

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUDGET JUSTIFICATIONS, F. Y. 1969



WATER POLLUTION CONTROL

**FEDERAL WATER POLLUTION
CONTROL ADMINISTRATION**

DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration

	<u>Page</u>
Highlight statement.....	1
Summary tables by appropriation	
(a) Obligations.....	8
(b) New obligational authority.....	9
Budget estimates compared to authorization.....	10
<u>Appropriation and activity</u>	
<u>WATER SUPPLY AND WATER POLLUTION CONTROL.....</u>	11
Research and development.....	18
Planning, assistance, and training activities.....	62
Enforcement.....	123
Administration.....	135
<u>BUILDINGS AND FACILITIES.....</u>	150
Water pollution control and water quality standards laboratories.....	152
Field evaluations.....	155
<u>CONSTRUCTION GRANTS FOR WASTE TREATMENT WORKS.....</u>	157
Waste treatment works construction.....	160
Appalachian regional development.....	163

DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration

Highlight Statement

There can be no substitute for clean water. Pollution, for too long has been increasing its threat to the Nation's lakes, streams and rivers--even to the ocean waters around us. The people of the United States now realize that polluted water affects us all.

They have mounted a massive effort to combat pollution and assure clean waters for the future. Reflecting the rising public concern--the urgency to correct and control pollution--Congress enacted two major pieces of legislation. The Water Quality Act of 1965 and the Clean Water Restoration Act of 1966 greatly strengthened the Federal Government's ability to launch a concerted, nationwide attack, so badly needed to save our water resources.

As thus amended, the Federal Water Pollution Control Act provides a broad range of tools, including research, enforcement, technical and financial assistance, comprehensive basin planning, and the training of manpower. It enlists the participation of State and interstate agencies, municipalities, industries, universities, and individuals. The success of the National program depends upon the skilled and effective use of these tools.

During FY 1968 and years to come, the major thrust will be the cooperative Federal-State effort to establish and implement water quality standards and attain adequate municipal and industrial waste treatment, and other controls. The Federal Water Pollution Control Administration will also develop, test, and demonstrate new technology to solve present and avert future pollution problems. The training of adequate manpower to operate the waste treatment facilities is crucial to the success of the whole antipollution effort. Program activity is being directed increasingly toward water quality control for entire river basins.

The budget estimate as programmed for FY 1969 represents FWPCA's evaluation of needs at the start of 1968. It reflects activities which are rapidly evolving to fully implement the provisions of recent legislation and to meet changing needs in a critical national program. We can expect this development to continue in the years ahead, conditioned by such factors as:

a. Better information on national needs

Federal expenditures should be governed in a large part by contemporary assessments of national needs, and we are moving rapidly to improve our understanding and ability to measure them. A recent report, "The Cost of Clean Water," identified requirements for waste treatment facility construction and estimates the costs to be incurred by municipalities, industries, and others in future years in meeting the requirements. Through the development of water quality standards and State and interstate agency program plans, we are gaining better information on associated programs and needs. This knowledge will contribute significantly to future Federal programming. Information will be refined, improved, and updated annually.

b. New problems

Despite the best long-range thinking that can now be applied, we will continue to encounter new problems to be solved and controlled. The proliferation of exotic chemicals produced, the persistence of man-made and natural soil erosion, the subsurface disposal of wastes with consequent groundwater pollution, pollution from animal feed lots in new locations, dredging and dredged material disposal, and thermal pollution all represent new or previously unrecognized pollution problems whose control is necessary in the context of today's accelerated clean up.

We must be alert to potential problems and ready to prevent them before they occur. Leaching and erosion of mine and mill tailings is a problem of unspecified magnitude. Past experience in the mining and milling industry has demonstrated that, to avert water pollution, pollution control must be developed as part of the production technology.

c. Development of new programs

Some programs, such as water quality standards and State-local basin planning grants, are just now in their early stages. Their development will involve new methods. Indeed, to be effective, the entire national pollution control effort must continue to seek out new approaches to resolve existing and new problems.

d. New legislation

Some new programs may be enacted into legislation. Already, the Senate has passed S. 2760, calling for accelerated research in lake pollution and acid mine drainage, and increasing the authorities to cope with oil pollution. Companion Administration bills, S. 2525 and H.R. 13923, have been introduced to program the control of pollution from boats and vessels. As such legislative changes occur, they will have a significant impact upon the Federal program. The FY 1969 budget makes no attempt to take potential legislative changes into account.

e. The role of related programs and other levels of government

There is a complex of interrelated effort in Federal agencies and programs which can help achieve the objectives of water pollution control. For example, the Departments of Labor and of Health, Education, and Welfare can assist in the training of sewage treatment plant operators to lessen the FWPCA costs for this item. The U. S. Geological Survey can contribute basic hydrologic data to help monitor water quality standards and reduce the FWPCA requirements in this respect. Remote sensors, such as the EROS satellite, a cooperative venture supported by NASA, TVA, and the Departments of the Interior and of Agriculture, may contribute to the surveillance of heat, oil, and other types of pollution. These complementary approaches with other Federal agencies will be developed and may have significant impacts upon FWPCA programs. There is encouraging evidence of increased efforts by State and local governments in response to the strengthened Federal effort to control pollution. As these stronger activities increase, they will in turn directly affect the shape and nature of Federal program activities. For example, the water quality standards established under the Water Quality Act of 1965, will generate new and strengthened relationships among Federal, State, municipal, and industrial entities in the whole area of water quality monitoring.

f. Changing relationships among various components of the Federal water pollution control program

Implementing the Federal Water Pollution Control Act, as amended, is a highly integrated process. Enforcement may depend on data gathered by the pollution surveillance program. Abating pollution control from Federal installations may rely heavily on technical assistance or on comprehensive basin planning activities. A major management objective of FWPCA is to strengthen this type of program integration in order to provide more flexible and economical utilization of the resources available.

Accomplishments

During the past year significant accomplishments and advances have or will have been made. Some of these are as follows:

a. Research and development

During the past few years considerable funding has been provided to stimulate and support realistic experiments which will demonstrate new and improved techniques to solve three most widespread and difficult problems in the field of water pollution control. These problems are (1) controlling polluted discharges from storm or combined sewers, (2) development of advanced waste treatment processes, water purification methods and joint treatment methods for municipal and industrial wastes, and (3) developing methods for treating and controlling industrial waste pollution. Interest in this program is evident by the fact that, as of

December 31, 1967, there were 39 communities or jurisdictions, 22 industries and one university which provided a portion of the cost of projects designed to advance these objectives. Since these programs are new and require time to determine effectiveness, reliability and cost, full benefit has not yet been realized. The broad application of those methods which prove successful will have program impact and public benefit, thoroughly justifying the cost.

b. State and interstate agency programs

In FY 1968 Congress appropriated \$10 million, an increase of \$5 million over the previous year, for the purpose of providing support to State and interstate water pollution control agencies. To assure the most effective utilization of these funds, comprehensive guidelines were issued, for the first time, setting forth the essential elements of an effective water pollution control plan as a basis for receiving these funds. Although most plans have been approved for FY 1968, it is evident that a great many of the programs require improvement. During the next five years, every effort will be made to upgrade these programs where necessary.

c. National requirements and cost estimates

As mandated by Congress, special reports have been transmitted to Congress as follows:

1. Need for and costs of treating municipal, industrial and other effluents,
2. Economic impact on State and local governments,
3. Possible economic incentives to industry,
4. Federal cost for carrying out the Federal Water Pollution Control Act, as amended, and
5. Manpower and training needs.

These reports represent the first comprehensive in-depth analysis of costs and related economic problems and manpower needs of water pollution control. The cost of water pollution control has been a subject of considerable discussion and controversy. It is not expected that these reports will conclusively settle this complex and difficult question. However, it is a start and it is proposed to continually refine and improve these initial findings.

d. Water quality standards

As provided by law, all States have submitted for approval their proposals for establishing, implementing and enforcing water quality standards for interstate and coastal waters. As of February 14, 1968, standards of 18 States have been approved. The setting and approving of standards is a difficult and involved task. It is anticipated that by the end of fiscal year 1968, with the cooperation of all concerned, standards of most States will have been approved. Once standards are set in all States, the Nation will have for the first time, specific

goals and objectives for interstate and coastal waters and plans for achieving these goals and objectives. This will be a landmark in water resource conservation.

e. Enforcement

During fiscal year 1967 and up to the present time, six enforcement actions have been instituted to abate water pollution. It is significant that three of these actions represented the first application of authority granted by the Water Quality Act of 1965 to stop pollution within a State that interfered with the interstate marketing of shellfish. These and other kinds of enforcement actions will continue when and where necessary.

f. Laboratory construction program

The program is primarily directed toward planning development of building programs for facilities to be located at Stevens Point, Wisconsin and Columbia, Missouri. Architectural and engineering design contracts are planned to be let near the end of the fiscal year. Hopefully, site determination for the facility authorized to service the Middle Atlantic area will have been made.

g. Construction grants for waste treatment works

Construction of needed municipal waste treatment works continues to increase as a result of the grants provided through FWPCA. It is estimated that construction of 930 facilities will be started in FY 1968, compared to 567 in FY 1967--an increase of 363. Furthermore, during FY 1968 700 facilities will be completed and operational--an increase of 229 over the 471 completed during FY 1967.

Anticipated Accomplishments in FY 1969

The FY 1969 program generally represents continued effort on the part of the Federal Government to stimulate and encourage the active participation of States and local agencies and all others to help solve many of the Nation's water pollution problems.

a. Research and development

Efforts will continue to be directed toward a wide variety of research studies, supporting development of projects demonstrating new and improved methods for controlling or preventing pollution from sewer systems and industry, developing and demonstrating practical means for treating waste waters to remove maximum possible amounts of pollutants and development of techniques for controlling pollution from all other sources. Increased emphasis will be given to determining and predicting the effects of pollution on the quality of water, in employing new mine drainage control measures and experimentally applying them in field sites and on expanded efforts in the fields of control and prevention of oil pollution and eutrophication (aging of lakes, streams and coastal waters).

b. State and interstate agency programs

Plans will continue to be critically reviewed with a view toward upgrading and strengthening programs.

c. State and local planning agencies

By the end of the fiscal year, it is anticipated there will be a number of State and local basin planning agencies actively developing comprehensive water quality control and abatement plans for action programs in basins with the most serious and complex water pollution problems.

d. Estuarine studies

A comprehensive study of the Nation's estuaries designed to develop recommendations for a long-range preventive and protective program will be expanded and directed toward analyzing data acquired through previously negotiated contracts, expanding the National Estuarine Register which includes various data on estuaries, determining research and study needs and developing a preliminary report. The report mandated by Congress is due in November 1969.

e. Water quality standards

Water quality standard efforts will be well into the second phase, i.e., seek and observe compliance with standards. Although States have first responsibility, FWPCA will review the extent to which implementation plans are being carried out.

f. Controlling pollution from Federal activities

Increased emphasis will be given to ascertain that positive actions are being taken by each Federal agency to prevent and control pollution from their activities. Among such pollution sources are new and existing installations and buildings, water resource projects, facilities or operations supported by Federal grants, loans, or contracts and vessel operations.

g. Technical assistance

Technical resources will be expanded to provide special technical assistance support on complex problems to other FWPCA programs, States, other Federal agencies, local bodies and others. Particular emphasis will be given to thermal pollution, agricultural runoff and drainage on water quality, pollution by wastes from watercraft, accidental spills such as oil, and maintenance and operation of waste treatment plants.

h. Pollution surveillance

An industrial waste treatment facility inventory will be initiated which is essential and necessary to the program. We will expand and improve the analytical quality control program to provide reliable data either on the part of the States or FWPCA in connection with water quality standards violations and increased support services for monitoring water quality at selected locations to determine trends and status of compliance to water quality standards.

i. Training

Training at all levels will be a major program thrust. The need to develop new treatment techniques and the accelerated activity at the Federal, State and local levels, industry and elsewhere, makes this a prime program requisite. In FY 1973 total manpower needs in water pollution control is estimated to be 135,000, or 90,000 more than the 45,000 now in this field. In addition to expanding existing FWPCA efforts, considerable emphasis will be placed on experimentation with new training techniques and exploring new channels to accelerate training programs to produce needed manpower.

j. Enforcement

The national commitment to abate, prevent and control water pollution is expressed in its final sense through the enforcement activity. Therefore, enforcement actions will be instituted, when applicable.

Finally, construction of needed municipal waste treatment works will increase. It is estimated that, as a result of financial assistance provided through FWPCA, construction will start on 1,350 new facilities--an increase of 460 over the estimate of 890 for FY 1968.

k. Laboratory construction program

The architectural and engineering design effort, started in FY 1968 for the Stevens Point, Wisconsin and Columbia, Missouri facilities will continue throughout FY 1969. A building program will be developed and architectural engineering design contract will be let for the Middle Atlantic laboratory.

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Obligations by Appropriation

	<u>FY 1967</u> <u>Actual</u>	<u>FY 1968</u> <u>Estimate</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1968</u>
Water Supply and Water Pollution Control.....	\$73,173,368	\$108,791,907	\$101,435,000	-\$7,356,907
Buildings and Facilities.....	636,096	4,598,001	160,000	-4,438,001
Construction Grants for Waste Treatment Works.....	<u>133,921,950</u>	<u>174,442,092</u>	<u>242,000,000</u>	<u>+67,557,908</u>
Total.....	207,731,414	287,832,000	343,595,000	+55,763,000

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
New Obligational Authority by Appropriation

	<u>FY 1967</u> <u>Actual</u>	<u>FY 1968</u> <u>Estimate</u>	<u>FY 1969</u> <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1968</u>
Water Supply and Water Pollution Control.....	\$75,082,697 ^{a/}	\$92,581,695	\$101,435,000	+\$8,853,305
Buildings and Facilities.....	6,279,618	...	...	...
Construction Grants for Waste Treatment Works.....	<u>153,000,000</u>	<u>203,000,000</u>	<u>225,000,000</u>	<u>+22,000,000</u>
Total.....	234,362,315	295,581,695	326,435,000	+30,853,305

^{a/} Includes \$20,000,000 comparative transfer from "Construction grants for waste treatment works construction."

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

Budget Estimates Compared to Authorizations

Federal Water Pollution Control Act, as amended

	FY 1968		FY 1969	
<u>Section of Act</u>	<u>Authorization</u>	NOA <u>Estimate</u>	<u>Authorization</u>	NOA <u>Estimate</u>
<u>Section 5--Research, Investigations, Training, and Information</u>				
Carry out all of Section 5 other than subsection (g)	\$60,000,000	\$33,148,695	\$65,000,000	\$39,048,000
(g)--Estuary studies.....	1,000,000	690,000	1,000,000	1,000,000
<u>Section 6--Research and Development Grants</u>				
General authorization provided for the purposes set forth in entire section including contracts....	20,000,000	10,000,000	20,000,000	11,300,000
(a)(2)--Advanced waste treatment and joint waste treatment.....	20,000,000	8,000,000	20,000,000	6,700,000
(b)--Industrial wastes.....	20,000,000	10,000,000	20,000,000	10,000,000
<u>Section 7--Grants for Water Pollution Control Program..</u>	10,000,000	10,000,000	10,000,000	10,000,000
<u>Section 8--Grants for Construction.....</u>	450,000,000	203,000,000	700,000,000	225,000,000
Total.....	581,000,000	274,838,695	836,000,000	303,048,000

Water Supply & Water Pollution Control

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

"Water Supply and Water Pollution Control" Bridge between Activities in

President's Budget

TO

Congressional Justification

Grants

- a. Research and development-----
- b. Training-----
- c. State and interstate agency program-----
- d. Comprehensive basin planning-----

Direct operations

- a. Comprehensive planning, management,
and assistance
 - 1. Comprehensive basin programs-----
 - 2. Water quality standards-----
 - 3. Estuary studies-----
 - 4. Technical assistance-----
 - 5. Pollution surveillance-----
 - 6. Training-----
 - 7. Economic manpower and evaluation-----
 - 8. Controlling pollution from
Federal activities-----
- b. Research and development-----
- c. Regulation and enforcement-----
- d. Construction grants administration-----
- e. Administration
 - 1. Executive direction-----
 - 2. Administrative support-----
 - 3. Regional direction and
management support-----
 - 4. Public information-----
 - 5. Commissioned officer
retirement fund-----

Research and development

Grants, contracts, and Federal
operations

Planning, assistance, and training activities

- a. Comprehensive planning
 - 1. State and interstate agency
program grants
 - 2. Comprehensive basin planning
 - 3. Estuary studies
 - 4. National requirements and cost studies
- b. Standards and controls
 - 1. Water quality standards development
 - 2. Controlling pollution from
Federal activities
- c. Technical assistance and services
 - 1. Technical assistance
 - 2. Pollution surveillance
 - 3. Construction grants administration
- d. Training
 - 1. Grants
 - 2. Federal operations

Enforcement

Administration

- a. Executive direction and management support
- b. Public information
- c. Commissioned officer retirement fund

DEPARTMENT OF THE INTERIOR

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Water Supply and Water Pollution Control

Appropriation, 1967.....	\$55,439,000
Transferred to:	
"Operating expenses, Public Building Service,"	
General Services Administration.....	-295,260
"Salaries and expenses, Office of the Solicitor,"	
Department of the Interior.....	-116,000
Transferred from:	
"Salaries and expenses, Office of Field	
Administration," Department of Health, Education,	
and Welfare.....	+55,000
Comparative transfer from "Construction grants for	
waste treatment works".....	+22,888,233
Total available, 1967.....	<u>77,970,973</u>
Total appropriation, 1968.....	92,800,000
Comparative transfer from "Construction grants for	
waste treatment works".....	+16,210,212
Transfer to:	
"Operating expenses, Public Buildings Service,"	
General Services Administration.....	-218,305
Total available, 1968.....	<u>108,791,977</u>

Summary of Increases and Decreases, 1969

	<u>Base for 1969</u>	<u>Increase 1969</u>
<u>Research and development</u>		
Net decrease for grant and contract effort due to new obligational authority for 1968 and balances brought forward from 1967 exceeding request for 1969.....	\$57,875,212	-\$14,675,212
Additional requirement to accelerate direct FWPCA effort in research, field investigations and demonstrations, and technically monitor, evaluate and assess progress and accomplishments of grant and contract effort.....	9,912,695	+2,859,305
To meet increased pay costs.....	...	+64,000
To provide full year employment of new personnel authorized for FY 1968.....	...	+551,000
Nonrecurring technical, special and other equipment costs.....	...	<u>-585,000</u>
		-11,785,907
<u>Planning, assistance and training activities</u>		
Provide financial assistance for new river basin planning agencies and increased support for those to be approved in 1968.....	500,000	+1,500,000
Expand study areas to meet Congressional mandate for report and recommendation on solving estuarial problems.....	690,000	+285,000
Increase technical capabilities and competencies in field installations to provide technical assistance to other FWPCA and Federal programs, and to States and local agencies and all others concerned.....	3,045,000	+288,000
Strengthen pollution surveillance program in analytical quality control activity, water quality standards compliance and expand collection and dissemination of data on municipal and industrial waste facilities.....	1,899,000	+591,000

	<u>Base for 1969</u>	<u>Increase 1969</u>	
Provide additional manpower resources necessary to cope with the increased workload for administering the grant program for construction of waste treatment works.....	2,183,000	+414,000	
Accelerate professional and technical manpower training in water pollution control field through increased grant funding and staffing in FWPCA field installations.....	4,878,000	+379,000	
To meet increased pay costs.....	...	+147,000	
To provide full year employment of new personnel authorized for FY 1968.....	...	+749,000	
Nonrecurring equipment costs.....	...	-267,000	
Phase out of special projects.....	...	-131,000	
Nonrecurring costs related to national requirements and cost studies completed in FY 1968.....	...	<u>-180,000</u>	+3,775,000
<u>Enforcement</u>			
To meet increased pay costs.....	...	+23,000	
To provide full year employment of new personnel authorized in FY 1968.....	...	<u>+82,000</u>	+105,000
<u>Administration</u>			
Support additional staff for headquarters to meet increased workload in procurement and fiscal service areas.....	2,660,000	+46,000	
Establish full time capability in all regional offices to carry out contract compliance and equal employment opportunity responsibilities and additional clerical staff to provide programs with adequate management support activities.....	1,270,000	+179,000	
Provide needed secretarial assistance for public information officers in regional offices and additional funding for national publications, exhibits and radio and television scripts.....	417,000	+85,000	

	<u>Base for 1969</u>	<u>Increase 1969</u>	
Reduction in requirement for FY 1969 to complete payment to civil service retirement fund, as required by law, for Public Health Service commissioned officers who converted to civil service status in order to remain with FWPCA.....	350,000	-50,000	
To meet increased pay costs.....	...	+45,000	
To provide for full year employment of new personnel authorized for FY 1968.....	...	<u>+244,000</u>	<u>+549,000</u>
Net decrease, 1969.....			<u>-7,356,907</u>
Budget estimate, 1969.....			101,435,000

Water Supply and Water Pollution Control

Activity	Analysis by Activities			
	Fiscal Year 1967	Fiscal Year 1968		
	Amount Available	Total Appropriations	Pay Cost Supplemental	Transfers Amount Available
Research and development.....	\$41,512,267	\$51,618,000		+\$16,169,907 ^{a/} \$67,787,907
Planning, assistance and training activities.....	25,117,791	33,036,000		-122,000 ^{b/} 32,914,000
Enforcement.....	2,999,575	3,412,000		-19,000 ^{b/} 3,393,000
Administration.....	3,401,350	4,734,000		-37,000 ^{b/} 4,697,000
Unobligated balance lapsing.....	2,437,562	...		... ..
Cost reduction program resulting in savings for FY 1967.....	2,360,000	...		... ..
Total.....	77,828,545	92,800,000		+15,991,907 108,791,907

^{a/} Includes \$40,305 transferred to General Services Administration and \$16,210,212 comparative transfer from "Construction grants for waste treatment works."

