is an important part of the congressional and agency decisionmaking process.

Although the Corps accepts this project as a viable solution to flood control, the Congress has not appropriated funds for further study nor has it authorized Corps construction funding. Also, under an agreement with OMB, the Corps cannot participate in flood control for urban areas if the storm runoff being conveyed in manmade structures would go to a treatment facility. Therefore, anticipated flood reduction and additional water quality benefits may not be fully realized.

A consistent Federal role does not exist for this or other huge multifaceted programs. There is no uniform policy for funding it or for involvement in the local cost-sharing community aspects of the project. Each agency's legislative mandates differ and permit the agency to vary its operations according to its independent responsibilities. In our view, exceptions should be made in dealing with huge interwoven multipurpose projects and a consistent Government policy should be applied.

Questions with national implications have arisen. The Corps and EPA looked for some guidance in the case of TARP. But there is no national policy on coordination of agency responsibilities and reporting for multiagency major civil projects of this type, and there are no limits above which congressional approval must be obtained for EPA's funding of such large multiagency projects. There is no single agency with oversight responsibilities, and funding is piecemeal.

The lack of overall responsibility, absence of reporting, and piecemeal funding may place the Congress in a position where it will be forced to fund all the remaining segments because of the investment already committed. At the same time, other communities with similar problems may feel entitled to equal consideration, placing further pressure on the Congress.

This and other multiagency projects may be too ambitious and may strive to meet extremely high goals. Was the Congress aware, or did it intend, that so large a program would be undertaken to resolve the problems of a single area when it mandated pollution control? Funds for control of water pollution and flood control, as with other elements of the Federal budget, are limited. It is not clear to what extent this Nation can afford to fund individual projects, such as Chicago's tunnel and reservoir project that would cost $8 billion. Consideration should be given to some lesser and/or flexible goals in the interest of economy.

There is increasing concern by Members of Congress and various citizens groups over individual project authorizations, cost projections, and benefit-cost analyses. In this case, the Congress is requiring EPA to report on the status of municipal combined sewer overflows. Accordingly, the Congress should evaluate this program and other similar situations and determine what the Nation's policy should be concerning such projects.

RECOMMENDATIONS

We recommend that the Congress:

--Establish a national policy defining the extent of Federal assistance that can and will be provided to urban areas for multipurpose projects of this type.

--Designate one agency to be responsible for this and other similar multiagency projects to coordinate program activities and to ensure effective and efficient project management.

--Require the designated agency to submit to the Congress periodic status reports similar to the Selected Acquisition Reports submitted by the Department of Defense on major weapon systems.

--Consider whether some reduction or flexibility in water quality goals for such huge projects would be acceptable in the interest of economy.

We recommend also that, if funds are appropriated for the Corps study, the Secretary of the Army require the Corps to:

--Develop alternatives for solving Chicago's flood control problems and compare the different benefits to be obtained at various funding levels. The alternatives should be coordinated with EPA and other appropriate agencies.

--Coordinate the availability of funding from all sources before beginning construction.

We also recommend that the Administrator, Environmental Protection Agency:

--Coordinate funding from all sources before beginning future construction of a project of this nature.

--Determine the impact that extensive funding of these projects may have on solving water pollution problems of other communities in Illinois and the other States and consider the results in the future funding distributions within the States.

AGENCY COMMENTS AND OUR EVALUATION

The Department of the Army generally concurs in the basic thrust of our report and the concern expressed regarding the high cost and financial feasibility of the project and the potential impact of Federal funding for other metropolitan areas. The Department sees no difficulty in fulfilling the recommendations directed to it. (See app. V.)

EPA believed the adoption of our recommendations should go a long way toward precluding future projects from becoming involved in interagency jurisdictional and funding disputes and from becoming burdens to the State and local taxpayers. EPA supports the establishment of a national policy defining the extent of Federal participation in large multiagency projects. It suggested that the Congress give one Federal agency, rather than the various agencies, the necessary authority and funds to plan, implement, manage, and complete these large multipurpose projects to ensure their continuity and for reporting to the Congress. (See app. VI.)

