

IMPLEMENTATION OF THE CONSTRUCTION
GRANTS PROGRAM OF THE FEDERAL WATER
POLLUTION CONTROL ACT OF 1972.

Frank J. Koiro

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GRANTS PROGRAM OF THE
FEDERAL WATER POLLUTION CONTROL ACT OF 1972

by

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IMPLEMENTATION OF THE CONSTRUCTION
GRANTS PROGRAM OF THE FEDERAL WATER
POLLUTION CONTROL ACT OF 1972

Frank J. Koiro Jr., M.S.C.E., M.P.W.
University of Pittsburgh, 1975

This thesis is an attempt to determine the problems encountered in implementing the construction grants program and what effect these problems have had on accomplishing the goals of the Water Pollution Control Act Amendments of 1972.

The Federal Water Pollution Control Act Amendments of 1972 are most probably associated with the goal of elimination of pollutant discharge into navigable waters by 1985, the so called "zero discharge" requirement. In order to meet this goal publicly owned treatment works are required to comply with two interim standards, first by 1 July 1977 treatment works must meet effluent limitations based upon secondary treatment as a minimum; secondly, by 1 July 1983 all

plants approved after 30 June 1974 must provide for the application of the best practicable waste treatment technology over the life of the works.

In order to help meet the Acts goals of cleaning up the nation's waters, the Act provides grant funds for the construction of wastewater facilities. The legislation provides that the Federal Government can fund 75 percent of the estimated total cost of construction of each individual project.

This thesis examines such requirements of the Act as user charges, industrial cost recovery, infiltration/inflow, environmental impact statements and standards of secondary treatment to determine in what way they impacted upon municipalities. Not only have the requirements of the Act placed added burdens upon the state and local governments, but also the administration of the Act has had an effect in slowing down the grants program. The areas of EPA management, state participation and impoundment of funds will be examined in order to determine their effect on the program.

An Act, as far reaching as this one, is affected by factors within the program, and from without. Accomplishment of the construction of treatment works is accomplished by architect and engineering firms and contractors outside the system. The capacity of the construction industry, number of design engineers, and supply of materials can have an effect on the achievement of the goals of the Act, with respect to completion times and costs of the projects.

The Act provides grant funds for the construction of wastewater treatment facilities, although these funds are not in the amounts necessary to meet the needs of all local governments. The estimates proposed by local governments and state water pollution control agencies to determine the total costs of the goals of the 1972 Act are much greater than the funds authorized by Congress to date.

Local Governments will need the continuing financial support of the Federal Government to accomplish the goals set forth in the Act. The level of this support will be the determining factor as to when the goals will be accomplished.

DESCRIPTORS

Wastewater Treatment	Administration
Construction Grants	Federal Assistance
Water Pollution	Capital Financing

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1.0 INTRODUCTION

1.1 General

"The generation of wastes is an inevitable consequence of life."^{(1)*} Due to increases in population, a rising standard of living and extensive industrial development, waste generation has increased in recent years. With this increased quantity of wastes being discharged into our waterways, both rivers and estuaries, the assimilative capacity of the waters has been exceeded in many places.

The resources of the earth are not unlimited. Moreover, man's actions can cause a shift in the balance of the environment. The percentage of water and land on this planet are relatively fixed; man living almost exclusively on land has the major impact on his environment. Increases in population add new strains on the environment by using natural resources to fulfill the needs of an increased population and also add to the stress of pollution. Water is one of the major resources required and utilized by man. When there is a sparse population and when discharges are simple in composition there is little reason for concern.

However, as our population, cities and industries grew, increasingly frequent conditions of water pollution became a reality. "Attempts over the past 40-50 years to control or prevent water

* Parenthetical references placed superior to the line of text refer to the Bibliography.

pollution through state and federal legislation were usually inadequate."⁽²⁾ The procedure had been to provide minimizing treatment and maintain a "dump it in attitude or philosophy."⁽²⁾

The sixties and seventies could be considered the beginning of a greater awareness of the environment by both individuals and environmentalist groups. Within the background of this era Congress passed the Water Quality Act of 1965, which required the states to establish receiving water quality standards, together with implementing plans to achieve these standards.

Congress felt that the act was not providing sufficient funds to clean up the nations waters as rapidly as they had envisioned and following lengthy hearings and numerous conferences, both Houses overrode a Presidential veto and passed the Federal Water Pollution Control Act Amendments of 1972, which represented a rewriting of the Federal Water Pollution Control Act.

The Act was a voluminous one and covered effluent standards, a grants program, permit program, areawide waste treatment management, basin planning, thermal discharges and toxic pollutants which applied in varying degrees to both municipal and industrial polluters.

"The 1972 Act attempts to restore environmental balance by protecting aquatic ecosystems which are the basic elements of a food chain involving man."⁽³⁾ The Act sets forth a framework under which this is to be accomplished.

1.2 Significance of Municipal Waste Water Treatment

There are 3 million miles of streams in the United States.⁽⁴⁾ An inventory of the water quality in each would be an impossible undertaking. It would take 1,000 inspectors covering a mile each day eight years to do so, and probably upon completion the data obtained would be outdated. Federal officials have tallied how much of 260,000 stream miles in our major drainage basins is markedly polluted. In 1971 it amounted to almost one mile out of every three.⁽⁵⁾ One indicator of the possible scope of the problem is the relative use of water that ends up as fluid waste in rivers, lakes and estuaries.

The biggest user is industry which uses 200 billion gallons a day, two-thirds of which is used for cooling, agriculture uses 150 billion gallons a day, of which 60 percent is actually consumed in producing crops;⁽⁶⁾ and municipalities use 40 billion gallons of water a day.⁽⁷⁾ About 8500 accidental and deliberate oil spills⁽⁸⁾ contaminate our coastal and inland waters each year. Everyday large volumes of stormwater drain into waterways bringing with it tons of pollutants and eroded soil. More than 62 million tons of garbage, sludge, chemicals, explosives, debris, and dirt are dumped off our coasts each year.⁽⁸⁾

Because of the scope and diverse nature of water pollution problems they cannot be solved overnight. Moreover, the money and manpower available for accomplishing the task are limited. The 1972 Act puts emphasis on cleaning up pollution from all sources;

however, the funding thrust is for action in reducing pollution from municipal sources. About 1500 municipal wastewater facilities are discharging untreated sewage and some 2700 plants provide only primary treatment of wastes⁽⁹⁾ which accounts for 20 percent of the pollutant load dumped into the nations waters.⁽¹⁰⁾ Table 1-1 shows that the growth of sewerage services has increased over the years. The percent of sewered population to total population has increased from 3% in 1860 to 76% in 1973. Also the percent of treated population to the number of sewered population has increased from 34% in 1932 to 97% in 1973.

Table 1-1⁽¹¹⁾

Expansion of Public Sewerage

Year	U.S. population	Unsewered population	Sewered population	Sewage untreated	Sewage treated
(millions of persons)					
1860	31	30	1	1	0
1870	39	34	5	5	0
1880	50	40	10	n.a.	n.a.
1890	63	47	16	n.a.	n.a.
1900	76	51	25	n.a.	n.a.
1904	82	54	28	27	1
1910	92	57	35	31	4
1915	99	57	42	n.a.	n.a.
1920	106	58	48	n.a.	n.a.
1930	123	62	61	n.a.	n.a.
1932	125	63	62	41	21
1940	133	66	67	30	37
1945	140	70	70	28	42
1948	145	72	73	28	45
1957	171	73	98	24	74
1962	186	68	118	17	101
1968	198	58	140	11	129
1973	210	47	163	4	159

Table 1-2 reviews the breakdown of type of treatment received by those communities which were sewered in the various years.

Table 1-2⁽¹²⁾

Degree of Sewage Treatment

Year	No treatment	Primary treatment	Intermediate treatment	Secondary treatment	Tertiary treatment
(millions of persons served by sewerage facilities)					
1937	35.8	16.7	2.8	16.3	-
1940	29.9	15.1	3.3	18.9	-
1945	27.9	17.2	3.8	21.7	-
1948	28.0	18.4	3.6	22.7	-
1957	23.8	25.7	5.6	43.3	-
1962	17.0	32.7	7.4	61.2	-
1968	10.9	36.9	5.9	85.6	0.3
1973	3.9	46.3	5.9	103.9	2.8
Annual rate of change,					
1937-1973	-8%	+4%	+3%	+7%	-

Table 1-3 is included to indicate the levels of collection and removal of BOD. While treatment facilities increased the amount of BOD removed from our waters, sanitary sewers apparently have brought more BOD for treatment. This is indicated by the fact that the amount of BOD discharged by treatment plants only varied by 8.4% for the selected years.

Table 1-3(13)

Effect of Sanitary Sewage Treatment

Year	Collected by sanitary sewers *	Reduced by** treatment	Discharged by treatment plants
(millions of pounds of BOD ₅ per day)			
1957	16.4	7.7	8.7
1962	19.8	10.8	9.0
1968	23.3	15.0	8.3
1973	27.1	18.5	8.6

* Based on 0.167 pounds of BOD₅ per sewerer person per day.

** Based on the distribution of treatment facilities shown in Table 1-2 and on estimates of removal efficiency from a variety of sources.

To meet the Act's requirement of secondary treatment areas receiving no treatment and those receiving primary treatment will need to be upgraded. Even the areas where there is secondary treatment may have to be upgraded to meet the Act's even more stringent requirements.

1.3 Objective of the Study

1.31 Primary Objective

The primary objective of this study is to determine the problems encountered in implementing the requirements of the Municipal Construction grants program and the possible effect they will have on the accomplishment of the goals of the Water Pollution Control Act Amendments of 1972.

1.32 Secondary Objective

The Secondary objective of this study is to review other related areas such as manpower requirements and future funding and their effect on accomplishing the goals of the Water Pollution Control Act Amendments of 1972.

1.4 Methodology

This study will review the construction grants program of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500).

Information will be obtained from:

- (A) a review of the enabling legislation;
- (B) a review of current publications dealing with the Act;
- (C) a review of current theses dealing with the requirements of the Act;
- (D) a review of Government reports dealing with the Act;
- (E) interviews with individuals within the Environmental Protection Agency;
- (F) interviews with individuals within the Pittsburgh office of the Department of Environmental Resources.

In reviewing the problem area of construction grants, an attempt will be made to set forth the requirements of the Act involved, present problems that have arisen, reasons why they occurred and present any impending proposals which in some significant way could alter the Act.

With any Act as complex as PL 92-500 the problems and emphasis that are paramount during the early years of its existence are not necessarily those which will be more important or pressing in the future. Various areas associated with the Act such as manpower availability, equipment availability, construction capability which may have a future impact will be reviewed. Where possible the views of the Pittsburgh region personnel of the Pennsylvania Department of Environmental Resources will be provided in an attempt to give a comparison with those views held on the national level.

An essential, if not the most essential, aspect of the Act is the matter of compliance. No program such as this which is envisioned to reduce the pollution of water can be successful unless the law is complied with. The matter of compliance will be reviewed from the area of funding needed to comply with the requirements of the Act.

1.5 Limitations to the Methodology

Limitations to the methodology employed in this study include:

(A) The complexity and far-reaching implications of the law and the number of municipalities which are affected preclude the surveying of each one. The information received will necessarily be of an overview of the total problem with case studies utilized whenever possible.

(B) The time frame under which this study was undertaken was such that all possible sources of information and views of divisions of governments and interested organizations may not have been presented.

(C) Those problems foreseen for the future are problems that are envisioned now and only experience will determine the true areas of future difficulty. Thus, the full scope of problems is still a matter for speculation rather than one which has been fully defined in qualitative and quantitative terms.

1.6 Organization and Content

The subsequent sections will be developed to meet the objectives of this study. Section 2.0 will deal with the objectives and goals of the Federal Water Pollution Control Act Amendments of 1972. Section 3.0 will describe the objectives and goals of the Clean Streams Act of Pennsylvania and describe how it interacts with the Federal Act. Section 4.0 will review the requirements of the construction grant process. Section 5.0 will present problems with implementation of the Act as viewed by Federal, State and municipal levels of government. Section 6.0 will review what effect the problems have had on funding of construction grants. Section 7.0 will review associated areas which may have an impact on meeting the Acts goals and deadlines. Section 8.0 will look at what effect funding could have on the goals of the Act.

Section 9.0 will present conclusions and recommendations.

2.0 THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972

2.1 The Purpose of the Amendments

2.11 General Background

The Federal Government's role in the area of water pollution control or abatement is not a new one; the Government has been involved to some degree since the beginning of the century. A review of Federal Water Pollution control legislation indicates how Federal authority has expanded from the prohibition of the discharge of non-liquid wastes into navigable waters by the Rivers and Harbors Act of 1899 to the present Federal mandate to eliminate the discharge of pollutants into the navigable waters by 1985.*

The 1972 Federal Water Pollution Control Act Amendments are probably most associated with the provision of zero discharge of pollutants. The Act was passed by both Houses of Congress and sent to the President who vetoed it. President Nixon stated that:

"pollution of our rivers, lakes and streams degrades the quality of American life. Cleaning up the Nation's waterways is a matter of urgent concern to me, as evidenced by the nearly tenfold increase in my budget for this purpose during the past four years. The law would exact an unfair and unnecessary price from the public and I am compelled to withhold my approval."⁽¹⁴⁾

Congress in a vote of almost unprecedented dimensions overrode the Presidential veto and enacted the Federal Water Pollution

* Appendix A contains a Summary of Federal Water Pollution Legislation.

Control Amendments of 1972. That action was hailed by many as a major milestone in the struggle for a cleaner environment. It was viewed as a decisive commitment of money and effort to a top national priority which Congress manifestly regarded as exceedingly urgent. "For many both in Congress and out, it was a time of great expectations. After 16 years of solid experience in a Federal-State matching program, we were ready for this effort to move rapidly into a higher gear."⁽¹⁵⁾

2.12 The Goals and Policies

The goals and policies of the Amendments are:⁽¹⁶⁾

2.121 Zero Discharge. It is the national goal that the discharge of pollutants into navigable waters be eliminated by 1985.

2.122 Interim Water Quality. A national goal was set whereby, whenever possible, an interim goal of water quality which will provide for the protection and propagation of fish, shellfish, and wildlife and also provide for recreation in and on the water be achieved by 1 July 1983.

2.123 Toxic Pollutants. It is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited.

2.124 Federal Financial Assistance. Federal grants were made available to construct publicly owned waste treatment works.

2.125 Areawide Management Planning. The Act provided funds for the development of areawide waste treatment management planning processes and implementation of such processes thus assuring adequate control of sources of pollutants.

2.126 Research and Development. A major research and demonstration effort with funding and direction from EPA be made to develop the technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone and the oceans.

2.127 States' Role. The Act recognizes, preserves and protects the primary responsibilities and rights of states to prevent, reduce, and eliminate pollution and also to plan the development and use of land and water resources. It is further the policy to provide Federal technical services and financial aid to state and interstate agencies and municipalities in connection with the prevention, reduction and elimination of pollution.

2.128 Public Participation. Public participation in the development, revision and enforcement of any regulation, standard, effluent limitation, plan or program established by the Administrator for any state under this Act is provided for and encouraged, and assisted by the Environmental Protection Agency and the states.

2.129 Minimization of Paperwork. It is the national policy that to the maximum extent possible the procedures utilized for implementing the Act will encourage the minimization of paperwork, and

interagency decision procedures. The Act also encourages the best use of available manpower and funds thus preventing needless duplication and unnecessary delays at all levels of government.

2.2 Municipal Impact of the Amendments

Additional impacts can be found in T. J. Eggum's thesis.⁽¹⁷⁾

2.21 The Timetable for Accomplishing the Goals

The ultimate goal of the Act, that of achieving zero discharge has been set at 1985. However, two intermediate goals have been mandated to facilitate achieving this goal. The mandated zero discharge is a goal, not a national policy.

2.211 Interim Water Quality Goal. Publicly owned treatment works in existence on 1 July 1977 are required by Section 301 of the Act to meet effluent limitations based upon secondary treatment. As of this time the required limits for secondary treatment are:⁽¹⁸⁾

(A) An effluent containing a weekly average not to exceed 45 milligrams per liter and a monthly average not to exceed 30 milligrams per liter.

(B) Suspended solids are not to exceed 45 milligrams per liter for the weekly average and are not to exceed 30 milligrams per liter for the monthly average.

(C) The effluent values for pH are to lie between 6.0 and 9.0.

For those treatment works approved prior to 30 June 1974 the above standards must be met four years after start of construction but not later than 1 July 1978.