^{b/} Transferred to General Services Administration.

Water Supply and Water Pollution Control

	FY 1967 Amount Available	FY 1968 Amount Available	FY 1969 Estimate	Increase (+) or Decrease (-) 1969 compared with 1968			Page Ref.
				Total	Pay Cost ^{a/}	Program	
Research and development.....	\$41,512,267	\$67,787,907	\$56,002,000	-\$11,785,907	+\$64,000	-\$11,849,907	18
Planning, assistance and training activities.....	25,117,791	32,914,000	36,689,000	+3,775,000	+147,000	+3,628,000	62
Enforcement.....	2,999,575	3,393,000	3,498,000	+105,000	+23,000	+82,000	123
Administration.....	3,401,350	4,697,000	5,246,000	+549,000	+45,000	+504,000	135
Unobligated balance lapsing.....	2,437,562	...	...	...	...	...
Cost reduction program resulting in savings for FY 1967.....	2,360,000	...	...	...	...	...
Total.....	<u>77,828,545</u>	<u>108,791,907</u>	<u>101,435,000</u>	<u>-7,356,907</u>	<u>+279,000</u>	<u>-7,635,907</u>	

a/ To provide for increased pay cost for fiscal year 1968 positions.

Research and Development

Research and development

Program Elements	FY 1967	FY 1968	FY 1969 Estimate	Increase (+) or Decrease (-) 1969 compared with 1968			
	Amount Available	Amount Available		Total	Pay Cost ^{a/}	Program	
Municipal-Pollution Control Technology.....	(NOT AVAILABLE ON THIS BASIS FOR FY 1967)	\$25,546,212	\$15,331,000	-\$10,215,212	+\$5,000	-\$10,220,212	
Industrial-Pollution Control Technology.....		11,762,000	8,506,000	-3,256,000	+5,000	-3,261,000	
Agricultural-Pollution Control Technology.....		1,630,000	1,991,000	+361,000	+2,000	+359,000	
Mining-Pollution Control Technology.....		4,478,000	4,325,000	-153,000	+5,000	-158,000	
Other-Sources-of-Pollution Control Technology.....		2,602,000	2,350,000	-252,000	+3,000	-255,000	
General Pollution Control Technology.....		7,914,695	8,434,000	+519,305	+12,000	+507,305	
Waste Treatment and Ultimate Disposal Technology.....		8,737,000	9,284,000	+547,000	+17,000	+530,000	
Water Quality Requirements.....		5,118,000	5,781,000	+663,000	+15,000	+648,000	
Total.....		\$41,999,805	67,787,907	56,002,000	-11,785,907	+64,000	-\$11,849,907

a/ To provide for increased pay cost for fiscal year 1968 positions.

Research and development (continued)

<u>Conventional Budget Elements</u>	<u>FY 1967</u>	<u>FY 1968</u>	<u>FY 1969</u>	<u>Increase (+) or Decrease (-)</u>		
	<u>Amount</u>	<u>Amount</u>		<u>1969 compared with 1968</u>		
	<u>Available</u>	<u>Available</u>	<u>Estimate</u>	<u>Total</u>	<u>Pay Cost^{a/}</u>	<u>Program</u>
Grants, contracts, and Federal operations:						
Combined Sewer.....	\$12,453,625 ^{b/}	\$14,510,212 ^{c/}	\$8,000,000	-\$6,510,212	...	-\$6,510,212
Advanced Waste Treatment.....	7,672,476 ^{b/}	14,200,000 ^{c/}	10,000,000	-4,200,000	...	-4,200,000
Industrial Wastes.....	2,619,704 ^{b/}	15,500,000 ^{c/}	10,000,000	-5,500,000	...	-5,500,000
Demonstration.....	3,004,169	2,500,000	2,500,000	...	...	...
Research Grants.....	6,467,871	6,500,000	6,500,000	...	...	...
Research Contracts.....	1,588,380	4,665,000	6,200,000	+1,535,000	...	+1,535,000
Direct operations.....	7,706,042	9,912,695	12,802,000	+2,889,305	+\$64,000	+2,825,305
Unobligated balance lapsing..	487,538	...	...	...	...	...
Total.....	<u>41,999,805</u>	<u>67,787,907</u>	<u>56,002,000</u>	<u>-11,785,907</u>	<u>+64,000</u>	<u>-11,849,907</u>

See summary table on page 59 for distribution of grant, contract and in-house funds by new program element.

a/ To provide for increased pay cost for fiscal year 1968 positions.

b/ Total amounts represent comparative transfer from "Construction Grants for Waste Treatment Works."

c/ Includes \$16,210,212 comparative transfer from "Construction Grants for Waste Treatment Works" and \$28,000,000 directly appropriated to "Water Supply and Water Pollution Control."

General Program Description

The primary long-range objectives of the research and development program of the Federal Water Pollution Control Administration are to provide;

1. The necessary new technology for effective and economical control of pollution from specific sources (e.g., municipal, industrial, agricultural, and mining sources) including the experimental application and initial demonstration of treatment and control technology to specific sources of pollution;

2. Generally applicable new scientific knowledge and technology for the control, prevention and abatement of water pollution, and fundamental knowledge in the general area of water pollution control involving eutrophication (aging of a lake), water quality control and coastal and ground water pollution;

3. The information on water quality requirements for specific water uses to serve as a more scientific basis for the continued evaluation and upgrading of water quality standards; and

4. New separation and disposal technology for more effective and economical treatment of waste discharges and for renovation and reuse of waste waters.

The attainment of these long-range research and development objectives is essential to the successful achievement of the Administration's primary goal--to control and prevent pollution to assure an adequate supply of water suitable in quality for public and industrial water supplies, recreation, agricultural and other uses, and for propagation of fish, other aquatic life and wildlife.

To achieve these objectives, FWPCA actively conducts in-house research at its laboratories and field installations and utilizes the scientific and technical community through grants and contract awards.

The major thrust of the FY 1969 research and development program effort will be concentrated on the development of new waste treatment processes, in determining and predicting the effects of pollution on the quality of water to provide a more scientific basis for the establishment of water quality standards, in exploring new mine drainage control measures and experimentally applying them at field sites, and an expanded effort in the fields of control and prevention of oil pollution and eutrophication.

The decrease in FY 1969 over FY 1968 of \$11,785,907 in total obligational authority should not be construed as a designed effort to reduce the program. The effort proposed for FY 1967 was not accomplished

as anticipated and, therefore, over \$16 million of grant and contract funds has been carried over from FY 1967 and available for FY 1968. The 1969 estimate includes \$4,424,305 more in new obligational authority than that appropriated for FY 1968. Most grant and contract projects begun in FY 1967 and FY 1968 will continue into FY 1969. The continuation of these efforts, coupled with those projects to be initiated in FY 1969, will require small increases in staffing for both in-house execution of the program, and the direction and coordination of existing extramural grants and contracts.

The research and development program, as stated above, is carried out by means of grants, contracts and in-house effort. Grants are employed in meeting objectives where it is desirable to utilize the State, municipality, intermunicipal or interstate agency, public and private institutional, industrial and individual talents and expertise in carrying out research, development and demonstration efforts on a cost-sharing basis resulting in mutual benefit to the Federal Government and the grantee.

Contracts are utilized for laboratory investigations and pilot-scale research projects which involve a large degree of uncertainty and which are primarily aimed at determination of feasibility. The latter are not the type of projects that municipalities and private corporations will readily sponsor with matching funds as under the grant procedure owing to the large degree of risk as to future self-benefits. The work performed under contract requires the application of highly specialized personnel and equipment and of facilities having a high value over a short period of time, but is of limited value as a long-term, capital investment.

The in-house research efforts are conducted at operational regional water pollution control laboratories in Ada, Oklahoma; Athens, Georgia; Cincinnati, Ohio; College, Alaska; and Corvallis, Oregon; in the National Water Quality Laboratory at Duluth, Minnesota; and in temporary facilities at Narragansett, Rhode Island and Metuchen, New Jersey. In addition to the laboratory effort, continued emphasis is being placed on research and development work at various field sites and pilot plants or facilities--for example, Lebanon and Newtown, Ohio; Pomona and Firebaugh, California; Ely, Minnesota; Blue Plains, D.C.; and Metuchen, New Jersey.

The research and development program is subdivided into eight substantive problem- and output- oriented program elements.

See table on page 59 bridging program elements with the conventional budget basis and chart on page 60 reflecting grant, contract and in-house effort by program element.

Excluding grants and contracts, the 1969 estimate provides for a net increase of \$2,889,305 and 175 positions for in-house activities. This increase includes:

+ \$64,000	To meet increased pay costs.
+551,000	To support full year employment of new personnel authorized for FY 1968.
-585,000	Due to nonrecurring equipment.
+2,859,305	To support 175 additional positions and costs of special sampling and control application equipment for field investigations and demonstrations. Increased staffing is proposed as follows:

Regional offices.....	8
Laboratories.....	155
Field sites.....	<u>12</u>
Total.....	<u>175</u>

Descriptions, plans for FY 1969, prior accomplishments and the need for increases for each program are described in the sections that follow.

1. Municipal-Pollution Control Technology: Fiscal year 1968, \$25,546,212; fiscal year 1969, \$15,331,000; decrease, \$10,215,212. The decrease consists of:

	<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	<u>Explanation</u>
(1)	+\$5,000	***	***	To meet increased pay costs.
(2)	+200,000	***	***	To support full year employment of new personnel authorized for FY 1968.
(3)	-130,000	...	...	Due to nonrecurring equipment costs.
(4)	-10,710,212	...	\$14,200,000	Decrease in grant and contract effort.
(5)	<u>+420,000</u>	<u>+12</u>	1,131,000	To strengthen in-house effort to assess progress and accomplishments of the numerous grant and contract projects under way or to be under way.
	<u>-10,215,212</u>	<u>+12</u>		

	<u>FY 1968</u>	<u>FY 1969</u>	<u>Increase (+)</u>
	<u>Amount</u>	<u>Estimate</u>	<u>or</u>
	<u>Available</u>		<u>Decrease (-)</u>
Grants.....	\$16,710,212	\$10,800,000	-\$5,910,212
Contracts.....	8,200,000	3,400,000	-4,800,000
In-house.....	<u>636,000</u>	<u>1,131,000</u>	<u>+495,000</u>
Total.....	25,546,212	15,331,000	-10,215,212

Need for Increase

In-house

Twelve positions and \$420,000 are requested to permit a slight expansion of field activities for directing, coordinating and monitoring the increasing number of developmental and demonstration projects in the area of municipal pollution control. Special sampling and control application equipment (e.g., chemical feeders, controllers, tanks, mixers and aerators) are required to support the in-house field activities and are included in this increase.

Objective

The objective is to develop and demonstrate the necessary technology in the areas of storm waters, combined storm and sanitary wastes, advanced waste treatment and joint municipal-industrial treatment to achieve at minimum cost, the most effective control of pollution from (a) sewerage wastes, (b) combined sewer discharges, (c) storm sewer discharges, (d) nonsewered runoff, (e) nonsewered wastes, and (f) joint (municipal-industrial) wastes.

Program of Work

This program includes all research, development and demonstration effort aimed at solving pollution problems attributable to municipal sources of pollution.

A combination of grant, contract and in-house effort is conducted utilizing treatment, ultimate disposal and water quality control technology. Pilot-scale experimental applications and full-scale field evaluations and demonstrations are carried out. Assuming no fiscal constraints, the major portion of work should be completed by 1975. By 1973, therefore, the major effort on all projects should be well into the full-scale demonstration phase.

(a) Storm and combined sewer discharges

Research and development efforts in the areas of combined sewer discharges and storm sewer discharges are well under way, primarily by means of pilot-scale development projects and full-scale development projects. By the close of FY 1967 there were 16 full-scale active grant projects designed to demonstrate applicability of control or treatment methods including surface storage of overflows with return to the sewerage system, treatment of overflows by means of lagoons, use of in-system storage capacity to reduce overflows, subsurface tunnels for combined sewage storage, improvements in disinfection techniques and others, including combinations of methods.

Twenty contract projects were active by the end of FY 1967, including investigation of the use of polymers as a sedimentation aid, applicability of air-flotation techniques for treating combined sewer overflows, use of hydraulic cyclones, feasibility of a flushing system for cleaning combined sewers, potential of off-shore storage and treatment methods, the use of combustible filters to treat combined sewage, feasibility of ultrasonic filtration as a treatment method, and others.

An additional 35 to 45 contracts will be negotiated during FY 1968 to include investigations in the areas of fine screening, improved filtration techniques, microscreening, chemical oxidation, improved methods of disinfection, new storage techniques, and others. It is anticipated that 14 grant projects will be awarded to demonstrate applicability of treatment of combined sewage and reuse of the waters for recreational purposes, high-rate filtration treatment, infiltration control methods, and others. Results of methodology development will be utilized to promote full-scale demonstration by means of grants.

These new projects are required to fill gaps in several technical areas not thoroughly investigated earlier and for the purposes of finding additional new applications for existing control or treatment methods. Emphasis will be placed on moving from the developmental stage to full-scale demonstration.

Research on the problem of urban drainage will continue in FY 1969 by means of grants.

(b) Sewered wastes

For sewerage wastes, emphasis is placed on demonstrating advanced treatment methods for removal of refractory organic and inorganic components of sewage and on methods to decrease the cost of both treatment plant sludge conditioning and ultimate disposal. The treatment of sewage in sewer lines, use of microscreens for solids removal, chemical treatment and activated carbon adsorption for dissolved solids removal, sludge freezing plus use of additives to decrease the cost of sludge dewatering and the regional disposal of sludge via long pipelines to rehabilitate coal mine or other devastated areas are some of the demonstrations that have been initiated in FY 1968 and will continue into FY 1969 or FY 1970. During FY 1969, emphasis will continue to be placed on demonstrating improved techniques for the treatment of sewerage wastes. These could include the use of ozone, reverse osmosis, electrodialysis and ammonia stripping, to mention a few, as well as some of the currently-demonstrated processes in order to augment the data necessary to completely prove a process.

Laboratory-scale (200 gallons per day) studies will continue on developing new techniques to remove phosphates in the activated sludge process and to remove nitrogen by biological denitrification. Studies at advanced waste treatment pilot plants such as at Blue Plains, D.C., and Lebanon, Ohio, will be moderately expanded and new studies initiated at Prince William County, Virginia, and Piscataway, Maryland, in FY 1969.

(c) Nonsewered wastes

For nonsewered wastes, emphasis will be placed on demonstrating individual home treatment, multiple home treatment and larger institutional treatment units which will be able to show convincingly how any level of treatment efficiency may be attained and to establish the capital and operating costs.

(d) Joint (municipal-industrial) wastes

Special efforts are being made to demonstrate the technology necessary to permit industrial effluents to be treated with municipal wastes to obtain more economic treatment and more effective control than may be achieved by handling these wastes independently. It is estimated that during FY 1968 joint (municipal-industrial) demonstrations will include pulp and paper, fiber dyeing, food processing, mineral wastes and petrochemical wastes.

(e) Summary

The large number of grants and contracts active in FY 1969 will require an intensive use of in-house personnel to both direct and monitor the project. Because most of the grant projects awarded during FY 1967 were for between two and three years, results from these projects will be forthcoming during FY 1969. Most importantly, it will be necessary to analyze and evaluate these results with in-house personnel and to correlate the results with other demonstrations for subsequent publication.

Though much technology will have been demonstrated in actual field or operating conditions, it is anticipated that there will be a major fraction of the technology which would have only recently advanced to the demonstration phase and will only be capable of being successfully demonstrated in FY 1969 or later.

Accomplishments

1967-1968

(1) Minneapolis-St. Paul Sanitary District--The purpose of this grant project is to demonstrate the applicability of a "dispatching system" for control of combined sewer overflows. Overflow regulators are being modified; flow gauging, water quality monitors and telemetering rain gauges installed and a control data logger placed in operation. Flows in the sewer will be regulated so as to obtain maximum utilization of the storage capacity of the sewers and thus minimize overflows. Construction and equipment installation are well along, and it is anticipated that the project will be "on line" during the spring of 1968. The significance of the project lies in its potential for control of combined sewer overflows with minimum expenditures to make this type of system operable. Information and operating experience will also be gained which will be useful to other cities with similar problems.

(2) Sewerage and Water Board of New Orleans--The New Orleans grant project is designed to demonstrate the use of drainage canals as treatment facilities to accomplish bacteriological control of wastes discharged to Lake Pontchartrain. Discharges now occurring during wet weather contaminate bathing beaches and the demonstration project has the objective of minimizing the effect of untreated waste discharges on the beaches. Volumes approximating the average discharges of the Potomac River (11,000 cfs) will be disinfected using both liquid chlorine and hypochlorite solution. Chlorination at this scale has never been accomplished before. Application of new materials and techniques will be important project features. Work is well under way, with construction of the key chlorination chamber to begin in the spring of 1968. The principal and most significant facet of the project will be the development of capability to disinfect huge volumes of wastes. This will be of great use to nearly every large city. It is anticipated that the direct result of the project will be an improved water quality in the beach areas so as to significantly reduce periods of closure with resulting increased usage.

(3) Columbus, Ohio--The Columbus grant project involves the modification and reconditioning of combined sewage overflow storage and treatment tanks. The tanks are the first tanks of this type built in the United States and were placed in operation in 1933. The major project purpose is the evaluation of the effectiveness of overflow tanks in controlling discharges of combined sewage. Construction has been completed and the evaluation program is beginning.