We had also suggested that EPA develop alternatives for solving Chicago's water pollution problems and compare the different benefits to be obtained at various funding levels and that the alternatives be coordinated with the Corps. In discussions, both EPA and Sanitary District officials mentioned that numerous alternatives had been reviewed in earlier years and that the current pollution control elements were deemed to be the most cost efficient. Moreover, alternative project sizes, each corresponding to a different level of pollution control, were compared with costs of achieving these levels to determine the optimum size of the facilities. Also they said that EPA had already obligated about 60 percent of the water pollution control elements of TARP and that construction of the tunnels was already well underway. Because of these factors, they believe that work on pollution control elements should not be stopped and reevaluated at this time.

OMB commented that direct Federal management in this project was not appropriate, and it did not think of it as a Federal construction project. OMB stated that the project was locally designed and managed and that it was receiving limited grant assistance from one Federal agency. If additional Federal agencies became significantly involved, it believed a lead-agency assignment to monitor the project might be desireable. (See app. VII.)

We do not agree with the comments of OMB that this project involves only limited grant assistance from the Federal Government. EPA has already committed almost $700 million, and its total contribution may exceed $3 billion. The potential for funding by the Corps could bring total Federal involvement to as much as $4.5 billion. Other urban areas will have similar problems with programs of this type. Accordingly, if the Federal Government becomes involved in such multipurpose programs for other urban areas, the single Federal manager concept is valid for oversight responsibility.

The Sanitary District stated that it generally supported some of our major recommendations, but it believed that our recommendation for some flexibility in water quality goals, where it was deemed to be too expensive, was contrary to the congressional intent and efforts to achieve water pollution control. It thought this recommendation strongly implied acceptance of water pollution from municipal waste if it is too expensive to correct but not from industry irrespective of cost. (See app. VIII.)

We believe that the availability of Federal funds is limited. Under such circumstances, consideration should be given to a trade-off or allowing some reduction or flexibility in water quality goals, especially when costly programs, such as this, are involved. This position is similar to OMB's views of the huge funding costs and other implications for drainage work included in the TARP project. Also there is no one approach which best suits the need for water cleanup in all cases. For these reasons, we believe there is a need for flexibility in the law to allow waivers, deferrals, or modifications to the goals. Also our report does not and was not intended to address the water pollution from industry as the Sanitary District suggests. But we are concerned with the effective and best use of Federal funds.

The Sanitary District maintains that the construction of tunnels and reservoirs to eliminate water pollution and reduce flood-related damages are distinct and separable projects in the combined sewer areas. It points out that the majority of the projects are directed toward resolving specific problems. But it concedes that all of the projects must be completed to derive the maximum benefits, thus admitting to the interrelationship of a combined system.

The most disconcerting item, the Sanitary District stated, is the including of interest during construction

as a cost item, which considerably inflates the total costs attributed to the project. It mentioned that interest had never been considered as a capital cost by the Corps or by any other Federal agency. But as mentioned earlier in our report, interest is a real cost, similar to the labor and material costs which must be borne in paying for the construction of capital works.

The Sanitary District believes that our conclusions and recommendations are based on improper cost information and the escalation of real costs since the initial estimates. The Sanitary District believes that the cost information should include only the tunnel and reservoir portions of the project and exclude the related projects. However, our report deals with the broader program aspects necessary to obtain full benefits. We based our cost information on data furnished to us by the Corps and the Sanitary District. The Sanitary District admits that current cost estimates reflect inflation, increases in insurance costs, and construction delays principally brought about by compliance with the multitude of Federal requirements for such projects.

The Sanitary District implies that we view the water pollution control aspects of the program as economically unfeasible, and thus a lower level of water quality is justified. We believe the costs of such huge programs are large enough to warrant consideration of this project in relation to the Nation's other needs for similar work in other urban areas.

CHAPTER 5

SCOPE OF REVIEW

We obtained the information contained in this report by reviewing project documents, records, studies, reports, and correspondence and by interviewing officials at

--The Metropolitan Sanitary District of Greater Chicago

--U.S. Environmental Protection Agency
Headquarters, Washington, D.C.
Region V, Chicago, Illinois

--U.S. Army Corps of Engineers
North Central Division, Chicago, Illinois
Chicago District Office