The effluent limitations based upon secondary treatment are to be considered as minimum levels of compliance. In instances where more stringent limitations on water quality standards and treatment standards, etc. have been established by state law, then municipalities must comply with these higher limitations.

2.212 The "Best Practicable Waste Treatment Technology" by 1983.

By 1 July 1983, wherever possible, water is to be of such quality that it is clean enough for swimming and other recreational uses, and clean enough to protect fish, shellfish and wildlife.⁽¹⁹⁾

What constitutes "best practicable treatment" has not been specifically defined by the Environmental Protection Agency, however, it simply considers three broad classifications of technological approaches: land utilization and land application, treatment and discharge, and reuse technology.⁽²⁰⁾

Information is provided so that municipalities, keeping in mind the cost effectiveness regulations of the grant procedures, can determine which alternative process to utilize in order to achieve the best results. The Act also sets other deadlines regulating such items as available grants and planning assistance. These requirements will be discussed later.

2.22 Penalties for Violation of the Act

The Administrator of the Environmental Agency can issue compliance orders and bring civil action to halt the pollution of the waters of the United States. In requesting relief he may obtain a temporary restraining order or a preliminary injunction until the case is decided in court.⁽²¹⁾ Penalties for civil action are not to exceed \$10,000 per day of violation. Willful or negligent violators are subject to more severe penalties. Those who falsify permit applications, misrepresent information or tamper with monitoring devices may be subject to a fine of \$10,000 per day. Criminal violations of any standard, limitation, or permit condition are subject to fines of between \$2,500 and \$25,000 per day of violation and/or one year imprisonment.⁽²²⁾ These penalties double if the violation is committed after a first conviction.

2.23 National Pollutant Discharge Elimination System

The permit program created by the Act improves upon the old permit system under the 1899 Refuse Act.⁽²³⁾ It is part of the comprehensive effort of the 1972 Act to reduce, prevent, and eliminate water pollution. The permit is not a license to pollute, rather it regulates what may be discharged and how much. The permit sets specific limits on the effluent from each source. If the discharger cannot comply immediately, the permit sets target dates for accomplishment. This is a commitment to reduce or eliminate discharges in specified steps at specified times. If a permit con-

tains a compliance schedule, each step is enforceable before final compliance. These commitments are legally enforceable. The permit system also requires dischargers to monitor their wastes and to report the amount and nature of all waste components. A National Pollutant Discharge Elimination System permit, in essence, is a contract between the government and a discharger. A violation of the contract could subject the discharger to penalties as described in the previous section.

2.24 Planning

The 1972 Act greatly expands the emphasis given to planning and establishes a comprehensive program to improve coordination between various water pollution control activities at different levels of government. Ten separate sections of the law deal specifically with planning programs. (24)

2.241 Municipal Facilities Plan. Municipal facility planning is designed to provide orderly development and submission of applications for Federal funding of waste treatment plants. Administered by currently designated municipal authorities, this planning system is designed to serve in the interim and minimize interruptions until the more complex areawide planning system is approved by the Environmental Protection Agency. At a minimum, all municipal facility plans will include: (25)

(A) a cost-effectiveness analysis of all available alternatives in order to select the most efficient treatment for the needs

of the municipality;

- (B) an evaluation of alternatives for advanced sewer systems;
- (C) an evaluation of alternative sites and service areas;
- (D) an environmental assessment of the project;
- (E) an analysis of costs of all elements in the system

to meet water quality standards for a 20-year period following construction.

2.242 Areawide Planning. The 1972 law inaugurated a special program for urban-industrial areas with substantial water pollution problems. The program calls for coordinated areawide planning to identify and provide municipal and industrial waste treatment. EPA is responsible for identifying areas where planning is required and the states are required to designate the boundaries of areas requiring areawide planning and to designate an agency to develop an effective regional plan. If a state fails to act, the elected officials within an area may make the designations themselves, subject to EPA approval. By July, 1974, each designated agency must have an areawide waste treatment management planning process in operation, and by July, 1976, the agencies first plan must be certified by the state and submitted to EPA for approval.⁽²⁶⁾ After an areawide plan is approved, EPA construction grants may be awarded to publicly owned treatment plants within the area only if they conform to the approved plan. No permit under Section 402 of the Act will be issued for any point source which is in conflict with an approved plan.

2.243 Basin Plans. In the past, states have held the primary role for setting and enforcing water quality standards. In the new Act, states retain this responsibility, yet have the added duty of protecting water quality standards by insuring that no effluent limitation written into a permit was inadequate for that purpose.⁽²⁷⁾ Since a complex relationship exists between effluent discharges and water quality, the permit issuance process must be coordinated with an overall study and planning program on water quality.

Section 303 (e) of the Act deals with basin plans. This section constitutes the overall framework within which 208 plans are developed for specific segments of a basin. Basin plans provide:⁽²⁸⁾

- (A) water quality standards and goals;
- (B) definite critical water quality conditions;
- (C) waste load constraints;
- (D) help in delineating 208 area boundaries.

From a monitoring program for each stream, segments will be classified into one of two categories, indicating the severity of pollution. These categories are: effluent limited which will require secondary treatment under the law, and water quality limited which will require treatment above secondary treatment for attainment of the water quality standard.

2.25 Funding Authorized by the Amendments

The Amendments authorize \$24.6 billion as the federal share for compliance with the requirements of the amendments. As states

and municipalities also contribute a portion, the total is somewhat higher.

Probably the most widely known portion of the Amendments is Section 207 which authorizes \$18 billion to be spent for "treatment facilities." Section 206 allows for the reimbursement of the federal share of projects built between 1956 and 1972 which were undertaken without federal aid. This section appropriated \$2.75 billion for reimbursement. Other funding for training, planning, research and development are also provided in the Amendments.

2.3 Appraisals of the Amendments

A few appraisals are presented here to give some insight into early reactions to the Amendments. Additional appraisals can be reviewed in T. J. Eggum's Thesis.⁽¹⁷⁾

2.31 Congressional Views

Prior to passage of the Amendments at least one congressman had some reservation. Senator James L. Buckley said, "the Act seems destined to be controversial because it may attempt to achieve too much on the basis of too little information."⁽²⁹⁾ With regard to whom should have final responsibility over domestic spending Representative Jim Wright replied, "The final authority should be based on constitutional guidelines, which give Congressional control over domestic spending."⁽³⁰⁾ Others felt that it would be wise for Congress, through the appropriations process, to make an

annual examination of the justification for funds to be spent for waste treatment grants.⁽³¹⁾ Some congressmen contended that a permit program run by 50 different governments without any meaningful federal control would become an environmental nightmare.⁽³²⁾

Senator Buckley felt that the Act "may threaten in too many instances to reduce the role of the states and local governments to that of errand boy so that the bill may, in fact, encourage states to withdraw from the national effort."⁽²⁹⁾

2.32 The States Views

Ralph Purdy, executive secretary of the Michigan Water Resources stated "the program is unstable, is encumbered by administrative delays, and contains insufficient funds to meet the goals within the specified time frame."⁽³⁰⁾ Fred A. Harper, general manager of the County Sanitation Districts of Orange County, California cited "the lack of program coordination and stability, the need for realistic timetables, the duplication of work, the lack of established priorities, and erratic funding as reasons for the impossibility of accomplishing the goals of the law as it stands."⁽³⁰⁾

In regard to the permit requirements of the Act, Jack K. Smith, executive secretary of the Missouri Clean Water Commission, indicated they would place a burden on both the states and Federal government staffs.⁽³⁰⁾

2.33 Professional and Technical Views

During the 14th Annual Government Affairs Seminar, J. Floyd Byrd, then president of the Water Pollution Control Federation, in discussing the possibilities for progress under PL 92-500 stated that "the only way to make this enormously complex document effective is through a cooperative effort of a team consisting of all sectors of our society."⁽³³⁾

3.0 THE CLEAN STREAMS LAW OF PENNSYLVANIA

3.1 The Purpose of the Law

3.11 General Background.

Prior to any specific legislation regarding pollution, legal protection was given to public water supplies by the courts under the common law doctrine of public nuisance.⁽³⁴⁾ The basis for the first Clean Streams program in Pennsylvania was the passage of the Purity of Waters Act of Pennsylvania PL 260 on 22 April 1905. This first comprehensive statute concerning the purity of the streams declared it a misdemeanor to discharge sewage into the waters of the Commonwealth without a permit. The effect was to make the action of discharging sewage into any stream a public nuisance. Only pollution caused by domestic sewage was applicable to the Act.⁽³⁴⁾

The Clean Streams Law Act 394, PL 1987 was approved by the Pennsylvania legislature on 22 June 1937; this was the first and presently operative general antipollution statute. The law designated the Sanitary Water Board, changed in 1971 to the Environmental Quality Board, whose duty it was to protect the waters of the Commonwealth from pollution. Not only the discharge of sewage, but also industrial wastes were brought under legal prohibitions.

The Clean Streams Law is the primary statute for water pollution control in Pennsylvania; however, other laws do have an effect and those most commonly utilized are listed in Appendix B.

3.12 The Goals of the Law⁽³⁵⁾

The law states that the discharge of sewage or industrial wastes into the waters of the Commonwealth, which causes or contributes to pollution, as defined within the Law, or creates a danger of such pollution, is not a reasonable or natural use of such waters, and is against public policy and is a public nuisance.

The goal is not only to prevent further pollution of the waters but also to reclaim and restore to a clean unpolluted condition those streams that are presently polluted in order to protect the public health, animal aquatic life and provide for the use of the waters for domestic, industrial and recreational purposes.

3.13 Standards

Whereas the Federal Law PL 92-500 is based on effluent limitations, regulating the amount of pollutants being discharged from particular point sources, the Clean Streams Law is predicated on water quality standards, regulating the amount of pollutants in a given body of water. Chapter 93 of the Department of Environmental Resources Rules and Regulations sets forth water quality criteria for the waters, based upon uses which are to be protected. The waters are basically broken down into three groups each one having limits for pH, dissolved oxygen, iron, temperature, dissolved solids, and bacteria. By review of Appendix C it can be seen that the various segments of the Commonwealth's waters are being classified in accordance with the guidelines of PL 92-500.

3.14 Timetable for Accomplishment of Goals

The State law does not contain any specific dates for accomplishment of the goal of preventing pollution.

3.15 Permits

The State law does not permit the discharge of sewage in any manner, directly or indirectly, into the Commonwealth's waters unless it is authorized by the rules and regulations of the Department of Environmental Resources or a person or municipality has first obtained a permit for such discharge. The State program is similar to that of the National Pollutant Discharge Elimination System (NPDES) with regard to the requirement that a permit must be obtained before discharging into the waters. The system appears to be the same; however, the results may not be. As discussed in Section 3.13 the Pennsylvania law is based upon the amount of pollutants in the body of water in question. Under the existing state law there could exist a valid permit for discharge which required only primary treatment, whereas under the Federal permit secondary treatment is the minimum acceptable.

3.16 Planning

The Clean Streams Law further provides that all plans, designs, and data for the construction of sewer systems, treatment works or intercepting sewer systems, will be submitted by the municipality for approval before construction begins. This state process could

be considered the same type of check or review that is required by the Federal law before a municipality is awarded grant money for the project.

Another aspect of the Clean Streams Law allows the board to require that municipalities undertake studies; prepare and submit plans; acquire, construct, repair, alter, complete, extend, or operate a sewer system or treatment facility; or negotiate with other municipalities for combined or joint sewer systems or treatment facilities. The orders may also extend to a prohibition on sewer systems extensions or any additional connections in order to prevent overtaxing of treatment plants. While not exactly the same as Section 208 of PL 92-500 the State Law has elements which could require the same type of regional approach to the water pollution problem as provided for in the Federal Law.

3.17 Penalties ⁽³⁶⁾

Any municipality which violates any provision of the Clean Stream Law or any rule or regulation or order of the Environmental Quality Board is guilty of a summary offense and upon conviction is subject to a fine of not less than one hundred dollars nor more than one thousand dollars for each separate offense. Failure to make payment of the fine could result in imprisonment for a period of up to sixty days. A second conviction within two years of the first subjects the violator to a fine of not less than one hundred dollars nor more than five thousand dollars.

All summary proceedings may be brought before any magistrate, alderman or justice of the peace of the county where the offense occurred or where the public is affected. Civil penalties, not exceeding ten thousand dollars plus five hundred dollars for each day of continued violation are provided for in the Law. In determining the amount of the civil penalty such factors as, willfulness of the violation, damage or injury to the waters, cost of restoration and other relevant factors will be considered.

3.2 Interaction of State Laws with the Federal Law

The State of Pennsylvania Clean Streams Law is being used as an example of one state's approach to the water pollution problem. It is not intended to imply that all state laws should be similar to Pennsylvania's.

The interaction of State and Federal laws is of importance in several areas. In the matter of standards a municipality could be subject to both State and Federal regulations, however, the Federal regulations must be adhered to as a minimum.

A municipality could also be required to obtain both a State and a Federal permit for discharges from a wastewater treatment plant, if the State has not assumed responsibility of issuing NPDES permits. This could be very cumbersome, both in the area of applying for permits and in enforcement of them. It is very possible that a municipality could have two, three or more people

inspecting their treatment plant for violations.

Municipalities operating under State laws having no timetables for eliminating pollution will have to comply with the Federal mandates.

4.0 CONSTRUCTION GRANT PROCESS

A major element of the Federal Water Pollution Control Act Amendments of 1972 authorized the Federal Government to award grants to municipalities to help finance construction of waste water treatment facilities to meet the goals previously stated in Section 2.21.

The initial step in the review of the grants program, the process whereby a project is developed, needs to be reviewed. Such a review will be useful in order to determine the actual project requirements and also to provide a framework to analyze municipal, state, and federal complaints about the requirements and/or administration of the Act.

The process described below consists of five stages of development with Federal grants available for the facilities planning, design, and construction stages. The facilities planning, design and construction stages correspond to Steps 1, 2, and 3 of the construction grants program.

4.1 Stages of Project Development

The following sections will explain the requirements of the five stages a project goes through from its conception to final operation. It appears that there is duplication in the review and approval process. This duplication will be outlined in a general way in the following sections.

4.11 Preapplication Stage⁽³⁷⁾

During this stage the locality selects an architectural-engineering consultant, who then holds a conference with State and EPA personnel in order to have the facilities planning requirements explained. Following preparation of the Step 1 application it is submitted to the State and to EPA for review and approval. This application is then entered on the State's project priority list for Step 1 funding.

4.12 Facilities Planning Stage (Step 1)⁽³⁸⁾

The second stage which corresponds to Step 1 of the construction grant process begins with the approval of a grant by EPA for preparing the facility plan. The consultant usually prepares the plan for the municipality which submits it to the State and EPA for review and approval. The entire plan or its components must be resubmitted until they are approved. During this stage EPA either prepares an environmental impact statement, or declares that such a statement is not necessary.

4.13 Design Stage (Step 2)⁽³⁹⁾

The design stage or Step 2 in the grant process begins with the preparation of the application for a design grant which must be reviewed by the State and EPA. Upon selection and before a grant is received the grantee must have signed letters of intent from each significant industrial user to satisfy industrial cost

recovery requirements. Additionally, the Administrator must have determined that the grantee has adopted or will adopt a system of user charges. Upon approval of a grant the consultant then prepares the plans and specifications which again must be reviewed by both the State and EPA and resubmitted until found acceptable. From a list of completed designs the State enters projects on a priority list as eligible for a Step 3 grant.

4.14 Construction Stage (Step 3)⁽⁴⁰⁾

After award of a Step 3 grant the grantee advertises for construction bids, selects a responsive low bidder and, submits all bids to the State and EPA for approval. Upon approval the grantee is given authority to award a construction contract. As construction continues the State and EPA conduct interim construction inspections while the grantee completes his user charge and industrial cost recovery system. During this time the State and EPA approve the Operation and Maintenance Manual. Upon project completion, final inspection and audit, final payment is made.

4.15 Operation and Maintenance Stage⁽⁴¹⁾

During this period the plant is operated and maintained by the municipality. The user charge fee system provides funds for continued operation and industrial cost recovery payments are collected. Compliance monitoring is conducted along with inspections by State and EPA to assure proper operation and compliance with the

conditions of the plant discharge permit.