(4) American Public Works Association--A preliminary appraisal of the effects of storm water and overflows from combined sewer systems was completed in 1964. The appraisal estimated that physical separation of storm water from sanitary sewage, as a pollution control measure, would entail a national cost of \$20 to \$30 billion.

A contract project was initiated during the summer of 1967 with the American Public Works Association to obtain an up-to-date assessment of the problem. Over 900 communities of an estimated 1,329 with combined sewers were contacted personally by engineer-interviewers to assess local combined sewer problems. All communities with population of 25,000 and over, and 30 percent of those with population less than 25,000 were covered.

The project has been completed and the final report submitted. APWA estimates that separation of storm and sanitary sewers would cost \$30 billion on a national basis. Inclusion of costs to make the necessary plumbing changes in and on private property to effect total separation would raise this cost to an estimated \$48 billion. Results of this study will be made available to State water pollution control agencies, municipalities, and consulting engineers to inform them of the type and magnitude of the combined sewer overflow problem. The information should serve to convince municipalities that alternative solutions to sewer separation should be considered for economic reasons.

(5) The Western Company--The purpose of this contract project is to explore the potential of injecting polymers into waste waters to reduce friction loss in pipe, thereby increasing pipe carrying capacity. Increased sewer capacity could reduce the number of overflows from combined sewers. The concept has been shown to be feasible by scale testing and in 1968 the concept will be demonstrated at full-scale. If applicable under actual field conditions, the method could be used to increase the carrying capacity of existing sewers, negating the need for relief or new sewers in numerous instances. Present indications are that use of this technique could save up to 50 percent of the cost of constructing relief sewers or replacing existing sewers.

(6) Two projects (Milwaukee and Cedar Rapids) have been initiated at a cost of \$654,000 for development and demonstration of advanced processing methods for municipal sewage sludges. Some 4.5 million tons of this material are generated each year in the United States. The new processes, sludge dewatering by freezing and waste fly ash conditioning of sludges, when developed and fully implemented are projected to reduce the current costs of this operation at these sites by nearly \$1,000,000 per year. This represents a savings of greater than \$10 per ton of sludge.

(7) A program to develop comprehensive design and operating guides for biological process for municipal waste treatment was initiated at Austin, Texas, for \$326,000. The project will result in updating the existing obsolescent 12 year-old guides.

(8) Several joint-treatment projects funded at a cost of \$677,000 at Dallas, Oregon, and Onondaga County, New York, have been initiated to demonstrate the feasibility of incorporating industrial waste discharges into municipal systems for pollution control at reduced costs over individual systems. Food canning, steel and chemical wastes are to be treated in conventional plants. The Onondaga Lake Project will also provide an excellent example of water quality restoration of the lake and assess the economic benefits resulting from the pollution abatement approach taken by the cooperative county-industry program.

(9) Water reuse projects for recreational and industrial purposes in water shortage areas is being demonstrated at Santee and Antelope Valley, California. Approximately 26 acres of recreational lakes are to be provided at Antelope Valley using renovated waste water. The estimated cost of treating the renovated waste water to meet quality criteria for recreational use is \$40 per acre foot. Current cost of the only water available from depleted ground sources is \$43 per acre foot. Projected water costs from the Feather River project when available in 1971 or 1972 if supplied to Antelope Valley are projected to be even higher in cost.

(10) Advanced waste treatment processes consisting of chemical precipitation, filtration, and carbon adsorption have been demonstrated at Lake Tahoe, California, and Nassau County, Long Island, at a total cost of \$1,722,000. In addition to providing the feasibility of removing eutrophication nutrients to very low levels, the renovated effluent water meets drinking water standards. Based on these demonstrations the incremental cost of producing the renovated water is estimated at 21 cents per 1,000 gallons for plants in the 10-20 million gallons per day size. In the case of the Lake Tahoe project, the renovated water is being piped over a mountain to a water shortage area for irrigation purposes without any additional treatment. In the case of Nassau it is being used to replenish the underground water supply used as a source for public water purposes and to prevent salt water intrusion.

2. Industrial-Pollution Control Technology: Fiscal year 1968, \$11,762,000; fiscal year 1969, \$8,506,000; decrease, \$3,256,000.

The decrease consists of:

<u>Increase (+) or Decrease (-)</u>			
	<u>Amount</u>	<u>Positions</u>	<u>Total Program</u>
(1)	+\$5,000	...	...
(2)	+30,000	...	...
(3)	-3,500,000	...	\$7,600,000
(4)	+209,000	+13	906,000
	<u>-3,256,000</u>	<u>+13</u>	
			<u>Explanation</u>
			To meet increased pay costs.
			To support full year employment of new personnel authorized for FY 1968.
			Reduction in grant effort.
			To accelerate in-house effort for developing industrial waste control programs and monitor projects under way under the grant and contract effort.

	<u>FY 1968 Amount Available</u>	<u>FY 1969 Estimate</u>	<u>Increase (+) or Decrease (-)</u>
Grants.....	\$11,100,000	\$7,600,000	-\$3,500,000
Contracts.....	...	...	...
In-house.....	662,000	906,000	+244,000
Total.....	11,762,000	8,506,000	-3,256,000

Need for Increase

Thirteen positions and \$209,000 are required to expand in-house program development in the areas of wastes from textile mills, meat processing, petrochemical, thermal pollution and lumber and logging operations, and to direct, coordinate and monitor the large number of development and demonstration projects in the industrial wastes area. Also included are special sampling and control application equipment to support the in-house field activities.

Objective

The objectives are to develop and demonstrate the required technology to achieve, at minimum cost, any needed degree of pollution control from all industrial sources.

Program of Work

This includes all research, development and demonstration effort necessary to solve pollution problems attributable to industrial sources of pollution.

The quantity of industrial wastes discharged annually into this country's rivers is at the very least equal in its pollutional effect to the total of all municipal wastes in the Nation. In all probability, the industrial pollution load is significantly greater. The determination and development of economical methods of control of pollution from industrial wastes is a challenge of major significance. The competitive economic aspects of industrial waste control require that both conventional and completely new approaches must be made to this problem to assure minimum cost solutions. Current waste treatment methods, although satisfactory under certain conditions, do not provide adequate results in many cases and offer little hope that they will provide the type and degree of treatment which will be required in the future. Therefore, this program must provide the answers.

In FY 1967 studies were initiated to identify and analyze the problem areas and establish the existing state of the art in treatment and control technology in selected industries. In addition, a major new program for industrial waste pollution control (authorized by Section 6(b) of the 1966 Act) was implemented. Under this new authority, 10 grant projects were awarded. These projects included 8 full-scale demonstrations in pollution control areas relating to the pulp and paper industry, meat-packing industry, potato processing, citrus food industry, etc. Projecting the accomplishments of the on-going FY 1968 program through FY 1969 will see research and demonstration grants covering representative industrial pollution from major sources encompassing a combined total of over three-fourths the entire industrial pollution load in terms of volume and biochemical oxygen demand. The program for FY 1969 also includes the priority projects which are the results of the FWPCA studies on immediate needs for the river basins. The investigations and demonstrations will include new and novel physical treatment techniques (e.g., screening, improvements in filtration, centrifugation), chemical processes (oxidation, precipitation, coagulant aids, ion exchange, polyelectrolytes), and biological processes such as high-rate anerobic oxidation of concentrated carbonaceous wastes.

An effective attack on these problems requires the development of a cooperative industry-government effort to determine, develop, and install treatment processes, process modifications, water conservation programs, etc. This approach will be followed primarily through utilization of the research and development grant mechanism, plus an active in-house laboratory research program. One specific technique in developing such a research program is the evaluation and separation of industrial wastes into broad categories requiring similar treatment. Here, in-house projects will carry the major load. These waste categories would then be

characterized to form the foundation for subsequent bench-scale and pilot-scale studies of new methods of control. Work on waste reduction at the source will be coordinated with treatment studies pointed ultimately toward the processing of an irreducible minimum of waste which will require treatment. The cooperative grant mechanism will ensure that the treatment methodology and at-source control techniques will be demonstrated to industry on a nationwide basis as being feasible and practical and help ensure that the results of this development effort will be actually applied to reduce the pollution impact of industrial waste sewers.

Accomplishments

The accomplishments of the on-going FY 1968 program will include research and demonstration grants covering representative industrial pollution from major sources encompassing a combined total of three-fourths the entire industrial pollution load in terms of volume and biochemical oxygen demand. It is anticipated that approximately 35 grants will be obligated in FY 1968.

Several of the full-scale demonstration projects representing a variety of industrial waste sources, treatment methods, and objectives are described briefly as examples in the following paragraphs.

(1) The feasibility of treating potato processing wastes from the R. T. French Company of Boise, Idaho, by aerobic biological oxidation, the establishment of operational criteria, and the determination of construction and operational costs will be investigated under a project now in the final design phase. A grant of \$483,217 was awarded for this project.

Approximately half of the 1965 U. S. potato crop of 11 million tons was processed and converted into potato products. The loss to waste on processing in general is approximately 20 percent and in 1965 this waste load had a population equivalent of 12 million persons. Primary treatment can reduce this waste load by 55 percent. The need for an effective means for secondary treatment can thus be seen to be significant.

(2) A full-scale demonstration plan for the aeration of fruit processing wastes from the Snokist Growers of Yakima, Washington, is now under construction to determine the suitability of using contact stabilization to achieve secondary treatment. A biological oxygen demand (BOD) reduction of greater than 85 percent is anticipated. A grant of \$374,669 was awarded for this project. The canned and frozen fruits and vegetables processing industry discharged approximately 66 billion gallons of water in 1964 of which only 38 percent received any treatment at all. Existing treating facilities consist primarily of methods for coarse solids removal.

(3) The feasibility of treating the Morrell packing house wastes at Ottumwa, Iowa, by the oxidation channel method will be investigated under another grant for \$489,000. An 85 percent reduction of BOD is anticipated. The meat slaughtering and processing industry discharged approximately 82 billion gallons of waste water in 1964 of which only 44 per cent received any treatment.

(4) A project which will result in the elimination of the discharge of caustic and phenolic processing waste waters from a glass-fiber insulation manufacturing plant of Johns Manville, Defiance, Ohio, has been approved and is now in the final design stage. Diatomite filtration and pH control will be applied to permit recirculation and reuse of the waste in a closed system. The pressed and blown glass industry, other than the manufacturers of containers, discharge approximately nine billion gallons of waste waters annually of which only one-third receives any treatment at all. A grant of \$82,350 was approved for this project.

(5) Additional projects will be pursued in such areas as treatment of steel pickling rinse waters, rolling mill emulsion wastes, color removal from kraft pulp mill effluent, combined pulp and paper mill, solids utilization and disposal, regeneration of olive processing brine solutions, and treatment of fruit processing wastes utilizing a high rate trickling filter.

3. Agricultural-Pollution Control Technology: Fiscal year 1968, \$1,630,000; fiscal year 1969, \$1,991,000; increase, \$361,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$2,000	...	...	To meet increased pay costs.
(2)	+30,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-50,000	...	...	Due to nonrecurring equipment costs.
(4)	+200,000	...	\$900,000	To expand grant effort for solving animal feed lot waste pollution.
(5)	<u>+179,000</u>	<u>+14</u>	691,000	Expand in-house effort for developing programs directed toward pollution problems related to irrigation and agricultural runoff.
	<u>+361,000</u>	<u>+14</u>		

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimated</u>	<u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u>
Grants.....	\$700,000	\$900,000	+\$200,000
Contracts.....	400,000	400,000	...
In-house.....	<u>530,000</u>	<u>691,000</u>	<u>+161,000</u>
Total.....	1,630,000	1,991,000	+361,000

Need for Increase

Grants

The \$200,000 increase in grant funds is required to determine the engineering methodology needed for preventing groundwater and surface water contamination by animal feed lot wastes.

In-house

An increase of fourteen positions and \$179,000 are required to support in-house program development in irrigation return flows and agricultural runoff. Special sampling and control application equipment are required to support the in-house field work such as the irrigation return flow studies being conducted at Firebaugh, California, and are included in the increase.

Objective

The objective of this program is to develop and demonstrate the necessary technology to allow effective and economical control of pollution from agricultural sources including (a) forestry and logging operations, (b) rural runoff, (c) irrigation return flows, (d) animal feed lots, and (e) nonsewered rural wastes.

Program of Work

All research, development, and demonstration effort to control and prevent pollution from sources relating to agricultural activity is included in this category.

The major forms of pollution associated with agricultural operations are nutrients, pesticides, and silt from runoff, concentrations of salts and other pollutants in return flows from irrigation systems, runoff from animal feed lots, and silt and other solids from logging and forestry operations. The pollution that results from return irrigation flow can present serious problems. Applied research is needed to develop and experimentally apply processes that will be economically feasible for removal of specific pollutants or for renovation of these waters to allow their reuse. The composition of the agricultural waste waters is important in selecting the appropriate waste treatment process, in defining the degree of treatment required, and in determining the costs. Unfortunately, data on the quality characteristics of agricultural waste waters are quite limited.

A specific agricultural drain pollution problem which must be solved within the next two years involves the disposal of irrigation waste water from the southern and western portions of the San Joaquin Valley. Present plans of the Bureau of Reclamation and the California Department of Water Resources provide for construction of a drain to discharge these wastes to the Sacramento-San Joaquin Delta which drains directly into San Francisco Bay. Significant water pollution problems in the bay area would result from the discharge of nitrogen nutrients. A joint project with the Bureau aimed at developing a satisfactory solution to this problem is now in progress and will be expanded in FY 1969. A variety of possible solutions including treatment for selective removal of nitrogen and treatment for complete renovation and recycle of the waste flow are being investigated. This latter pilot plant study is being made cooperatively with the Office of Saline Water.

Farm animal wastes enter streams, rivers or lakes either in the form of surface runoff or through seepage. In some watersheds, farm animals contribute considerably more wastes than humans, and the drainage from certain land areas supporting large animal populations leads to significant water contamination. Farm animals in the U. S. produce ten times as much waste as the human population. Disposal of farm animal wastes has created a major and ever-growing problem for the American farmer.

There is no single method generally satisfactory for the treatment and disposal of animal manure originating in confinement livestock operations. Field spreading, composting, anerobic digestion, incineration, lagooning, dehydration and other procedures have been attempted or proposed as possible disposal methods. Research is required on the physical, chemical and biological properties of farm animal manure and on the behavior of such farm wastes in ground and surface water in order to devise efficient disposal practices.

Because of the unique and extremely challenging task of devising effective control technology for rural runoff, altogether new and imaginative water quality control methods must be conceived and developed. This highly fluctuating and completely diffuse source of silt, nutrient, pesticide, and other pollution must be controlled and, to the present time, no effective, broadly applicable methods of control exist.

Logging operations can contribute to the deterioration of water quality. The principal polluting substances which are likely to enter a watercourse from timber harvesting and management activities are: silt, logs, brush, decayed vegetation, pesticides, cinders, oil, gasoline, and logging camp wastes. Silt is frequently washed into streams from poorly located or constructed roads, skid trails and burned-over areas.

In FY 1969 work on control of rural runoff, irrigation return flows, and pollution from feed lots will receive emphasis. A minor effort in unsewered wastes will continue and the research phase on forestry and logging pollution will be completed. A contract research work will be closely tied to and in support of our own laboratory and field effort. Most will relate to experimental pilot-scale applications of various pollution control methods to runoff, irrigation returns, and feed lot discharges. Grants will be made to support large pilot-scale and demonstration projects to show the applicability of advanced waste treatment processes to irrigation return flows and high strength feed lot discharges. It is also planned that nontreatment control of wastes from the logging and stockyard industries by a variety of water quality control approaches will be supported. Demonstration grant funds will be used for a demonstration of rural runoff control.

In-house research in this category is carried out at three of FWPCA's laboratories located at Corvallis, Oregon; Ada, Oklahoma; and Athens, Georgia and field sites such as the Firebaugh, California site.

Accomplishments

Animal Feed Lots

Statistics on the polluttional aspects of animal feed lots are simply overwhelming. It has been estimated that over 10 times the wastes of the human population of the U. S. are produced by this one section of our environment. This is becoming one of the major problems in those areas wherein feed lots are concentrated. We are initiating programs for the

study of this problem of disposal of both cattle and swine wastes. The systematic collection of such wastes and possible use as fertilizer will be investigated as a disposal-management tool. The first step in the development of a sound research and development program in this area--a state of the art study--was completed in FY 1968.

Irrigation Return Flows

Pilot plant facilities have been constructed at Firebaugh, California for the removal of nutrients from return waters by reverse osmosis, electrodialysis and biomass algae stripping with subsequent anerobic decomposition. The aspects of the project dealing with application of desalination processes to return flows are being carried out on a cooperative basis with the Office of Saline Water.

Rural Runoff

A project to develop and demonstrate a practical biological treatment method for the removal of nutrients from agricultural drainage waters has been initiated. Design criteria, construction and operation costs, and treatment efficiency will be determined by means of a large pilot plant.

4. Mining-Pollution Control Technology; Fiscal year 1968, \$4,478,000; fiscal year 1969, \$4,325,000; decrease \$153,000. The decrease consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$5,000	...	...	To meet increased pay costs.
(2)	-90,000	...	...	Due to nonrecurring equipment costs.
(3)	-500,000	...	2,600,000	Reduction in grant effort.
(4)	+700,000	...	1,000,000	To expand contract effort for developing treatment processes for controlling mine drainage pollution.
(5)	<u>-268,000</u>	<u>-6</u>	725,000	Reduction in in-house effort resulting from decrease in cooperative-agreement effort involving other Federal agencies.
	<u><u>-153,000</u></u>	<u><u>-6</u></u>		

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u>
Grants.....	\$3,100,000	\$2,600,000	-\$500,000
Contracts.....	300,000	1,000,000	+700,000
In-house.....	<u>1,078,000</u>	<u>725,000</u>	<u>-353,000</u>
Total.....	4,478,000	4,325,000	-153,000

Need for Increase

An increase of \$700,000 in contracts is required to develop treatment processes and process sequences not only for control of acid and iron loads to streams, but to provide water suitable for direct reuse for industrial and municipal purposes. The gross water quality deterioration in mining areas has resulted in major decreases in the availability of water supply in these regions. To ensure the continued economic development and growth of affected areas, particularly in Appalachia, the search for adequate treatment technology must be extended and will include application of desalination processes, the development of new processes, and the adaptation of existing advanced

treatment processes to the mine drainage problem. This effort is optimally conducted through the contract mechanism.

Objective

This program has as its objective the control, alleviation or reduction of pollution from all sources included in the areas of mine drainage, oil production, uranium mining and other mining sources. As part of this program, the development of technology and the demonstration of this technology are required to obtain effective and economical control of pollution from these sources.

Program of Work

Because of the seriousness and the widespread and long standing magnitude of the mine drainage problem, it has received a high priority. Acid mine drainage results in changes in the chemical quality of the receiving streams and thus results in destroyed fish, fish food and other aquatic life. The annual corrosion damage to industrial, municipal and other equipment exposed to these waters is a significant portion of the value of this equipment. It is estimated that over $3\frac{1}{2}$ million tons of acid are annually discharged into more than 4,000 miles of streams. Most previous attempts to resolve or reduce the amount of acid drainage have failed due to high costs or technical problems for which there was no immediate solution. Several research and development projects are in the final stages of negotiation and should be active during late FY 1968 and most of FY 1969.

These projects are specific as to the avenues of approach to the problem of acid mine drainage. For example, a large demonstration plant is planned for the development and demonstration of limestone neutralization of acid mine drainage. Another project which is still in the preliminary stages involves a demonstration plant designed to offer comparable conditions for evaluation of other (nonchemical) methods of treatment of AMD by such processes as reverse osmosis, electrodialysis and ion exchange. Other projects involve the in-situ treatment of AMD by such methods as injection of a thixotropic mixture to form plugs or seals, the use of an inert gas to exclude oxygen in sealed mines or chambers and biological organisms to inhibit the action of oxidative bacteria which accelerate acid mine drainage.

