# *REPORT TO THE CONGRESS*

# Federal Grants Awarded For Constructing Waste Treatment Facilities Which Benefit Industrial Users

B-166506

Federal Water Quality Administration
Department of the Interior

*BY THE COMPTROLLER GENERAL OF THE UNITED STATES*

MAY 8, 1970

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 presents the results of our review of Federal grants awarded by the Federal Water Quality Administration, Department of the Interior, for constructing waste treatment facilities which benefit industrial users.

Our review was made 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, Bureau of the Budget, and to the Secretary of the Interior.

Comptroller General
of the United States

# Contents

## ABBREVIATIONS

BOD Biochemical oxygen demand, which is a measure of the strength of sewage in terms of the amount of oxygen required to sustain decomposition of the waste by bacteria.

FWQA Federal Water Quality Administration

GAO General Accounting Office

*COMPTROLLER GENERAL'S REPORT TO THE CONGRESS*

# FEDERAL GRANTS AWARDED FOR CONSTRUCTING WASTE TREATMENT FACILITIES WHICH BENEFIT INDUSTRIAL USERS

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## D I G E S T

### *WHY THE REVIEW WAS MADE*

The Federal Water Quality Administration (Agency) awards grants to State and local governments and interstate commissions for the construction of treatment facilities to prevent the discharge of sewage or other waste into lakes, rivers, streams, etc.

The Agency estimates that $10 billion for constructing municipal facilities for waste treatment, including a Federal share of $4 billion, and $2.2 to $4 4 billion for constructing industrial facilities for the same purpose will be required during the fiscal years 1971-74.

Because of a trend toward municipal treatment of industrial wastes, the General Accounting Office (GAO) reviewed Federal grants that had been awarded to municipalities for the construction of facilities which treat only, or substantial quantities of, industrial wastes.

### *FINDINGS AND CONCLUSIONS*

The Agency has awarded grants to municipalities for the construction of facilities to treat (1) domestic wastes only, (2) industrial wastes only, and (3) domestic and industrial wastes.

When ~~If~~ a municipality assumes jurisdiction over a waste treatment facility, the Agency considers the project as being eligible for a grant of as much as 55 percent of the total eligible cost. The Agency has not required industrial plants to finance any part of the construction costs of waste treatment facilities, but

their ~~An industry~~'s contribution, if any, to the construction cost of a waste treatment facility has been based on whatever agreement is made between the industry and the sponsoring municipality. In two instances where industrial plants planned to contribute to the construction costs, such planned contributions did not result in Federal grants being less than they would have been without the contributions.

Information developed during GAO's review showed that a large amount of Federal grant funds awarded to municipalities was for the construction

of facilities to treat significant quantities of industrial wastes. A partial list of projects in which industrial wastes represent 50 percent or more of the total volume of wastes treated showed Federal grants of about $81 million for 381 facilities estimated to cost about $360 million. (See p. 9.)

An audit by the Department of the Interior showed that at least 44 of the 381 facilities were designed to process primarily industrial wastes (75 percent or more). In one of these cases, Federal grants totaling $806,000 were awarded for the construction of a waste treatment plant which was used to induce a new industry to locate in the area. The plant was designed for the sole use of the industrial company. As of September 30, 1969, however, the waste treatment plant was not operating because the company discontinued operations in June 1969. (See p. 16.)

In its review at three of the Agency's regional offices, GAO identified seven waste treatment facilities which treat industrial wastes only. Grants awarded by the Agency to the seven municipalities amounted to about $503,000. The names of the municipalities which received the grants have not been identified because the purpose of this report is to demonstrate the existence of a situation which GAO believes should be brought to the attention of the Congress and not to highlight specific cases where waste treatment facilities have benefited industrial users. (See p 9.)

GAO recognizes that the Congress is aware of the Agency's policy of awarding grants to municipalities for the treatment of domestic and industrial wastes. GAO believes, however, that it is questionable whether the Congress intended that grants be awarded for the construction of facilities for the treatment of industrial wastes only.

*RECOMMENDATIONS OR SUGGESTIONS*

This report discusses some of the factors to be considered in determining the extent to which industry should participate in financing the cost of municipal waste treatment facilities which treat industrial wastes (See p 22 )

*AGENCY ACTIONS AND UNRESOLVED ISSUES*

The Department of the Interior concurred in the need to examine existing policies and to develop new policies where appropriate in connection with the growing complexity and importance of the matters of treatment and disposal of industrial wastes within municipal systems. The Department stated that it had this matter under review. (See p. 23.)

## *MATTERS FOR CONSIDERATION BY THE CONGRESS*

The Congress may wish to (1) clarify its intent as to whether Federal grants are to be awarded to municipalities for construction of facilities to treat industrial wastes only and (2) consider other alternatives to present practices for financing the construction of waste treatment facilities for the treatment of domestic and industrial wastes. The Congress may wish also to consider the information in this report in view of proposed water pollution legislation in 1970 regarding the financing of municipal waste treatment facilities and the problem of financing industrial pollution control.

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On March 31, 1970, proposed amendments to the Code of Federal Regulations were issued by the Secretary of the Interior. One of the proposed amendments relates to the financing of waste treatment plants which treat industrial wastes. The full import of this amendment is not clear at this time. (See pp. 24 and 25.)

# CHAPTER 1

## INTRODUCTION

The General Accounting Office has examined into the Federal Water Quality Administration (FWQA) policy of awarding grants to municipalities to assist in financing the construction of waste treatment facilities for treatment of substantial quantities of industrial wastes. FWQA was previously referred to as the Federal Water Pollution Control Administration. FWQA and its predecessor agency will be referred to hereinafter as FWQA. The scope of our review is set forth on page 26 of this report.

The Federal Water Pollution Control Act of 1956, as amended (33 U.S.C. 466), authorizes FWQA to award grants to State, interstate, municipal, and intermunicipal agencies for the construction of necessary waste treatment facilities to prevent the discharge of untreated or inadequately treated sewage or other waste into any waters. The act limits the extent of FWQA financial assistance to an amount from 30 to 55 percent of the eligible cost of constructing the facilities, dependent upon the fulfillment by the State and the grantee of certain conditions specified in the act. Eligible construction costs are exclusive of certain costs such as site acquisition. Certain other Federal grants have been awarded to assist such agencies to meet their share of the cost of constructing waste treatment facilities.