4.2 Facilities Planning Guidelines⁽⁴²⁾

Full compliance with the facilities planning provisions of the Act will be required prior to award of grant assistance for Steps 2 or 3. To better understand the scope of the requirements of Facilities Planning a brief summary of their content is given below. Facilities planning which is initiated after 30 April 1974 must encompass, to the extent deemed appropriate by the Regional Administrator, the following:

(A) a description of the treatment works to be constructed including cost estimates;

(B) a description of the waste treatment system of which the treatment works is a part;

(C) infiltration/inflow documentation;

(D) a cost-effectiveness analysis of alternatives for the treatment works and treatment system which is to include:

(a) the relationship of size and capacity of the alternative works;

(b) an evaluation of alternative flow and waste reduction measures;

(c) an evaluation of improved effluent quality attained by upgrading Operations and Maintenance of existing facilities;

(d) an evaluation of each alternative's ability to meet

applicable effluent limitations;

(e) identification of and provision for applying the best practicable waste treatment technology;

(f) an evaluation of the alternative means for disposal of treated wastewater and sludge;

(g) an assessment of the expected environmental impact of alternatives;

(E) copy of permit;

(F) required comments or approvals of relevant state, interstate, regional and local agencies;

(G) summary of public hearings on the plan;

(H) statement insuring the implementing authorities have the necessary legal, financial, institutional, and managerial resources available to insure the construction, operation, and maintenance of the proposed treatment works;

(I) statement that requirements of the Civil Rights Act of 1964 have been satisfied.

4.3 Interaction of Facility Planning and Areawide Planning

Section 208 of the Act provides for the development and implementation of areawide waste treatment management plans. Within these planning areas designated under Section 208 of the Act, any facilities plans, existing or underway, should be construed as a step toward and supplementary to the more comprehensive areawide

plan which when completed and approved, will supersede any existing facilities plans within that area. The intent of the areawide plan is to provide for integrated waste treatment management including industrial and non-profit source abatement measures and regulatory programs as well as municipal waste treatment facilities. The municipality preparing a facility plan should furnish a copy of their plan, upon its completion, to the designated areawide planning agency for comments, if no approved areawide plan is yet in existence.

4.31 Delays in Implementing Areawide Plans

EPA has had difficulty in publishing final guidelines for development and implementation of areawide waste treatment management plans.⁽⁴³⁾ The Act required EPA to publish areawide planning guidelines by 16 January 1973, however, they were not published until 14 September 1973. In its defense, EPA said that the guidelines were not released on time because time was required to receive responses from state and local governments interested in planning agencies, and because of lack of funds.⁽⁴³⁾

The delayed publication of areawide planning guidelines deferred EPA's approval of planning organizations and the preparation and approval of areawide waste treatment management plans. Due to these actions areawide planning regulation powers probably will not be effectively used to control and abate water pollution until FY 1977 or later.

Delays were not only caused by EPA, some states were slow to act for the following reasons:⁽⁴⁴⁾

(A) Some states felt areawide planning agencies were not needed if the state had been active in planning and implementing a water quality program.

(B) The plans of an areawide agency were not required to be submitted until 3 years after the agencies were designated and this could delay abatement actions in those states.

(C) Some municipalities view areawide planning as an encroachment on their local zoning authority which they are unwilling to relinquish. Therefore, they might not enter into required cooperative agreements.

(D) Designations of areawide planning agencies could compound the problems of local cooperation and agreement because of municipalities strong home rule attitude.

4.32 Impact on the Grants Program

Section 208 (d) requires that after approval of the areawide plan a waste treatment management agency is to be designated and only such designated agency can receive grants for construction of a publicly owned treatment works within that area.

At the present time few areawide waste treatment management plans have been undertaken, and few facilities are being proposed in areas with areawide planning.⁽⁴⁵⁾ In the absence of these plans in the majority of instances, single municipal facilities plans

will be the principal source of planning.

This requirement for another review of the facility plan by an areawide planning agency has the potential for causing delay in approval of these Step 1 requirements. With a single community the problems could be many, but with an areawide approach the problems could be multiplied many times over.

The construction grants program is being reviewed without the constraint of areawide planning since a sufficient amount of material is not available to provide actual experience with its effects upon the grant program. Future reviews of the grant program will need to consider areawide planning since this concept of combating water pollution could cause delay in the initial Step 1 stage of the construction grants process.

5.0 IMPLEMENTATION PROBLEMS

5.1 User Charges

Section 204 (b) (1) of the Act provides that after 1 March 1973, Federal grant applicants will be awarded grants only after the Regional Administrator of EPA has determined that the applicant has adopted or will adopt a system of charges to insure that each recipient, whether municipal residents or industry, pay a proportionate share of the costs of operation, maintenance and replacements costs of treatment works. Thus, the intent of this section could be interpreted as follows:

(A) User charge systems are intended to enable the grantee to be financially self-sufficient with respect to maintenance and operation of treatment works.

(B) The monetary contributions of each individual user would be based upon their actual use of the system. The domestic users are not to underwrite the cost of treatment for industrial users.

5.11 Ad Valorem Taxes

The above system of user charges seems fair and equitable, however, there have been many problems with the method of levying such charges. The primary stumbling block has been the use of ad valorem (real property) taxes and industrial surcharges as meeting the goals intended by Congress and the Act. It is estimated that 25 percent of the urbanized areas of the United States are

using ad valorem taxes as a means of recouping the user charges.⁽⁴⁶⁾

In areas where ad valorem taxes are used there usually is a lack of meters to measure actual consumption, making compliance with the Act difficult, if not impossible. Moreover, most large metropolitan areas are not served by a single treatment plant, but by a system of plants thus making it very difficult to determine the user charges applicable to each plant.

5.111 Los Angeles County. In Los Angeles County, it is felt that the only way to meet the requirements of the Act, in the absence of ad valorem taxes, is to require the installation of sewage meters. Such a system would require the installation of 1,200,000 sewage meters in the area of Los Angeles. This solution could cost an astronomical sum of money.⁽⁴⁶⁾

One alternative considered by Los Angeles County would be to base sewage charges on the amount of water going into each place of use as determined from water meters. That solution, though less costly than installing 1,200,000 meters, is estimated to cost \$2 million per year in additional accounting expenses to the sanitation districts of Los Angeles County.⁽⁴⁶⁾ The additional cost arises because a particular area may receive water from one source, but is served by two or more sanitation districts or vice versa. Matching up sewage output and water input could be an administrative nightmare.

5.112 Chicago. The experiences of Chicago are somewhat the same as Los Angeles County. The metropolitan sanitary district is a

taxing body and dedicates the revenue received to the operation and maintenance of its treatment works, but it too has problems with the user charge requirement of the Act. In order to even try to implement a system as Los Angeles County, to bill for sewage as a percentage of water consumption, they estimate that 350,000 potable water meters would have to be installed to the currently unmetered population. In addition to their estimated cost of \$70-\$100 million for installation, another sum of \$5 million annually would be required for meter reading and billing.⁽⁴⁷⁾

One argument raised by EPA against Chicago's present system of sewage charges was that an \$80,000 home contributes no more to the waste water treatment facility than a \$20,000 home, but would pay a proportionately higher cost for the use of these facilities. The sanitary district of Chicago argued that the cost of determining any inequities in this particular area far outweigh the benefits to be achieved, that is, they felt that the user charge requirement of the Act would result in higher costs to all users.⁽⁴⁸⁾ Chicago contends that the use of the ad valorem tax and an industrial surcharge does comply with the intent of Congress in meeting the goals outlined in 5.1 and that this system should be accepted by the Environmental Protection Agency as being in compliance with their requirements.

5.113 Great Falls, Montana. In Great Falls, Montana, public works officials are expecting a great public reaction to the fact that water rates are going to be substantially higher when the flat

rate method of charging for water is replaced by universal metering. This action will eliminate a conflict with the user charge provisions in the Act. (49)

5.12 Regional Systems

Another problem that occurs in regional systems is getting all the municipalities or jurisdictions that are part of an areawide sewer system to comply with the user charge provision. The central jurisdiction, the one operating the treatment plant, and the one applying for the federal grant, often has little leverage or control over the actions of independent neighboring political jurisdictions. In fact, in many cases there may be a certain amount of friction between them.

For example, Allegheny County Sanitary Authority serves the city of Pittsburgh and 74 surrounding municipalities having a combined population of 1,200,000. Completion of the original project required the execution of long-term agreements with each of the participating municipalities. This was a formidable undertaking which involved practical, political and psychological problems since never before had it been possible to get the elected officials of so many dissimilar municipalities to agree on any project. (50) Requiring all communities in such a system to adopt user charges, if they are not now in force, could be a problem of unbelievable proportions.

5.13 Industry

During congressional hearings it was discovered that in several instances some industries have already elected to provide their own treatment because of the technical difficulties in working out an equitable user charge system with the municipality.⁽⁵¹⁾ After congressional hearings and meetings between affected municipalities the Environmental Protection Agency on 5 April 1974 ruled that an ad valorem tax system was an acceptable and permissible type of user charge under the Act, provided that the distribution of operating and maintenance costs for treatment works were shared in proportion to the use of the system. In addition, the ruling stipulated that the use of the ad valorem tax system be permitted only where it had been used historically and where it could be shown that its abandonment would be administratively difficult and more costly than implementing another form of user charge.⁽⁴⁶⁾

The above decision was welcomed by many, however, it was short lived. On 2 July 1974 the Comptroller General of the United States ruled that an ad valorem tax for the payment of sewage charges does not meet the requirements of the Federal Water Pollution Control Act.⁽⁵²⁾ In his decision the Comptroller General held that the Act requires jurisdictions to implement a system which will measure, as precisely as possible, the actual amount of sewage each user places into the collection system.⁽⁴⁶⁾

5.14 Congressional Position on User Charges

It appears that the user charge, as specified by the Comptroller General's ruling was the way Congress had intended. An amendment was brought to the floor of the House to remove this aspect from the Act. By a vote of 337 to 66 the amendment was defeated. (53)

5.15 Support for Ad Valorem Taxes

Support for the use of ad valorem taxes seems widespread. A survey by the Association of State and Interstate Water Pollution Administrators indicates that 46 out of 50 states support the use of such a tax. (54)

The Professional Engineers in Private Practice and the American Consulting Engineers Council have said that Prohibition of the ad valorem method of financing operation and maintenance has resulted in needless delays in grant approvals, thus causing increased construction costs. (55)

With regard to EPA's position on the matter they favor the use of the ad valorem taxes where charges are porportionate to use. (56)

5.16 How Non-Compliance Affects Grant Holders

In compliance with EPA regulations a regional administrator can not pay more than 80 percent of the Federal share of any construction project unless there is an approved user charge system.

For example, in Region V on 24 March 1975 10 out of 45 grants awarded to 8 of 27 grantees were being held at the 80 percent level. As of 11 July 1975, there were 16 Region V grants being held at the 80 percent payment level. (52)

5.2 Industrial Cost Recovery

Section 204 (b) (1) of the Act provides that after 1 March 1973, Federal grant applicants will be awarded grants only after the applicant has made provision for industrial users to pay the applicant that portion of the cost of construction of the treatment works used by such industries to the extent attributable to the Federal share of the construction cost.

Both large and small municipalities have objections to implementation of the cost recovery requirement.

5.21 Opinions on the Cost Recovery Requirement

In the larger urban areas the feeling is that multimunicipal or regional treatment plants have proven more economical and a better solution to water pollution problems. To make the approach work it is necessary that waste water be collected from all sources. The requirement that industries repay a portion of the federal grant is creating a paperwork nightmare. The cost recovery requirement can cause a break up of regional projects as shown by the fact that industry is being driven out of the projects in New York State. (57)

5.211 New York State. New York State opposes industrial cost recovery since: (57)

(A) The cost recovery requirement represents double taxation.

(B) Pretreatment regulations require dischargers to treat discharges of incompatible pollutants to a municipal system. In essence industry could pay for both pretreatment facilities and for repayment of the federal share of the capital costs.

(C) Industries receive tax breaks as incentives to abate pollution in their own facilities.

(D) Only the largest municipalities have the kind of staff needed to collect and account for funds in this type of system.

(E) It may be impossible to even identify industrial sources contributing to the municipal system.

(F) Repayment of capital costs is a business expense and gets added to the cost of consumer goods.

The requirement, as seen by New York State, fails to recognize that industries are tax-paying citizens of local, state and federal governments and as such should be accorded the same benefits of financial assistance as residential users.

5.212 Denver. This same theme is echoed by the Manager of the Metropolitan Denver Sewage Disposal District, Mr. W. E. Korbitz. He states that additional accounting costs will occur and any additional costs will be passed on to the consumer, thus any intent of Congress to ease the financial burden on the consumer is not achieved. (58)

Further any intent to eliminate the discrimination against industries which are not connected to public sewer systems does not appear proper because the total municipal construction grant program does discriminate against private citizens who are not connected to public sewer systems. (59)

5.213 Chicago. Chicago also objects to some facets of the regulations. Their primary objection is industrial cost recovery on an individual plant and funded project basis. Because of the complexity and size of their system and the large number of grants needed to complete the required facilities it would be impossible to comply with the requirements. (60) They contend the regulation, if required for each individual industrial company of which there are 9,500, would require daily redistribution of the cost recovery assessment among the companies for each of the many Federal grants received. Industries within the system are continually changing; that is, going in or out of business, or relocating with the Sanitary System. The feeling of the Metropolitan Sanitary District of Greater Chicago is that the logical manner of cost recovery would be to treat all industry as a class. (61) This would be accomplished by getting total industrial waste loadings from all industrial sources to all plants within the system and the cost recovery among and charging industry, as a class, in proportion of their load to the total load.

5.214 Association of Metropolitan Sewer Agencies. The Association of Metropolitan Sewer Agencies agreed with the remarks

made by Chicago. Their concern is with the accounting complexity and administrative cost of industrial cost recovery covering projects which include many industries during various time intervals. They urge that each individual municipal agency be permitted to determine its own basis for industrial cost recovery whether on a systemwide basis, project by project or some combination of the two, as long as valid reasoning is behind the plan proposed. (62)

5.215 St. Louis. (63) Mr. C. B. Koiser, Jr., General Counsel of the Metropolitan St. Louis Sewer District expressed some thoughts on situations where cost recovery could have an impact on cities located directly on the river. If a system was starting new it would be hard to convince industries that they should invest in the cost of interceptors and pump stations when they have land available and could economically treat their wastewater, and then discharge it into the river. St. Louis feels that industry would utilize the lower capital cost rather than the higher operating costs because such costs could be written off their taxes.

Furthermore, by forcing industries out of a municipal system the result would be an increased number of outlets into rivers that would not be under the municipality's control. Twenty outlets into a river cannot be monitored for 24 hours a day as could be done if all the discharges ran through the municipal plant. Mr. Koiser believes that industrial cost recovery may be forcing industry out of municipal systems because they have to provide a letter of intent that they plan to stay in the system, and they may move

out of town in a few years. If they moved out of the town in the future, the industry might be required to continue paying their portion of the treatment plant costs.

5.216 Various Communities' Views. With regard to smaller communities the problem could be even more critical as it could create an economic hardship. Some small towns have one or two industries that employ large proportions of the town's population. The city fathers are fearful that the industrial recovery requirement of the Act may force industry to leave, thereby causing severe economic problems. This is the case in Woonsocket, Rhode Island where the town has two industries and is trying to solve the industrial cost recovery requirement. (64)

Mr. M. Smith of the engineering firm of Jones and Henry in Toledo, Ohio and past president of the Consulting Engineer's of Ohio expressed fears that some communities have signed agreements that they will institute an industrial cost recovery program, but they do not understand what they are doing and the commitment they are making on behalf of their industries. Mr. Smith remarked that the city of Pontiac, Michigan has signed stipulations that General Motors will use Pontiac's system, but Mr. Smith does not believe Pontiac impressed upon General Motors the consequences. Until General Motors must pay their share, he feels they will not fully comprehend the agreement.

5.217 EPA Action on Cost Recovery Charges. In a program guidance memorandum (PG-28) EPA has allowed a systemwide basis for cost recovery charges. (65)

5.3 Impoundment of Fund

The 1972 Act authorized EPA to allocate \$18 billion to the states; \$5 billion, \$6 billion and \$7 billion for fiscal years 1973, 1974 and 1975 respectively, to finance the Federal Government's share of the construction cost of publicly owned sewage treatment plants.