The problems arising from oil production are of a different nature. The high brine content of the water and the quantity of the water obtained in conjunction with the production of oil is a serious and widespread problem in the southwest portion of the United States. The uncontrolled diversion of this brine has caused entire stream systems to become devastated in terms of aquatic life. Organic material is also

carried into the streams, predominantly materials which are leached from the crude petroleum. These brines may also pollute groundwater resources which are of lesser salt content and thus prevent these other sources from being tapped for industrial or municipal use.

Another recent mining technique has potential for becoming a serious source of pollution. The commercial production of petroleum from the oil shale deposits in the Rocky Mountains is anticipated to cause saline and severe alkaline water pollution in streams and aquifers in those regions, as well as siltation of streams. Substantial research and developmental efforts should be undertaken to prevent this problem from becoming more significant in later years.

Various new research and developmental and demonstration measures will be investigated in an attempt to minimize the cause and the effects of each of these mining pollution problems.

Due to the priority of the projects and the interest in the problem, increased emphasis will be placed on methods of treatment and on control at the source through grants and contracts in FY 1969. The in-house acid mine demonstration effort previously planned and proposed is being modified. This modification primarily consists of development and demonstration projects through grants and contracts on smaller problem areas. Therefore, the reduction in in-house funds will provide additional funding for grants and contracts. Laboratory, field site, grant and contract projects on mine drainage, copper mining, phosphate mining, oil production and oil shale mining will be actively pursued in FY 1968.

Accomplishments

Acid mine drainage

The construction phase (which was funded from the field evaluation activity under the "Buildings and Facilities" appropriation) of the Acid Mine Drainage Demonstration Project at Elkins, West Virginia, for the demonstration of at-source control measures was completed in late 1967. The effectiveness of land renovation techniques, particularly strip mine reclamation using various types of backfilling techniques, will be evaluated during, and subsequent to, revegetation of the demonstration areas during the remainder of FY 1968.

The development of treatment technology, particularly lime and limestone neutralization processes, membrane processes, and sludge handling techniques has begun and will continue into FY 1969. Treatment process development will occupy an increasing fraction of the total effort in mine drainage pollution control technology as the program progresses. Research to develop new processes to the point of practical application and economical operation will proceed on such processes as ion exchange, electrodialysis, and distillation. New methods are being sought for high efficiency means of reclaiming and

reusing chemical sludges resulting from neutralization processes which are already in the development stage. The potential for recycling and reuse of lime sludges in the neutralization process is being examined with the objective of reducing neutralization costs, the size of reaction vessels and the settling time characteristics.

A number of potentially attractive at-source control measures, some of which are new, are being investigated during 1968. These include chemical grouting, air sealing, air displacement with inert gases and water diversion. Biological treatment processes and microbiological control at the source such as the use of bacteriophages and bacterial static chemical agents are being investigated.

Oil production

Work has begun on the development of a program to prevent pollution from production of oil from oil shales. A unique opportunity exists in this area to have the necessary pollution control technology available before full-scale production is under way and the pollution problems become severe.

Work has begun to develop techniques for the disposal of waste brines from conventional oil mining by deep well disposal. When this work is completed, a significant pollution source, namely, high total dissolved solids effluents, will have been eliminated from affecting fresh surface and groundwater supplies throughout the United States.

5. Other-Sources-of-Pollution Control Technology: Fiscal year 1968, \$2,602,000; fiscal year 1969, \$2,350,000; decrease, \$252,000. The decrease consists of:

	<u>Increase (+) or Decrease (-)</u>		<u>Total Program</u>	<u>Explanation</u>
	<u>Amount</u>	<u>Positions</u>		
(1)	+\$3,000	...	...	To meet increased pay costs.
(2)	+15,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-60,000	...	...	Due to nonrecurring equipment costs.
(4)	-900,000	...	\$1,200,000	Reduction in grant effort.
(5)	+500,000	...	700,000	Increased contract effort on problems of impoundments, dredging and landfill, and oil pollution.
(6)	<u>+190,000</u>	<u>+4</u>	450,000	To expand in-house effort on water quality changes and control and oil pollution.
	<u>-252,000</u>	<u>+4</u>		

	<u>FY 1968 Amount Available</u>	<u>FY 1969 Estimate</u>	<u>Increase (+) or Decrease (-)</u>
Grants.....	\$2,100,000	\$1,200,000	-\$900,000
Contracts.....	200,000	700,000	+500,000
In-house.....	<u>302,000</u>	<u>450,000</u>	<u>+148,000</u>
Total	2,602,000	2,350,000	-252,000

Need for Increase

Contracts

The increase of \$500,000 in research contracts is required to supplement the in-house effort on the problems of impoundments, dredging and landfill, and oil pollution.

In-house

An increase of four positions and \$190,000 is required to support in-house research in water quality changes and water quality control in impoundments and in oil pollution. Also included in the increase are special sampling and control application equipment in support of the oil pollution studies conducted out of the Metuchen, New Jersey facility.

Objective

The objective of this program is to develop and demonstrate the necessary technology to allow effective and economical control of pollution from sources such as: (a) recreation, (b) boats and ships, (c) construction projects, (d) impoundments, (e) salt water intrusion, (f) natural pollution, (g) dredging and landfill, and (h) oil pollution.

Program of Work

This program is devoted to research and development and demonstration projects which have as their objective the solutions of problems which have arisen from sources other than municipal, industrial, agricultural, and mining activities.

Increasing amounts of watercraft wastes are discharged from the evergrowing number of recreational and commercial vessels which ply our waters, both inland and coastal. Vessels may discharge wastes into such critical areas as those used for water sports, potable water supply intakes, and shellfish beds. Water pollution from vessels includes sewage, oils, chemicals and other wastes discharged from 46,000 documented American flag vessels, 40,000 foreign ships which annually enter U.S. waters, 1,500 Federal vessels and 8,000,000 recreational watercraft.

Most vessels are not equipped to give even minimal treatment of sewage and other wastes. Suitable on-board equipment for properly treating vessel wastes before discharge is not fully developed. Generally, on-board sewage treatment units are bulky and heavy, or only minimally effective. Further research, development, testing and evaluation are urgently needed to deal more effectively with these problems.

Construction activities that affect the quality of water relate to roads, railroads, power transmission lines, mines and dams. The polluting substances which are likely to enter streams during and after construction include silt, chemicals, oil, gasoline, litter thrown from vehicles, and wastes from construction camps and trains. The control of soil erosion during and after construction is essential to maintain water quality.

Salt water intrusion is a growing water pollution problem in coastal areas. It is caused by excessive pumping of the fresh groundwater which lowers the water table allowing salt water to flow into the groundwater aquifers. This is of particular significance in California, Florida, Maryland, New Jersey, Texas, and Long Island, New York. One solution now being researched involves recharge of these aquifers with renovated waste water.

With the increasing number and importance of impoundments in the development of water resources, more detailed knowledge of the reservoirs themselves is required if they are to be managed for optimum results in terms of water quality. Unfortunately, the storage of water in reservoirs can adversely affect its quality. Thermal stratification can occur leading to chemical stratification and diminished dissolved oxygen concentrations in the colder bottom waters. By 1969, field evaluation projects aimed at mechanical destratification of impoundments to alleviate these problems should be in progress.

The FY 1968 funds will be utilized in the following areas: (1) recreation, (2) commercial vessels, (3) impoundments, (4) dredging and landfill, and (5) oil pollution. Due to the increased emphasis on these pollution problems, the effort in all areas is proposed to be expanded in FY 1969. Grants and contracts will be awarded for:

(1) Studies of the effects of waste inflows on pollution phenomena in impoundments and studies of the variability of impounded versus free flowing water quality;

(2) Investigations into the feasibility of dredging in the abatement of lake, estuary and stream pollution and the effects of dredging operations upon environmental balance;

(3) Studies of the magnitude and means for control of oil pollution; treatment processes to remove oil, greases and other hydrocarbon derivatives from waste sources is currently under way. Flotation, skimming and biological treatment will be investigated. Development of control methods for oil spills by burning, chemical treatment, and collection are being investigated.

The nature and complexity and extent of nonpoint sources of pollution require a concentrated in-house effort through a series of laboratory and field projects directed at development of short-term problem solutions and evaluation and testing of long-term control techniques in the following problem areas: (a) dredging in the Great Lakes and Coastal areas, (b) oil pollution in the East and Gulf Coasts, (c) salt water intrusion in all coastal areas, and (d) pollution control techniques for impoundments.

Accomplishments

Recreational pollution

A program has been initiated to develop a pneumatic curtain (i.e., a stream of air bubbles), to modify and alleviate beach pollution. The idea is extremely novel and inexpensive in its concept and first data indicates that the idea has considerable merit. The curtain of bubbles aerates the water and reduces the concentration of coliform bacteria. It also forms a barrier to small debris such as floating cans, brush, litter, etc. Oil slicks may also be contained by this technique.

Waste from boats and ships

This relatively new and growing source of pollution will be given ever increasing attention and priority. At the present time, we are negotiating a program for the study of a novel and very efficient biological treatment process for use aboard boats and ships. This unit involves the trickling filter concept but a novel filter media will allow much higher through put while maintaining the same efficiency.

RFPs are being drawn up for contracts to develop other treatment devices for larger ships and recreational water craft while the technique of impoundment aboard and disposal at a shore facility will be developed for smaller craft.

Salt water intrusion

Salt water intrusion is a continuing and growing pollution problem in coastal areas. There is no coastal State which is not threatened by this aspect of over pumping existing fresh groundwater.

We are continuing our studies at Orange County, California and at Nassau County, New York wherein the water from secondary treatment and advanced waste treatment units is used for injection to prevent salt water intrusion into existing but threatened water table aquifers. If this technique becomes widely available, it can reduce two problems, i.e., disposal of secondary effluents and the prevention of salt water intrusion.

Dredging and Landfill

The problems facing us in the areas of pollution from dredging and landfill are as varied as the streams and lakes being polluted. The alleviation of this phenomenon is presently under way and the first project will be a study of the effects of removing benthic deposits from the bottom of a highly polluted lake. Other programs dealing with the efficiency of various dredging methods and their effect on marine life and the effect on nutrient release will be initiated in the near future.

Oil pollution

Studies to determine the effects of oil pollution on estuarine microorganisms are in progress.

6. General Pollution Control Technology: Fiscal year 1968, \$7,914,695; fiscal year 1969, \$8,434,000; increase \$519,305. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>	<u>Total</u>	<u>Explanation</u>
	<u>Amount</u> <u>Positions</u>	<u>Program</u>	
(1) +\$12,000	...	...	To meet increased pay costs.
(2) +100,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3) -35,000	...	...	Due to nonrecurring equipment costs.
(4) -400,000	...	\$4,000,000	Reduction in grant effort.
(5) +35,000	...	1,100,000	To expand contract effort in eutrophication (aging of lakes, streams and coastal waters).
(6) <u>+807,305</u>	<u>+36</u>	3,334,000	To expand in-house effort in laboratories and at field sites in water quality control, coastal and ground water pollution and eutrophication.
<u>+519,305</u>	<u>+36</u>		

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u>
Grants.....	\$4,400,000	\$4,000,000	-\$400,000
Contracts.....	1,065,000	1,100,000	+35,000
In-house.....	2,449,695	3,334,000	+884,305
 Total.....	 7,914,695	 8,434,000	 +519,305

Need for Increase

Contracts

An increase of \$35,000 in research contract funds is required in support of the eutrophication program.

In-house

An increase of 36 positions and \$807,305 is required to expand laboratory and field site research in the areas of eutrophication (aging of lakes, streams and coastal waters), water quality control, and

coastal and groundwater pollution. Included in this increase are special sampling and control application equipment required to support the in-house field work such as the eutrophication studies being conducted at Ely, Minnesota.

Objective

Effort in this category includes research, development and demonstration aimed at prevention and control of accelerated eutrophication of lakes, streams, and estuaries; at control of pollution by means other than waste treatment; at socioeconomic, legal, and institutional aspects of pollution; at assessment and control of pollution in extreme cold climate areas; at identification, source, and fate technology of a generally applicable nature across a variety of pollution sources; and at long-range solutions to pollution problems (basic research).

Program of Work

The natural aging of waters (eutrophication) is evidenced by an increased ability of the water to support excessive plant growth, such as phytoplankton blooms, either on a sporadic or continuous basis. The over-fertilization of certain lakes and streams with inorganic nutrient pollutants--particularly nitrogen and phosphorus compounds--has accelerated during recent years. This is due to the increased nutrient loads imposed by growing quantities of wastes from municipalities, industries, land runoff, and natural pollution. The basic mechanisms involved in lake eutrophication are not well understood. This understanding is important in developing control methods for this type of pollution but, in addition, a simultaneous empirical approach involving large-scale removal and elimination of nutrients from lakes may demonstrate various means of reversing this eutrophication process which can be applied on a practical scale in some situations. Controlling eutrophication will require study of the biology and chemistry of the aquatic environment, more complete analytical data about nitrogen and phosphorus compounds, research on new and improved methods of waste treatment and control for nutrient removal including pilot plant studies and field evaluations.

Development of "water quality control" technology is of major and increasing importance as we move nearer and nearer to the margin of limiting payoff for pollution control by waste treatment. This area includes development of a so-called at-source control method, as well as control concepts such as synthesis, diversions, dispersion, dilution, process change, environmental treatment, etc. New techniques in these categories are being explored beginning in FY 1968; the promising ones must be moved into pilot-scale and field studies in FY 1969 while exploratory work is continued.

Steps have been taken to initiate a program for the development of a practical engineering model for the design and specification of waste treatment facilities by computer. Studies are being carried out in the areas of instrumentation and automation of sewage treatment plants for improved and more economic operation. Future emphasis will be placed on obtaining practical management tools for controlling pollution and maintaining quality standards for urban areas, areas of high industrial development, watersheds and whole river basins.

Mathematical models do exist to permit prediction of dissolved oxygen changes and concentration and fate of some pollutants in water. However, models relating pollution causes and the broad range of effects expressed in social and economic values must be evolved. Regional water quality schemes cannot be operated, much less optimized, in the absence of an adequate social, legal, and institutional framework. Much new understanding of these elements of pollution control is needed. Research effort of a new character will be under way in FY 1969 aimed at augmenting our understanding of these factors in order that we may begin approaching water management with improved confidence and efficiency.

A minor increase will be made in effort on cold climate pollution problems. This effort is needed to forestall inevitable increases in the newly-populated cold climate areas of Alaska and the northernmost States of the "lower 48."

Work on pollution control research generally applicable across many sources of pollution must also be expanded in FY 1969. This research on identification and characterization of pollutants, on methodology for detecting and quantifying sources of pollution (especially nonpoint sources such as runoff), and on determining the fate of pollutants as they move through the water environment is essential to the accomplishment of effective pollution control. The work on pollution fate, for example, will provide predictable relationships between discharge loads and in-stream pollution levels at any point downstream. It is only through understanding of this that consistent and reliable limits may be placed on pollution discharges to achieve desired stream quality.

Basic or long-range payoff research is a desirable investment for the future in any problem-solving research program. It is difficult to arrive at an objective analysis of the level of support for such experimentation; based on knowledge of others' judgments on this matter, both in governmental and industrial research programs and on our own experience, it is proposed that long-range research support of about two or three percent of the total research and development budget be provided. Most of this support would be through research grant funding and a large fraction of the research would be at academic institutions.

Accomplishments

1967

- (1) Determined that atrazine is adsorbed on soil colloids and undergoes an irreversible chemical change which greatly limits the pollution effect of atrazine in water supplies.
- (2) Developed an improved method of qualitative and quantitative determination of presence of ligno-sulfonates in water.
- (3) Developed an isotropic current analyzer to measure velocities adjacent to stream bottom.
- (4) Constructed a pilot plant for studies of eutrophication at Ely, Minnesota.
- (5) Developed method for detection and measurement of salmonella organisms in waste water and streams.
- (6) Developed method for detection and measurement of pseudomonas in waste water and streams. This organism is occasionally pathogenic.

1968

- (1) Developed a method for determination of relative effects of photosyntheses, diffusion and respiration in the reaeration of streams.
- (2) Constructed pilot plant facilities and obtained preliminary results which gives promise of the effectiveness of hydroponic culture of grasses (using sewage effluent) for removal of nutrients from the effluent.
- (3) Determined that DDT is heavily adsorbed by groundwater aquifers in a short travel distance.
- (4) Developed a method to pinpoint the sources of pollution by specific synthetic organic chemicals.
- (5) Determined that adsorbed organic pollutants in water are greatly affected by the turbid sediments in water and that the turbidity reduces the pollutional effect of the organic compounds.
- (6) Developed instruments and methods for organic and inorganic nutrient recovery from water.
- (7) Developed an improved method for measuring C.O.D. (Chemical Oxygen Demand) in the low range of concentration.

(8) Determined that the herbicide silvex does not persist in the ester form in soil or water in sufficient quantity to be a significant pollutant.

(9) Developed a simplified computer programming language for water quality.

7. Waste Treatment and Ultimate Disposal Technology: Fiscal year 1968, \$8,737,000; fiscal year 1969, \$9,284,000; increase, \$547,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$17,000	...	...	To meet increased pay costs.
(2)	+50,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-120,000	...	...	Due to nonrecurring equipment costs.
(4)	-400,000	...	\$2,000,000	Reduction in grant effort.
(5)	+400,000	...	4,400,000	To expand contract effort to support new potential advanced waste treatment processes.
(6)	<u>+600,000</u>	<u>+23</u>	2,884,000	To expand in-house effort in laboratories and at field sites in treatment and disposal technology.
	<u>+547,000</u>	<u>+23</u>		

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u>
Grants.....	\$2,400,000	\$2,000,000	-\$400,000
Contracts.....	4,000,000	4,400,000	+400,000
In-house.....	<u>2,337,000</u>	<u>2,884,000</u>	<u>+547,000</u>
Total.....	8,737,000	9,284,000	+547,000

Need for Increase

Contracts

The increase of \$400,000 in contracts is required to develop those processes which are on the horizon and show potential for being highly applicable for more efficient and economical removal of nutrient compounds and complex organics; to replace on a more efficient basis the primary and secondary process sequences for new treatment facilities; and to further develop those processes such as freezing, hydrate freezing, and distillation which have received only limited attention in the past because of program limitations.

In-house

Twenty-three positions and \$600,000 are required in order to expand laboratory and field effort in treatment and control research, physical-chemical treatment research, biological treatment research, and particularly ultimate disposal research. Included in this increase are special sampling and control application equipment required to support the pilot plant studies being carried out at such facilities as Pomona, California; Blue Plains, Washington, D.C.; and Lebanon, Ohio.

Objective

The objectives of this research is to develop generally applicable waste treatment and ultimate disposal technology to achieve any desired degree of treatment of point sources of pollution and to develop and demonstrate technology capable of returning municipal, industrial, and agricultural waste waters to qualities suitable for direct reuse. Improved techniques must be made available for separation and disposal of (a) dissolved nutrients, (b) dissolved refractory organics, (c) suspended and colloidal solids, (d) dissolved inorganics, (e) dissolved biodegradable organics, and (f) microorganisms.

Program of Work

This program covers research and development on waste treatment and ultimate disposal processes and systems and research, development, and demonstration on technology for the renovation of waste waters for reuse.

Work under this program has already shown in the laboratory that it is technically possible to achieve any degree of waste treatment desired and, in fact, to return waste water to a quality at least as high as that of the water before use. Considerable work remains to be done to achieve the goal of accomplishing these degrees of treatment, at any necessary location, under any necessary conditions, and at minimum cost. A large part of the overall FWPCA research effort is directed toward the development of completely new waste treatment processes. The objective is to develop, by 1975, feasible techniques for complete elimination of all point sources wastes. A panel of the Federal Council for Science and Technology has recommended a greatly accelerated advanced waste treatment program incorporating the best talents of the Federal Government, universities, private research groups, and industry. Such a program is, of course, under way and the proposed FY 1969 activity is part of this continuing effort.