FWQA does not differentiate between municipal and industrial wastes and considers the term "other waste" as including industrial wastes. FWQA officials have informed us that this policy is consistent with the provision of the Federal Water Pollution Control Act which defines waste treatment facilities as

> "the various devices used in the treatment of sewage or industrial wastes of a liquid nature, including the necessary intercepting sewers, outfall sewers, pumping, power, and other equipment, and their appurtenances, and includes any extensions, improvements, remodeling, additions, and alterations thereof."

In its report to the Congress entitled "The Cost of Clean Water and its Economic Impact" dated January 10, 1969, FWQA estimated that, for the 5-year period--fiscal years 1969-73--about $8 billion would be required for the construction of municipal waste treatment facilities and from $2.6 billion to $4.6 billion would be required for the construction of industrial waste treatment facilities. The report stated that the estimates were considered extremely tentative and had been based on a series of assumptions. More current estimates prepared by FWQA show that, for fiscal years 1971-74, about $10 billion, will be required for the construction of municipal waste treatment facilities and from $2.2 billion to $4.4 billion will be required for the construction of industrial waste treatment facilities. Of the required $10 billion, the Federal Government's share is estimated to be $4 billion and the State and local agencies' share is estimated to be $6 billion.

With regard to the size of waste treatment plants and the trend toward municipal treatment of industrial wastes, the 1969 FWQA report stated that:

> "The average size of plant has increased markedly in recent years, as has the tendency of municipalities to treat industrial wastes. Existing data suggest that about half of the total volume of wastes processed by municipal plants is of industrial origin; and the portion seems to be rising."

The FWQA report stated also that increased treatment of industrial wastes by municipalities is requiring larger waste treatment plants in an increasing number of instances. The report stated further that in 1968 17.5 percent of all waste treatment plants in service were designed to treat more than three times the wastes contributed by the human population in the areas served by these plants and that this large capacity could most reasonable be attributed to large industrial waste treatment requirements.

Through June 30, 1969, Federal grants for the construction of waste treatment facilities averaged $142,400. Since 1967 many of the larger municipalities have applied to FWQA for Federal construction grants and there has been an increasing trend toward constructing joint

municipal-industrial waste treatment facilities. As of June 30, 1969, applications for grants pending at the FWQA, State, and local levels totaled about $2.3 billion for 4,648 projects having an estimated total construction cost of about $5 billion. The average amount of the pending applications is $495,000, or 3.5 times the average amount of the grants awarded through June 30, 1969. (See app. III.)

The conventional waste treatment process is usually considered to consist of two steps--primary treatment and secondary treatment. Primary treatment involves (1) the removal of suspended and settleable solids by flotation and sedimentation and (2) chlorination of the effluent. Primary treatment plants normally reduce the biochemical oxygen demand (BOD)[1] by about 35 percent through removal of about 50 percent of the suspended solids and about 90 percent of the settleable solids.

Secondary treatment involves the aerobic decomposition[2] of the greater portion of the organic matter left in the effluent after the primary treatment process. Secondary treatment plants will normally remove from 80 to 95 percent of the total BOD and approximately 85 percent of the suspended solids. The presence of high industrial waste concentrations can be expected to reduce the removal of BOD and suspended solids if the plant is not properly designed and if careful control is not continually maintained over the treatment process. A picture of a secondary treatment plant is shown on the next page.

The principal officials of the Department of the Interior responsible for administration of the activities discussed in this report are listed in appendix IV.

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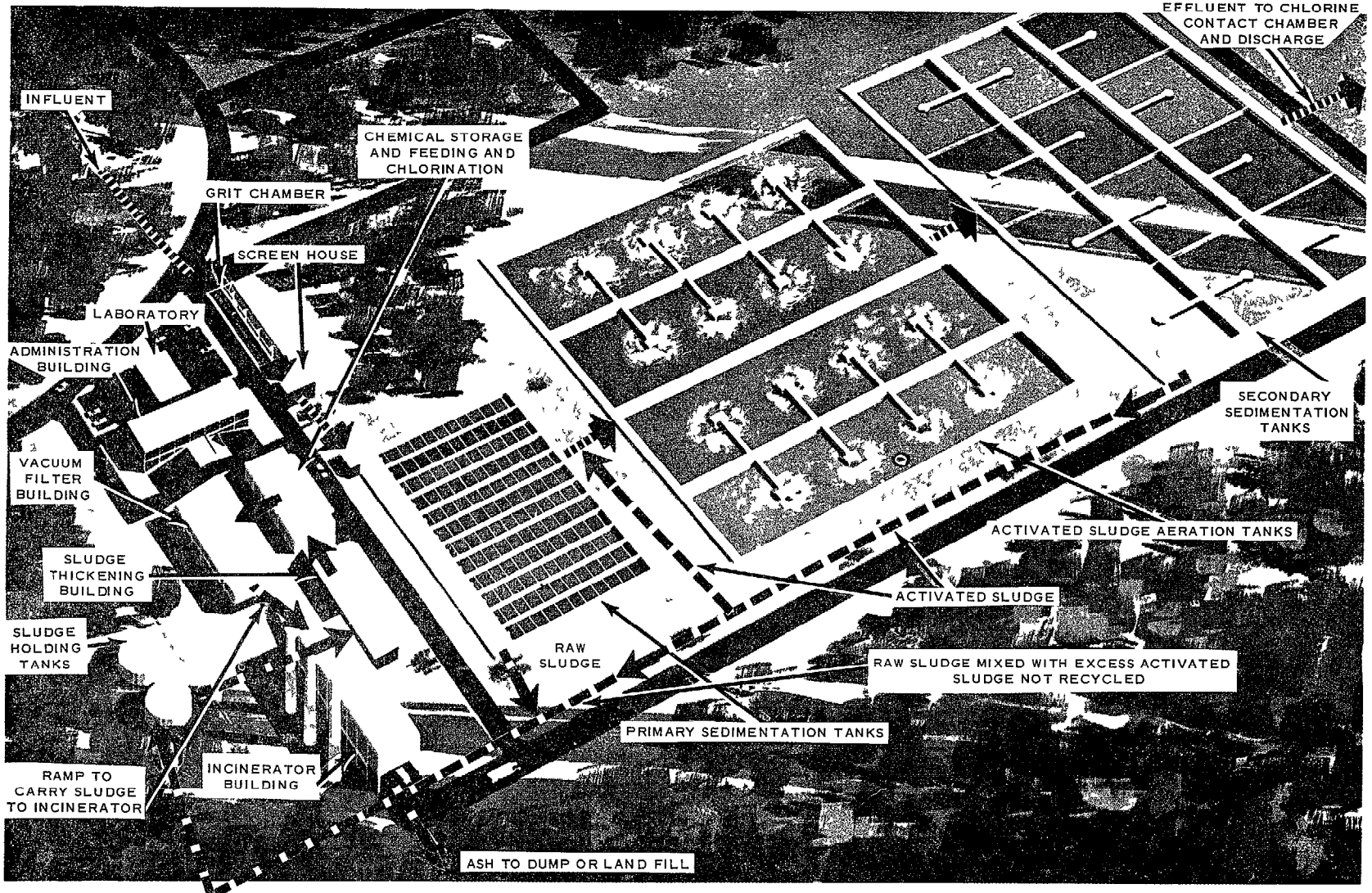
[1]BOD is a measure of the strength of sewage in terms of the amount of oxygen required to sustain decomposition of the waste by bacteria.