On 22 November 1972 President Nixon instructed EPA to allocate \$5 billion, \$2 billion for fiscal year 1973 and \$3 billion for fiscal year 1974, which amounted to holding back \$6 billion of the originally authorized amount. On 1 January 1974 the President again instructed EPA to allocate only \$4 billion of the \$7 billion authorized for fiscal year 1975. Both actions amounted to an impoundment of \$9 billion of the total of \$18 billion authorized.⁽⁶⁶⁾

On 18 February 1975 a unanimous decision of the Supreme Court stated that there was no basis for denying funds to the states at the allotment stage.⁽⁶⁷⁾

5.31 Effect on Construction Grant Process

The impoundment of construction funds poses some interesting legal questions; the important point to be considered, however, is did it slow up the construction grants program? An argument used by the Federal Government in defense of the impoundment was that funds could not be spent any faster because an insufficient number of projects were ready to begin.⁽⁶⁸⁾ Sections 5.311 and 5.312 will look at this argument from both the state and EPA's viewpoint.

5.311 States' Estimates. During hearings by the House Subcommittee on Investigations and a review of the Committee on Public Works in the House of Representatives on 7 February 1974 several states testified on the impact of impoundment. The following are statements made by the states regarding projects they felt were ready for funding: (69, 70)

(A) New York claimed that 156 projects had met the requirements of the Act and were ready for grants. The costs were estimated at \$1.22 billion, while actual allocations to New York for FY 73-74 were \$553 million.

(B) Pennsylvania claimed 311 projects costs \$495 million had plans and specifications and were ready for construction. Actual allocations to Pennsylvania were \$271 million for FY 73-74.

(C) Georgia claimed 150 applications worth \$175 million were ready for funding, while actual allocations to Georgia were \$49 million for FY 73-74.

(D) Texas claimed 135 projects worth \$200 million were ready for funding. Actual allocations to Texas were \$139 million for FY 73-74.

A conclusion from the above is that impoundment of funds did have a serious effect on the construction grants program. A survey taken by the Association of State and Interstate Water Pollution Control Administrators indicated that on 1 January 1974, 33 of 50 states who replied, had 449 project applications in the regional offices, which in their judgments met existing requirements. (71)

5.312 EPA Estimates. For the record EPA provided data which challenged the states contentions. EPA provided data (summarized in Table 5-1) showing the status of applications on 28 February 1974.

Table 5-1(72)

Applications at Regional Office

	Completed Applications		Incompleted Applications	
	Number	Grant Amount (millions)	Number	Grant Amount (millions)
Total	69	48.5	377	706.9
New York	-	-	5	17.0
Pa.	-	-	102	239.4
Georgia	-	-	-	-
Texas	17	5.2	-	-

	Applications at State level		Applications at Municipal level	
	Number	Grant Amount (millions)	Number	Grant Amount (millions)
Total	4332	8591.5	1659	1228.1
New York	358	2307.7	-	-
Pa.	440	1024.6	-	-
Georgia	35	28.8	-	-
Texas	31	7.2	75	28.4

A comparison of the data contained in Table 5-1 and the data of Section 5.311 leaves some questions as to who is telling the truth. This comparison raises the issue that a bona fide ongoing, ready-to-go application in state language, does not seem to be one in EPA language. Moreover, what may have been considered a project ready to be funded from the states point of view may not yet have been submitted for funding to EPA. Mr. J. Rhett Deputy Assistant Administrator for Water Programs operations stated that failure to comply with infiltration/inflow requirements was the main

reason that existing projects in the regional offices had not yet been approved. (72)

5.32 GAO Report

In a GAO Report concerning Implementation of the 1972 Act, six states were reviewed as to the impact of impoundment. Of the six states: California, Illinois, Michigan, New Jersey, New York and Ohio, the report states that only in New York, did the investigation identify projects ready for construction that could have been funded if funds had not been impounded. (73)

The report concluded that this impoundment did have a significant negative effect on cleaning up pollution in New York State.

5.4 Program Management at EPA

The EPA has looked at the performance of the construction grants programs and has indicated areas where improvements could be made. This section will look at the Management of the construction grants program by the Environmental Protection Agency. The development stage of each phase of a project is the most important because it is the point at which the most influence can be exerted.

5.41 Facility Planning Stage

Some of the major elements of the grants program such as infiltration/inflow analysis and environmental assessments are

encountered during this period. An EPA report has brought out several deficiencies: (74)

(A) All feasible alternatives have rarely been examined; and if they have, EPA has not insisted on documentation and early rejection.

(B) Operational improvement of the existing facilities has often been ignored.

(C) Economic comparison of alternatives has often been incomplete or lacking.

(D) Operation and maintenance aspects of treatment works have often been cursory.

(E) The impact of the facility on growth has been overlooked.

(G) Environmental and social impacts traditionally have not been adequately considered.

The report noted a wide variation among EPA's regional offices on what is considered an acceptable facilities planning document. Some Regions have accepted minimal documentation, while in other cases a concerted effort is made to obtain facilities plans as outlined in Section 4.2. In this area the report recommends that due to the complexity of facilities planning to grantees, consultants, and the states, EPA should hold a planning conference to fully describe all necessary requirements; this would, of necessity, be tailored to the size and complexity of the project. EPA participation in state held conferences in the past has varied from 100 percent to seldom. (75) Moreover, having EPA personnel who are versed in the

requirements of the program available for consultation could help avoid delays since those doing the planning would understand the requirements.

5.42 Design Stage

The report contends the Regional Offices are doing an adequate job in the reviews of both the technical and administrative aspects of project plans and specifications. However, several recommendations were made to improve the process: ⁽⁷⁶⁾

(A) As in the facilities planning stage conduct face to face conferences to ensure all requirements are understood.

(B) Review industry letters of intent and grantees commitment to and schedule for developing a user charge and industrial cost recovery system.

(C) Monitor progress in implementation of the user charge/ industrial cost recovery system.

The above process should help avoid some delays in the approval process and avoid some of the user charge/industrial cost recovery problems as described in section 5.1. In essence, the report recommends that EPA have available for consultation personnel trained in municipal finance and in utility rate systems in order to provide both technical and review assistance for the grantee.

5.43 Headquarters

In a report presented to EPA administrator, Russel E. Train, a task force listed several problem areas it discovered in conducting interviews with construction program officials: (75)

(A) Regions are receiving confusing guidance from a number of headquarters sources in various forms. Some mechanisms must be devised to give the regions a clear understanding of which items are mandatory and which are discretionary.

(B) Some regions expressed a need for guidance and a clarification of standards of acceptability in such areas as reserve capacity and infiltration/inflow analysis.

(C) A major problem is inadequate manpower at the state level. Moreover the problem is compounded since some states have hiring freezes.

(D) Many smaller communities use FHA loans to finance their local share of project costs; the result is additional work and delays because of duplicative FHA requirements.

(E) The Municipal Construction Division does not have all the necessary management and analytical skills necessary to carry out the program.

(F) The functional responsibilities between the Municipal Construction Division and other headquarters officers should be clarified.

Another report contends that guidance from EPA headquarters has not been adequate; regulations and policy guidance have been

delayed and when they are available, they often cannot meet the complexities experienced in the field. Since policy flows from various headquarters sources, guidance is sometimes viewed by the regions as contradictory and thus subject to varied interpretations. (??)

The problem areas discussed above are of a general nature; in order to discuss the problem in a more concrete form Table 5-2 is presented to show the number of people involved in the issuance of regulations and guidelines. The section on delays in issuance of regulations will be used in Section 6.0 which discusses the effects problems have had on the obligation of construction grants.

In conclusion, EPA discovered that the construction grants program is really 10 separate programs managed by EPA's 10 Regional Offices. (??)

5.44 Application Processing

The task force report concludes that problems in application processing are attributable to: (75)

- (A) delays caused by late issuance of guidelines;
- (B) the handling of the program in a crisis type of atmosphere;
- (C) the tendency of headquarters and regions to avoid difficult decisions.

Table 5-2

Delays in Issuance of Selected Regulations

Regulation/ Guideline	Responsive Unit*	Statutory Time Period	Time Period for Interim/Proposed Publication	Time for Final Publication
Title II Regulations	OWHM OWPO MCK OPM OA GAD OEGC OGC GCCAD	-	133 days	481 days
Secondary Treatment Regulations	OWHM OWPO MCD	60 days	194 days	303 days
Project Priority Criteria	OWHM OWPS WPD	-	201 (QAWP Memo) 254 (Sec. 106 Reg.)	
User Charge/ Industrial Cost Recovery Reg.	OWHM OWPO MCD	180 days	216 days	307 days
Facility Planning Guidelines	OWHM OWPS WPD			454 days
BPWTT** Guidelines	OWHM OWPO MCD	270 days	513 days	

*OWHM - Office of Water and Hazardous Materials
OWPO - Office of Water Program Operations
MCD - Municipal Construction Division

OPM	-	Office of Planning and Management
OA	-	Office of Audit
GAD	-	Grants Administration Division
OEGC	-	Office of Enforcement and General Counsel
OGC	-	Office of General Counsel
GCGAD	-	General Counsel, Grants Administration Division
OWPS	-	Office of Water Planning and Standards
WPO	-	Water Planning Division

** Best practicable waste treatment technology.

5.5 Infiltration/Inflow

Section 201 (g) (3) of the Act states that the administrator will not approve any grant after 1 July 1973 for treatment works unless the applicant shows to the satisfaction of the administrator that each sewer collection discharging into the treatment works is not subject to excessive infiltration.

Infiltration/inflow into sewer systems is not a recent phenomenon; its occurrence is as old as the first sewer system. Since infiltration/inflow may play a major role in overtaxing collection and treatment systems, more emphasis has recently been focused on the problem. It now must be considered in order to obtain funding under the 972 Act.

5.51 Definition of Infiltration/Inflow

The Act defines excessive infiltration/inflow as that quantity of extraneous water which can be economically eliminated from a sewer system by rehabilitation as determined by a cost effective analysis. The analysis compares the costs for correcting

versus costs for transporting and treating the infiltration/inflow.

5.52 Need for Elimination of Infiltration/Inflow

Infiltration/inflow is now recognized as a substantial portion of sewer overflow. There is a need to eliminate infiltration/inflow and unless it is eliminated the following results could occur:⁽⁷⁹⁾

- (A) a reduction in the carrying capacity of the sewer system;
- (B) a reduction in the design capacity of the wastewater treatment facilities;
- (C) an increase in operation and maintenance costs since wastewater is treated that does not need to be treated.

5.53 Problems of Performing Infiltration/Inflow Analysis

During Congressional hearings on the Act, Mr. C. B. Koiser, President of the Association of Metropolitan Sewer Agencies indicated that completion of infiltration/inflow analysis, required as a condition for funding was causing consternation among the associations members. Infiltration/inflow analysis was considered an ambitious and time consuming undertaking for most municipalities.⁽⁶²⁾

In order to perform a meaningful cost-effective analysis, the data of the infiltration/inflow analysis must be reliable. The inadequacy and general lack of historical data on excessive infiltration/inflow makes the cost-effective analysis difficult unless a long-range program of infiltration/inflow monitoring is put into effect.⁽⁸⁰⁾ If such flow data must be obtained before the analysis can be done, the performance of infiltration/inflow analysis will

slow down the grant program. In addition, the study must cover a period of six months in order to include periods of highgroundwater level and low groundwater level.⁽⁸⁰⁾ The Association does not quarrel with the benefits to be achieved by the program: they believe, however, that this rigorous requirement should not be a condition precedent to receiving Federal funds.

5.54 EPA Action

The Act requires that the municipality must satisfy the regional administrator that the system is not subject to excessive infiltration/inflow before receiving Step 2 or Step 3 construction grants.

Publication of construction grant regulations on 11 February 1974 has administratively eased the burden on municipalities. The regional administrator can now make a determination that infiltration is not a problem by accepting state certification to that effect. Moreover, the regulations now permit exceptions such that if a community is subject to excessive infiltration, it may be awarded Step 2 or Step 3 grants provided, as a special condition in the grant agreement, the community agrees to complete the sewer system evaluation and will carry out any resulting rehabilitation on an accepted implementation schedule. The problem seems to have eased after the publication of these grant regulations: the requirements for infiltration/inflow analysis, however, had caused problems before the issuance of these regulations and its effect on

construction grants obligations will be discussed in Section 6.0.

5.6 Secondary Treatment

The final determination as to secondary treatment has been previously defined in Section 2.211. The definition of secondary treatment and its application nationwide has caused complaints, because some communities, looking at a variety of local circumstances, consider it wasteful and excessive. A few of the areas mentioned most often as needing greater flexibility are: ⁽⁵⁶⁾

- (A) deep ocean outfalls;
- (B) year-round chlorination;
- (C) small communities.

5.61 Deep Ocean Outfalls

An example of the condition of deep ocean outfalls, could be the Seattle, Washington area. The area has argued that the receiving water from their treatment plant did not require secondary treatment when it entered into Puget sound. They believe that they should treat the water beyond primary treatment but not secondary treatment.

EPA has issued a Step 1 grant to the City of Seattle to fully evaluate what the impact would be on the receiving water of not only secondary treatment but also other levels different than secondary treatment. ⁽⁸⁰⁾ EPA stresses that judgements in this area would have to be

on a case by case basis after a community has fully evaluated the situation. There may be instances when treatment less than secondary treatment may be acceptable if the results would not violate water quality standards or interfere with the beneficial use of that water.⁽⁸¹⁾

5.62 Year-Round Chlorination

Some communities contend that chlorination on a year round basis is very expensive and at times not needed. Here, too, EPA feels that each treatment plant would have to be looked at on a case by case basis to insure that the discharges would not violate water quality and bacterial problems would not occur.

5.63 Small Communities

A strict definition and enforcement of secondary treatment could have a marked effect on small communities. Many small communities in the 1,000 to 4,000 population range utilize stabilization ponds to treat their wastes.⁽⁸²⁾ Requirements for more sophisticated type plants will use more electricity, require equipment and cause sharply higher operations, maintenance and monitoring costs to communities where secondary treatment may not be necessary to maintain water quality.

In conversations with Mr. A. Hall, Chief of the Planning section, Pittsburgh Regional Department of Environmental resources he indicated that some flexibility should be given in the area of strict requirement of secondary treatment. For example, some areas

within the region which have only primary treatment, discharge into streams that are so polluted by acid mine drainage from abandoned mines that requiring these communities to have secondary treatment would be a waste of money.

5.7 State Participation

Section 101 (b) of the Act states that it is the policy of the Congress to recognize, preserve and protect the primary responsibilities and rights of states to prevent, reduce and eliminate pollution of water resources.

5.71 Duplication of Effort

A review of Section 3.0, the Clean Streams Law of Pennsylvania, shows that this law requires that project documents be submitted for state approval whether or not a municipality is applying for a federal grant. In states where state funding for construction of waste water treatment works is provided, state approval of the project documents must be received in order to receive state funding. Additionally, all projects must appear on a state priority list in order to receive federal funding.

There are also various levels of review of a project submitted for federal funding and these are outlined in Sections 4.1 and 4.3. This review of projects by many levels of government can be considered a time consuming effort and a misuse of available manpower.

5.72 Position of States on Delegation of Powers

The states have long been proponents of assuming more responsibility and authority in the construction grants program. Mr. Webb of the Association of State and Interstate Water Pollution Control Administrators stated that even though certain responsibilities are delegated to the states by the regional office of EPA or by Washington, there is still close monitoring of projects by the government. In essence, Washington must review everything done by the states and this results in a duplication of effort. Mr. Webb further asks, "To what degree of finality can a state act?"⁽⁸³⁾

Mr. D. Metzler, Deputy Commissioner for Environmental Quality, New York State Department of Environmental Conservation urged that real delegation of authority be granted to the states. He felt that what the program needed was a sense of trust in people on the state and local levels.⁽⁸⁴⁾

Mr. B. Dendy, Executive Officer of the State Water Resources Control Board said that delegation of powers to state agencies will encourage EPA to eliminate duplication of effort in the grants program.⁽⁸⁵⁾

A survey taken by the Association of State and Interstate Water Pollution Administrators showed that 45 out of 50 state administrators supported more delegation of authority to the states, 3 states opposed such delegation of authority and 2 did not respond.⁽⁸⁶⁾

In testimony before Congress Mr. S. L. Warrington, President of the Water Pollution Control Federation stated that the federation

supported increased delegation of authority and responsibility to the states. He cautioned that in order for such delegation of authority to succeed it must be implemented in a spirit of mutual trust between the states and the federal government. (87)

The Professional Engineers in Private Practice and the American Consulting Engineers Council believe that part of the administrative tangle of the Act would be relieved by delegating certain administrative responsibilities to state agencies which have been certified by the EPA Administrator. (88)

Mr. M. Gray, Water Pollution Control Administrator for the State of Kansas, stated that he was seriously considering proposing that the Kansas legislature abolish the state laws dealing with the requirements of waste water treatment plants and let the program revert to the Federal Government since the taxpayers were not receiving their monies worth due to the existing duplication. (89)

5.73 Present Delegation Actions by EPA

The Grants Administration Division conducted a study to examine the extent of duplicative reviews by state and EPA regional personnel as part of the review process for waste water facilities grants. The objective of this study was to determine whether or not duplication did exist, and if it did, could the use of delegation of certain review functions to state agencies by means of a certification process eliminate portions of the duplication. The study demonstrated that: (90)

(A) many state and EPA reviews of applications are duplicative;

(B) some states are capable and willing to accept more responsibility for reviews;

(C) acceptance of reviews by qualified states is feasible and legal.