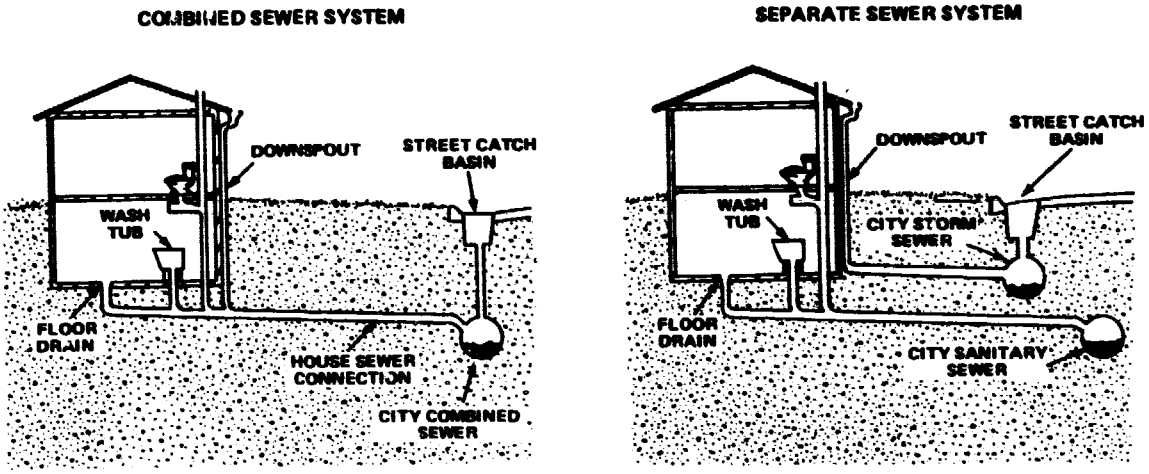
--Office of Management and Budget
Headquarters, Washington, D.C.

Our work included an extensive review of the Corps' analysis of TARP and its associated projects.

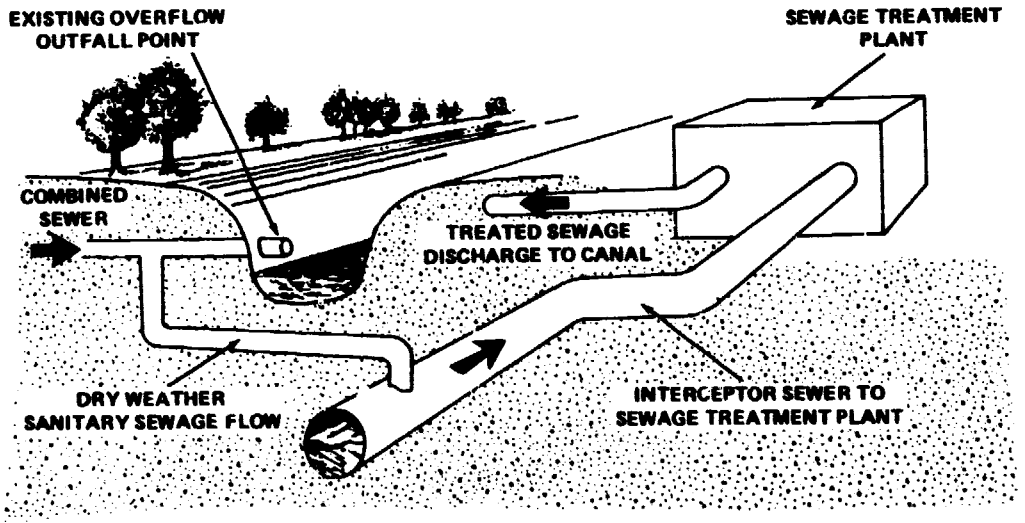
We also obtained information from Federal and private insurance organizations, toured waste treatment plants and construction sites to observe tunnel-boring operations, and contacted a private construction company official.