[2]Aerobic decomposition is the breakdown of organic matter in sewage by bacteria which grow only in an aquatic environment containing dissolved oxygen.




SECONDARY TREATMENT PLANT

## CHAPTER 2

## MUNICIPAL TREATMENT OF INDUSTRIAL WASTES

FWQA has awarded grants to municipalities for the construction of waste treatment facilities for the treatment of (1) domestic wastes only, (2) industrial wastes only, and (3) both domestic and industrial wastes (joint municipal-industrial waste treatment facilities). The industrial wastes being treated at a waste treatment plant may come from one or two industrial plants or may come from many industrial plants.

Concerning the awarding of grants for the construction of joint municipal-industrial waste treatment facilities, the Senate Committee on Public Works, in Senate Report 1367 dated July 11, 1966, stated:

> "The committee has recommended greater emphasis on joint municipal-industrial treatment systems operated by public agencies. Such systems are eligible for assistance under the sewage treatment grant program."

Information developed during our review showed that a large amount of Federal grant funds was awarded to municipalities for the construction of waste treatment facilities to treat significant quantities of industrial wastes. Our review showed also that a heavy demand on Federal construction grant funds could occur in the future if the trend toward municipal treatment of industrial waste continued.

The Congress may wish to consider this information in its deliberations of proposed water pollution legislation in 1970, which is concerned with financing the construction of municipal waste treatment facilities and the problem of financing industrial pollution control. In addition, the Congress may wish to consider other alternatives for financing the cost of treating industrial wastes.

With regard to FWQA's awarding of grants for the construction of municipal waste treatment facilities for the treatment of industrial wastes only, we believe that it is

questionable whether the Congress intended that Federal grants be awarded for the construction of such facilities. Concerning this, Senate Report 1367 stated:

> "The proposal by the American Paper Institute for specific Federal grants to municipalities to construct industrial waste treatment facilities would provide an effective means of meeting the needs of both the marginal industries as well as the profitable industries. Such a Federal grant approach would not be inconsistent with public policy because the grant would, in effect, be made to a unit of government. This approach differs from that proposed by Senators Cooper and Ribicoff and is a matter which can and will be considered by this committee. However, realizing that there is no final answer to the problem of financing industrial pollution control, the committee reiterates its strong recommendation that appropriate committees consider tax relief legislation."

Also, in hearings before the House Public Works Committee in March 1969 on House bill 4148 and related bills to amend the Federal Water Pollution Control Act and for other purposes, the acting chairman of the Committee stated that it was not the intent of the law that Federal funds be used to construct waste treatment plants that serve only industry.

The Congress may therefore wish to clarify its intent as to whether Federal grants are to be awarded to municipalities for the construction of waste treatment facilities for the treatment of industrial wastes only.

These matters are discussed in more detail in the following sections of this report.

## FEDERAL GRANTS AWARDED FOR THE CONSTRUCTION OF FACILITIES TO TREAT SUBSTANTIAL QUANTITIES OF INDUSTRIAL WASTES

We identified 44 projects in three FWQA regions for which Federal grants were awarded to municipalities for the construction of facilities for the treatment of municipal and/or industrial waste. Eligible costs of the 44 projects were about $50.3 million and construction grants awarded by FWQA totaled about $15 million.

Seven of the 44 projects involved the construction of facilities to treat only industrial wastes. Eligible costs of the seven projects were about $1.6 million and construction grants awarded by FWQA totaled about $503,000. The remaining 37 projects involved the construction of facilities for the treatment of both industrial and domestic wastes. For 29 of the 37 projects, industrial wastes represented 50 percent or more of either the total volume of waste treated or to be treated or of the BOD removal capacity of the treatment plants. FWQA officials informed us that both the volume of wastes, expressed in gallons per day, and the strength of the wastes, expressed in terms of BOD, affect the cost of treatment facilities.

In two instances the industries involved planned to contribute to the municipality's cost of constructing the projects. Although the planned industrial contributions were about $352,000, the grants awarded by FWQA were not less than they would have been without the contributions.

In April 1969, FWQA compiled a list of 411 waste treatment facilities in which industrial wastes represented 50 percent or more of the total volume of wastes treated. FWQA awarded grants totaling about $80.7 million for 381 of the facilities that had an estimated eligible cost of about $359.7 million. (See app. II.) Grants from another Federal program totaling about $2.6 million had been awarded for 11 of the projects estimated to cost a total of $5.2 million. Data pertaining to the remaining 19 projects was not available at FWQA headquarters at the time of our field review.

FWQA's listing does not include all grants awarded by FWQA for the construction of facilities where treatment of

industrial wastes represents 50 percent or more of the total volume of waste treatment. Of the 44 projects identified by GAO, eight were not included in the FWQA listing although industrial wastes represented 50 percent or more of the total volume to be treated. Eligible costs of the eight projects were about $8.4 million and FWQA grants amounted to about $3 million.

Moreover, the FWQA listing did not include waste treatment facilities where the industrial wastes treated were significant in terms of BOD removal capacity of the treatment plants, if the volume of industrial wastes was less than 50 percent of the total wastes treated. For example, the industrial wastes treated at four plants in one FWQA region represented only 3 to 12 percent of the total volume of wastes treated. However, the industrial wastes represented from 65 to 84 percent of the BOD removal capacity of the plants. FWQA awarded grants totaling about $2.5 million for the construction of the four waste treatment plants which were estimated to cost about $8.8 million.