The study concluded that elimination of duplication would: ⁽⁹¹⁾

(A) allow regional administrators freedom to direct personnel to other tasks;

(B) shorten the time required for processing construction grant applications.

5.74 EPA Order 1270.3

This order delegates authority to regional administrators to execute written agreements with states for certification of the adequacy of documents relating to waste water treatment facility grant applications in lieu of Federal review. Each regional administrator was delegated the authority to execute written agreements with the states for certification by the state on the technical and/or administrative adequacy of operations and maintenance manuals, plans and specifications, and bid and contract documents. The agreements are to be based on the following minimum conditions: ⁽⁹²⁾

(A) The state must:

(a) have formally adopted written design criteria;

(b) be committed to review for defined Federal

requirements;

(c) have legal authority to make the agreement.

(B) The agreement must:

(a) be in writing;

(b) be for a specific period of time;

(c) define responsibilities of each party;

(d) contain renewal continuation and termination

terms and conditions;

(e) reserve the right for EPA to review state

determinations with respect to arbitrary action, fraud, and gross error.

5.75 Participation

As of 30 November 1974, 25 states had been granted the authority to review plans and specifications and operation and maintenance manuals and EPA expected the number to increase to 35 to 40 by the end of 1975. ⁽⁷⁶⁾

The order essentially describes a process whereby EPA would delegate the review functions to the states and would expect to exercise its approval responsibilities based on the receipt of certifications of adequacy prepared and submitted by the reviewing state agency.

5.76 Success of EPA Order 1270.3

In July, 1974, EPA completed a brief study of the status and success of delegations. The study found that the delegations of

plans and specifications and operations and maintenance manuals, to the extent they were operationally implemented at the time generally: (93)

- (A) worked satisfactorily;
- (B) reduced duplication;
- (C) improved administration of the program;
- (D) received the support of the state and regional

staff involved.

5.77 Limitations of the Present Act

Under Title II of PL 92-500 EPA cannot delegate the authority to actually award grants, make payments or approve a variety of documents, including facilities plans, plans and specifications, operation and maintenance manuals, and user charge/industrial cost recovery systems. (93)

5.78 Congressional Action

H. R. 7418 sponsored by James Cleveland introduced on 22 May 1975 proposes to allow the EPA Administrator to delegate many present EPA responsibilities to the states. For example, state could review facility plans, including environmental assessments, cost-effectiveness studies, infiltration/inflow analysis, project plans and specifications, and bidding procedures. The bill would authorize the reserving of 2 percent of the allocation to each state for each fiscal year to increase the administrative capacity of the state. (94)

The EPA has given its support to the bill and is setting up a task force to draft and review regulations concerning implementation of the bill's proposed state certification program.⁽⁹⁵⁾ This bill does not relieve EPA of the responsibilities of preparing the Environmental Impact Statements as required by the National Environmental Policy Act.⁽⁹⁵⁾

5.79 Constraints

Whatever method is used to expand delegation to the states two principal factors affect its success:

(A) The ability of the states to attract and keep qualified personnel capable of performing these functions.

(B) The need to provide financial support to the states to perform these delegations.

5.8 Environmental Integrity

5.81 Requirements

One component of a Facilities Plan (Step 1 of the grant process) is an Environmental assessment of the impact of the alternatives being considered for the treatment works.

The EPA independently reviews the adequacy of the environmental assessment included in the facilities plan to determine whether the proposed project is likely to result in some significant impact on the environment. If EPA determines there will be no impact, it files

what is called a negative delcaration, supported by the applicants facility plan and an environmental impact appraisal describing the work and findings of EPA's review.

If EPA determines that there will be an impact, it prepares and distributes a letter of intent notifying the public that it will prepare an Environmental Impact Statement (EIS). A public hearing is held to discuss the environmental aspects of the proposed project. Following this EPA prepares the EIS and circulates the draft to all relevant Federal, state and local government agencies as well as any interested groups and private citizens. These parties are allowed 30 days for review and written comments with 15 additional days upon request. Utilizing the comments received EPA prepares the final EIS and files it with the council on Environmental Quality. EPA is then required to wait an additional 30 days before taking any action on the project.⁽⁹⁶⁾

5.82 State Experiences

New York State feels that municipalities have been able to work within the regulations, the major impact of the requirement has been a loss of time. The requirement for a complete EIS could possibly delay construction of a project from 9 to 12 months and if and EIS appears imminent it should be developed as early as possible.⁽⁹⁷⁾ The State of Kansas did have two major projects held up by requirements for an Environmental Impact Statement, one for a period of two years. The State of South Carolina did not have any instances of cases being held up by environmental assessments, however, they have experienced

some delays due to compliance with the public participation requirement of the Act. It seems that during the required hearings for the facility plan the discussions from the public involved not environmental considerations, but zoning requirements. The objections of citizens are not that the facility is going to degrade the environment, but because they don't want it located in a particular area.⁽⁹⁸⁾

Massachusetts did not have any problems with the requirements of the Act. Their comments were similar to South Carolina's, namely, questions asked at hearings were not concerned with protecting the environment, but rather a question of zoning. Mr. A. Hall of the Pittsburgh Region Department of Environmental Resources echoed the comments presented above that the public participation in the Environmental Impact process has caused delays in processing grant applications.

One other concern was that the cost of and time spent at public hearings can become quite burdensome.⁽⁹⁹⁾ During Congressional hearings it was called to the attention of the Congressmen that EPA had awarded a \$217,000 grant to a Conservation Foundation to operate a series of courses across the county to explain citizens participation in the environment.⁽¹⁰⁰⁾

5.83 Internal EPA Review

During an internal review 43 negative declarations filed by nine regional offices were reviewed. None of them were found to have consistently good documentation. None of the 43 negative declarations could be justified on the basis of documentation above,

however, it was possible the regions decisions could be justified on the basis of additional information held in their office. (101)

Another part of the review suggested that EPA should try to develop a set of objective threshold criteria for use in specifying when an EIS should be made on facility projects. (102)

6.0 OBLIGATIONS

Dissatisfaction with the construction grants program of PL 92-500 has been expressed by many. It has been said that the nations clean water program has been and is being emasculated by an almost unbelievable proliferation of administrative red tape, a fantastic maze of baffling guidelines, burgeoning regulations, bewildering paperwork, and ever-changing directives; all these have brought the program to a virtual halt.⁽¹⁰³⁾ This appears to be an exaggerated statement, but, nevertheless, is the feeling of many who have dealt with the grant program. Section 5.0 dealt with several problems associated with the implementation of the construction grants program from the perspective of what problems a community faced when trying to comply with the Act and implement its regulations. This section will build upon the problems by introducing the timeframes when regulations became effective and discussing the effect of these regulations on the obligation of funds.

6.1 EPA Administration of the Law

6.11 EPA Work Load

It has been said that the program envisioned by PL 92-500 is the largest federal construction program in history.⁽¹⁵⁾ Various requirements of the Act have had an effect on the federal workload. Table 6-1 is a summary of the total investment in public sewerage facilities.

Table 6-1(104)

Investment in Public Sewerage Facilities

Period	Gross investment*	Replacement**	Net investment
(billions of 1972 dollars)			
1856-69	\$ 0.5	\$ 0.1	\$ 0.4
1870-79	0.6	0.1	0.5
1880-89	0.8	0.2	0.6
1890-99	1.2	0.4	0.8
1900-09	1.5	0.6	0.9
1910-19	2.7	0.9	1.8
1920-29	5.7	1.6	4.1
1930-34	2.5	1.3	1.2
1935-39	4.8	1.6	3.2
1940-45	2.1	3.2	(.2)
1946-56	10.8	5.1	5.7
1957-61	7.5	3.2	4.3
1962-67	9.1	4.8	4.3
1968-71	8.6	3.9	4.7
Totals	\$58.4	\$26.1	\$32.3

*Based on data published by the Department of Commerce and by EPA; all values converted to 1972 dollars through use of EPA's sewerage construction cost indices and the discontinued Associated General Contractor's Index of Construction Costs.

**Estimated funds required to "replace" existing facilities, rather than add new capacity. Computed at a rate of 2 percent of sewers and 4 percent for plants, based on estimates of the relative weights of each in each period.

In order to further determine the impact the new funding levels would have on EPA, Table 6-2 shows the Federal Contribution to waste water treatment works construction from 1957-1975.

Table 6-2⁽¹⁰⁵⁾

Construction Grants for Municipal Waste Water Treatment Works
(1957-74)

Fiscal year	Authorization	Appropriations	Fiscal year obligations
(millions of dollars)			
1957	50	50	38
1958	50	45+	47
1959	50	47+	46
1960	50	46+	48
1961	50	46+	45
1962	80	80	64
1963	90	90	92
1964	100	90	85
1965	100	90	84
1966	150	121	118
1967	150	150	131
1968	450	203	191
1969	700	214	201
1970	1,000	800	424
1971	1,250	1,000	1,152
1972	2,000	2,000	860
1973	5,000**	2,000++	2,989
1974	6,000**	3,000++	2,625
1975	7,000**	4,000++	4,133
Total	26,320	15,972	13,375***

* Funds obligated in any fiscal year may include funds appropriated in prior years.

+ Includes supplemental appropriations of \$657,000 in 1958, \$1,816,000 in 1959, \$1,101,000 in 1960, and \$645,260 in 1961.

** Contract authority (method of funding changed from authorized appropriation to contract authority by 1972 Act.)

++ Amount of contract authority released by Presidential action.

*** Includes \$6,676 million obligated under PL 92-500.

Fiscal year	Fiscal year obligations
1957-61	224 million
1962-67	574 million
1968-71	1968 million

Table 6-1 is shown in 1972 dollars whereas Table 6-2 is not. If Table 6-2 were brought to 1972 dollars it could be assumed that the Federal share of costs would be greater than a straight comparison of the two tables in their present form.

Table 6-3 shows the EPA personnel involved in the grants program.

Table 6-3 (106)

Construction Grant Program Employees

Fiscal year	Employees
1968	320
1969	320
1970	360
1971	420
1972	402
1973	452
1974	595
1975	595
1976	707

Since the inception of the program in 1956 the Federal Government has obligated \$13.4 billion for the construction and expansion of more than 18,700 projects. From Tables 6-2 and 6-3 it can be seen that in 1975 EPA obligated 4.1 billion with 595 program personnel, in 1968 they obligated \$.2 billion with 320 people. This indicates that personnel did not increase as rapidly as the dollar

amount of work has. The 1972 Act is more complex and time consuming to administer than previous laws. This complexity and manpower shortage is one reason for the initial slowness in starting up the grants program and prompted some participants in congressional hearings to say that although the old laws did not encompass as much as the new one at least the old laws worked.

As of 30 September 1974 EPA had 4399 active projects of which 1873 were for PL 92-500 funding.⁽¹⁰⁷⁾ As of 30 September 1975 EPA had 6425 active projects for waste water construction grants, 4415 of these were for PL 92-500 funding and 2010 were for PL 84-660 funding.⁽¹⁰⁸⁾ EPA estimates that during fiscal year 1976 they will have 8,300 active projects.⁽¹⁰⁹⁾

The difficult start up period apparently has passed and to help insure smooth running in the future Russel E. Train, EPA Administrator, recently announced that there would be 300 additional personnel on the construction grants staff; with these additional personnel EPA would have a total of 1007 to support the construction grants effort.⁽¹¹⁰⁾

6.12 Obligations

During committee hearings a major point raised by both members of Congress and witnesses was that grants were not getting to the people fast enough. For the big dollar figures and grand promises the Act was not producing the dramatic results it was supposed to.⁽¹¹¹⁾ Table 6-4 is presented to show the obligations

made by EPA for the construction of waste water works. Obligations are those monies reserved for a municipality for accomplishment of work whether for the feasibility, design or construction stage of the project.

Table 6-4⁽¹¹²⁾

Waste Water Treatment Works Obligations
(Million Dollars)

Month	1972	1973	1974	1975
Jan.	-	-	30.8	219.0
Feb.	-	283.7	60.4	138.1
Mar.	-	218.0	29.1	291.9
Apr.	-	.3	31.0	129.2
May	-	32.4	178.0	666.3
Jun.	-	1,063.5	883.0	1,343.3
July	-	127.4	81.5	223.6
Aug.	-	.4	169.1	309.5
Sept.	-	6.2	194.0	226.5
Oct.	-	7.1	205.7	-
Nov.	-	1.8	143.6	-
Dec.	-	17.2	134.8	-

Fiscal Year

Monthly Average

1972	0
1973	319.6 (5 months)
1974	114.4 (12 months)
1975	309.7 (12 months)
1976	253.2 (3 months)

Fiscal Year

1973	1597.9
1974	1372.4
1975	3716.5
1976	759.6

Total	7446.4
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Monthly Average over 32 months	232.7
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A review of Table 6-4 points out that except for Feb., March and June of 1973 and May and June of 1974 the level of obligations was virtually nonexistent. During the first 21 months a basic factor behind the low overall level of obligations was the absence or slowness of regulations. For example, the notice of proposed definition of secondary treatment was published on 30 April 1973 and finalized on 17 August 1973 with revisions. Title II interim grant regulations were published on 28 February 1973, however, the final regulations were not published until 11 February 1974 almost one whole year later. Included in the 28 February 1973 interim regulations were requirements that for projects approved after 1 July 1973 an infiltration/inflow analysis would have to be performed in order to determine if excessive flow existed in the system. Individual effects of some of these problem areas will be discussed later.

6.121 Time Frame of Payment. Under PL 84-660, the predecessor to PL 92-500, obligations were front end loaded. By this process the entire funding for a project was made available when the initial stage of the project was approved. PL 92-500 restructured the grants program to provide separate Step 1 (Facilities Planning), Step 2 (Design) and Step 3 (Construction) grants. By the use of this process the major obligation of funds would occur at the end of the project.

Also included in the regulations were provisions for awarding combination grants for preparing plans and specifications and

constructing the facility (Step 2 + 3 grants).

Step 2 + 3 grants were awarded on the basis of one or more of three criteria specified in EPA regulations:⁽¹¹³⁾

- (A) water quality enforcement considerations;
- (B) serious public health problems;
- (C) administrative efficiency.

This policy was challenged by some in Congress.⁽¹¹³⁾ In reply EPA explained that Step 2 + 3 awards were needed because:⁽¹¹⁴⁾

(A) some communities require firm assurance of the Federal assistance before they can initiate local actions to obtain non-federal project funds;

(B) relatively high administrative costs would be incurred if low-dollar grant awards were processed through separate project steps;

(C) there would be a time savings;

(D) a strong interest by some states in retaining this type of grant.

On 1 July 1974 the Comptroller General told EPA that the regulations were inconsistent with Congressional intent and should be revised to preclude step 2 + 3 grants.⁽¹¹³⁾

The above is not a reason for the delay in awarding the monies of the Act, but is a partial answer to some critics who claimed that obligations should be higher.

6.122 Lack of Guidelines. During much of the first twelve months interim Title II grant regulations were in force under which obligations could be made, grantees and the states generally understood that final regulations were imminent. Many prospective grantees and states elected to hold back on development of applications, infiltration/inflow analysis, environmental assessments, and other documents until they could be sure of what the final rules would be. Unfortunately, this waiting period was constantly extended and, hence, it is why many states, municipalities and organizations expressed their displeasure with the Act. Finally on 11 February 1974 the final regulations were issued, resulting in renewed activity on the part of grantees and states and increased obligations in May and June 1974, the first significant period of obligations in over a year.

6.123 User Charges/Industrial Cost Recovery. The effect of two statutory provisions, that of user charge and industrial cost recovery, will be discussed as to their effect on obligations. In Sections 5.1 and 5.2 a more detailed analysis is made on the effect of user charges and industrial cost recovery on grantees.