APPENDIX I

BASIC DIFFERENCE BETWEEN COMBINED AND SEPARATE SEWER SYSTEM

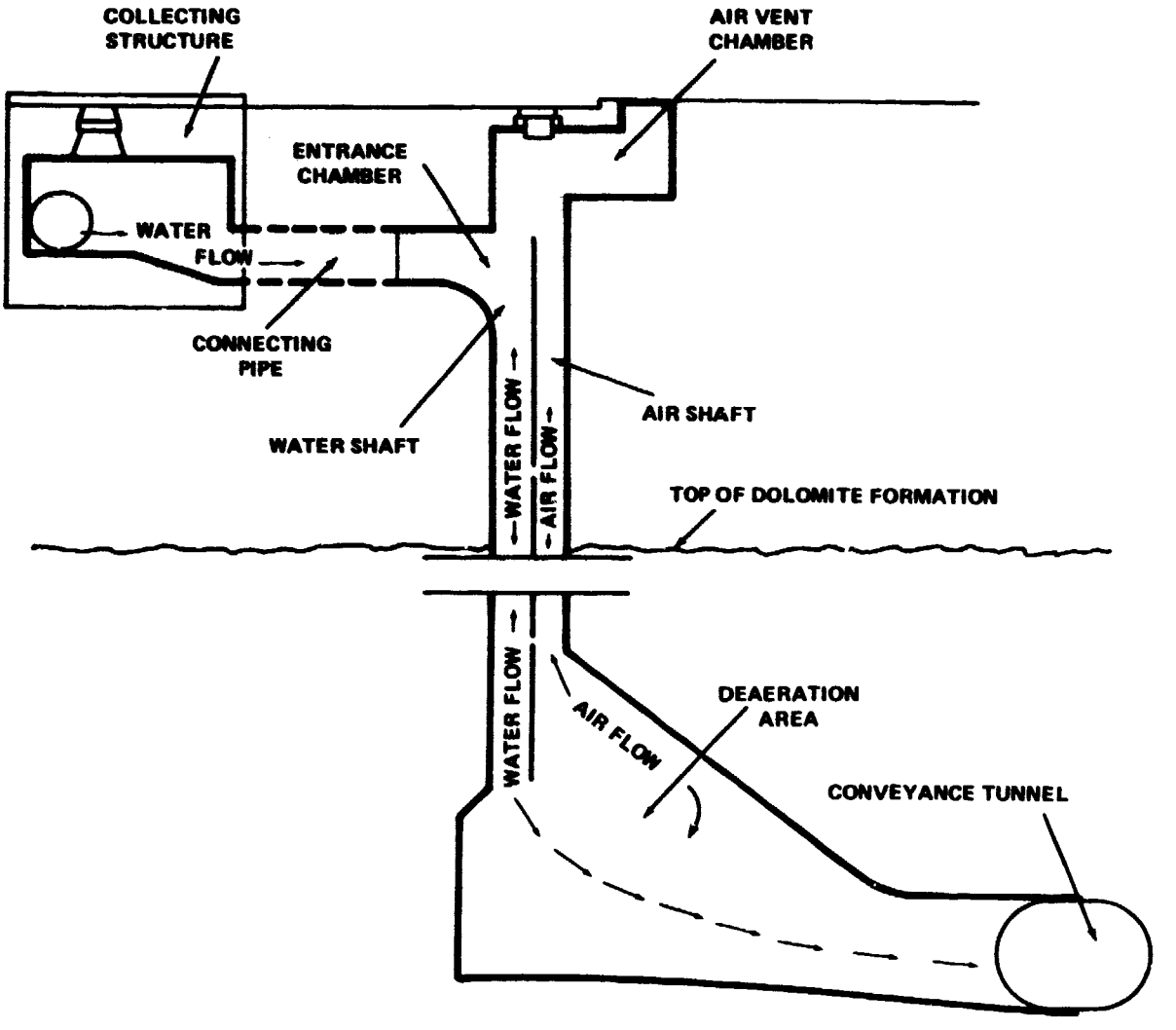


EXISTING OVERFLOW OUTFALL POINT IN RELATION TO COMBINED SEWER SYSTEM

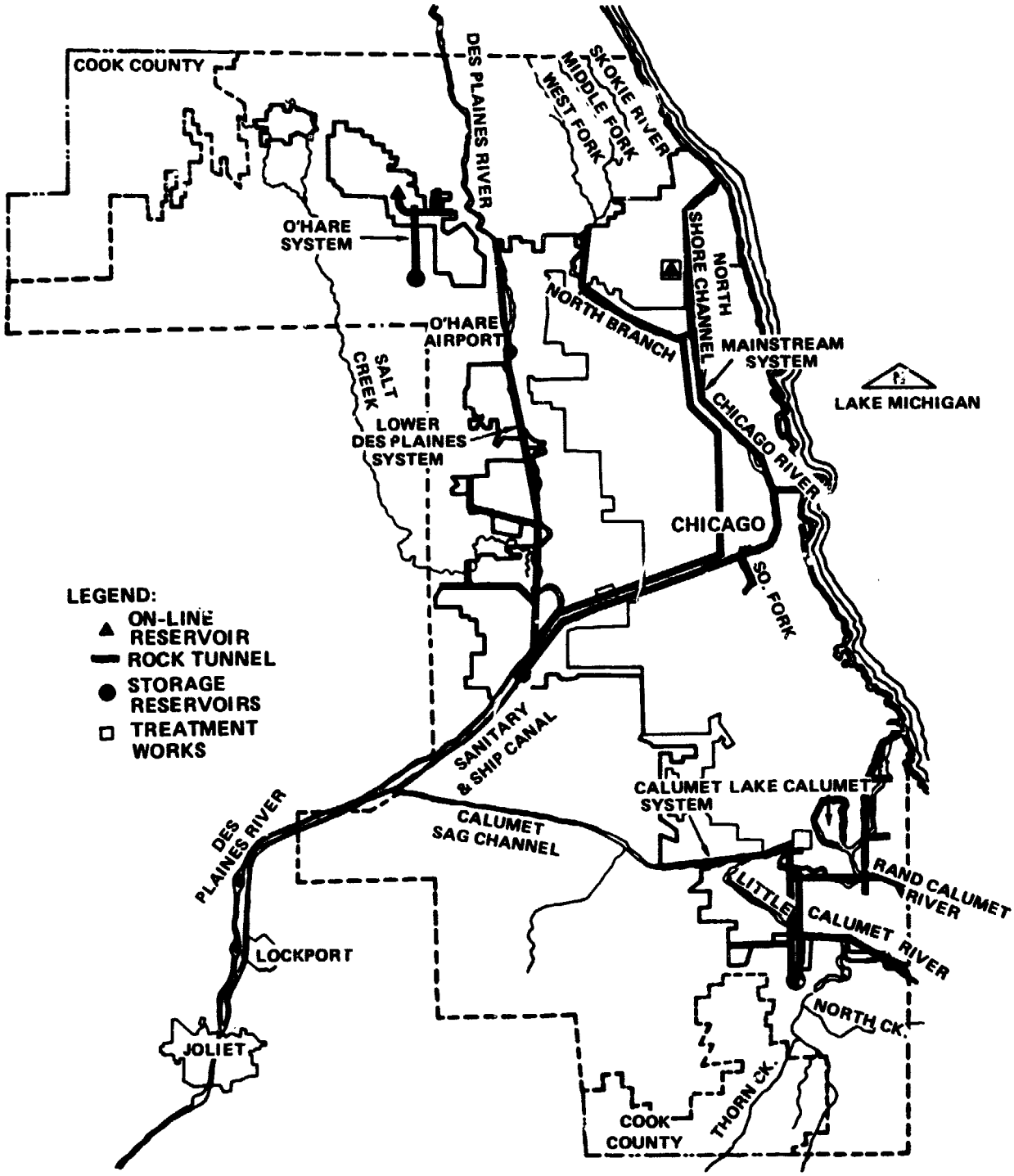


APPENDIX II

TARP COLLECTING STRUCTURE,
DROP SHAFT, AND CONVEYANCE TUNNEL



TARP SYSTEMS AND ROUTES



APPENDIX IV

HOW A TUNNEL AND RESERVOIR SYSTEM WOULD WORK
1 During heavy storm, rainwater runoff and sewage mix and Sanitary District is unable to treat all the waste.
2 Treatment plant, fed by interceptor pipe, continues to treat sewage, while overflow drops to tunnel.
3 The drop shaft funnels the mixture of excess runoff and sewage to tunnel system which conveys it to the reservoir.
4 Overflow sewage is held in reservoir until the treatment plant can process waste.
5 Pumping station draws sewage for treatment when facilities can handle the waste.
RAIN AND SEWAGE
COLLECTING STRUCTURES
TREATMENT PLANT
TREATED WASTE PUMPED INTO RIVER
STORAGE RESERVOIR HOLDS WASTE UNTIL IT CAN BE TREATED
INTERCEPTOR
DROP SHAFT
DEEP ROCK TUNNEL
PUMPING STATION
OVERFLOW SEWAGE

APPENDIX V

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

16 JAN 1978

Mr. Henry Eschwege
Director, Community and Economic
Development Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

This is in reply to your letter to the Secretary of Defense regarding your draft report dated November 1977 on "Chicago's Acquisition of Tunnel and Reservoir System: Status and Problems to be Resolved," OSD Case #4755, GAO Code 951312. The GAO report relates to the Corps of Engineers Study, "The Chicagoland Underflow Plan."