Also, a number of plants which treated significant quantities of industrial wastes were not included in the FWQA listing because the industrial wastes represented less than 50 percent of the volume of wastes treated. For example, one FWQA regional office reported that 10 grants totaling about $3.6 million had been awarded for the construction of one large treatment plant which was estimated to cost about $11 million. Industrial wastes represent about 44 percent of the total volume of wastes to be treated at the plant. Furthermore, six of the nine FWQA regional offices indicated that their contributions to the listing of 411 projects was not necessarily complete.

The examples discussed in the following paragraphs are illustrative of the facilities that are constructed for the treatment of substantial quantities of industrial wastes and financed in part with grants awarded by FWQA.

## Facilities to treat only industrial wastes

### South Central Region--FWQA

1. Municipality A's waste treatment plant was treating domestic wastes and the industrial wastes from a carpet mill. The wastes from the mill, however, seriously overloaded the treatment plant, the alkalies and other salts contained in the wastes corroded metal parts, and undigestible materials in the industrial wastes interfered with the treatment processes. Another carpet mill in the municipality was discharging its industrial wastes through a screening device into an open drainage ditch.

A report by the municipality's consulting engineers stated that, if the industrial wastes from the first carpet mill were not treated at the municipality's plant, the plant could effectively treat the municipality's domestic wastes for years. The consulting engineers recommended that, because of the nature of the wastes from the two mills, a separate facility should be constructed for treating their industrial wastes. The municipality applied for and was awarded a grant of $65,970 by FWQA for the construction of a plant, estimated to cost about $218,000, for treating the industrial wastes. The municipality also was awarded a grant of $43,500 by another Federal agency.

2. Municipality B was awarded a grant of $68,110 by FWQA for the construction of (1) pretreatment facilities for a newly constructed food-processing plant and (2) a connection from the plant to the existing sewer system. The pretreatment was to remove grease and solids from the industrial wastes and thus to reduce the strength of the wastes so that they could be treated at the municipal waste treatment plant. Municipality B also was awarded a grant of $40,000 from another Federal program.

3. Municipality C was awarded a grant of $130,800 by FWQA and a grant of $218,000 from another Federal program for the construction of "*** a collection system and treatment facilities to accommodate waste waters generated by the *** Canning Company."

The wastes from the cannery were being screened to remove the larger particles of waste and the liquid residue was being disposed of in two ways. The liquid residue from green vegetables was discharged into the municipal sewers and treated at the municipal treatment plant. The residue from a potato peeling process was sprayed on nearby fields for irrigation causing odors which resulted in complaints.

A report prepared by the grantee's consulting engineering firm stated that, although the municipality's existing waste treatment plant was capable of treating the domestic wastes of the community, the volume and strength of the green wastes from the cannery caused the plant to be overloaded and resulted in a poor quality effluent being discharged into the waterway and in some odors.

To treat the wastes from the cannery, the firm recommended that "the combined [potato and green vegetable] raw waste stream be separated entirely from the municipal sewage treatment plant and be routed to its own treatment facilities." The facilities to be constructed with the assistance of the Federal grants include an interceptor sewer to transport the wastes from the cannery to the plant, settling basins, and basins to provide for extended aeration to process the food wastes.

Northwest Region--FWQA

1. Municipality A treated the wastes from a food cannery in its waste treatment plant. The industrial wastes overloaded the treatment plant resulting in a poor quality effluent being discharged into and polluting the waterway.

The municipality was awarded a grant of $133,320 by FWQA for the construction of an interceptor sewer, a pumping station, and a spray irrigation system to dispose of the waste from the food cannery. The cost of the facilities was about $444,400.

2. Municipality B had a waste treatment plant for the treatment of both domestic wastes and the wastes from food-processing plants. The solids contained in the wastes of the food-processing plants caused the municipality's treatment plant to become overloaded. The municipality was

awarded a grant of $52,950 by FWQA for the construction of a pretreatment facility to remove excess solids from the industrial wastes prior to their entering the waste treatment plant. The cost of constructing the pretreatment facility was about $176,500.

Northeast Region--FWQA

1. Municipality A had a waste treatment plant for treating domestic and industrial wastes, including the wastes from a wool-processing plant. Wool fibers contained in the wastes caused operational difficulties at the treatment plant. The municipality was awarded a grant of $40,700 by FWQA for the construction of pretreatment facilities to remove the wool fibers from the wastes prior to its entering the waste treatment plant. The municipality estimated that the pretreatment facilities would cost about $75,000.

Facilities to treat both domestic and industrial wastes

South Central Region--FWQA

1. Municipality A had a waste treatment plant for treating domestic wastes and waste of numerous industrial and commercial establishments. The waste flow exceeded the efficient treatment capability of the plant. Additional treatment facilities were constructed to treat the present wasteload, to allow for a 50-percent increase in the domestic population, and to provide capacity for treating the industrial wastes of a brewery. FWQA estimated that the industrial wastes would represent about 20 percent of the total volume of wastes to be treated by the expanded plant and about 50 percent of the BOD removal capacity of the plant.

The municipality was awarded a grant of $593,000 by FWQA for the construction of the additional treatment facilities estimated to cost about $1,976,000.

Northwest Region--FWQA

1. Municipality A was ordered by the State to expand its waste treatment facilities so that more of the pollutants contained in the waste water would be removed. The municipality's existing waste treatment facilities were in excellent condition. The expanded waste treatment facilities were designed to treat industrial wastes from food-processing plants which represented about 11 percent of the total volume of wastes to be treated and about 80 percent of the plant's BOD removal capacity.

The municipality estimated that the expansion would cost about $2,090,000. FWQA awarded the municipality a grant of $1,045,000.

Northeast Region--FWQA

1. Municipality A discharged its domestic wastes, and a woolen mill discharged its industrial wastes, untreated into a river. The municipality applied to FWQA for a grant to construct interceptor sewers and a treatment plant which were estimated to cost about $1,150,000. The municipality estimated that about 83 percent of the volume of the wastes to be treated would be from the woolen mill and that such wastes represented about 95 percent of the BOD removal capacity of the treatment plant.