The more promising treatment processes now being investigated include: biological denitrification, biological phosphate removal, coagulation-sedimentation, electrodialysis, filtration, granular activated carbon adsorption; ion exchange, phosphate removal by mineral addition, powered activated carbon adsorption, and reverse osmosis. Disposal processes of potential value include calcination, conveyance, digestion, incineration, recovery and reuse, and surface spreading.

Because of somewhat more successful research findings than had been anticipated, an accelerated program of research and development can be undertaken with increased assurance of both short and long-term payoffs in both water pollution control and augmentation of fresh water supplies through water reuse. Practical payoffs have already occurred from this research with the design and construction of a number of full-scale demonstrations of several of the processes beginning as early as 1965. With the level of support proposed, it can reasonably be expected that suitable processes for purification of all waste streams and ultimate disposal of waste concentrates (both municipal and industrial) can be developed, field evaluated, and demonstrated by the mid-70's.

Experience has demonstrated the importance and efficiency of conducting simultaneous and complementary in-house and contract research and development projects. It has also proven valuable to utilize cooperative project agreements with various local authorities to allow actual plant-site studies by both direct program and contract researchers. Such installations have been initiated or are planned at Cincinnati, Cleveland, and Lebanon, Ohio; at Lancaster, Pomona, and Whittier Narrows, California; at Manassas, Virginia; and at the District of Columbia.

Accomplishments

1967

(1) Pilot plant development of powered activated carbon adsorption, electrodialysis, ion exchange, and reverse osmosis were successfully conducted.

(2) Nitrogen removal by biological nitrification-denitrification was proven feasible in bench-scale studies.

(3) Studies of the effectiveness of new disinfection methods on waste water organisms were initiated.

(4) A pilot plant for disposal of biological sludges with a potential view for reclamation of strip-mined areas was designed.

(5) A new method for high efficiency removal of phosphorus from municipal wastes has been developed and proved effective in bench-scale tests.

1968

(1) Cost of granular activated carbon adsorption for achieving 98-99% removal of organic pollution from secondary sewage effluent has been reduced by 20% to an estimated 8.3 cents per 1000 gallons.

(2) Preliminary tests of a new phosphate removal process (use of mineral additions) at 2 full-scale waste treatment plants were completed with promising results.

(3) Solutions have been found to the serious membrane fouling problems which have been prevalent in electrodialysis treatment of waste waters. Pilot-scale verification of these techniques are now under way.

(4) The powered carbon adsorption process for the treatment of primary effluent has been developed to the pilot scale. Early results indicate the process may produce a better quality effluent than conventional secondary treatment.

(5) The effectiveness of organic polyelectrolytes in the treatment of primary influent was demonstrated on a full-scale plant.

(6) The feasibility of a 3-stage combined chemical-biological process for the removal of phosphorus and nitrogen was established in bench-scale tests.

(7) The technical feasibility of two new waste oxidation processes, involving ozone and light-catalyzed chlorine, was established.

(8) An anion exchange process was evaluated and shown to be effective in removing up to 50% of the soluble organics from secondary effluents without irreversible fouling.

(9) A comprehensive summary of capital and operating costs for both conventional and advanced waste treatment processes has been completed.

(10) Mathematical models are being formulated to predict and control the performance of waste treatment processes by computer. A preliminary model for the activated sludge process was completed.

(11) A technique for recovering and reusing chemical precipitants used in treatment for phosphate removal has been evaluated. The technique may lead to significant cost reductions for phosphate removal.

(12) Exploratory research has shown that the hydrolysis of sewage sludge can recover amino acids and other dissolved nutrients which may be reusable as a by-product from sludge disposal operations.

8. Water Quality Requirements: Fiscal year 1968, \$5,118,000; fiscal year 1969, \$5,781,000; increase \$663,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$15,000	...	...	To meet increased pay costs.
(2)	+126,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-100,000	...	...	Due to nonrecurring equipment costs.
(4)	-100,000	...	\$2,200,000	Reduction in grant effort.
(5)	<u>+722,000</u>	<u>+79</u>	2,681,000	To expand in-house effort on effects of pollution on salt and fresh water.
	<u>+663,000</u>	<u>+79</u>		

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u>
Grants.....	\$2,300,000	\$2,200,000	-\$100,000
Contracts.....	900,000	900,000	...
In-house.....	<u>1,918,000</u>	<u>2,681,000</u>	<u>+763,000</u>
Total.....	5,118,000	5,781,000	+663,000

Need for Increase

Seventy-nine positions and \$722,000 are needed to increase the staffing of the Water Quality Laboratory, Duluth, Minnesota, the temporary Marine Water Quality Laboratory, Narragansett, Rhode Island, and to permit a slight expansion in technical staffing at the Newtown, Ohio, field site. Special sampling equipment in support of the Newtown, Ohio, field site is included in this increase.

Objective

The objective is to provide the scientific bases for the establishment of water quality standards for the Nation's waters. These standards relate to use of fresh and marine water for municipal, agricultural, industrial, and recreational purposes and for propagation of fish, other aquatic life and wildlife.

Program of Work

Included in this category is all research aimed at scientifically establishing the water quality required to allow use of water for the entire range of purposes desired by man. In other terms, this covers research on the effects of pollution.

Far too little is known about the effects of pollution. The drastic effects (e.g., the massive fish kill) can, of course, be recognized but quite often the true cause of such events cannot be defined, even on extensive retrospection. To look ahead and to predict the occurrence of such events is, unfortunately, well beyond our current capability for any but the simplest systems with the least complicated set of environmental conditions and pollution loads. Along with this, we have the challenge of detecting, understanding, and then preventing the more subtle, long-term effects of pollution which could, even now, be robbing us of our water resources through insidious, irreversible effects, as yet unknown but just as real as the sudden fish kill, the unpalatable water supply, or the condemned bathing beach. Because of the difficulty of solving these problems and the inadequate baseline from which we must start, a rapidly accelerating program will be necessary in FY 1969.

Accomplishments

1967

- (1) Additional water quality requirements for use in establishing water quality standards for fish and aquatic life in both fresh and salt water environments were determined.
- (2) An autopsy method for proof of cadmium-caused mortality of fishes was developed.

(3) For selected species of fish (blue gills and fathead minnows) and types of water, water quality requirements for hexavalent chromium, nickel, copper, and malathion were determined.

(4) Water quality requirements (dissolved oxygen, pH, and temperature) for propagation and growth of the fathead minnow were established.

(5) A technique for long-term collection of blood samples from an individual fish to allow measurement of the effects of pollution exposure over a long period of time was developed.

(6) The major research efforts to establish the effects of the pesticide, endrin, in the lower Mississippi River was completed.

1968

(1) The National Water Quality Laboratory at Duluth was dedicated and made operational.

(2) Research which furnished additional evidence that the "application factor" applied to bioassay data is a valid method for determining water quality requirements for fishes was completed.

(3) It was discovered that an organophosphate insecticide, parathion, is not metabolized in the body of a fish as it is in the body of a mammal and that concentrations as high as 30-40 ppm. may be found in blood of fish intoxicated with parathion.

(4) Studies have shown that a chronic bioassay technique measuring reproduction and growth of fish is a feasible and useful method for measuring effects of pollutants on fish.

(5) Histopathological studies on the hard clam or quahog (*Mercenaria mercenaria*) and the oyster (*Crassostrea virginica*) to determine the effects of heavy metals on these two species was initiated.

(6) A study of normal histology of important marine invertebrates for preparation of a manual to allow rapid identification of pollutional effects on these organisms was initiated.

(7) Development of methods and procedures for use of fish enzymes as possible indicators of toxic effects of pollutants are under way.

(8) Investigations of the effects of Nitrilotriacetic Acid (NTA) upon the toxicity of metals (known metabolic toxins) to marine phytoplanktonic organisms have been initiated.

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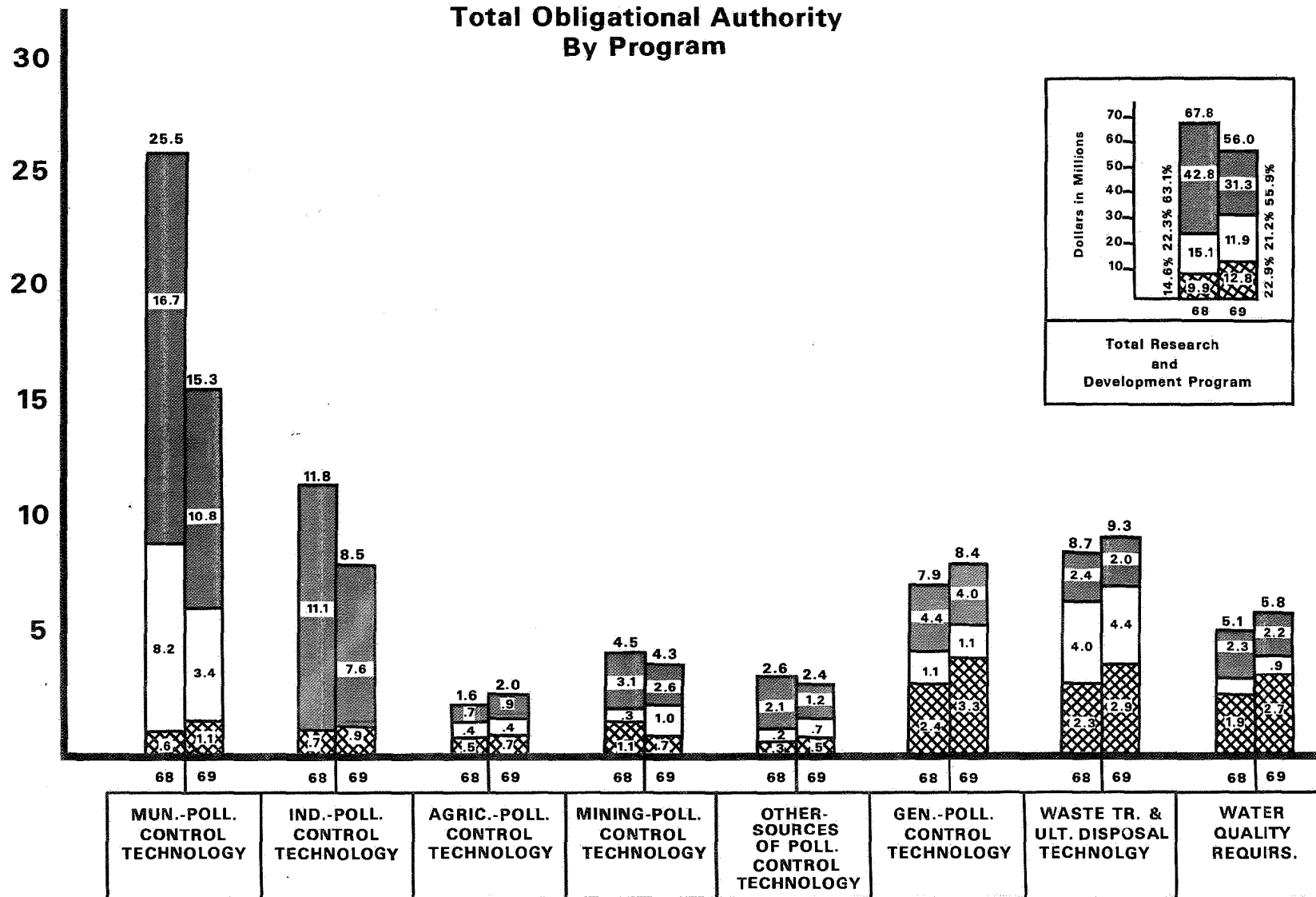
Research and Development Program
Bridge between Program Elements and Conventional Budget Basis
FY 1968 and FY 1969

	Municipal- Pollution Control Technology		Industrial- Pollution Control Technology		Agricultural- Pollution Control Technology		Mining- Pollution Control Technology		Other-Sources- of-Pollution Control Technology		General Pollution Control Technology		Waste Treatment and Ultimate Disposal Technology		Water Quality Requirements		Total	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Combined Sewer.....	\$14,510	\$8,000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	\$14,510 ^a	\$8,000 ^a
Grants.....	8,510	5,600	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8,510	5,600
Contracts.....	6,000	2,400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6,000	2,400
<u>Advanced Waste Treatment and</u>																		
Joint Treatment..	10,300	6,100	...	...	\$700	\$700	...	...	...	...	...	...	\$3,200	\$3,200	...	...	14,200	10,000
Grants.....	8,100	5,100	...	...	500	500	...	...	...	...	...	...	1,500	1,100	...	...	10,100 ^b	6,700 ^b
Contracts.....	2,200	1,000	...	...	200	200	...	...	...	...	...	...	1,700	2,100	...	...	4,100 ^a	3,300 ^a
<u>Industrial Waste</u>																		
Grants.....	...	...	\$10,700	\$7,000	...	...	\$3,400	\$2,500	\$1,400	\$500	...	...	...	...	...	...	15,500	10,000
Contracts.....	...	...	10,700	7,000	...	...	3,100	2,500	1,400	500	...	...	...	...	...	...	15,200 ^c	10,000 ^c
<u>Demonstration</u>																		
Grants.....	...	...	...	...	200	200	...	...	700	700	\$1,600	\$1,600	...	...	...	...	2,500	2,500
Research Grants....	100	100	400	600	...	200	...	100	...	...	2,800	2,400	900	900	\$2,300	\$2,200	6,500	6,500
<u>General Research</u>																		
Contracts.....	...	...	...	...	200	200	...	1,000	200	700	1,065	1,100	2,300	2,300	900	900	4,665	6,200
In-House.....	636	1,131	662	906	530	691	1,078	725	302	450	2,450	3,334	2,337	2,884	1,918	2,681	9,913	12,802
Total.....	25,546	15,331	11,762	8,506	1,630	1,991	4,478	4,325	2,602	2,350	7,915	8,434	8,737	9,284	5,118	5,781	67,788	56,002
Grants.....	(16,710)	(10,800)	(11,100)	(7,600)	(700)	(900)	(3,100)	(2,600)	(2,100)	(1,200)	(4,400)	(4,000)	(2,400)	(2,000)	(2,300)	(2,200)	(42,810)	(31,300)
Contracts.....	(8,200)	(3,400)	...	...	(400)	(400)	(300)	(1,000)	(200)	(700)	(1,065)	(1,100)	(4,000)	(4,400)	(900)	(900)	(15,065)	(11,900)
In-House.....	(636)	(1,131)	(662)	(906)	(530)	(691)	(1,078)	(725)	(302)	(450)	(2,450)	(3,334)	(2,337)	(2,884)	(1,918)	(2,681)	(9,913)	(12,802)

a/Applicable to authorization under section 6(e)(1) under the Federal Water Pollution Control Act, as amended, and available until expended.
b/Applicable to authorization under section 6(e)(2) under the Federal Water Pollution Control Act, as amended, and available until expended.
c/Applicable to authorization under section 6(e)(3) under the Federal Water Pollution Control Act, as amended, and available until expended.

Section 5 authorization
68 69
4,665 6,200

FWPCA RESEARCH AND DEVELOPMENT FISCAL YEARS 1968 and 1969 Total Obligational Authority By Program



Grants
Contracts
In House

FY 1968 INCLUDES \$16.2 MILLION OF UNOBLIGATED FUNDS CARRIED OVER FROM FY 1967

See next page for subprogram elements

(January 1968)

Planning, assistance, and training

Planning, assistance and training activities

	FY 1967 Amount Available	FY 1968 Amount Available	FY 1969 Estimate	Increase (+) or Decrease (-) 1969 compared with 1968		
				Total	Pay Cost ^{a/}	Program
a. Comprehensive planning.....	\$13,791,420	\$19,503,000	\$21,235,000	+\$1,732,000	+\$67,000	+\$1,665,000
b. Standards and controls.....	1,021,198	1,406,000	1,487,000	+81,000	+13,000	+68,000
c. Technical assistance and services.....	5,808,369	7,127,000	8,558,000	+1,431,000	+59,000	+1,372,000
d. Training.....	4,496,804	4,878,000	5,409,000	+531,000	+8,000	+523,000
Unobligated balance lapsing.....	1,231,949	...	...	...	...	...
Total.....	26,349,740	32,914,000	36,689,000	+3,775,000	+147,000	+3,628,000

a/ To provide for increased pay cost for fiscal year 1968 positions.

State & interstate agency program grants

a. Comprehensive planning

	<u>FY 1968 Amount Available</u>	<u>FY 1969 Estimate</u>	<u>Increase (+) Decrease (-) Over 1968</u>
1. State and interstate agency program grants.....	\$10,000,000	\$10,000,000	...
2. Comprehensive basin planning			
(a) Grants.....	500,000	2,000,000	+\$1,500,000
(b) Federal planning and studies.....	7,933,000	8,033,000	+100,000
3. Estuary studies.....	690,000	1,000,000	+310,000
4. National requirements and cost studies.....	380,000	202,000	-178,000
Total.....	19,503,000	21,235,000	+1,732,000

1. State and interstate agency program grants: Fiscal year 1968, \$10,000,000; fiscal year 1969, \$10,000,000; no change.

Objective

Section 7 authorizes grants to States and interstate agencies to assist in meeting the costs of establishing and maintaining adequate measures for preventing and controlling water pollution, including the training of personnel. In 1967 the Act authorized \$5 million for this purpose. However, in passing the Clean Water Restoration Act of 1966, Congress increased the authorization to \$10 million for fiscal years 1968 through 1971. Therefore, the request is for \$10 million, the full amount authorized by the Act. It provides \$9 million for States and \$1 million for interstate agencies.

Program of Work

State agencies are the first line of defense in the national water pollution control effort, and during the next few years their responsibilities will increase as that effort gains momentum. Increased State capability is needed to enable them to initiate or expand their activities in conducting field studies of actual and potential water pollution problems; to establish water quality standards and implementing plans; to establish monitoring systems to provide current information on the quality of existing waters; to train technicians and administrators as specialists in water resources planning and water pollution control; to work with communities and industries to effect abatement of pollution; and to assist municipalities in developing plans for the installation of waste treatment facilities.

Accomplishments

In order to assure the most effective utilization of the Federal support, the Federal Water Pollution Control Administration issued "Guidelines for Developing Fiscal Year 1968 Program Plans for State and Interstate Agencies." These "Guidelines" set forth the essential elements of an effective program plan as a basis for receiving Federal grant funds. Each applicant must now describe how it will carry out a broader, improved water pollution control program with the additional Federal grant.

In 1963 a study by the Senate Committee on Public Works, "A Study of Pollution-Water," (Staff Report to the Senate Committee on Public Works, 88th Congress, 1st Session, Committee Print), indicated that few States had adequate water pollution control programs. The need for State program improvement was further highlighted in a study, "Staffing and Budgetary Guidelines for State Water Pollution Control Agencies," done by the Public Administration Service for the Public Health Service in 1964. Despite recent strengthening and improvement by a number of States, most State programs are still considered inadequate, although program effectiveness is difficult to quantify. Based on FWPCA's review of State program plans for FY 1968 which considered such factors as State agency authority, budget, staff, and treatment plant operator certification; establishment of intrastate water quality standards; water quality planning activity; and water quality monitoring; only about one-third of the States are now considered adequate. The kind and degree of improvement needed varies widely from State to State. During the next five years, every effort will be made to upgrade State programs.

Program grants are also awarded to interstate pollution control agencies. These interstate agencies, such as the Delaware River Basin Commission and the Ohio River Valley Water Sanitation Commission, may assume a more important role with a growing emphasis upon basinwide cleanup.