We generally concur in the basic thrust of the report and the concern expressed regarding the high cost and financial feasibility of the project and the potential impact of Federal funding for other metropolitan areas. We believe the report deals with significant issues and is deserving of very close consideration by the Congress.

The report expresses concern regarding the ability of local communities to fund the upgrading of their sewer systems. To emphasize the questionable financial feasibility of the project it should be noted that local communities may also be required to share in the cost of the water damage control features of the work. These features are shown in the report to be funded by the Federal Government thru the Corps of Engineers. However, the extent of Federal funding will be dependent upon the distinction drawn between flood control and urban drainage and the Federal policy to be adopted toward urban drainage. Accordingly, it is recommended that the tables on pages 9 and 10 of the report be clarified.
[See GAO note 1.]

We see no difficulty in fulfilling those recommendations directed to the Secretary of the Army. Prior to initiating construction, the Corps of Engineers routinely obtains assurances from local interests concerning their willingness and ability to contribute their share of the costs. The Phase I Advanced Engineering and Design Study will review the alternatives available, refine cost estimates, and address the proper

Mr. Henry Eschwege

division of responsibilities for funding and construction to comply with the developing Administration policy. However, it is noted that the Corps must examine alternatives within the framework of existing national policies. Therefore, if Congress should relax water quality goals for TARP, as recommended for consideration in your report, then this could expand the range of available alternatives.

Additional comments of a more detailed nature are attached.

We appreciate the opportunity to review and comment on the draft report.

Sincerely,

Charles R. Ford
Acting Assistant Secretary of the Army
(Civil Works)

Inclosure

[See GAO note 2.]

GAO notes:

1. Page references in this appendix refer to our draft report and may not correspond to the pages of this final report.

2. Detailed comments in the inclosure have not been included in this report.

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

MAR 20 1978

OFFICE OF
PLANNING AND MANAGEMENT

Mr. Henry Eschwege
Director, Community & Economic Development Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) revised draft report entitled "Metropolitan Chicago's Combined Water Cleanup and Flood Control Program: Status and Problems to be Resolved." We consider this a timely report which properly focuses attention on large, multi-agency projects. Future projects of this type may not readily lend themselves to the clear delineation of lines of responsibility and funding authorities which were possible with the Chicago Metropolitan Sanitary District's Tunnel and Reservoir System (TARP) and its associated projects. We find the report's conclusions and recommendations to be well conceived and adoption of them should go a long way towards precluding future projects of this type from possibly becoming enmeshed in inter-agency jurisdictional and funding disputes and becoming burdens to the State and local taxpayers.

The Agency supports the establishment of a national policy defining the extent of federal participation in large multi-agency projects. Another possibility, instead of funding these large multi-purpose projects thru various agencies, would be for Congress to give one Federal agency the necessary authority and funds to plan, implement, execute, manage, and complete these kinds of large projects thus ensuring their continuity. Adoption of either policy would be particularly helpful when responsibilities and funding authorities of various agencies within a particular multi-purpose project are not clear. For a multi-agency project, it is important to designate one agency to manage and monitor the projects and periodically report to the Congress on its status. The agency with the most enforceable or immediate requirements to be met in a particular multi-agency project would be the most appropriate lead agency. The establishment of a national policy and lead agency for large, multi-agency projects similar to TARP would facilitate coordination, orderly progress, and overview of federal funding to ensure that scarce federal funds will go to those projects which can produce the greatest benefits.

APPENDIX VI

Our review has identified one minor point of information which requires clarification. A statement is made on page 23 of the report that the TARP concept "...was selected as a cost effective and environmentally acceptable plan to fully meet the water pollution control goal of public Law 92-500..." We recommend this wording be revised. Public Law 92-500 had not been enacted when the TARP plan was selected as the most desirable alternative.

We appreciate the opportunity given us to work closely with GAO's staff on this draft report.