FWQA awarded a grant of $230,000 to the municipality. The grant was limited to 20 percent of the estimated cost of the facilities at the request of the State. FWQA agreed to award an additional $345,000, or 30 percent of the estimated project cost to the municipality as future construction grant funds become available.

## INTERNAL AUDITORS' REVIEW OF GRANTS AWARDED FOR THE CONSTRUCTION OF WASTE TREATMENT FACILITIES

In November 1969 the Department of the Interior's internal auditors issued a report on the results of their examination into FWQA's policy of awarding grants for the construction of waste treatment facilities which were designed to process industrial waste only or were designed to process industrial wastes in combination with domestic wastes.

The internal auditors identified 44 grants for the construction of waste treatment facilities designed to process primarily (75 percent or more) industrial wastes from the list of 411 waste treatment facilities compiled by FWQA. The total estimated cost of the 44 facilities was $46.3 million. For the 44 facilities, FWQA awarded grants of about $14.8 million and other Federal programs awarded grants of about $2.4 million, a total of about $17.2 million. The industrial wastes to be treated by 20 of the waste treatment facilities represented 95 percent or more of the designed capacity of the facilities. Each of nine facilities was designed to treat almost exclusively the wastes of a single industrial plant.

The report stated that various agreements that had been made between the municipalities and the industrial plants to be served by the waste treatment facilities concerned the financing, construction, and operation and maintenance of the treatment facilities. Some of the agreements provided for the municipalities to finance their portions of the cost of constructing the facilities and to recover those costs through user charges to the industrial plants. Officials of two industrial plants agreed to provide most of the funds required over and above the Federal and State grants. In several instances, officials of industrial plants participated in designing, constructing, and/or operating the waste treatment facilities. In some instances, the municipalities undertook the construction of the waste treatment facilities as an inducement for new industries to move into the area.

The report contained four examples of a Federal grant to assist a municipality in constructing a waste treatment facility that served only one industrial plant.

Example 1--Federal grants were awarded to a municipality that had waste treatment facilities. The grants, which totaled $806,000, were for the construction of a waste treatment plant which was designed for the sole use of a food-processing company as an inducement to the company to locate in the area. Another Department of the Interior report dated September 30, 1969, covering the audit of the grant of $806,000, stated that this waste treatment plant was not being operated because the only user of the treatment plant, the food-processing company, discontinued operations on June 29, 1969. The report stated also that there were reports of plans to reopen the food-processing plant which would reestablish the need for the waste treatment facilities; however, there were no indications at the date of the audit that a treatment plant of the designed capacity would be needed. The report concluded that the grant was made to a municipality but was solely for the use of a private corporation.

Example 2--A municipality was awarded Federal grants of $692,000 to assist in the construction of a waste treatment plant that was designed for "only the treatment of the textile waste from the *** Plant." The operation and maintenance of the treatment facility will be accomplished by the industrial plant.

Example 3--A municipality, that had a municipal treatment plant, was awarded a Federal grant for the construction of a waste treatment plant for treating industrial wastes from a chicken-processing plant.

Example 4--A municipality was awarded a Federal grant to assist in the construction of a treatment facility designed to treat the wastes of a single industrial plant. The industrial plant agreed to (1) pay 75 percent of the construction cost over and above any Federal or State grants, (2) assume full responsibility for operating and maintaining the treatment plant, under the general supervision of the municipality, and (3) pay the cost of operating the treatment plant.

The report concluded that:

"*** some of the facilities handle only industrial waste and in other cases, the nonindustrial waste is only token. Moreover, there were instances where the waste treatment facility was integral to the industrial plant; the company involved was totally responsible for continued operations and/or the company had agreed to repay the municipality for its share of the construction costs. While in a narrow sense the municipality was the technical owner, the company enjoyed the beneficial use and had assumed ownership responsibilities. Thus, it appears that an indirect means is being employed to accomplish an objective which is not possible through direct grants to private industry."

# CHAPTER 3

## ALTERNATIVE METHODS FOR FINANCING THE COST OF CONSTRUCTING FACILITIES FOR THE TREATMENT OF INDUSTRIAL WASTE

The joint treatment of domestic and industrial wastes has several beneficial effects. The construction of joint municipal-industrial waste treatment plants frequently results in economies of scale--that is, the cost of constructing a joint treatment plant may be less than the cost of constructing separate facilities for treating domestic and industrial wastes. Also, additional savings could accrue through reduced operation and maintenance expenses.

Treatment of organic wastes generally involves the breakdown of organic matter by bacteria. When hot industrial wastes increase the temperature of the mixture to be treated, the bacterial action may be improved. Furthermore, the nutrients that are required for efficient bacterial action are found in domestic wastes but may be lacking in industrial wastes, in which case the nutrients would have to be purchased for proper treatment of the industrial wastes. Thus, when domestic and industrial wastes are treated together, nutrient purchases may be reduced or eliminated.

On the other hand, many industrial wastes contain elements of a toxic nature which retard or stop the bacterial action essential to the treatment process. For example, a treatment plant was shut down for 9 months because toxic wastes had stopped the bacterial action. In addition, corrosive elements contained in some industrial wastes have damaged the metal parts of waste treatment plants. Also, process residue such as fur, feathers, hair, entrails, blood, and grease have adversely affected the operation of waste treatment plants.

This chapter discusses some of the factors requiring consideration in determining the extent to which industry should benefit under grants awarded by FWQA to municipalities for the construction of waste treatment facilities.

Also discussed is an alternative to the present FWQA policy of awarding grants to municipalities for financing the construction of facilities for the treatment of industrial wastes.

## CONSIDERATIONS REGARDING INDUSTRY PARTICIPATION IN THE CONSTRUCTION PROGRAM

FWQA's policy of awarding grants to municipalities for the construction of waste treatment facilities for the treatment of significant quantities of industrial wastes enables some types of industries to have their wastes treated in municipal treatment plants. The food-processing and meat-packing industries frequently discharge their wastes into municipal treatment plants. Other types of industries are generally precluded from having their wastes treated in municipal treatment plants because the wastes are toxic and corrosive, for example, the petro-chemical industry.

Even within an industry some companies have their wastes treated at municipal waste treatment plants while other companies must construct and operate waste treatment plants. For example, some pulp and paper mills have constructed and operate waste treatment plants while other mills have discharged their wastes into municipal waste treatment facilities. In this regard, the National Council of the Paper Industry for Air and Stream Improvement, Inc., stated in a 1967 survey that, of 753 pulp and paper mill locations, 214 had, or contemplated having, their waste treated in municipally owned facilities. The 214 mills accounted for about 22 percent of the annual paper production capacity. The remaining 539 mills, accounting for about 78 percent of annual production capacity, were either discharging their wastes untreated or providing waste treatment.