Section 204 (b) (1) of the Act requires that the grantee adopt user charges and industrial cost recovery systems on all projects awarded after 1 March 1973. In order to preclude a rush of applications before the 2 March 1973 deadline, EPA established stringent criteria for selecting projects for funding:⁽¹¹⁵⁾

(A) projects would be jeopardized if funding were delayed after 1 March 1973 because of withdrawal of industrial sources which

were committed to the municipal treatment service;

(B) projects where the applicants had plans and specifications ready for bidding.

Some problems associated with the determination of what is a project ready to be funded have been discussed in Section 5.3. On 28 February and 1 March 1973 EPA awarded 43 grants totaling about \$501 million before it published proposed user charge and industrial cost recovery regulations on 22 May 1973. Final guidelines were published on 21 August 1973. The Act required EPA to publish these guidelines by 16 April 1973.⁽¹¹⁵⁾

6.124 Infiltration/Inflow. Section 201 (g) (3) requires that the grantee perform infiltration/inflow analysis on all grants awarded after 1 July 1973. Between 22 May and 1 July 1973 additional requirements were enacted which established a new state priority system and required the assurance that excess infiltration/inflow was not present in the sewer system. These actions placed a heavy burden on state agencies in preparing grant proposals and on EPA in reviewing and approving grant applications before the 1 July 1973 deadline. In recognizing the problem and realizing the burdens imposed, EPA extended the deadline for complying with additional requirements to 31 July 1973 for those applications received prior to 1 July 1973. Officials in some states indicated that shortages of personnel limited the number of applications they were able submit.⁽¹¹⁶⁾ From 22 May to 1 August 1973 EPA awarded 579 grants totaling approximately \$1.2 billion.⁽¹¹⁶⁾

6.125 State Project Priority Lists. Prior to the 1972 Act, municipalities' financial needs were a principal factor in establishing state priorities for EPA sewage treatment plant construction grants. The Act required the establishment of a new state priority system as part of a continuing planning process.⁽¹¹⁶⁾ Beginning 1 July 1973 EPA required that to be eligible for grants projects must be on a state priority list prepared in conformance with the new criteria. These criteria were:⁽¹¹⁷⁾

- (A) population affected;
- (B) severity of pollution problems;
- (C) need for the preservation of high-quality water;
- (D) national priorities (as well as total funds available);
- (E) additional criteria applied by states.

Political consideration such as insuring that every part of a state received a share of the available money has been given as one of the reasons which influenced the development of prior state lists.⁽¹¹⁷⁾ In addition the timeframe given for submission, was in April for the next fiscal year beginning 1 July, thus allowing little time for approval of these lists. During fiscal year 1974 this was a major problem. By 31 December 1973 EPA had approved the priority lists of 37 of the 56 states and territories covered by the program.⁽¹¹⁸⁾ Because of the difficulties the states and municipalities were having in meeting the requirements for priority lists, EPA awarded only 53 grants totaling about \$33 million from 1 August to 31 December 1973. In order to provide review time an internal

review within EPA recommended that submission dates for state priority lists be moved up to January preceding the fiscal year to provide adequate time for review by regions.

Another area of concern with the priority lists was the mix of Step 1, Step 2, and Step 3 projects contained on the priority lists. EPA desired to have a number of Step 1, Step 2 and Step 3 projects so that all Step 3 construction projects would not come due during any one year. EPA desired to have a proper mix so a continuous, smooth-flowing program could be developed and would not be hampered by an abundance of Step 3 projects on its list in any one year.

6.126 Impoundment of Funds. Problems relative to Presidential impoundment of funds authorized by Congress has been discussed in Section 5.3. Table 6-5 gives a breakdown showing authorizations, amounts released by President Nixon and the amount actually obligated by EPA. It appears from this chart that impoundment of funds did not have a major effect on the overall obligation of construction grant monies, however, in some states there may have been problems.

Table 6-5

A Comparison of Funds Authorized Under PL 92-500,
Released by President Nixon and Obligated by EPA

<u>Year</u>	<u>Authorizations</u>	<u>Released by President Nixon</u>	<u>Obligated by EPA</u>
(amounts in billions)			
1973	5.0	2.0	1.6
1974	6.0	3.0	1.4
1975	7.0	4.0	3.7
Total	18.0	9.0	6.7

6.2 Optimizing Obligations

In a March 1975 memorandum, Russel E. Train, EPA Administrator, said, "I firmly believe that we can maintain a high rate of grant awards for the next two fiscal years. My goal is that we obligate the entire \$18 billion by September 1977." In order to accomplish this a monthly obligation goal was set at \$400-500 million.⁽¹¹⁹⁾ From April to September 1975 EPA made obligations of \$2.9 billion which amounts to an obligation rate of \$483 million a month.

Although these obligations seem to be meeting the goal, they may have been due to the normal seasonal variations in the program. As can be seen from Table 6-4 EPA has traditionally obligated large amounts during May and June before allocations expire normally on the 30th of June. Funds remaining unobligated at the end of the allotment period are immediately reallocated by EPA to those states which have used their full allotment.⁽¹²⁰⁾ If this year end obligation was not done the administration would probably have come under more criticism than it has come under now.

6.3 Previous Projects

Another, although lesser cause of delays in obligations, were projects proceeding under the previous requirements of PL 84-660 which had to be redeveloped according to the requirements of PL 92-500. Some of these projects, designed with PL 84-660 money, had to meet the new Act's requirements for infiltration/inflow analysis, alternative

solutions, user charges, industrial cost recovery and environment assessment.⁽¹²¹⁾ Bringing these projects into compliance has caused delays and increases in cost due to inflation.⁽¹²²⁾ EPA is administering 1932 projects costing \$4.2 billion obligated under PL 84-660 and has 78 projects valued at \$146 million awaiting construction with PL 84-660 funds.⁽¹²³⁾

7.0 OUTSIDE INFLUENCES

Not only can the requirements of the Act slow up the construction grants program, but also outside pressures influence the program. The intent of this section is not to discuss questions such as to what degree or how long these influences hold up the grants program, but rather to give a generalized review of various outside factors and their possible effects on the grants program.

7.1 Construction Industry

In an in-house study conducted by EPA in 1972 it was stated that the construction industry was experiencing increasing difficulty in supplying the services needed for sewage construction at a rate matching available Federal funding.⁽¹²⁴⁾ After three contractor reports on U. S. construction capability were received in December, 1972, April 1973 and October, 1973, EPA stated in December 1973 that:⁽¹²⁵⁾

"The results of econometric models indicate that the construction industry should be able to build the required facilities with real price increase of less than 1 percent attributable solely to EPA-stimulated demand, assuming resource transferability within the construction industry. The skilled labor needed should be available but there will be some impact on wages. In some localities, the construction industry may lack adequate short-term capacity, especially in light of changes in the nation's economy that may result from the recent devaluations and the energy crisis."

In a report to Congress the Government Accounting Office reviewed the construction industry's capability to build more

sewage treatment facilities by: examining records on construction activity, interviewing officials of state and local governments and the construction industry, and inquiring into the availability of data which might show the construction industries capacity to construct treatment facilities authorized by the 1972 Act. The analysis covered six states and indicated an active bidder interest in projects. The report did not comment on the construction industries capability on a state-by-state basis because resources could be drawn from other states and also statistical data and studies were not available. (126) The study further stated that the number of projects that would be initiated under the full funding of the Act could not be handled. The problem was not in obtaining the general-type construction workers or the skilled craftsmen but was in obtaining the needed number of experienced design engineers. (126)

In a draft report of 10 October 1975 the National Commission on Water Quality stated: (127)

"One characteristic of treatment plant construction is its higher requirement for non-professional and unskilled labor, unlike other requirements for other types of pollution control which tend to require relatively more professional and technical skill. The increased demand for construction labor could be significant at a time when construction trades are experiencing 20 percent unemployment. Also, because the treatment facility requirement is geographically distributed throughout the nation, the impacts would be widespread, providing new opportunities for employment in construction work in towns and cities all over the nation."

The report further stated that strict industrial and municipal compliance with the 1977 and 1983 deadlines of PL 92-500

would cause severe shortages of sanitary engineers needed to design and construct water pollution abatement facilities. Current unemployment levels in the construction industry were such that construction labor would not be an impediment to achieving the requirement of PL 92-500.⁽¹²⁸⁾

In an EPA report it was said that unanticipated delays are being experienced in the start of some construction and in construction in progress. The report was not able to pinpoint the exact reason, but attributed these delays to the delivery of certain types of equipment and materials.⁽¹²⁹⁾ The uncertainties faced by both the suppliers and manufactures, though not the fault of the contractors, eventually become problems for the contractor.

7.2 Materials Supply

During Congressional hearings Mr. R. J. Dougherty, Chief Administrator, Metropolitan Sewer Board of the Twin Cities Area, Minnesota, indicated that shortages of reinforcing bars, steel piping and cement will extend the construction times on some of their projects which normally would take three years, now would take up to four years.⁽¹³⁰⁾ The National Commission on Water Quality stated: "Chances of shortages of materials especially pipes, valves and fittings; structural clay products; service industry machinery; industrial controls; and cement and gypsum, increase if the deadlines are strictly enforced."⁽¹³¹⁾

The problems inherent in construction cost escalations manifest themselves in many ways such as the inability of a contractor to get needed supplies. The beginning of the problem lies with the raw materials supplier. As prices rise and materials become scarce these constraints are also placed on the manufacturer. Unprecedented demand, spurred in part by the Federal Water Pollution Control Act, has been a main contributor to supply shortages and increased prices. Suppliers pass along price increases to manufacturers and manufacturers pass their increased costs onto their customers, the contractors.⁽¹³²⁾ At this point, trouble usually appears. Contractors, having signed fixed price contracts with a municipality, now find that their costs for materials and equipment are increasing. Suppliers are giving contractors a price at time of delivery quote. Mr. S. Horowitz, President of the Associated General Contractors believes that this type of operation could force some contractors into business failure.⁽¹³²⁾

Mr. R. Sullivan, executive Vice-President of Valve Manufacturers Association states that demand is currently outrunning the ability to supply. Therefore orders are being accepted on longer and longer lead times.⁽¹³³⁾ He further contends that as backlogs of the valve industry extend, price escalations can tend, in some cases, to be double those in effect at the time the order was placed. Mr. Sullivan believes that it is folly to quote a firm price on a product not to be delivered for anywhere from 90 days to two years from the date of order.⁽¹³⁴⁾

Cost escalation is a critical problem. If manufactureres cannot recoup their costs, they may start backing away from municipal projects.⁽¹³²⁾ Mr. H. Cahill of EPA says there is no agreement on the causes of cost escalations, so finding a solution will not be easy.⁽¹³²⁾

The intent of this section was not to seolve or enumerate all possible material supply problems, but rather to indicate that delays in delivery and higher costs of materials are possible in this area. These higher costs hamper the construction grant program by using more of the fixed amount of money alloted to the program and delays put off meeting the goals of the Act.

7.3 Manpower

The effectiveness of water quality control programs will be influenced to a major degree by the availability of skilled manpower. This manpower will be needed in the federal, state and private sectors of the economy and will involve skill levles that vary from professional to manual operational tasks.⁽¹³⁵⁾

7.31 Water Pollution Control Personnel Requirements

Tables 7-1, 7-2, 7-3 are presented to show the personnel requirements that are estimated to be needed by 1976 in the water pollution field.

Table 7-1⁽¹³⁶⁾

Total FY 1971 Manpower Engaged in Water Quality Activities

Occupational Category	Non Government	Local	State	Federal (Non-EPA)	EPA	Total
Professional	13,200	4,300	2,100	4,600	1,200	25,400
Operator	15,400	29,700	-	4,200	-	49,300
Technician	20,500	4,000	300	1,800	300	26,900
Other	4,700	38,700	1,200	1,900	1,300	47,800
Total	53,800	76,700	3,600	12,500	2,800	149,400

Table 7-2⁽¹³⁷⁾

Total Projected FY 1976 Manpower Engaged in Water Quality Activities

Occupational Category	Non-Government	Local	State	Federal (Non-EPA)	EPA	Total
Professional	23,400	5,600	5,500	5,900	1,800	42,200
Operator	48,700	38,600	-	5,600	-	92,900
Technician	38,900	5,200	700	2,000	500	47,300
Other	15,100	50,400	2,100	2,300	1,900	71,800
Total	126,100	99,800	8,300	15,800	4,200	254,200

As of 30 January 1974 the states had 5244 people working in the water pollution control field.⁽¹³⁸⁾ Appendix D contains data from a yet unpublished internal EPA staff study indicating that the present state manpower needs are 6692 people.

Table 7-3⁽¹³⁹⁾

Additional Manpower Required by 1976

Personnel Category	Non-Government	Local	State	Federal (Non-EPA)	EPA	1976 Total
Professional	10,200	1,300	3,400	1,300	600	16,800
Operator	33,300	8,900	-	1,400	-	43,600
Technician	18,400	1,200	400	200	200	20,400
Other	10,400	11,700	800	400	600	23,900
Total	72,300	23,100	4,600	3,300	1,400	104,700

7.32 Training Grants and Fellowships

In addressing the House Public Works Committee in April, 1974, representatives of the Association of Environmental Engineering Professors asserted that a conservative estimate of the present situation is that 4,000 to 5,000 environmental engineers must be graduated each year through 1976 in order to meet the demand generated by the construction grants program and other environmental quality control measures.⁽¹⁴⁰⁾

Two studies were made to determine what effect the phase out of EPA training grants and fellowships by 30 June 1976 was having on programs that had received such funds. They showed that enrollment reductions ranged from 10 to 60 percent.⁽¹⁴⁰⁾ In the past one-half to two-thirds of the environmental engineers who received graduate training were supported by EPA. Elimination of

this support put strong pressures on the universities. Declining enrollment results in less frequent offering of courses, diminished quantity and quality of laboratory courses and reduced summer research productivity.⁽¹⁴⁰⁾ This decrease in the supply of water pollution control personnel will occur at a critical time. If more responsibility is given to the states for PL 92-500 they could have difficulty attracting qualified personnel.

7.321 Who Should Pay. In two consultant reports for EPA the findings have been that those engineers who solve the water pollution problems represent the public segment of society because their efforts are directed toward the protection of resources, therefore public agencies have a primary role in the education of these people. The reports also point out that the use of federal funds for university activities has significant historical precedent in such fields as agriculture, health, defense, basic scientific research and meeting the national needs in water pollution abatement.⁽¹⁴¹⁾

EPA is hoping that state and local governments and also the private sector will take up the slack left by the agency's withdrawal from support of education.⁽¹⁴²⁾ However, as industry supported less than 1 percent of water pollution control education in 1970-71 the prospects do not look good.⁽¹⁴¹⁾

7.33 Operations and Maintenance

An in-house EPA report on the performance of EPA-financed plants indicated that of the secondary plants built, 52 percent were

found to be producing effluent that did not meet EPA secondary effluent standards.⁽¹⁴³⁾ This should be an indication that an adequate supply of well-trained personnel is needed. The Association of State and Interstate Water Pollution Control Administrators are in agreement that a lot more pollutants can be removed from our streams by better operation of our existing facilities. This objective is attainable through the constant training and skill upgrading of treatment plant operator personnel.⁽¹⁴⁴⁾ An EPA report indicates that many regional offices do not effectively coordinate operation and maintenance programs with manpower development and training activities, and have not used budgeted operations and maintenance positions for operations and maintenance work.⁽¹⁴⁵⁾

7.331 Charges for Tuition Lead to Enrollment Drop. In past years EPA has provided free training for operations and maintenance personnel, at the National Training Center in Cincinnati, Ohio and at other locations. Due to cutbacks in funding it was decided by EPA and the Office of Management and Budget to institute charges for attendance at these courses. Due to this decision it has been estimated that participation has dropped from 3000-4000 per year to approximately half.⁽¹⁴⁶⁾

Mr. M. Davost from Chicago's Department of Water and Sewers commented that "these courses were free only a few years ago but now most of them are around the \$280 mark for a few days and our region hasn't scheduled even one course locally."⁽¹⁴²⁾

In an editorial Mr. Charles Heckroth, Editor of Water and Wastes Engineering expressed the view that many utilities are too complacent in not sending people to training courses, and also do not set aside money in their budgets, nor plan training and educational schedules. He urged utilities to move now since tomorrow would be too late. (142)

7.34 Salaries

Another factor in the shortage could be the high demand level itself. Industry, trying to meet the requirements of the Act, and consulting firms with federal funds for planning, design and construction which want to get projects underway can afford to pay B. S. engineers high salaries. These high salaries can influence engineers to bypass government work and graduate training and go to work for industry instead. The latest American Water Works Association survey of utility salaries shows that sewerage personnel are among the lowest paid people in positions of public trust in the United States. (147)

In order to get and keep qualified personnel in the water pollution field on the federal, state and local level, it appears that both training and higher salaries may be required. The greatest danger from a lack of adequate training lies in the possibility of attracting unqualified personnel into the environmental field. (148)

8.0 FUNDING CONSIDERATIONS

The Federal Water Pollution Control Act Amendments of 1972 have been said to be the single largest construction program in the United States.⁽¹⁵⁾ To accomplish the goals set in the act will require large sums of money and will take years to accomplish. While it appears that the total cost is not a direct major problem in implementation of the requirements of the Act, it is still an area which should be considered, as it does in some respects, affect the implementation of the Act.