In view of the foregoing, continued financial assistance is important to the States and interstate agencies in maintaining and improving their programs. The State and interstate agencies will spend approximately \$23 million of their own funds in 1968 as compared to an estimated \$18 million in 1967.

In FY 1969 it is anticipated that the increased spending for water pollution control programs on the part of the States will continue.

The tables showing allocations by State and interstate agencies, in accordance with a prescribed formula, follow:

Allocations of Grant-in-Aid Funds for Water Pollution Control

State or Territory	1967 Allocations	1968 Allocations	1969 Allocations	Increase (+) or Decrease (-)
Alabama	\$95,900	\$185,300	\$183,900	-\$1,400
Alaska	15,400	19,600	19,700	+100
Arizona	39,900	71,000	72,500	+1,500
Arkansas	61,400	112,600	111,900	-700
California	294,200	615,300	623,900	+8,600
Colorado	45,100	80,700	80,700	...
Connecticut	83,000	159,300	160,500	+1,200
Delaware	45,400	81,400	81,900	+500
District of Columbia	47,200	84,400	84,500	+100
Florida	125,300	252,900	252,300	-600
Georgia	109,500	212,900	210,800	-2,100
Hawaii	38,100	64,700	65,100	+400
Idaho	26,100	41,000	41,100	+100
Illinois	203,700	405,800	407,900	+2,100
Indiana	112,500	216,800	216,800	...
Iowa	67,000	119,700	117,100	-2,600
Kansas	53,600	93,100	93,600	+500
Kentucky	86,600	163,300	161,800	-1,500
Louisiana	93,800	177,400	177,400	...
Maine	36,200	62,200	61,000	-1,200
Maryland	87,900	172,100	173,300	+1,200
Massachusetts	130,800	254,300	254,900	+600
Michigan	174,000	337,200	338,500	+1,300
Minnesota	80,800	149,400	148,100	-1,300
Mississippi	77,400	143,700	142,900	-800

Allocations of Grant-in-Aid Funds for Water Pollution Control--continued

State or Territory	1967 Allocations	1968 Allocations	1969 Allocations	Increase (+) or Decrease (-)
Missouri	94,400	186,000	188,300	+2,300
Montana	24,400	38,200	38,200	...
Nebraska	39,500	66,600	64,700	-1,900
Nevada	17,400	23,700	23,800	+100
New Hampshire	35,000	60,500	60,400	-100
New Jersey	149,100	292,700	295,900	+3,200
New Mexico	31,300	51,000	50,400	-600
New York	311,300	630,700	632,300	+1,600
North Carolina	127,700	257,600	254,500	-3,100
North Dakota	24,300	37,900	37,400	-500
Ohio	212,700	424,000	425,300	+1,300
Oklahoma	63,400	113,000	112,700	-300
Oregon	45,800	90,700	92,100	+1,400
Pennsylvania	236,200	469,800	467,900	-1,900
Rhode Island	58,400	104,600	104,600	...
South Carolina	80,500	154,100	151,000	-3,100
South Dakota	26,100	40,400	39,400	-1,000
Tennessee	104,100	203,500	200,800	-2,700
Texas	205,200	411,100	411,800	+700
Utah	31,200	51,200	52,100	+900

Allocations of Grant-in-Aid Funds for Water Pollution Control--continued

	1967 Allocations	1968 Allocations	1969 Allocations	Increase (+) or Decrease (-)
Vermont	25,700	42,000	42,100	+100
Virginia	103,000	202,400	200,900	-1,500
Washington	64,200	122,100	123,900	+1,800
West Virginia	57,100	106,600	105,800	-800
Wisconsin	101,300	187,200	185,500	-1,700
Wyoming	17,600	23,500	23,100	-400
Guam	40,900	71,700	72,400	+700
Puerto Rico	101,200	191,000	190,300	-700
Virgin Islands	<u>40,200</u>	<u>70,100</u>	<u>70,300</u>	<u>+200</u>
Total	4,700,000	9,000,000	9,000,000	...

Basis for allocation:

1. \$12,000 basic grant
2. Remainder: $\frac{2}{3}$ population weighted by per capita income
 $\frac{1}{6}$ population density
 $\frac{1}{6}$ number of "wet" industries

Allocations to Interstate Agencies

	1967 Allocations	1968 Allocations	1969 Allocations	Increase (+) or Decrease (-)
✓ New England Interstate Water Pollution Control Commission	\$40,600	\$135,700	\$135,900	+\$200
Connecticut New Hampshire				
Massachusetts Rhode Island				
Maine New York				
Vermont				
✓ Ohio River Valley Water Sanitation Commission	92,100	305,300	305,000	-300
Illinois New York				
Indiana Kentucky				
Ohio West Virginia				
Pennsylvania Virginia				
Delaware River Basin Commission	40,000	132,900	132,900	...
Delaware New Jersey				
New York Pennsylvania				
Interstate Sanitation Commission	65,200	218,100	218,800	+700
New York Connecticut				
New Jersey				
Klamath River Compact Commission	7,500	27,500	27,400	-100
Oregon California				
Interstate Commission of the Potomac River Basin	22,200	73,900	73,700	-200
Pennsylvania Virginia				
Maryland West Virginia				
District of Columbia				

Allocations to Interstate Agencies--continued

	1967 Allocations	1968 Allocations	1969 Allocations	Increase (+) or Decrease (-)
Bi-State Development Agency Illinois Missouri	17,100	56,500	56,700	+200
✓ Tennessee River Basin Water Pollution Control Commission Tennessee Mississippi Kentucky	15,300	50,100	49,600	-500
Total	300,000	1,000,000	1,000,000	...

Basis for allocation:

2/3 population weighted by per capita income
1/6 population density
1/6 number of "wet" industries

Basin planning grants

2. Comprehensive basin planning

Effective river basin planning and comprehensive approaches to pollution control are essential to assure that the massive investment in abating pollution will yield optimum returns in cleaning up entire stream systems. To achieve pollution control on a river basin approach, the Federal Water Pollution Control Administration is authorized to provide grants to non-Federal planning agencies to support the development of effective comprehensive water quality control and abatement programs and, through direct Federal effort, to prepare or develop pollution control action programs in cooperation with all concerned. The following are specific details on the activities carried out for this purpose:

- (a) Basin planning grants: Fiscal year 1968, \$500,000; fiscal year 1969, \$2,000,000; increase, \$1,500,000. The increase consists of:

<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	<u>Explanation</u>
<u>Amount</u>	<u>Positions</u>	<u>Program</u>	
+\$1,500,000	...	\$2,000,000	Support 20 new non-Federal basin planning agencies and provide increased support for those initiated in FY 1968.

Need for Increase

This is a new program being initiated in FY 1968; therefore, at this writing the program has no experience factor to fully justify the proposed increase. However, it is the goal of the Federal Water Pollution Control Administration in FY 1969 to stimulate the establishment of 15 to 20 basin planning agencies at a cost of \$1,200,000 to develop effective comprehensive water quality control and abatement plans for specific basins. Particular emphasis will be given toward stimulating establishment of and supporting those agencies in basins with the most serious and complex water pollution problems in order that basinwide management systems can be under way during the early 1970's. An additional \$300,000 is requested to provide for the second year increased cost of the 5 to 8 agencies anticipated to be supported from the funds appropriated for FY 1968.

Objective

Section 3 of the Federal Water Pollution Control Act, as amended, provides for grants not to exceed 50% to planning agencies if they adequately represent State, interstate, local or international interests in the basin, and if they are capable of developing an effective comprehensive water quality control and abatement plan for a basin.

These grants are to financially assist each planning agency in the development of a comprehensive pollution control and abatement plan for the basin. Each of these plans developed must be consistent with applicable water quality standards established for the basin concerned. The planning agencies are to recommend treatment works and sewer systems for the most effective and economical means of collection, storage, treatment and purification of wastes as well as methods to encourage both municipal and industrial use of such works and systems. The agencies will recommend both maintenance and improvement of water quality standards within the basin as well as a plan for adequately financing facilities necessary in the execution of this maintenance and improvement.

The financial assistance which these grants provide will aid in the conservation of interstate waters and tributaries thereof for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, agricultural, industrial, and other legitimate uses.

Grants may be given to an approved agency for a period not to exceed three years.

Program of Work

Congress recognized the need for providing Federal assistance for initiating local institutional arrangements to establish effective water quality planning and management programs for river basins. Every effort will be made to stimulate the establishment and support of the kind of basin planning that is important to the implementation and improvement of water quality standards, and also lead to the formation of permanent arrangements for coordinated river basin water quality management. It is hoped that the Federal assistance provided for this purpose will prove to be a vital catalyst in stimulating State and local efforts to develop comprehensive basinwide pollution control programs.

By the end of FY 1969 it is anticipated that there will be about 25 agencies being supported which will be actively involved in planning action programs to solve pollution problems in specific river basins.

Accomplishments

This program is currently in the early stages of development. The first appropriation under the 1966 authorization was \$500,000 for FY 1968. To assist prospective grantees, FWPCA has prepared and distributed "Guidelines for Grants-Comprehensive River Basin Planning" to State, local, and interstate pollution control agencies. These guidelines indicate that the basic purpose of a pollution control plan is (1) to serve as a guide for effective action to eliminate and control pollution throughout interstate or intrastate basins; and (2) to provide permanent basinwide water quality management programs which involve

joint efforts of State, local, and metropolitan bodies as well as private interests. An essential feature of a basin plan is the action program which sets forth arrangements for financing and an appropriate institutional framework through which States and local communities can coordinate their efforts to control pollution in the basin on a continuing basis.

It is anticipated that support for 5 to 8 agencies will be provided in FY 1968.

Federal planning and studies

b. Federal planning and studies: Fiscal year 1968, \$7,933,000; fiscal year 1969, \$8,033,000; increase, \$100,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	<u>Explanation</u>
(1)	+\$64,000	...	...	To meet increased pay costs.
(2)	+114,000	...	...	Provide for full year employment of new personnel authorized in FY 1968.
(3)	-894,000	-60	\$4,914,000	Reduction in program effort in following projects: Arkansas-Red River, Chesapeake-Susquehanna, Columbia, Great Lakes-Illinois, Ohio, and Southeastern.
(4)	+366,000	+26	2,408,000	To enable redirection of program to spearhead the planning task on action programs in major river basins, encourage State-local establishment of planning agencies, and participate in Federal interagency water resources planning.
(5)	<u>+450,000</u>	<u>+34</u>	711,000	Expand effort in three projects initiated in FY 1968 or earlier--New England, Middle Atlantic and Western Gulf and initiate interstate program development in the Great Basin.
	<u>+100,000</u>	<u>...</u>		

Need for Increase

A total of 26 positions and \$366,000 is proposed to expand and strengthen the planning program to achieve pollution control on a comprehensive river basin approach. Heretofore, considerable emphasis was placed on extensive surveys of sources of pollution. As directed by the House Appropriations Committee in their action on the FY 1968 budget, the program is being reoriented with emphasis being placed more on developing comprehensive guides for pollution control actions necessary

in each major river basin. The extent and nature of Federal planning necessary depends on State and local planning contributed in the basin concerned. To minimize Federal effort in this area, considerable emphasis will be put on encouraging formation of State and local planning agencies for the purpose of planning action programs in specific watersheds or river basins in the shortest time possible. To implement this reorientation, various staff capabilities are required that have not been available heretofore. There is a need for staff in the area of public administration, political science, water resources planning, economics and public utility financing. Although some progress was made in this area in FY 1968, total staff needs have not been achieved because of the administrative problems involved in phasing-out technical aspects of existing comprehensive projects to fund these new kinds of personnel. The objective now is to accomplish this early in FY 1969.

In addition to the foregoing, there is a need to strengthen and expand FWPCA's participation in Federal interagency water resources planning. Particular emphasis in FY 1969 is to increase participation in Type I Framework Studies for the Colorado River Basin in accordance with the coordinated schedule of the Water Resources Council.

An increase of 34 positions and \$450,000 is provided to expand activities of the projects for New England, Middle Atlantic, Western Gulf and to initiate activity in the Great Basin. Requirements for these projects are to accelerate the development of water pollution control action programs to assess data and institutional requirements for the various basins included in these project areas, continue or expand participation in Type I Framework Studies, where applicable, and conduct technical studies as needed. FWPCA efforts in these areas have been minimal or none at all; therefore, it is necessary to carry out essential activities only. No major field investigations such as those conducted in the past are proposed.

Objective

Section 3 of the Act provides for the development of comprehensive water pollution control programs; for studies of the need and value of storage in Federal reservoirs for regulation of streamflow for the purpose of water quality control; and for financial assistance to basin planning agencies. The latter provision was added by the Clean Water Restoration Act of 1966.

The legislative history underlying the passage of the Clean Water Restoration Act of 1966 places an important mandate on the Federal Water Pollution Control Administration to orient pollution control in the United States toward a basinwide basis. Effective planning will be essential to assure that the massive Federal investment in the costs of abating pollution, provided for in the Act, will yield optimum returns in cleaning up entire stream systems. The comprehensive program activity will be the focal point for this effort.

The specific objectives are as follows:

- (a) Provide a comprehensive guide to pollution control actions--both immediate clean-up needs and long-range preventive measures--necessary in each major river basin. The extent and nature of Federal planning activities necessary to accomplish this will be related to the extent to which State and local planning activities are making a contribution in the basin concerned.
- (b) Participate in Federal interagency water resource planning, as coordinated and scheduled by the Water Resources Council with respect to the pollution control and water quality management aspects of multipurpose water resource development.
- (c) Guide, assist and encourage the activities of State-local basin planning agencies.

Program of Work

This activity is presently in a period of transition to reflect changing circumstances and planning needs.

Initially, planning was the responsibility of individual comprehensive projects. For the purpose of establishing comprehensive projects, the Nation has been divided into 20 major river basins. (See map on page 82). Projects were under way in 15 of the basins in 1968.

Since their establishment, these projects have provided the technical and scientific resources necessary to support the development of pollution control plans and programs. In addition, they have provided the resources and capability needed to support closely related pollution control investigations and activities. This has often involved studies of a more detailed, technical nature than would be needed merely to support planning. For example, comprehensive project staffs have provided the principal source of support over the past year for the review and development of water quality standards. Data collected in connection with comprehensive studies has also contributed to the support of a number of enforcement actions.

With the changing nature of the planning task, efforts are being made to reorient planning activities along the following general lines:

- (1) More emphasis is being given to the nontechnical ingredients of planning that are essential to effective pollution control programs. Attention in 1968 has been focused on minimizing technical inputs not essential to decision making in the planning process and on strengthening staffs in the areas of public administration, political science, water resources planning, economics and public utility financing. This reorientation of activities and staff reflects the House Appropriations Committee Report directing such action.

(2) The planning capability of regions and basins not covered by comprehensive projects is being increased, in order that adequate attention can be given to planning and water resource development problems in those areas as rapidly as possible. This involves establishment of a staff competence in each regional office to spearhead planning in geographical areas not specifically covered by a comprehensive project. Emphasis is on developing outlines of basinwide pollution control action programs which can be implemented immediately on providing technical guidance to basin planning agencies, and on relating State-local planning efforts to Federal planning. These staffs will also strengthen and complement the more detailed work of the individual comprehensive projects.

A considerable amount of effort will be devoted to encouraging the formation of planning agencies, providing assistance in their formation, reviewing applications of basin planning agencies to determine need for and adequacy of proposed planning activities, and providing assistance in planning. Grants will be awarded and administered in accordance with the provisions of the Act and prescribed regulations.

(3) There will be a continuing effort to restructure the individual comprehensive projects to reflect more fully only those activities necessary to support planning and to minimize nonessential technical inputs. This does not mean, however, that some technical activities found not essential to planning will not be continued, if they are essential to support other related program purposes. For example, certain data collection and monitoring activities must be continued and expanded because of the need to support the implementation phase of water quality standards. There will be continued effort to identify such essential technical activities and, if necessary, to reflect this through future comparative transfers to items such as technical assistance and services, and pollution surveillance.

Considerable progress along the above lines has been made in 1968. However, employment ceilings and other problems related to a redirection of this magnitude have not permitted completion of these efforts in 1968. The program of work proposed for 1969 calls for continued progress. The program of work planned in the restructuring of activities for 1969 will call for:

(1) Headquarters activities which will involve program review and guidance, and development of new policies and methods to accomplish the objective of basinwide control programs and planning. As a special technical effort, there will be a continuing attempt to perfect mathematical procedures for simulating water quality responses and for testing the cost and effectiveness of pollution control measures. This is the technology which led to development of the Delaware Estuary Program. Headquarters will provide problem solving backup to individual comprehensive projects and instruct and guide field personnel in the application of new computer programs and systems analysis techniques.

(2) Studies will continue to be carried out for Federal construction agencies concerning need for and value of storage for quality control in reservoirs. This will include assembling information on the physical, economic and demographic environment, water use and waste production, present uses, and estimating the ways in which these are expected to change in the future. Based on the anticipated future waste treatment, available streamflows and assimilative capacity, the need for storage to maintain water quality necessary for possible beneficial uses is determined. Benefits resulting from proposed quality control are determined. The information is assembled in a report for use by the construction agencies in formulation of their report on water resources development.

In 1969 it is anticipated that approximately 50 projects will be studied. There will be continued emphasis on applying the Secretary of the Interior's new policy on streamflow regulation in these studies.

This activity also will provide necessary reviews and comments on water and related land resource development proposals in project reports under Interagency Review Procedures and Executive Order 11288.

(3) Basin planning activities will be continued, in association with Federal interagency water resource planning, and with State and interstate planning wherever appropriate. In basins where State and local planning efforts are not adequate or under way, the Federal program must spearhead the planning task on its own in order to put pollution control on a basin basis in the shortest possible time.

The bulk of these basin planning activities will be conducted by individual comprehensive projects. The projects will continue to provide the basis for undertaking detailed technical planning studies of complex pollution and hydrologic situations, to participate in interagency water resources planning, including work with the river basin commission established under the Water Resources Planning Act of 1965, and providing the solid factual base which will both guide the overall Federal pollution control effort in each basin concerned, and for effectively reviewing basin planning agency proposals.

Through 1968 the program has projects covering the following major river basins:

Arkansas-Red River	Central Pacific
Chesapeake-Susquehanna	Missouri
Columbia	Lower Mississippi
Great Lakes-Illinois River	Upper Mississippi
Delaware Estuary	New England
Ohio	Middle Atlantic
Southeastern	Western Gulf
Hudson-Champlain	

In 1969 it is proposed to initiate a project encompassing the Great Basin. This will be done without any overall program increase since the proposed funding level will be offset by decreases in other projects. Participation in Type I Framework Studies for the Colorado River Basin, which were initiated at a minimal level in 1968, will be increased in accordance with the coordinated schedule of the Water Resources Council.

Accomplishments

Examples of accomplishments are as follows:

(1) In recognition of the need to focus immediate attention and action on known sources of pollution, all on-going comprehensive projects have been working toward the identification of immediate pollution control needs for interstate streams in their geographical areas. To date, immediate pollution control needs have been identified for 128 basins and subbasins. The resulting information on identification of the problems, the pollution sources, the required corrective measures, and the estimated costs is serving as a reference point for establishing priorities and guiding the immediate pollution control actions of FWPCA and others.

(2) Comprehensive water pollution control studies directed toward developing longer range guidelines to provide a regulated supply of clean water for all legitimate users in a river basin have resulted in a report on the water quality control and management of the Willamette River Basin developed by the Columbia River Basin Comprehensive Project, and a preliminary report on the Delaware Estuary developed by the Delaware Comprehensive Project. In the latter instance, the report and findings have been incorporated into the program of the Delaware River Basin Commission and the FWPCA has continuously provided forecasting services and the evaluation of water quality control alternatives, passing on recommendations to the Commission.