In one river basin where food-processing plants were the primary sources of industrial wastes discharged in the waterway, an FWQA report identified 16 plants that had their wastes treated in municipal waste treatment facilities and 18 plants that had constructed or planned to construct their own waste treatment facilities.

An FWQA regional official informed us that some municipalities use treatment plants constructed in part with Federal funds to attract new industry to the area. As stated on page 16, Department of the Interior internal auditors identified a grant that was awarded to a municipality to assist in constructing a waste treatment plant that was intended to induce a new industry to locate in the area.

In a December 1967 report to FWQA entitled "Incentives to Industry for Water Pollution Control: Policy Considerations," Abt Associates Inc., of Cambridge, Massachusetts, discussed alternative approaches for providing incentives to industry to comply with the pollution abatement standards being created under the Water Quality Act of 1965 and the Clean Water Act of 1966. The report stated, in part, that:

> "One of the most important methods for improving stream quality is to reduce the amount of pollution which is generated. Different processes for manufacturing the same products often appear to result in significantly different waste loads per unit of product. Such process changes can often be made at relatively low cost. Similarly, better housekeeping and operating practices can often drastically reduce the amount of pollution resulting from a given process."
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> "There is clear evidence from several industries of the possibility for process change. ***"
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> "Because the industry is not paying the full costs of treating its wastes when it uses a federally funded capacity, the incentives for the firm in such circumstances to engage in process changes to lower its waste load is less than it should be. For charges based on

water use, as is the case, the firm enjoys no decrease in charges for reducing its waste load, when water use is not also lower. Consequently there is almost no incentives for process changes of certain types. This is a very important point since process change is often one of the most efficient ways to eliminate or limit water pollution."

* * * * *

"*** strong arguments also imply that municipalities should not be given federal construction grants for that portion of their facilities which are intended for the treatment of wastes from industrial plants. Instead firms should pay the agency creating the plant a reasonable service charge to cover the share of the costs of constructing and operating the treatment capacity meant for industry. Grants to municipalities that result in low service charges to industry in turn sharply lower the inducements to the firm to engage in changes in its production process to lower waste loads. ***"

As stated on page 5, current estimates prepared by FWQA show that about $10 billion for the construction of municipal waste treatment facilities and about $2.2 to $4.4 billion for the construction of industrial waste treatment facilities will be required during fiscal years 1971-74. Of the required $10 billion for municipal waste treatment facilities, the Federal Government's share is estimated to be $4 billion and State and local agencies' share is estimated to be $6 billion. If the trend continues toward municipal treatment of industrial wastes, it may well be that some of the above cost for constructing industrial waste treatment facilities, which presently is industry's responsibility, may become eligible for Federal assistance.

## INDUSTRY PARTICIPATION IN FINANCING CONSTRUCTION COSTS OF MUNICIPAL WASTE TREATMENT FACILITIES WHICH TREAT INDUSTRIAL WASTES

An alternative to the present policy of financing the construction of municipal waste treatment plants for treating industrial wastes could be a requirement that industrial companies share in the cost of constructing the facilities. Under this alternative the benefits associated with the construction and operation of larger facilities would be realized and increased Federal funds would be available to assist in financing the construction costs of municipal waste treatment facilities. Also, since an industrial company would be financing the costs of treating its wastes, the company may be encouraged to engage in process changes to lower its waste loads. (See pp. 20 and 21.)

Under this alternative, criteria would be needed for allocating the costs of constructing the facilities between industrial companies and municipalities. In developing criteria, consideration should be given not only to the volumes of wastes to be treated but also to the BOD capacity of the facilities. Our opinion is based on the fact that, of the total volume of wastes treated in a facility, a small percentage might represent industrial wastes but the treatment of those wastes might require a high percentage of the BOD capacity of the facility. For example, the industrial wastes treated at four plants in one FWQA region represented only 3 to 12 percent of the total volume of wastes treated, but represented from 65 to 84 percent of the BOD removal capacity of the plants. (See p. 10.)

Since industrial wastes in certain instances may represent a very small percentage of the volume of the wastes treated or BOD removal capacity of the treatment plant, further consideration may have to be given to the need to establish criteria for use in determining when industry would be required to participate in financing the cost of constructing joint municipal-industrial waste treatment facilities.

# CHAPTER 4

# AGENCY COMMENTS, CONCLUSIONS, AND MATTERS FOR CONSIDERATION BY THE CONGRESS

## AGENCY COMMENTS

By letter dated February 6, 1970 (see app. I), the Department of the Interior, in commenting on the matters discussed in this report, concurred in the need to examine existing policies and to develop new policies, where appropriate, in connection with the growing complexity and importance of the matters of treatment and disposal of industrial wastes within municipal systems. The Department stated that it had this matter under review. The Department stated also that, in general, it believed that the treatment of industrial wastes within municipal systems was a desirable practice and one which should be encouraged, provided that proper provision was made in the planning, design, construction, operation, and financing of the works to ensure effective pollution control results and equitable cost sharing.

## CONCLUSIONS

Information developed during our review showed that a large amount of Federal grant funds was awarded to municipalities for the construction of waste treatment facilities for the treatment of significant quantities of industrial wastes. Our review showed also that a heavy demand on Federal construction grant funds could occur in the future if the trend toward municipal treatment of industrial waste continues.

We recognize that the Congress is aware of FWQA's policy of awarding grants for the construction of municipal waste treatment facilities for the treatment of industrial wastes; however, we believe that it is questionable whether the Congress intended that grants be awarded for the

construction of waste treatment facilities for the treatment of industrial wastes only.

## MATTERS FOR CONSIDERATION BY THE CONGRESS

Accordingly, the Congress may wish to (1) clarify its intent as to whether Federal grants are to be awarded to municipalities for the construction of waste treatment facilities for the treatment of industrial wastes only and (2) consider other alternatives for financing the costs associated with the construction of waste treatment facilities for the treatment of industrial wastes. The Congress may also wish to consider the information in this report in view of proposed water pollution legislation in 1970 regarding the financing of municipal waste treatment facilities and the problem of financing industrial pollution control.