8.1 Preliminary Cost Estimates

8.11 Preliminary Cost Estimates of Senate Bill (S.2770)⁽¹⁴⁹⁾

During deliberations on the Senate version of the Act, \$14 billion was provided to be used over four years for grants to communities for construction of treatment works. Of this amount \$9 billion was to be for fiscal years 1972 to 1974 and \$5 billion for fiscal year 1975. The \$9 billion figure was based on 70 percent of the \$12.6 billion backlog estimated by EPA through 1974. This estimate considered the needs to provide secondary treatment to all sewerred communities and some tertiary treatment.

The Senate Committee on Public Works figures reflect certain constraints or limitations in the figures provided for EPA. The limitations are:

- (A) the EPA calculations are projected for only three years;

(B) the calculations do not include treatment for any unsewered urban population;

(C) no provision was made for investment in storm and sanitary sewer overflow;

(D) no anticipation was made for joint municipal and industrial waste treatment facilities;

(E) EPA calculations did not consider the magnitude of the effort projected by the proposed legislation.

In addition to the estimates received from EPA, the Senate Committee on Public Works asked the National League of Cities-- United States Conference of Mayors to determine the need for Federal grant assistance by surveying their member cities. The results of that survey indicated that a waste treatment backlog of \$33-37 billion was needed, well above the \$14 billion the Senate was considering. The Committee agreed that the Act would not provide sufficient funds to retire the entire backlog, but the amount provided should make major inroads into the backlog and begin to achieve the kind of a program anticipated by the legislation.

The Committee agreed the task envisioned by the Act was a massive one in terms of funds required and the work to be done, that is, the time for actual construction of facilities required to treat municipal wastes was to extend over four to seven years.

8.12 Preliminary Cost Estimates of House Bill (HR 11896)⁽¹⁵⁰⁾

The House estimated the total cost of the Act to be \$24.6 billion for fiscal years 1972 to 1977; of that amount \$18.4 billion

was for the construction of waste treatment works. The final figure as provided for in the Act was \$18 billion. The estimates of the cost of HR 11896 were prepared by the House Committee on Public Works. No estimate of the cost of the bill had been submitted by any government agency to the Committee.

In response to House requests for views and comments on HR 11896 the EPA supported their proposed three year \$6 billion construction grant program, stating that their proposal was based on the most comprehensive and reliable assessment of waste treatment needs available. EPA believed the waste treatment construction industry was not capable of rapid expansion to accept the larger construction funding demands and that costs already inflated in this area, would mount as the lag between construction capacity and funding increased.

8.2 The Needs Survey

8.21 Background

In accordance with Section 516 (b) of the Act, the Administrator, in cooperation with the states, is required to make a biennially revised detailed estimate of the cost of construction of all needed publicly owned treatment works in each of the states. These are called "Needs" Surveys and to date two of them have been performed.

8.22 Needs Survey Categories (151-153)

The 1973 Needs Survey contained five categories. One additional category, dealing with the costs for treatment and control of stormwater, was added to the 1974 survey to bring the total to six categories.

8.221 Category I - Secondary Treatment Required by the 1972 Act.

All municipalities are required to provide a legally required level of secondary treatment. For purposes of the survey "secondary treatment" and "best practicable wastewater treatment technology" were to be considered synonymous..

8.222 Category II - Treatment More Stringent Than Secondary Required By Water Quality Standards.

The level of treatment for many waterways exceeds that required by secondary treatment and must meet levels required by water quality standards. Included are costs to remove pollutants such as phosphorous, ammonia, nitrate and organic substances to the extent required by applicable laws.

8.223 Category III - Rehabilitation of Sewers to Correct Infiltration and Inflow.

This category is broken down into two parts. Part A includes costs for correction of sewer system infiltration/inflow problems. Costs of infiltration/inflow studies are included in the estimates for Part A. Included in Part B are costs for replacement or major rehabilitation of existing sewage collection systems. Major rehabilitation is considered extensive, that is, repairs of existing sewers beyond the scope of normal maintenance programs is required.

In the 1973 Survey costs were considered under one part, while for the 1974 Survey, costs were broken down into two parts.

8.224 Category IV - New Sewers. This category also is broken into two parts. Part A consists of costs for construction of collector sewer systems designed to correct violations of applicable laws. Part B details costs for new interceptor sewers and transmission pumping stations.

8.225 Category V - Correction of Overflows from Combined Sewers. The costs of facilities to correct periodic by passing of untreated wastes from combined sewers into waterways is included in Category V, however, it does not include treatment and control of stormwaters.

8.226 Category VI - Treatment and/or Control of Stormwaters. Abating pollution from stormwater run-off channelled through sewers and other conveyances used only for such run-off are estimated in this category. Run-off carried in combined sewers is included in Category V. This category was not included in the 1973 Needs Survey.

8.23 Needs Survey Constraints

8.231 1973 Needs Survey. The Constraints of the Needs Survey include: (150)

- (A) costs in June, 1973 dollars;
- (B) projections for 1990 population;
- (C) only those costs that could be clearly defined and documented were to be reported, while facilities that would achieve

the best practicable treatment technology and zero discharge were not to be included.

8.232 The 1974 Needs Survey. The 1974 Survey included the first two constraints of the 1973 Needs Survey, however, the third was deleted as a requirement.

8.24 Results of 1973 and 1974 Needs Surveys

Table 8-1 represents the findings of the two most recent Needs Surveys for the United States. This table can be found on page 102.

8.25 Overall Costs

The reliability of the Needs Survey has been questioned by EPA. Russel Train said, "Our preliminary analysis of the 1974 state data strongly indicates that the total estimates reported by states exaggerated the costs of meeting the requirements of Public Law 92-500." (153)

After EPA reviewed the 1974 figures for Categories, I, II, and IVB which reflect the costs for the traditional Water Quality Program of treatment plants and interceptors, the costs were reduced from \$53 billion to \$46 billion. If the \$46 billion and \$36 billion from the 1973 Survey are compared with the \$33-37 billion figures shown in Section 8.11, it is conceivable that the figures are not totally exaggerated.

Table 8-1(154)

Costs Reported For Construction
of Publicly-Owned
Wastewater Treatment Facilities

CATEGORY		(millions of 1973 dollars)			
		1974 Survey			
		(A) State Preliminary Data	(B) State Corrected Data	(C) EPA Adjusted Data	(D) 1973 Survey Data
I	Secondary Treatment	11,679	12,628	12,629	16,639
II	More Stringent Treatment Required by Water Quality	21,311	20,330	15,776	5,650
IIIA	Correction of Sewer Infiltration/Inflow	5,355	5,348	5,287	691
IIIB	Major Sewer Rehabilitation	7,070	7,330	3,287	-----
IVA	Collector Sewers	23,090	24,583	17,458	10,825
V	Correction of Combined Sewer Overflows	26,070	31,192	31,076	12,697
VI	Treatment and/or Control of Stormwaters	235,006	235,006	235,006	-----
	TOTALS	349,613	356,177	342,442	60,123
	Totals for Categories I, II, and IVB Combined	52,922	52,716	46,328	35,910

The reliability of the Survey are said to be limited by three factors: (155, 156)

(A) Some states assumed that the 1983 standards would be similar to those utilized in the 1973 Survey, while others assumed that major increases would be required in the stringency of standards and estimated very high levels of treatment. This problem of differing goals caused EPA to question the costs reported in Categories III, V and VI.

(B) The ability to make reasonably accurate engineering cost estimates and to validate them depends on how advanced the particular pollution abatement technology is. Categories I, II and IV pertain to technical areas that are rather well developed, whereas EPA felt that the technology and cost estimating capability for Categories III, V, and VI were at a lower level of refinement.

(C) The facilities planning element was more effective in producing good cost estimates for Categories I, II and IV than for the other categories since these areas have received the most attention in the planning effort. The costs in these categories generally relate to the 1977 requirements and 1983 costs have been estimated without much formal planning. EPA effectively discounted all cost estimates for Categories III and V except for those which had a completed analysis. Virtually no completed planning was available for Category VI estimates; EPA emphasized the inadequacy of planning in this area.

8.3 The Allocation Formula

In the previous section we have seen that EPA considers the needs survey somewhat unreliable and because of this EPA considers the needs survey a questionable basis on which to allot funds.

8.31 Prior to PL 92-500

Before the passage of the Federal Water Pollution Act of 1972 funds were allocated to the states on the basis of population.

8.32 Fiscal Years 1973 and 1974

As mandated by PL 92-500 allotments to the states for fiscal years 1973 and 1974 were made on the basis of a 1971 needs survey made by EPA. This survey was not much more than an educated guess.⁽¹⁵⁷⁾ Following a review of the 1973 needs survey, EPA considered it to be unbalanced and unfair and suggested that allotments be made instead on only a portion of needs that were considered the most valid, Categories I, II, and IVB.

8.33 Fiscal Year 1975

Congress in passing PL 93-243 directed that allotments to the states for fiscal year 1975 be based half on the total needs, and half on those needs in Categories I, II, and IVB. At the same time it directed that no state should get less than it did in 1972.

8.34 Future Allotments

Future allotments are to be based in part on the 1974 and future needs surveys. However, EPA presently feels that a new allocation formula based half on population and half on estimates for Categories I, II and IVB of the needs survey should be utilized.⁽¹⁵⁸⁾ HR 4161 and S 1216 introduced in the House and Senate respectively would provide for such an allotment formula.

8.35 Allocation Issue

The question of how to develop an allocation formula for distributing available construction grant funds is a continuing problem. The use of a purely population based formula failed to provide adequate funds to states that had high population concentrations and a need for sophisticated treatment facilities. A purely needs-based allocation presents difficulties as described in Section 8.25. A formula based on Categories I, II and IVB will give proportionally more money to states that have done very little about water pollution control problems and still have most of their secondary treatment attainment ahead of them. It will give fewer funds to those state that have done a great deal toward attaining secondary treatment and have done some of their advanced treatment but still have problems with combined sewers and stormwaters.

All attempts at a formula seem to be concerned with equity. A fundamental premise in the law, however, seems to be forgotten, that is, put money where the pollution is and in the kinds of invest-

ments required to abate it.

8.4 Reimbursements

The Act does not exclude municipalities from federal grants which had started construction before the 1972 Amendments. A reimbursement program was provided for in Section 206 of the Act to pay back to those who had set out on their own in the water pollution control area without the assistance of federal funds.

8.41 Facilities Constructed Between 30 June 1956 and 30 June 1966⁽¹⁵⁹⁾

Municipalities that constructed facilities during this time period are eligible to receive federal funds provided the project was approved by the state water pollution control agency and met the requirements of the Water Pollution Control Act in effect at the time of construction.

8.42 Facilities Constructed Between 30 June 1966 and before 1 July 1972⁽¹⁵⁹⁾

Those municipalities able to qualify may be reimbursed for the difference between the amount received in federal aid and 50 percent of total cost of the project. If the project was constructed in accordance with a comprehensive regional treatment plant, the agency may receive an additional 5 percent of the total cost.

8.43 Federal Funds for Reimbursement

The 1972 Amendments authorized \$2.75 billion in funds to be reimbursed to eligible agencies.

8.5 Future Reimbursement

Congressmen Robert A. Roe when talking about public officials said it would be foolhardy to propose spending municipal money when 75 percent of the cost of treatment works was available from the Federal Government. (160)

Mr. C. B. Koiser, President, Association of Metropolitan Sewerage Agencies, claimed that since 1972 many sewerage districts have gone ahead with construction projects without the assistance of Federal funds. The projects are urgently needed treatment facilities which could not be postponed until Federal funds were made available. (161)

Title II regulations do not permit reimbursement for voluntary advanced Step I and Step II projects after November, 1974 and no reimbursement at all for Step II voluntary advanced projects. (162)

Mr. T. C. Williams of Williams and Works Grand Rapids, Michigan, stated in congressional hearings held in 1974 that he had at least eight clients that would be willing to go forward with the construction of wastewater treatment facilities. He said they would be willing to finance Step I, Step II and in some cases even Step III of the project in order to save construction money in a period of inflationary costs. Their reason for not starting these projects

is simply that they would not want to lost grant monies if funds became available at any time in the near future.⁽¹⁶²⁾

8.6 Future Funding

In a recent letter to the Office of Management and Budget EPA has recommended a funding level of \$42 billion over a 6 year period, fiscal years 1977-1982 for the construction grants program. EPA emphasized that the public needs a realistic achievable program in view of the \$342 billion estimate of the 1974 needs survey.⁽¹⁶³⁾

The recommendation aims at giving priority to funding for:

- (A) completion of necessary treatment plants and interceptor sewers (Categories I, II, IVB);
- (B) correcting infiltration/inflow (Category IIIA);
- (C) controlling stormwater discharges (Category VI).

The National Commission on Water Quality stated that in order to achieve compliance with the law for Categories I, II and IVB by 1980 and IIIA, IIIB and V by 1985 without increments for inflation would require Federal appropriations averaging \$7.8 billion yearly for the first six years and \$14,5 billion yearly over the next five years. Future inflation could require increasing Federal expenditures selected now; the quoted annual figures could be \$8.6 and \$25.3 billion to account for inflation.⁽¹⁶⁴⁾

9.0 CONCLUSIONS AND RECOMMENDATIONS

Since passage of the Act in 1972 demands for changes have been made by wastewater management at all levels of government, by professional organizations and facility operating personnel.⁽¹⁶⁵⁾ Changes for improving the Act are encouraged, however, achieving the goals of the Act has affected municipalities in many ways since not all are being confronted with the same problems. Therefore, care should be taken with regard to any changes made. The Act is complex; it imposes some stringent requirements on the Federal Government in administering the Act and on state and municipal governments in complying with the Act.

After leaving the Environmental Protection Agency, William Ruckelshaus said, "When I was administrator of the Environmental Protection Agency, I saw Congress pass bills on clean air and clean water when they knew - absolutely knew - that the goals couldn't be fulfilled."⁽¹⁶⁶⁾

9.1 Conclusions

As was indicated previously, the objective of this thesis is to determine the problems encountered in the implementation of the construction grants program and their effect on meeting the goals of the 1972 Act. As already discussed not one but many problems interacted to cause delays in meeting the Acts goals. However, these delays were only partial; the initial authorizations for the grants program were insufficient for all municipalities to meet the require-

ments of the Act.

9.11 Reliability of This Review

Much of the information on the construction grants program has been written in an overview fashion. Publications have generally given broad coverage to subjects such as use of ad valorem taxes for compliance with the user charge requirements of the Act. The articles have not given specific examples of where the problem exists.

Internal EPA reviews of the grants program have generally been concerned with giving reports of findings, not presenting all the data upon which those findings were based. Findings such as management did not totally utilize all available manpower to accomplish a function or EPA did not give sufficient and timely guidance to the field are difficult to evaluate in terms of their specific effect on the grants program. Congressional testimony has given the most specific information as to the problems encountered by state and municipal governments. The review of publications, EPA reports, congressional testimony, and limited interviews have complimented each other. The overall conclusions presented are considered valid.

9.12 Delays Caused by Implementation Problems

Problems such as user charges, industrial cost recovery, environmental impact statements, infiltration/inflow analysis, and state priority lists have caused delays in implementing the requirements of the Act. If the estimate of 4 to 6 years for completion of a waste water treatment facility from start to finish is accepted a

project approved in October, 1972 could be expected to be operational around October, 1976. For all those projects funded from the original \$18 billion the problems reviewed have caused delays and will cause many of them to miss the 1 July 1977 date for secondary treatment.