Sincerely yours,

Bill Drayton

William Drayton, Jr.
Assistant Administrator
for Planning and Management

GAO note: Page reference in this appendix refers to our draft report and may not correspond to the page of this final report.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

MAR 23 1978

Mr. Victor L. Lowe
Director, General Government
Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Lowe:

The Office of Management and Budget appreciates the opportunity to review the draft report on "Chicago's Acquisition of a Tunnel and Reservoir System: Status and Problems to be Resolved" which we have read with interest.

Our primary comment is directed to the recommendation that "Congress designate one agency to manage and monitor the entire project ...." At present, this is not a Federal construction project. It is a locally designed and managed project which is receiving limited grant assistance from one Federal agency. Under those circumstances, direct Federal management is not appropriate. There are still significant open questions as to whether any Federal agency should become involved in direct construction. Should additional Federal agencies become significantly involved, assignment of a lead agency to monitor the entire project may indeed be desirable. However, direct Federal management would still not be appropriate unless the responsibility for both planning and constructing the project is removed from the municipality and placed in a Federal agency by law.

Second, the discussion of the definition of flood control on page 14, though accurate as of the date of its writing, has now been superseded. It should be brought up to date before the report is issued in final form.

We have no objection to the remaining recommendations.

Sincerely,

James T. McIntyre, Jr.
Acting Director

APPENDIX VIII

NICHOLAS J. MELAS
PRESIDENT

THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO

BOARD OF COMMISSIONERS
JOANNE H. ALTER
JEROME A. COSENTINO
DELORIS M. FOSTER
WILLIAM A. JASKULA
NELLIE L. JONES
JAMES C. KIRIE
CHESTER P. MAJEWSKI
NICHOLAS J. MELAS
RICHARD J. TROY

April 10, 1978

Mr. Henry Eschwege
Director, Community & Economic
Development Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

This letter is intended to summarize the comments of the Metropolitan Sanitary District of Greater Chicago on your draft report dated November 1977 on "Chicago's Acquisition of Tunnel & Reservoir System: Status and Problems to be Resolved," OSD Case No. 4755, GAO Code 951312.

As you know, our respective staffs have met on a number of occasions and discussed the original draft report and subsequent revisions. We sincerely appreciate the opportunity provided to us to discuss material in the draft report prior to its finalization. We are sure that the information provided during these discussions helped to clarify a number of matters, resulting in the issues being more clearly delineated.

We are presuming that points raised in the latest discussions will not be fully reflected in the final report. This presumption may result in some comments being moot if the final report does in fact respond to our contentions.

We generally support some of the major recommendations of the report. We believe the federal commitment to any large project should be well enough defined that agencies undertaking such projects are assured of funds until project completion. The District, individually and collectively with other metropolitan sewerage agencies, has frequently testified as to the necessity for long-range identification of funding for projects of the magnitude required by large municipalities in order to achieve compliance with Public Law 92-500.

We further agree that a specific "overview agency" of the federal government should be assigned to coordinate projects which, being multi-purpose in scope, are eligible for funding from a number of federal agencies. Such a mechanism would serve not only the federal

interests, but the local agency interests in many areas. The designation of a lead agency for such projects would significantly reduce the delays, paperwork, duplication of costs, and perhaps mitigate or eliminate the differing requirements of the various federal agencies.

In our discussions on the draft report, we have argued that the use of the phrase "flexibility in water quality goals" is a euphemism for "lowering water quality standards" or "an increased level of water pollution." It is our opinion that the requirements of PL 92-500 and, subsequently, the amendments contained in the Clean Water Act of 1977 stated and reaffirmed the Congressional intent to eliminate pollution of the Nation's waters by the establishment of specific standards. The standards were not predicated upon the familiar cost/benefit analysis, nor have they been reduced as a result of information generated since 1972 on the cost of achieving those standards. If "flexibility" were used in the context of achieving the same level of water quality by other mechanisms, we would have no objection. However, in the context of the draft report, it is clear that the recommendation is for lesser standards of water quality to reduce the costs. We believe this to be antithetical to the Congressional intent and to the efforts to achieve the national goal of water pollution control. The implication in this report is that where it is deemed to be too expensive, the goal for clean water should be relaxed.

A further ramification of this recommendation--in the context of federal funding of municipal water pollution control facilities--is that water pollution occurring as a result of municipal wastes is acceptable if it is too expensive to correct; but that industry--irrespective of cost--must not pollute the waters. While this conclusion is not explicit in the draft report, its implication is very strong.