- - - -

On March 31, 1970, the Secretary of the Interior issued proposed amendments to subpart B of part 601, title 18, Code of Federal Regulations. One of the Secretary's amendments relates to industrial waste treatment and reads, as follows:

> "(a) No grant shall be made for any project if such project is included in a waste treatment system, determined by the Commissioner to be intended to treat industrial waste, rather than the wastes of the entire community, metropolitan area, or region concerned. For purposes of this section 'waste treatment system' means one or more treatment works which provide integrated waste disposal for a community, metropolitan area or region.
>
> "(b) If industrial waste is to be included in the waste treated by the proposed project, the applicant shall assure the Commissioner that such applicant will require pretreatment of industrial waste, which would if untreated be detrimental to the treatment works or its proper and efficient operation and maintenance, or will otherwise prevent the entry of such waste into the treatment plant.

"(c) Where industrial wastes are to be treated by the proposed project the applicant shall assure the Commissioner that it has, or will have in effect when the project will be operated, an equitable system of cost recovery. Such system of cost recovery may include user charges, connection fees or such other techniques as may be available under State and local law. Such system shall provide for an equitable assessment of costs whereby such assessments upon dischargers of industrial wastes correspond to the cost of the waste treatment, taking into account the volume and strength of the industrial, domestic, commercial wastes and all other waste discharges treated, and techniques of treatment required. Such cost recovery system shall produce revenues, in proportion to the percentage of industrial wastes, proportionately, relative to the total waste load to be treated by the project, for the operation and maintenance of the treatment works, for the amortization of the applicant's indebtedness for the cost of such treatment works, and for such additional costs as may be necessary to assure adequate waste treatment on a continuing basis. For purposes of this section 'industrial waste' shall mean the waste discharges (other than domestic sewage) of industries identified in the Standard Industrial Classification Manual, Bureau of the Budget, 1967, as amended and supplemented, under the category 'Division D--Manufacturing,' and such other wastes as the Commissioner deems appropriate for purposes of this section."

## CHAPTER 5

## SCOPE OF REVIEW

Our review was directed primarily to obtaining information which would show the number and amounts of grants awarded to municipalities for the construction of facilities to treat substantial quantities of industrial wastes.

We reviewed pertinent legislation, FWQA instructions, and Department of the Interior internal audit reports, and examined pertinent documents, reports, records, and files at FWQA headquarters and regional offices and at the State agencies offices. We interviewed FWQA headquarters and regional officials and officials of the State water pollution control agencies.

Our review was conducted at FWQA headquarters in Washington, D.C.; at FWQA regional offices in Boston, Massachusetts; Portland, Oregon; and Dallas, Texas; and at State water pollution control agencies in Little Rock, Arkansas; Portland, Oregon; Austin, Texas; and Olympia, Washington. The review covered grants awarded during the period July 1962 to January 1969.

# APPENDIXES

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON D C 20240

FEB 6 1970

Mr. Allen R. Voss
Associate Director, Civil Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Voss

A review has been made of your draft report to Congress entitled, "Examination into Federal Grants Awarded for Constructing Waste Treatment Facilities Which Benefit Industrial Users." The report states that a number of the FWPCA construction grants have been awarded to municipalities for facilities treating substantial quantities of industrial wastes, and takes no exception to the policy being followed in awarding grants for such joint municipal-industrial facilities. However, you questioned whether the Congress intends that FWPCA award grants to municipalities for the construction of waste treatment facilities which will treat only industrial wastes.

The Department of the Interior has been aware of the growing complexity and importance of the matter of treatment and disposal of industrial wastes within municipal systems, and that the trend towards such treatment is increasing. We concur, therefore, with the need to examine existing policies and to develop new policies where appropriate in connection with these practices. The Department has had this matter under review as part of its overall review of the administration and accomplishments of the construction grants program.

In general, we believe that the treatment of industrial wastes within municipal systems is a desirable practice and one which should be encouraged, provided that proper provision is made in the planning, design, construction, operation, and financing of the works to assure effective pollution control results and equitable cost sharing. Such practices have a number of advantages, including economies of scale and the realization of regional approaches to waste treatment and disposal, which both the General Accounting Office and the Department have recognized to be an important element in securing

greater benefits in pollution abatement. We are currently in the process of developing policies which will contribute towards these ends, and we expect to apply such policies within the construction grants program as rapidly as possible.

We appreciate the opportunity to review your report in draft.

Sincerely yours,

F. J. Hall, Jr.

Director of Survey and Review

FWQA

LIST OF WASTE TREATMENT FACILITIES

IN WHICH INDUSTRIAL WASTES TREATED

REPRESENT 50 PERCENT OR MORE

OF TOTAL VOLUME OF WASTES

TREATED

COMPILED AS OF APRIL 1969

| | | Federal grants | | |
|---|---|---|---|---|
| | Number of facilities | Number of facilities for which grants awarded by FWQA | Eligible costs | Amount of grant |
| NORTHEAST | | | | |
| Conneticut | - | - | $ - | $ - |
| Delaware | 1 | 1 | 847,413 | 254,223 |
| Maine | 4 | 4 | 3,582,134 | 917,430 |
| Massachusetts | 3 | 3 | 9,301,500 | 2,262,250 |
| New Hampshire | 2 | 1 | 1,576,000 | 630,400 |
| New Jersey | 4 | 3 | 5,685,100 | 1,856,780 |
| New York | 3 | 3 | 5,934,700 | 1,093,230 |
| Rhode Island | - | - | - | - |
| Vermont | 4 | 4 | 2,622,400 | 1,014,400 |
| Total | 21 | 19 | 29,549,247 | 8,028,713 |
| MIDDLE ATLANTIC. | | | | |
| Maryland | 4 | 3 | 2,152,975 | 422,935 |
| North Carolina | 21 | 21 | 16,535,350 | 4,432,847 |
| Pennsylvania | 7 | 7 | 4,372,874 | 1,139,344 |
| South Carolina | 9 | 9 | 15,129,319 | 3,734,579 |
| Virginia | 2 | 2 | 1,499,549 | 438,664 |
| Dist of Columbia | - | - | - | - |
| Total | 43 | 42 | 39,690,067 | 10,168,369 |
| SOUTHEAST | | | | |
| Alabama | 8 | 8 | 6,371,543 | 1,990,339 |
| Florida | 3 | 3 | 2,690,252 | 868,990 |
| Georgia | 20 | 18 | 19,026,999 | 4,485,895 |
| Mississippi | 8 | 8 | 1,370,692 | 414,947 |
| Tennessee | 6 | 5 | 7,528,500 | 1,764,250 |
| Puerto Rico | - | - | - | - |
| Virgin Islands | - | - | - | - |
| Total | 45 | 42 | 36,987,986 | 9,524,421 |
| OHIO BASIN. | | | | |
| Indiana | 1 | 1 | 120,000 | 36,000 |
| Kentucky | 2 | 2 | 1,192,942 | 357,882 |
| Ohio | 2 | 2 | 1,298,195 | 219,408 |
| West Virginia | 1 | 1 | 1,776,000 | 532,800 |
| Total | 6 | 6 | 4,387,137 | 1,146,090 |
| GREAT LAKES: | | | | |
| Illinois | 18 | 17 | 25,413,949 | 6,711,975 |
| Iowa | 20 | 19 | 12,932,399 | 4,150,755 |
| Michigan | 33 | 25 | 37,005,212 | 8,586,510 |
| Minnesota | 40 | 38 | 14,453,503 | 4,271,346 |
| Wisconsin | 35 | 33 | 12,108,742 | 3,253,563 |
| Total | 146 | 132 | 101,913,805 | 26,974,149 |