Problems have also been caused by the late issuance of guidelines and regulations pertaining to the areas of user charges, etc., and the duplication of effort by Federal and State governments in the initial stages of the program have caused delays and probably have affected some municipalities in meeting the 1 July 1977 date for secondary treatment.

As the problems and administration of the Act can effect states and municipalities in differing degrees, it is impossible to quantify how long a delay was caused by each specific problem. Overall the problems with meeting the Acts requirements and the administration of the Act will delay meeting the 1977 secondary treatment goals.

9.13 Workability of Construction Grants Program

The final regulations concerning construction grants for wastewater facilities mandated by the Act have clarified some of the administrative processes required for state and local governments compliance and obtaining construction grants. The requirements for infiltration/inflow have been modified so that EPA will accept certification by a state agency that excessive infiltration/inflow is not present. Some states have accepted responsibility for

review of plans and specifications, and operation and maintenance manuals, thereby relieving some of the duplication that has been present in the program.

Final regulations have taken away some of the hesitancy on the part of municipalities. It appears that the late issuance of regulations and the problems of gearing up to administer this complex law have passed the initial problem stage and the program is proceeding more smoothly than during the first eighteen months.

Even with factors which have made the program more workable and manageable for all levels of government, more administrative changes could be made to make delivery of funds more rapidly to municipalities.

9.14 Impoundment of Funds

Much has been said and written about Presidential impoundment of funds, however, it does not appear that this action had a significant effect on the entire construction grants program. Individual states may have been delayed by the action.

A review of Table 6-5 indicates that in neither FY 73, 74 or 75 did EPA obligate the full amount of funds released by the President. The delay during these years could be attributable to other problems namely: user charges, industrial cost recovery, infiltration/inflow analysis and state priority lists. Impoundment of funds at this particular point in time, now that the grants program is working smoothly, could cause very serious delays in working toward meeting the treatment of wastewater required by the Act.

9.15 Construction Grant Funds Required

Ignoring the stormwater treatment and control category of the 1974 Needs Survey, as it was not included in the 1973 survey, the change in the needs survey from 1973 to 1974 was almost 78 percent. For Categories I through V the 1973 total was approximately \$60 billion and the 1974 total was \$107 billion.

Categories I, II and IVB which EPA considers the traditional water quality program of treatment plants and interceptors were \$35.9 billion in 1973 and increased to \$46.4 billion in the 1974 survey. This represents an increase of 29 percent. In 1973 the states were restricted in using only existing water quality standards to base their needs. In 1974 anticipated water quality standards were used. It is conceivably possible the increase could be due to the standards used.

As of 30 September 1975 only \$7.4 billion of the available \$18 billion had been obligated by EPA. To meet the 1977 secondary treatment goals as described by Categories I, II and IVB will require an additional \$28 billion in 1973 dollars according to the 1974 needs survey. The \$7.4 billion obligated represents only 16 percent of the costs required to meet the 1977 secondary treatment goals.

The goals of secondary treatment will not be met unless the \$28 billion is funded and with inflation this figure will probably be even higher. The single most important catalyst in meeting the goals of the Act is the availability of federal grant funds.

9.2 Recommendations

The following recommendations will, if implemented, aid in providing for a smoother running grants program by lessening the administrative requirement of the construction grants program. These recommendations are not intended to change the thrust of the Water Pollution Control Act but to make it easier to work within its requirements and comply with its goals.

9.21 Federal Funding Commitment

As previously stated the availability of Federal grant funds is the most important factor, if municipalities are going to meet the treatment goals of the Act. What is needed is a long term federal funding commitment which would not only set a reasonable date when the goals of the Act should be complied with but also provides the necessary funding with which to meet the specified dates.

With a price tag of \$350 billion it is highly improbable that Congress will authorize the necessary funds to meet the goal of "zero discharge" by 1985. In the absence of such funding it is recommended that within the federal funding commitment, priorities be set as to which categories of projects can expect funding in the near future. If the most critically needed facilities are treatment plants and interceptor sewers then the major effort should be spent to fulfill these needs first, with any additional funding spent on the next priority item. Both the funding commitment and priority order of funding needs must be a policy that all eligible grant

recipients are aware of. This type of procedure would give the grants program a form of stability and provide the means to reach an end.

9.22 State Participation

Review of documents by both the state and federal governments is a duplication of effort and causes delays in the construction grant process. States which are closer to the practical issues which must be resolved in the grants process are in the best position to review applications and facility plans. Having states responsible for the review should enable municipalities to be able to more readily get personnel attention as the states would be geographically closer to the municipalities than the regional offices and reduced processing time would speed up grants.

Any delegation to the states of responsibilities now performed by EPA must be a methodical and deliberate process, if not, the problems experienced on the Federal level will be just shifted to the state level. In making any transfer the following are necessary:

(A) a clear delineation of the authorities and responsibilities of both EPA and the states;

(B) the capability of attracting and retaining qualified state personnel capable of performing these functions;

(C) adequate federal assistance be provided to help the states.

The success of this program depends both on the states willingness to accept the program and the long term commitment of

federal funding. Failure of a large number of states to participate could cause a dual system of reviews and may not improve the present arrangement, and a long term federal commitment may be a needed incentive to hire these people as there is an insurance the Federal Government is not going to discontinue grants tomorrow.

9.23 Use of Ad Valorem Taxes

It is recommended that the U. S. Congress pass legislation to allow the use of ad valorem taxes to meet the user charge requirement of the Act. It is unfair to require communities who have historically utilized ad valorem taxes for wastewater facilities to go to an extra expense just to comply with the Act.

The concept of everyone paying a proportional share of costs is a valid one, however, this could be accomplished by ad valorem taxes and surcharges on industry. Many school districts and municipalities use property taxes to finance operations, however, all tax payers do not receive benefits in proportion to the amount of taxes paid. The concept of equity in payment for services should have some flexibility in its application.

9.24 Step 2 + 3 Grants

As of the end of February 1975, 53 percent of the number of grants awarded representing 10 percent of the dollars awarded under the construction grants program were to communities with under 5000 population.⁽¹⁶⁷⁾ In this area it is recommended that EPA review the requirements of these grants to determine the feasibility

of streamlining the grant process for these small communities by a reinstatement of the Step 2 + 3 grant.

It would appear that a streamlined process for small community grants which are for relatively small sums of money as compared with large city grants, could save a great deal of effort now expended on grant review.

If upon review the above recommendation is found feasible Congressional action would be required for its implementation.

9.25 Pre-Financing

It is recommended that the Act be amended to provide that for a community wanting to go forward with construction of treatment works now, reimbursement of the Federal share of the project would be forthcoming at a future date. In order to be eligible the community would have to comply with all the Acts requirements. The community would have to raise the entire amount of the capital cost required and would have to have service charges high enough to cover the bond payments.

Whenever the communities project reaches a high enough priority to receive a federal grant, they would receive a retro-active grant for the portion of the project that would be eligible for grant participation. The community could then buy back callable bonds or invest the grant monies to make bond payments as they become due and reduce the constomers sewer rates.

The community would gain in lower construction costs by not having to wait several years for a grant and the Federal government

would also gain as they are supplying 75 percent of the cost of the facility.

9.26 Training Program

It is recommended that in conjunction with the recommendation for a long term federal funding commitment, continued support be given to training the manpower necessary to design and operate the proposed treatment facilities. To have the required funding to construct treatment works and not have sufficient manpower to design and operate them is a counterproductive effort.

In order to determine the manpower needs, it may be necessary for EPA to update their 1972 report on Manpower Development and Training Activities. The results of this review should become an input into the funding commitment made to the construction grants program.

9.27 Mandated Requirements

The 1972 Act authorizes federal construction grants for wastewater facilities. Local governments are responsible for meeting the mandated goals of the Act even in the absence of Federal grants. It is apparent that the goals will not be met by the required dates, therefore, it is recommended that legislation be enacted to authorize case-by-case extensions of the 1977 municipal secondary treatment deadline based on the unavailability of federal funds. Any granted extensions should be tied to the proposed long term commitment of federal funding.

A community would be granted an extension of time in meeting the secondary treatment requirement until a time when it appears that the projects priority will warrant funding. This extension also should be subject to adequate operation and maintenance of the existing facilities.

APPENDIX A

Federal Water Pollution Control Legislation*

- 1866 - A Federal Statute was enacted prohibiting the dumping of refuse into New York Harbor.
- 1899 - The Rivers and Harbors Act
-Prohibited the discharge of non-liquid wastes into navigable waters.
-Attempted to prevent hazards from floating debris.
-Imposed criminal penalties for violation.
- 1912 - The Public Health Services Act
-Directed the Public Health Service to conduct research into the health effects of water pollution; this research provided the basic knowledge used in current studies.
-Established the basis for nation-wide drinking water standards.
- 1924 - The Oil Pollution Control Act
-Prohibited the non-emergency dumping of oil into navigable waters.
-Required violators to clean up spills.
-Imposed fines for violation.
- 1948 - The Water Pollution Control Act
-Established, as experimental, the beginning of the present body of legislation.
-Pertained to more than one type of pollutant.
-Authorized federal research and technical and planning assistance to state and local governments.
-Authorized \$5 million annually for expenditures under the Act and \$22.5 million for loans.
-Recognized the "primary" of states in water pollution abatement.
- 1956 - The Federal Water Pollution Control Act
-Established the basis for current programs.
-Authorized aid for research, and aid for state and interstate water pollution control agencies.
-Authorized grants for construction (\$50 million annually, 30% project cost, a limit of \$250,000 per project).
-Established an enforcement procedure.

- 1961 - Amendments to the Federal Water Pollution Control Act.
- Increased research aid, including the construction of research facilities.
 - Increased construction grants (to an average of \$90 million annually, increased per project limit to \$600,000, required 50% of funding to go to cities with populations under 125,000).
 - Prompted joint-municipality treatment works (by setting per project funding limits at \$2,400,000).
 - Extended federal responsibilities to all navigable water.
- 1965 - The Water Quality Act
- Authorized a research and development program for combined sewers.
 - Increased grant funding (to \$150 million annually doubling the per project fund limits to \$1,200,000 for single municipality projects and \$4,800,000 for joint projects, but removed limitations in states that matched federal funding grants).
 - Prompted comprehensive planning (by adding an additional 10% funding to projects certified as conforming with comprehensive plans).
 - Established the Federal Water Pollution Control Administration with the Department of Health, Education and Welfare.
 - Established a mandatory water quality standards program for interstate waters.
- 1966 - Reorganization Plan No. 2
- Transferred the administration of the Federal Water Pollution Control Act to the Department of the Interior.
 - Authorized an Assistant Secretary of the Interior for Water Quality.
- 1966 - The Clean Water Restoration Act
- Increased research grants.
 - Increased construction grants (to 55% of project costs if states provide 25% and establish enforceable water quality standards, and if the project fits into a comprehensive plan).
 - Authorized 50% funding of official planning agencies who develop comprehensive, basin-wide water pollution abatement plans.
 - Authorized studies of estuaries, watercraft and industrial pollution.

- Authorized the Secretary of the Interior to study intrastate pollution if requested by a majority of involved officials.
- 1969 - The National Environmental Policy Act
 - Requires federal agencies to study the impact of their proposed actions (this may include the environmental agencies).
- 1970 - Reorganization Plan No. 3
 - Established the Environmental Protection Agency (an umbrella-type environmental organization reporting directly to the executive office; consists of eight formerly separate anti-pollution organizations).
- 1970 - The Water Quality Improvement Act
 - Authorized federal cleanup of oil spills.
 - Requires federal license holders to obtain state certification of conformance with existing water quality standards.
- 1972 - Amendments to the Federal Water Pollution Control Act
 - Increased construction grants (to 75%, no ceilings, no state participation, but requires regional planning, industrial payback, user charges and system evaluation).
 - Establishes "zero discharge of pollutants" goal.
 - Changes abatement approach from water quality standards to effluent standards.
 - Authorizes federal intervention in ineffective water pollution abatement programs.

*T. J. Egum, "Local Wastewater Financing and the Impact of the 1972 Federal Water Pollution Control Act," (unpublished Masters Thesis, University of Pittsburgh, 1973).

APPENDIX B

LAWS AND REGULATIONS PERTAINING TO WATER POLLUTION

The following is not an index to all applicable State and Federal Laws and Regulations but rather a listing of those most commonly enforced by the Department of Environmental Resources in water pollution control.

<u>Commonly Used Name</u>	<u>Public Law Number</u>	<u>Applicable Chapters of the Rules and Regulations of the D.E.R.</u>
1. Clean Streams Law	P.L. 1987	73, 91, 93, 95 97, 99, 101 and 102
2. Pennsylvania Sewage Facilities Act (Act 537)	P.L. 1535	71 and 73
3. Dams and Encroachments Act and Water Power and Water Supply Act and Section 1920-A of the Adminis- trative Code	P.L. 555 P.L. 704 No P. L. Number	105
4. Waterworks Act and Sections 1918-A and 1920-A of the Admin- istrative Code	P.L. 260 No P.L. Number	109
5. Public Bathing Law	P.L. 899	193
6. Pennsylvania Sewage Treatment Plant and Waterworks Oper- ators Certification Act (Act 322)	P.L. 1052	301, 101, 105
7. Amended Federal Water Pollution Control Act	P.L. 92-500 (Federal)	None

APPENDIX C

SEGMENT CLASSIFICATION AND CATEGORIES

<u>Area No.*</u>	<u>Area</u>	<u>Segment Classification</u>	<u>Category</u>
1	York Area	Water Quality	I
2	Bald Eagle Creek Basin	Water Quality	II
3	Schuylkill River Basin, except Schuylkill County portion and Schuylkill River main stem	Water Quality	I
3.1	Schuylkill River, Delaware River to Black Rock Dam	Water Quality	I
3(a)	Schuylkill River, Black Rock Dam to Hay Creek	Effluent Limitation	II
3.2	Schuylkill River, Hay Creek to Maiden Creek	Water Quality	I
3(b)	Maiden Creek to Schuylkill County Line	Effluent Limitation	II
3(c)	Schuylkill County Portion, Schuylkill River Basin	Mine Drainage Affected	III
4	Pittsburgh Area, except Ohio River, Allegheny River, Monongahela River and Youghiogheny River	Water Quality	I
4.1	Ohio River, Sewickley Creek to source	Water Quality	I
4.2	Allegheny River, Ohio River to Kiskiminetas River	Effluent Limitation	I
4.3	Monongahela River, Ohio River to Allegheny County Line	Water Quality	I

4.4	Youghiogheny River, Monongahela River to Allegheny County Line	Water Quality	I
4(a)	Monongahela River South of Allegheny County Line	Effluent Limitation	II
4(b)	Youghiogheny River South of Allegheny County Line	Effluent Limitation	II

* Area numbers correspond to water quality standards hearing area numbers.

APPENDIX D

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TABLE 1
Aggregated Estimate
of State Water
Pollution Control
Agency Manpower Needs

FUNCTIONS	FULL TIME OR SHARED	PROFESSIONAL				TECHNICIANS			GRAND TOTAL	
		ENGINEERS	SCIENTISTS	INTERDISCIPLINARY	OTHER	ENGINEERS	LABORATORY	OTHER		CLERICAL
Oil and Hazardous Materials	FT			185				136	73	394
	S									
Manpower Planning Training and Operator Certification	FT	118		79					138	335
	S			115						115
Municipal Wastewater Treatment Plant Operation & Maintenance	FT			83	28	229			74	414
	S			2					4	6
Municipal Wastewater Treatment Construction	FT	484		88	123			39	209	1002
	S									
Monitoring and Data Support	FT	119	247	588	312		264	136	443	2115
	S			35	5					40
State Water Quality Management Planning	FT	202	108	45	182				122	659
	S									
Area-wide Waste Treatment Management Planning	FT	31		73	14				21	139
	S	8		5	3				25	41
Administration and Support	FT									
	S									
Enforcement	FT	211	82	361	144			39	264	1101
	S			6	1					7
Laboratory Quality Assurance	FT		281	14					14	309
	S		17	41					41	99
Research and Development	FT			10				2	9	21
	S			45				7	46	98
SUBTOTAL	FT	1165	718	1526	869	229	264	352	1366	6489
	S	8	17	249	9	—	—	7	116	406
TOTAL = FT + S		1173	735	1775	878	229	264	359	1482	6895
ESTIMATED WORK YEARS = FT + (1/2) S		4420				848			1424	6692

* Totals do not agree due to rounding errors

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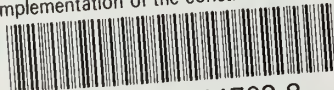
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