(3) Representative of recent accomplishments of the comprehensive projects in the area of participation in Federal interagency water resources planning are (a) completion of the FWPCA segment of the Water Resources Council's comprehensive framework study for water and related land resources in the Ohio River Basin, developed by the Ohio River Basin Project, and (b) completion of Type II detailed comprehensive surveys of the Big Black, Pascagoula and Pearl River by the Southeastern Comprehensive Project. In a closely related area, the Southeastern, Ohio, and Chesapeake-Susquehanna projects have completed reservoir evaluation for the Appalachian Region, pursuant to the requirements of the Appalachian Regional Development Act of 1965.

(4) Other specific examples of accomplishments related to supporting the development of pollution control plans and programs include (a) evaluation of the effect of the Texas Water Plan on Rivers in the Western Gulf Basins by the Western Gulf Project, (b) participation by the staff of the Chesapeake-Susquehanna Project in the work of the Potomac River Interdepartmental Task Force, including completion of a simulation model

of the Potomac estuary, completion of a waste inventory of the Potomac basin in Maryland, and development of background information on water quality in the estuary, and (c) development by the Arkansas-Red River Project of a report on investigations of salt pollution in the two basins.

(5) It is estimated that during 1968 approximately 30 studies will be carried out for Federal construction agencies concerning need for and value of storage for quality control in reservoirs. Since 1960, the FWPCA has carried out 203 studies for the Corps of Engineers and 86 studies for the Bureau of Reclamation.

(6) Under the authority of Section 4 of the Federal Power Commission Act, the FWPCA reviews and comments on all applications for new licenses for electric generating operations, as well as the renewal of old licenses. The applications are reviewed from the standpoint of Departmental policy, consideration, and technical adequacy relative to the maintenance of adequate stream quality. It is estimated that in 1968, 45 license applications will be reviewed. Since 1963 the FWPCA has processed 421 applications for the Federal Power Commission.

(7) All on-going comprehensive projects have served as principal resources in carrying out the water quality standards provisions of the Act by providing technical support internally as well as by furnishing water quality data to the States as required.

(8) Perhaps most representative of accomplishments of the comprehensive projects in supporting closely related pollutional control investigations and activities in the work that has been done in carrying out Federal responsibility for surveillance, investigations and recommendations of enforcement actions. For example, the comprehensive study of the Illinois River Basin by the Great Lakes-Illinois River Basin Project provided the facts needed for use by the Department of Justice Special Master for the U. S. Supreme Court in the Lake Michigan diversion litigation between Illinois and other Great Lakes States. In addition, data collected from the Lake Michigan studies have been used in the preparation of reports on the interstate pollution of the Calumet area and of the entire Lake Michigan Basin. These reports were the basis of Federal actions in the Calumet Enforcement Conference held in Chicago on March 29, 1965, and in the Lake Michigan Enforcement Conference held in Chicago on January 31, 1968. In another area, the Hudson-Champlain Project provided data for the Hudson River Enforcement action and continues to carry out surveillance activities of the Hudson River main stream in accordance with recommendations of the conference.

In 1969, basin planning activities will continue to be centered in the individual comprehensive projects. The projects will continue to attack complex pollution control problems and pursue the development

of river basin plans that incorporate technical solutions and alternatives, financing estimates and cost sharing arrangements, and the necessary and practicable institutional arrangements for implementation. Moreover, the projects also will participate in interagency water resources planning under the Water Resources Council and serve as focal points for inter-agency review of water and related land resources development plans of other agencies.

During 1969, the data assessment, evaluation of institutional requirements, and necessary technical studies will be completed and initial comprehensive water quality control reports will be prepared for a number of river basins now under study. For example, the Columbia River Basin Project is in the process of developing initial reports, similar to the published report on the Willamette, for the six remaining subbasins of the Columbia River. Among other reports planned for 1969 are initial reports on the Klamath Basin, the Central Valley Basin of California, and the San Francisco Bay-Delta Area.

Individual project activities in connection with Type I Framework Studies and Type II detailed studies of the Water Resources Council will continue or be expanded, where required. The emphasis on coordinating FWPCA activities with those of other Water Resources Council planning agencies is reflected in the proposal to initiate in 1969 a comprehensive project for the Great Basin to coincide with the start of comprehensive program development in that area by the other Council agencies.

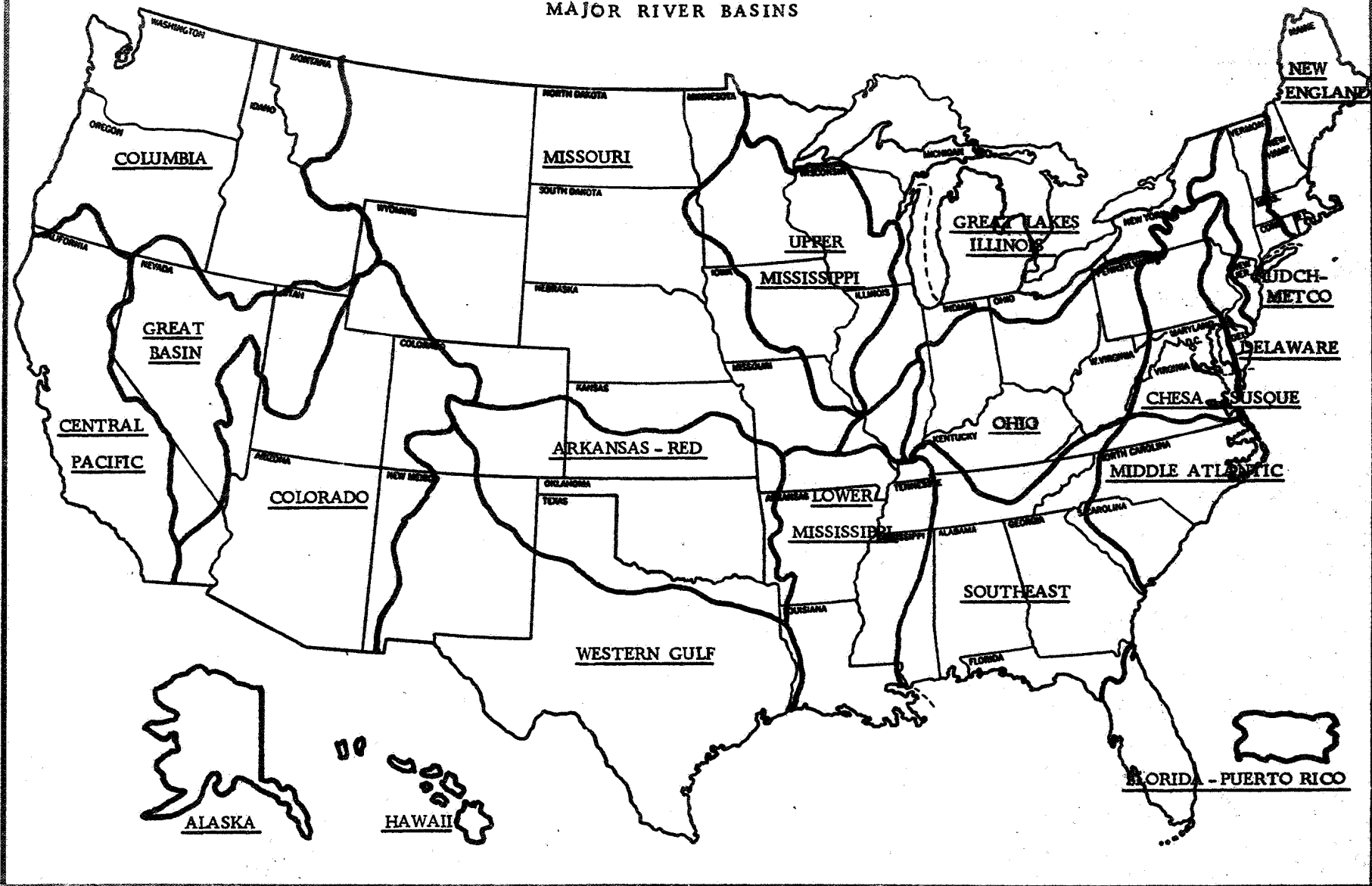
Although attention will continue to be focused on restructuring the individual comprehensive projects to reflect more fully only those activities necessary to support planning and to minimize nonessential technical inputs, there will be, by necessity, some continuation of technical activities that are required to support other related program purposes. For example, to the extent necessary the projects will continue to serve as technical resources on the implementation of the standards' provision of the Act, and in carrying out FWPCA responsibility for surveillance, investigation and recommendations of enforcement actions.

Comprehensive Projects
(dollars in thousands)

	<u>1968</u> <u>Estimate</u>	<u>1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1968</u>
Arkansas-Red.....	\$52	...	-\$52
Chesapeake-Susquehanna.....	541	\$400	-141
Columbia.....	336	300	-36
Great Lakes-Illinois River.....	1,155	760	-395
Delaware.....	120	120	...
Ohio.....	911	748	-163
Southeastern.....	680	598	-82
Hudson-Champlain.....	814	809	-5
Central Pacific.....	406	402	-4
Missouri.....	309	305	-4
Lower Mississippi.....	358	351	-7
Upper Mississippi.....	126	121	-5
New England.....	190	274	+84
Western Gulf.....	32	143	+111
Middle Atlantic.....	33	144	+111
Great Basin.....	...	150	+150
Total.....	6,063	5,625	-438

COMPREHENSIVE PROGRAMS

MAJOR RIVER BASINS



Estuary studies

3. Estuary Studies: Fiscal year 1968, \$690,000; fiscal year 1969, \$1,000,000; increase, \$310,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$1,000	...	...	To meet increased pay costs.
(2)	+33,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-9,000	...	...	Due to nonrecurring equipment costs.
(4)	<u>+285,000</u>	...	\$1,000,000	To continue the study of estuaries as provided for by section 5(g) of the Clean Water Restoration Act of 1966.
	<u>+310,000</u>			

Need for Increase

The Clean Water Restoration Act of 1966 authorized the appropriation of \$1,000,000 annually for fiscal years 1967, 1968 and 1969 to conduct a comprehensive study of the estuaries of the United States, to prepare a report of these studies, and to develop recommendations to the Congress for a comprehensive management plan. The project requires the acquisition and review of extensive economic, demographic, industrial development, biological, and pollution control data for each of the 850 estuarine systems of the United States. In contrast to the authorization, a total of only \$940,000 was available for the project in the first two years. The requested increase is necessary for the support of contracts and reimbursable arrangements required to complete a report with an acceptable level of technical accuracy and coverage. The future national program directed toward management of this resource is expected to be strongly influenced by the recommendations supported by the study.

Objective

Section 5(g) (1) of the Federal Water Pollution Control Act, as amended, provides for a comprehensive study of the effects of pollution in estuaries. This endeavor will be in cooperation with the Departments of Army and Agriculture, the Water Resources Council, and any other appropriate Federal, State, interstate or local public leaders, and private organizations, institutions, and individuals.

Specifically, the Act provides for the following:

1. Developing a comprehensive study of the effects of pollution, including sedimentation, in the estuaries and estuarine zones of the United States.

2. Determining the effects of pollution, in these estuarine areas, on fish and wildlife, sport and commercial fishing, recreation, water supply and water power, and other beneficial uses.

3. Considering the effect of demographic trends, exploitation of mineral resources and fossil fuels, land and industrial development, navigation, flood and erosion control, and other uses of estuarine zones upon the pollution of waters therein.

4. Identifying the problems and areas where further research and study are required as determined from investigations of representative estuaries and estuarine zones.

5. Delineating recommendations for a comprehensive national program for the preservation, study, use and development of estuaries of the Nation; and the respective responsibilities which should be assumed by Federal, State, and local governments, and by public and private interests.

Program of Work and Accomplishments

The estuary study is being carried out primarily through contracts with public and private agencies and will utilize data already available to Federal, interstate, State and local agencies to the maximum extent possible. Advice and council are being solicited from all interested official agencies and national interest groups. Public meetings are being held in the coastal States to provide the general public and local organizations with an opportunity to express their views on estuarine values and utilization. A National Estuarine Register has been established to provide, obtain, store, and evaluate data on the numbers, characteristics, types, and uses of the Nation's estuaries. The project is structured to recognize the vast differences which prevail in the several major coastal areas of the country, including the Arctic and Central Pacific areas.

Primary efforts in FY 1969 will be directed toward the analysis of data acquired in contracts negotiated in the two prior fiscal years; in the expansion of the National Estuarine Register; in the conduct of a major scientific meeting to identify, highlight, and discuss estuarine research and study needs; in the acquisition of data on demographic, economic and pollution problems; and in the development of a preliminary draft of the report. Technical societies and outstanding specialists will be invited to assist with the development of the report.

FWPCA has taken the lead as authorized and directed in Section 5 (g) to conduct, in cooperation with other appropriate Federal, State, interstate, and local public bodies and private organizations, institutions, and individuals, a comprehensive study of the effects of pollution upon the aquatic environment of the Nation's estuaries. A report of this

study is to be made to Congress by November 1969. It will analyze the importance of estuaries to the economic and social well-being of the people of the United States and the effects of pollution upon estuaries; it will discuss major social and economic trends in the estuarine zones; and the report will recommend a comprehensive national program for the preservation, study, use, and development of estuaries.

Information is being obtained through other agency contracts, contract studies, and the findings of other FWPCA activities concerned with the marine environment. In addition, approximately 28 public hearings are planned at strategic locations around the country. The first of these hearings was held in January 1968. These hearings will enable local government officials, industry, conservation groups, and private citizens to present their views on the use and value of estuaries directly to the study team.

National requirements and cost studies

4. National requirements and cost studies: Fiscal year 1968, \$380,000; fiscal year 1969, \$202,000; decrease \$178,000. The decrease consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$2,000	...	...	To meet increased pay costs.
(2)	<u>-180,000</u>	...	\$202,000	Due to nonrecurring costs of initial studies required by the Clean Water Restoration Act of 1966.
	<u>-178,000</u>			

Objective

As required by Sections 16 and 18 of the Federal Water Pollution Control Act, as amended, special studies were undertaken to provide Congress with a basis for evaluating authorized programs, development of new programs, information necessary for authorizing appropriations beginning with fiscal year 1969, and recommendation for providing incentives to industry to reduce or abate pollution by industry.

Assessment of the Nation's needs and related costs involved in controlling pollution from municipal, industrial, agricultural, mining, and other sources is essential to national policy making. Information has not been readily available in the past to adequately perform such an assessment. Even at this point, there is an urgent need to develop analytical tools and evaluation methods to facilitate a better understanding of the national needs and related issues.

If the annual, updated reports as required are to have maximum utility for Congress, information gaps regarding needs and costs must be filled. Accordingly, as future reports are issued, the amount and reliability of the data will be improved. Information exchange with State and local planning agencies will be encouraged as will exchange of program-related information from other Federal agencies. Better methods will be sought to evaluate programs, reexamine goals, needs and objectives, sharpen projections, and assess progress and benefits. Participation of industry, educational institutions and nonprofit organizations will be encouraged to stimulate the highest quality of professional interest in this important national problem.

Program of Work

Investigations and evaluations will continue to be pursued. These include: (1) an updated estimate of the cost of carrying out the provisions of the Act; (2) continuing analysis of the economic

impact on affected units of government of the cost of installing waste treatment facilities; and (3) continuing analysis of the national requirements for and the cost of treating municipal, industrial, and other effluent to attain established water quality standards.

The assessment of national requirements and costs must be the basis for shaping as well as for evaluating FWPCA's operational programs. As such, the projected expenditures in economic and related analyses are expected to be a sound investment eventually showing the way to more effective methods of doing business.

Accomplishments

The following reports have been developed and transmitted to Congress in accordance with their mandate:

1. National requirements and cost of treating municipal, industrial and other effluents,
2. Economic impact on State and local governments,
3. Possible economic incentives to industry, and
4. Federal cost of carrying out the Federal Water Pollution Control Act, as amended.

Water quality standards

b. Standards and Controls

	<u>FY 1968 Amount Available</u>	<u>FY 1969 Estimate</u>	<u>Increase (+) Decrease (-) Over 1968</u>
1. Water quality standards development.....	\$656,000	\$729,000	+\$73,000
2. Controlling pollution from Federal activities.....	750,000	758,000	+8,000
Total.....	1,406,000	1,487,000	+81,000

1. Water quality standards development: Fiscal year 1968, \$656,000; fiscal year 1969, \$729,000; increase, \$73,000. The increase consists of:

	<u>Increase (+) or Decrease (-) Amount</u>	<u>Positions</u>	<u>Total Program</u>	<u>Explanation</u>
(1)	+\$5,000	...	...	To meet increased pay costs.
(2)	+68,000	...	...	To support full year employment of new personnel authorized for FY 1968.
	<u>+73,000</u>			

Objective

As provided by Section 10 (c) of the Federal Water Pollution Control Act, as amended, establish water quality standards applicable to interstate and coastal waters to ensure the protection of high quality waters and the enhancement of presently polluted waters. When standards are set for all interstate and coastal waters--whether by State action or, if necessary, by Federal intervention--the Nation will have, for the first time, a body of specific goals and objectives for its waters and, in the implementation plans, realistic means for accomplishing those goals and objectives. Clearly, this will be a landmark in water resource conservation. Attainment of the water quality set in the standards will constitute FWPCA's principal program objective in the future. Because most of the water quality standards call for compliance with conventional waste implementation plans in about a five-year period, full attainment of the objective is not expected until the end of FY 1973.

Program of Work

Following approval of the standards, the second phase will begin; FWPCA will begin to seek and observe compliance with the standards. Although States have first responsibility, FWPCA will continuously review the extent of which implementation plans are being carried out. Extensive water quality

monitoring by FWPCA, as well as State and other Federal agencies, will be important in the review process. Knowledge gaps discovered in the standard setting phase indicate a need for special studies to deal with various technical problems. Marine waste disposal, salinity and temperature are three examples. Research is also needed to improve our judgments concerning water quality requirements. Finally, the water quality standards will have to be revised and upgraded at such time in the future as technical knowledge improves and as waste disposal conditions and water use change.

Specific activities to be pursued or carried out are as follows:

(a) Initiating the establishment of approvable standards where States have failed to act.

This activity will have been started in FY 1968, but should be terminated by the end of FY 1969. It will require coordination of technical service programs to develop the necessary data and will require the planning and execution of public hearings.

(b) Initiating programs to provide continuing evaluation of progress toward fulfilling implementation.

A program will have to be established to provide periodic reports on the status of compliance with water quality standards and particularly the implementation plans developed by the States. Vigorous surveillance on progress in meeting implementation plan goals will be required at least until the end of FY 1973. A detailed review of progress at least twice each year will be required.

(c) Initiating studies to be made by technical programs, research and development, and comprehensive planning in matters relating to water quality standards.

Scientific and technical information will have to be collected for standards decision-making purposes. This will include data on water quality, water uses, water polluters, costs of achieving standards, methods of upgrading water quality, and the cause and effect relationship of pollution.

(d) Revising water quality standards where appropriate.

Upon review of National Technical Committee Reports on data collected by technical programs and/or comprehensive planning, or upon the request of a State Governor, adopted water quality standards may need to be revised. A standard modification program that includes public hearings will have to be established and pursued.

(e) Participating in the evaluation of State program plans.

Annual State program plans will update information originally contained in the standards implementation plan. A review is required to determine whether construction priorities, monitoring programs, and other activities are in accord with the enhancement of water quality.

(f) Analyzing basic data to identify the effectiveness of water quality standards.

Basic data must be collected, catalogued and analyzed in order to determine effectiveness of standards programs.

(g) Reviewing and evaluating new and existing scientific and technical information for standards decision-making purposes.