FWQA

LIST OF WASTE TREATMENT FACILITIES

IN WHICH INDUSTRIAL WASTES TREATED

REPRESENT 50 PERCENT OR MORE

OF TOTAL VOLUME OF WASTES

TREATED

COMPILED AS OF APRIL 1969 (continued)

| | | Federal grants | | |
|---|---|---|---|---|
| | Number of facilities | Number of facilities for which grants awarded by FWQA | Eligible costs | Amount of grant |
| MISSOURI BASIN. | | | | |
| Colorado | 4 | 4 | $ 1,701,593 | $ 519,956 |
| Kansas | 12 | 11 | 12,363,317 | 3,685,422 |
| Missouri | 25 | 19 | 75,424,840 | 7,817,558 |
| Nebraska | 27 | 27 | 31,282,472 | 4,958,702 |
| North Dakota | 3 | 3 | 734,554 | 227,367 |
| South Dakota | 8 | 8 | 2,703,442 | 811,371 |
| Wyoming | - | - | - | - |
| Total | 79 | 72 | 124,210,218 | 18,020,376 |
| SOUTH CENTRAL: | | | | |
| Arkansas | 18 | 18 | 6,529,614 | 1,897,026 |
| Louisiana | 2 | 1 | 33,800 | 10,140 |
| New Mexico | - | - | - | - |
| Oklahoma | 17 | 17 | 4,251,332 | 1,313,639 |
| Texas | 5 | 5 | 1,524,603 | 454,563 |
| Total | 42 | 41 | 12,339,349 | 3,675,368 |
| SOUTHWEST | | | | |
| Arizona | 1 | 1 | 1,874,167 | 562,250 |
| California | 10 | 8 | 4,171,512 | 1,214,990 |
| Guam | - | - | - | - |
| Nevada | - | - | - | - |
| Utah | - | - | - | - |
| Hawaii | - | - | - | - |
| Total | 11 | 9 | 6,045,67° | 1,777,240 |
| NORTHWEST | | | | |
| Alaska | - | - | - | - |
| Idaho | 3 | 3 | 220,585 | 66,175 |
| Montana | - | - | - | - |
| Oregon | 1 | 1 | 205,812 | 61,740 |
| Washington | 14 | 14 | 4,177,097 | 1,251,785 |
| Total | 18 | 18 | 4,603,494 | 1,379,700 |
| TOTAL | 411 | 381 | $359,726,982 | $80,694,426 |

COMPARISON OF TOTAL ESTIMATED FACILITY CONSTRUCTION COSTS AND CONSTRUCTION GRANTS FOR APPROVED AND PENDING FWQA CONSTRUCTION GRANTS

| | Number of facilities | Estimated facility construction costs | Construction grant offers/ requests | Average facility construction costs | Average construction grant offer/ request |
|---|---|---|---|---|---|
| GRANTS APPROVED THROUGH JUNE 30, 1969 | 8,969 | $5,791,099,401[a] | $1,191,388,005 | $ 645,679 | $132,834 |
| GRANTS PENDING | | | | | |
| In FWQA regional offices (note b) | 405 | $ 599,067,651 | $ 191,295,440 | $1,479,179 | $472,334 |
| In State agencies (note b) | 1,261 | 1,327,451,006 | 568,456,394 | 1,052,697 | 450,798 |
| Other reported applications (note b) | 2,982 | 3,104,719,687 | 1,541,246,605 | 1,041,153 | 516,849 |
| Total pending grants | 4,648 | $5,031,238,344 | $2,300,998,439 | $1,082,452 | $495,051 |

[a]Estimated eligible costs were $5,217,338,685. Total estimated construction costs were used because estimated eligible costs were not available for pending grants.

[b]Applicants' estimates which may include some ineligible costs.

APPENDIX IV

## PRINCIPAL OFFICIALS OF THE DEPARTMENT OF THE INTERIOR RESPONSIBLE FOR ADMINISTRATION OF THE ACTIVITIES DISCUSSED IN THIS REPORT

| | Tenure of office | |
|---|---|---|
| | From | To |
| SECRETARY OF THE INTERIOR: | | |
| Walter J. Hickel | Feb. 1969 | Present |
| Stewart L. Udall | Jan. 1961 | Jan. 1969 |
| ASSISTANT SECRETARY FOR WATER QUALITY AND RESEARCH (note a): | | |
| Carl L. Klein | Mar. 1969 | Present |
| Max N. Edwards | Dec. 1967 | Feb. 1969 |
| Frank C. Di Luzio | July 1966 | Dec. 1967 |
| COMMISSIONER, FEDERAL WATER QUALITY ADMINISTRATION (note b): | | |
| David D. Dominick | Mar. 1969 | Present |
| Joe G. Moore, Jr. | Feb. 1968 | Mar. 1969 |
| James M. Quigley | Mar. 1966 | Jan. 1968 |

[a]Designated as Assistant Secretary for Water Pollution Control until October 1968.

[b]The Federal Water Quality Administration was transferred from the Department of Health, Education, and Welfare in May 1966.



U S GAO Wash , D C