With respect to the analysis of the TARP Program, we have attempted to convey the fact that TARP, i.e. the construction of tunnels and reservoirs for the elimination of water pollution resulting from combined sewer overflows and the reduction in flood-related damages in the combined sewer areas of the District, are distinct and separable projects responsive to specific problems.

The draft report utilizes the combined costs for every project in the Metropolitan Chicago area which may be in some manner related to TARP and implies that all such projects must be completed for each project to be justified. While it is true that the maximum benefit derives from completion of all projects, the majority of those projects are directed toward resolution of specific problems. The inclusion of some of those projects in the analysis is, at best, improper. For example, a cost associated with widening of the Main Channel which was a navigation project authorized in 1946. This project was fully justified as a navigation effort, but is now being

APPENDIX VIII

Mr. Henry Eschwege April 10, 1978

considered as a water management project. Similarly, maintenance dredging of the waterways is not a justifiable cost when considering the water management program.

Perhaps the most disconcerting item in the draft report is the inclusion of an item for "interest during construction." This factor is utilized by the Corps of Engineers in economic analyses comparisons of various alternatives, and to generate cost/benefit comparisons. It has been included as a capital cost item in the draft report but, to our knowledge, has never been considered as a capital cost by the Corps of Engineers or any other federal agency. Inclusion as a cost item inflates, to a considerable degree, the total costs attributed to the projects.

The report relies for its conclusions and recommendations upon what we consider to be improper cost information, and the escalation of real costs since the initial estimates. With respect to the TARP portion, the present-day costs, when compared with the initial estimates, are fully defensible. Current estimates reflect inflation of construction costs and significant increases in insurance costs in Illinois. Delays in construction will continue to escalate project costs. Delays occasioned by compliance with the multitude of federal requirements for such projects are principally responsible for the increased costs. Perhaps the draft report should make reference to this fact.

It should also be noted that the Metropolitan Sanitary District of Greater Chicago services a total area of 865 square miles with a population of approximately 5.5 million people. This population exceeds that of 39 states. In that context, the plans to resolve the water pollution and flood control problems, which result in an overall positive cost/benefit ratio, should be considered as an important achievement.

In general, we feel that the draft report reflects an unfair evaluation of the accomplishments of a water management program for the Metropolitan Chicago Area in order to support a conclusion that achievement of water pollution control objectives and standards promulgated under Public Law 92-500 are economically unfeasible and, thus, a lower level of water quality is justified.

Very truly yours,

Nicholas J. Melas
President

NJM/BTL/FCN/HM/sb
cc: Mr. Weintraub

APPENDIX IX

PRINCIPAL OFFICIALS RESPONSIBLE FOR ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
DEPARTMENT OF DEFENSE		
SECRETARY OF DEFENSE:		
Harold Brown	Jan. 1977	Present
Donald H. Rumsfeld	Nov. 1975	Jan. 1977
James Schlesinger	June 1973	Nov. 1975
William P. Clements, Jr. (acting)	May 1973	June 1973
Elliott L. Richardson	Jan. 1973	Apr. 1973
Melvin Laird	Jan. 1969	Jan. 1973
DEPARTMENT OF THE ARMY		
SECRETARY OF THE ARMY:		
Clifford L. Alexander, Jr.	Feb. 1977	Present
Martin R. Hoffmann	Aug. 1975	Feb. 1977
Howard H. Calloway	May 1973	July 1975
Robert F. Froehlke	July 1971	May 1973
Stanley R. Resor	July 1965	June 1971
CHIEF OF ENGINEERS:		
Lt. Gen. John W. Morris	July 1976	Present
Lt. Gen. William C. Gribble, Jr.	Aug. 1973	June 1976
Lt. Gen. Frederick J. Clarke	Aug. 1969	July 1973
ENVIRONMENTAL PROTECTION AGENCY		
ADMINISTRATOR:		
Douglas M. Costle	Mar. 1977	Present
John R. Quarles, Jr. (acting)	Jan. 1977	Mar. 1977
Russell E. Train	Sept. 1973	Jan. 1977
John R. Quarles, Jr. (acting)	Aug. 1973	Sept. 1973
Robert W. Fri (acting)	Apr. 1973	Aug. 1973
William D. Ruckelshaus	Dec. 1970	Apr. 1973

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