A program will be initiated to develop a water quality criteria intelligence system of scientific and technical information appropriate for standards decision-making purposes, and to make this information available to the States and other Federal agencies under a continuing program of assistance. Effective liaison will be established with all State and Federal water resources agencies and institutions, corporations and individuals involved with water quality and use. Current analytical and sampling procedures and techniques will be maintained for water pollution control programs at all levels of government and for appropriate use by private enterprise.

(h) Developing a program which would ensure the generation of new information necessary for keeping standards current.

This would involve development in the design and evaluation of a monitoring system to assure adequate surveillance for compliance with water quality standards as well as to establish base-line conditions. It would also require input of research needs to the appropriate facility in those areas where new knowledge must be developed. Pertinent information will be maintained and disseminated on Federal, State, and local quality surveillance and monitoring programs on water and waste discharges. Information on current status of compliance with water quality standards and changes or improvements planned in the future will be acquired, organized, and maintained.

(i) Reporting to Congress, the Secretary of the Interior, and others interested in water quality.

Periodic reports to Congress, the Secretary, and others will be required in order to show the progress being made in cleaning up the Nation's waters as a result of joint Federal-State programs. These reports will be prepared by regional and headquarters personnel on the basis of major river basins.

Controlling pollution from Federal activities

Proposed activities: The water quality standards set the goals and objectives of nationwide water pollution control programs. Utilizing a small core staff, the major effort of the standards program will be to coordinate, direct and evaluate activities toward achieving these goals and objectives. Other operating programs within the Federal Water Pollution Control Administration will be called upon to perform the necessary surveillance, technical studies, and other activities leading to successful implementation of the water quality standards.

Accomplishments

By the beginning of FY 1969, the initial water quality standards-setting process should be essentially completed. This will result from over two years of sustained effort on the part of the States and FWPCA in which a new tool in the national water pollution control program was developed from a limited base. Defining goals, developing guidelines, and reviewing, negotiating and approving the State submissions--all were involved and difficult tasks.

As of February 14, 1968, the standards of 18 States had been approved by the Secretary of the Interior. Negotiations have gone well, in all but a few States, toward meeting the initial objective of having standards in approvable form by the beginning of 1968. In those cases where negotiations are not successful in arriving at approvable standards, the Federal Government will have to establish standards.

A major effort in FY 1967 and in the early part of FY 1968 was the development of reports by five National Technical Advisory Committees on the current status of knowledge concerning water quality requirements for public water supply, agriculture, recreation and aesthetics, industrial water supply, and fish and aquatic life and wildlife. This data has been and is being used in reviewing and approving standards.

2. Controlling pollution from Federal activities: Fiscal year 1968, \$750,000; fiscal year 1969, \$758,000; increase, \$8,000. The increase consists of:

<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
+\$8,000	To meet increased pay costs.

Objective

Under Executive Order 11288 and Section 11 of the Act (33 U.S.C 466h), Federal agencies are obligated to prevent and control pollution from their activities. The Federal activities coordination program implements the responsibilities assigned the Department of the Interior.

The Executive Order requires positive action from each Federal agency, and implementing Section 11 of the Act requires their cooperation with the Secretary of the Interior and with State and local agencies. The Department of the Interior is responsible for providing the necessary

technical advice and assistance to its sister agencies in developing adequate methods and facilities for preventing pollution from their activities.

The Department has heavy responsibilities in the following areas:

(1) New and existing facilities and buildings: Consult in the development of water pollution control measures for inclusion in plans for new or modified installations; review final plans for adequacy prior to construction; inspect existing treatment and pollution control works for adequacy.

(2) Federal water resources projects: Review plans and report on the potential impact on water quality, recommending needed changes in design, construction, or operation.

(3) Facilities or operations supported by Federal loans, grants, or contracts: Assist Federal agencies in formulating standards and prescribing regulations requiring borrowers, grantees, and contractors to adhere to water quality standards similar to those imposed on direct Federal operations.

(4) Pollution from vessel operations: Review operation of and recommend pollution control measures to assure adequate treatment of wastes from federally-operated watercraft.

(5) Intergovernmental coordination: Coordinate Federal agency water pollution control efforts with those of other Federal agencies, other FWPCA program elements, and with State, interstate, and local agencies.

(6) Advice and assistance: Advise Federal agencies on water pollution control standards and needs, effective plant operation and maintenance, laboratory analyses, and recordkeeping.

Program of Work

During 1968, as other departments, agencies, and establishments make increasing use of the assistance provided by the Department, large volumes of work are anticipated in the following major areas:

(A) Advise Federal agencies on water pollution control standards and water pollution control needs, effective plant operations and maintenance, laboratory analyses, and recordkeeping;

(B) Provide information on water pollution control needs in the initial stages of planning for new installations or projects, attend predesign conferences, review and advise on essential features of control and treatment measures proposed for new and existing facilities and projects, and inspect existing treatment facilities for adequacy;

(C) Review plans submitted by other agencies for proposed water resource development projects and report the potential impact of such projects on water quality, including recommended changes where deemed necessary;

(D) Provide technical assistance to other Federal agencies in determining the extent of water pollution control standards to be applicable to those activities in the United States which are supported by Federal loans, grants, or contracts; encourage and assist agencies in prescribing by regulations, loan, grant, and contract practices designed to reduce water pollution, and review the results accomplished thereunder and recommend appropriate preventive or corrective action;

(E) Organize, coordinate, and conduct periodic inspections of Federal installations;

(F) Advise agencies on the preparation and submission of annual progress reports, coordinate and review such reports, and prepare such other periodic reports as from time to time may be needed;

(G) Establish, as needed, additional guidelines to supplement those parts of the already approved general guidelines which may need clarification; and

(H) Establish a systematic and continuing evaluation of activities and resources to ensure maximum effectiveness in providing assistance to other agencies, enforcement of required standards with respect to Federal activities, and the reduction, to the lowest possible level and at the earliest possible date, of pollution caused by Federal operations and activities.

Accomplishments

During fiscal years 1966, 1967, and 1968, the program reviewed and evaluated plans from seventeen agencies for improvements needed to prevent or abate water pollution from new or existing buildings and facilities under their control. In accord with prior agreements, there was forwarded to the Bureau of the Budget, on August 15, 1967, an evaluation and recommendation for approval of those projects with highest priorities. Valuable assistance and recommendations were furnished during consultations in preliminary and early planning stages of many other projects.

When complete reports have been received for FY 1968, it is estimated that the Department will have reviewed the adequacy of existing waste treatment procedures and facilities at more than 1,100 Federal installations. A considerable proportion of these reviews involved on-site inspection of treatment methods. Related

conferences with responsible officials permitted the Department to establish lines of communication with other agencies that will facilitate the cooperation and coordination that is required under both the Executive Order and the Federal Water Pollution Control Act, as amended.

Although the review of water resource development projects, which is required under Executive Order 11288, is not a fully developed program, there was considerable coordination between the Department and agencies initiating these projects. Much of this cooperative effort took place during the initial development stages of project planning. Participation was reported in 110 projects.

As required by the Executive Order, the heads of Federal agencies conducted a review of loan, grant, or contract practices to determine the extent water pollution standards, similar to those required for direct Federal operations, could be applied to borrowers, grantees, and contractors. These reports are now being evaluated. While some technical assistance has been provided other agencies, this program is only partially developed and is expected to be a major activity during 1969.

A comprehensive report on water pollution caused by vessels in the United States, required under the Executive Order, was completed and submitted. In compliance with the requirement of the Clean Water Restoration Act of 1966, a report, "Wastes from Watercraft," was completed on June 30, 1967, and sent to Congress. This was prepared in consultation with the Department of Defense, Department of Transportation, Department of Commerce and Department of Health, Education, and Welfare.

Guidelines to assist Federal agencies to accomplish their responsibilities under the Executive Order were completed and distributed August 10, 1967. These guidelines establish uniform procedures that govern the joint efforts of this Department and other Federal agencies in meeting the requirements of the Order.

Reports and informational materials were supplied the Natural Resources and Power Subcommittee of the Committee on Government Operations.

Technical assistance

c. Technical assistance and services

	<u>FY 1968 Amount Available</u>	<u>FY 1969 Estimate</u>	<u>Increase (+) Decrease (-) Over 1968</u>
1. Technical assistance.....	\$3,045,000	\$3,561,000	+\$516,000
2. Pollution surveillance....	1,899,000	2,330,000	+431,000
3. Construction grants administration.....	2,183,000	2,667,000	+484,000
Total.....	7,127,000	8,558,000	+1,431,000

1. Technical assistance: Fiscal year 1968, \$3,045,000; fiscal year 1969, \$3,561,000; increase, \$516,000. The increase consists of:

	<u>Increase (+) or Decrease (-) Amount</u>	<u>Positions</u>	<u>Total Program</u>	<u>Explanation</u>
(1)	+\$23,000	...	...	To meet increased pay costs.
(2)	+255,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	+419,000	+34	3,561,000	To strengthen and expand total capabilities for providing or applying special technical advice or skills on complex and diversified pollution problems.
(4)	-131,000	-9	...	Phase out of Tampa Bay and Pearl River Projects
(5)	-50,000	...	...	Due to nonrecurring equipment costs.
	<u>+516,000</u>	<u>+25</u>		

Need for Increase

The FY 1969 program will provide for an increased capability for providing technical resources at the regional level to conduct necessary field investigations and to provide more effective assistance to States and other water pollution control agencies.

Technical assistance primarily involves identifying the nature of the problem, recommending application of known methods and techniques to solve

it or, if these are not available, recommending accelerated effort through research or other means for developing appropriate solutions.

Developing, maintaining, and effectively utilizing a force of technical experts is essential to water pollution control. These experts work closely with the other on-going FWPCA activities, such as enforcement and comprehensive planning, to provide specific technical support on complex problems. Of equal importance, they provide advice to the States, to other Federal agencies, to local governments, and others, drawing on FWPCA's nationwide technical resources.

Requirements for this type of assistance are accelerating. Accidental spills of pollutants, such as a recent fly ash release to the Clinch River in Virginia, are an ever present possibility. Means of solving or minimizing effects of accidental spills are under study. Similarly, there is a need to develop more effective means of carrying out the provisions of the Oil Pollution Act, 1924. Although oil spills are investigated in cooperation with the Coast Guard, the Corps of Engineers, and the involved States, and although technical advice and assistance are provided in combating the resulting pollution, the dimensions of the problem require the development of better and expanded surveillance, a more effective alerting system and a substantially improved reaction capability.

To date, much of the resources necessary to provide this technical expertise have been located at the Robert A. Taft Sanitary Engineering Center and to some degree at other FWPCA field laboratories. Requests for technical assistance, however, have far exceeded the resources available to provide such assistance. Furthermore, the demand for technical assistance is expected to increase as water pollution control accelerates, and as the States move toward implementation of water quality standards.

To meet these technical investigations and technical assistance needs, additional staffing is proposed for regional offices and laboratories. The increase of \$419,000 and 34 positions includes \$188,000 and 13 positions primarily for strengthening regional office capabilities and \$231,000 and 21 positions for the following laboratories:

	<u>Positions</u>	<u>Amount</u>
Ada, Oklahoma	7	\$77,000
Athens, Georgia	7	77,000
Corvallis, Oregon	<u>7</u>	<u>77,000</u>
	21	231,000

Objective

Section 5 provides for encouraging, cooperating with and rendering assistance to other appropriate public authorities, agencies and institutions, private agencies and institutions, and individuals. The activity, therefore, is the heart of the Federal-State-regional-local cooperative approach to water pollution control problems. Activities range from letter responses to requests for information on major project investigations requiring several years.

Expert consultations and field investigations, as necessary, are provided on specific local and regional water pollution problems by regional offices, field laboratories, the Sanitary Engineering Center, and the headquarters staffs.

The regional water pollution control laboratories will greatly increase the resources available for providing on-the-spot assistance and consultation. The technical assistance staff in these laboratories will be able to respond quickly and efficiently to the solution of existing or imminent water pollution problems on location in the areas serviced by the laboratories. Numerous requests for technical assistance are being received by the field laboratories.

In contrast to the research activities at these laboratories, where the basic objective is to develop new and broader understandings concerning a problem area, technical assistance investigations will emphasize the application of existing knowledge to solve specific problems. Technical assistance primarily involves identifying the nature of the problem, recommending application of known methods and techniques to solve it, or, if these are not available, recommending acceleration of efforts through research or other means for developing the appropriate methods that will solve it. Although the primary objective is not to develop new understandings of the basic relationships involved, this might result as a by-product.

Program of Work

Thermal pollution of the waters of the Nation is becoming more critical as population and industry grow. The establishment of nuclear power facilities and their need to dissipate waste heat in large quantities is a relatively new area of concern. The Columbia River heat study was undertaken in FY 1968 to develop a capability to use mathematical models to predict the impact of hydroelectric projects and thermal loads on the upper Columbia River. More consideration and study of this and similar problems is anticipated in FY 1969 and succeeding years to honor requests for technical assistance already received and anticipated.

Continued investigation of the effects of agricultural runoff and drainage on water quality is needed. Acquisition of this information must be complemented by the development of suitable methods for control of such wastes to minimize or eliminate their water pollution characteristics. Included in these studies must be examination of their role in the eutrophication of receiving waters. Requests for technical assistance already received discloses the concern of States in which agriculture is an important segment of the economy. More requests are anticipated for work during FY 1969 and beyond.

The regulation of stream flow for the purpose of water quality control is increasing in importance, particularly in relation to water quality standards. The role of stratification in water quality must be more clearly understood and is another area in which requests for technical assistance have been received with more anticipated.

The problem of water pollution by wastes from watercraft must receive increased attention. Waste treatment needs and the capabilities of existing waste treatment devices must be studied and more clearly understood. A program to evaluate biological waste treatment facilities on board vessels of the U.S. Army Corps of Engineers was initiated in FY 1968 at the request of the Corps and will extend into and possibly through FY 1969. Its objective is the determination of the degree of treatment provided by these devices as produced by different manufacturers and recommendations to the Corps of tests to be used to monitor treatment effectiveness.

Accomplishments

Klamath River Basin Study

This study was designed to determine the effects of pesticides and other contaminants from agricultural land drainage on the Tule Lake and Lower Klamath Lake National Wildlife Refuges, and to recommend procedures to control or eliminate damages due to present agricultural practices.

During FY 1968, biological pollution surveys were completed, as was application of biological data to a computer program for analysis and evaluation of water quality trends. This will lead to recommendations on agricultural land management and basin water management changes to improve water quality and reduce or avoid pollution damage. Studies needed for verification of a computer program were conducted in FY 1968 to make the mathematical simulation of the Lost River system completely verified and operational.

Tampa Bay Project

A field project to determine the cause of obnoxious odors along the western side of Hillsborough Bay--an arm of Tampa Bay--was begun in FY 1967. Activities during the first year consisted of establishing physical facilities for the study and initial field work in the Bay area. Field studies and report preparation are scheduled for completion by the end of FY 1968.

Recreation and water quality

The study of the Ross R. Barnett Reservoir in Jackson, Mississippi (Pearl River Project), afforded us the opportunity to compile water quality data prior to impoundment, thereby permitting direct comparison between preimpoundment and after impoundment water quality. Of particular importance was the quality change, if any, developing from extensive recreational use of the reservoir, including the effect of power boats on water quality, treatment and/or disposal of sanitary waste and refuse, the effect of concentrated swimming, and the effect of nutrient sources on the biological quality of the reservoir.

In FY 1968, a substudy has been made and a final report prepared. This report reveals a definite decrease in bacteriological quality, attributable to recreational activities in the marina areas of the reservoir.

The various types of technical assistance activities during calendar year 1967 included both long-term and short-term efforts. Examples of long-term activities:

(1) The San Joaquin Tile Drainage Constituent Project was initiated in 1967 to determine the chemical constituents in irrigation tile drainage and to develop an equation for estimating the nitrogen, phosphorous and pesticide concentration in such waters. This is part of a larger project involving the California Department of Water Resources, U. S. Bureau of Reclamation and Federal Water Pollution Control Administration to determine methods of treating tile drainage water and whether such waters may be discharged to San Francisco Bay or must be discharged to the ocean.

(2) The San Diego Project, initiated in 1966, is to determine the extent of pollution caused by the discharge of untreated wastes from vessels and to develop recommendations for any corrective action necessary to eliminate adverse effects of vessel wastes. The San Diego Bay is considered ideal for such a study because of completion in 1963 of treatment and sewer systems which effectively removed all domestic sewage from the Bay.

(3) At the request of the Hawaii State Department of Health, a study has been initiated to determine the magnitude and characteristics of wastes resulting from sugar mill operations, the characteristics of storm water runoff from sugar cane fields and cultivated lands, the effect of such wastes on ocean waters, and recommendation for remedial measures to control such pollution as is disclosed by the study.

Examples of short-term efforts:

(1) An evaluation was made of water quality of New York City beaches at the request of the City. Many beaches were found to have water unsuitable for swimming due to excessive coliform counts.

(2) A study to determine the causes of the massive fish kills which occurred in the Lower Mississippi River in 1961-1963. The pesticide endrin was identified as the cause, sources of this material were located, corrective action taken, and this potential danger to the raw water supply of New Orleans eliminated.

(3) Pesticide analyses were made for the States of Florida, Alabama and Georgia; Tampa and Punta Gorda, Florida; the Atomic Energy Commission's Savannah River Plant near Augusta, Georgia; and for the Governor's Commission on Lake Apopka, Florida.

(4) A review of the adequacy of treatment of proposed waste discharges from the proposed nuclear facility near Hartsville, South Carolina, for the Department of Health, Education, and Welfare.

Pollution surveillance

2. Pollution surveillance: Fiscal year 1968, \$1,899,000; fiscal year 1969, \$2,330,000; increase \$431,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$14,000	...	...	To meet increased pay costs.
(2)	+87,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	-130,000	...	...	Due to nonrecurring equipment costs.
(4)	<u>+460,000</u>	<u>+35</u>	\$2,330,000	To provide for strengthening capabilities for analytical quality control, stream quality monitoring systems, and maintaining municipal and initiating industrial waste treatment and control facility inventories.
	<u>+431,000</u>	<u>+35</u>		

Need for Increase

The pollution surveillance program of FWPCA involves the planning, developing and coordination required in the collection, evaluation, and dissemination of water pollution control and water quality data vital to the implementation and enforcement of water quality standards and to meet day-to-day requirements for Federal, State and local purposes. The increase of \$460,000 and 35 positions is necessary to provide for expansion or initiation of several activities as identified below. This program must be capable of supporting routine activities as well as a variety of technical assistance requests from State and interstate agencies on the one hand, or enforcement activities if a State fails to implement water quality standards.

Three broad categories of technical information are essential to the FWPCA program on a point-by-point basis. The first category includes specific information covering the status (in-place or needed) and effectiveness (efficiency) of waste treatment and control facilities (municipal, industrial and Federal), current and desired future water uses, and pollution caused problems. The second category, economic data associated with construction activities, is necessary to convert needed waste treatment and control facilities statistics into realistic cost estimates, as required by law on an annual basis. The third category, water quality data, is the ultimate quantitative check on pollution control progress on a day-to-day basis. Water quality data are essential to define compliance with water quality standards and to identify emerging pollution trends so that they may be traced to the source as quickly as possible for corrective action.

Consistent with the above categories, the proposed increase is for the following purposes:

(a) Maintain a municipal and initiate an industrial waste treatment and control facility inventory - Heretofore, municipal inventories were conducted periodically. However, because of the Congressional mandate for annual information on this and other areas, data will have to be processed and evaluated on a continuous day-to-day basis if it is to be meaningful. Up to now, no in-depth inventory has been made of industrial waste treatment facilities. In order to have an effective national water pollution control program, this data is essential and necessary and is proposed to be initiated in FY 1969. In this connection, it will also be required to increase and expand the Storage and Retrieval System Computer program to cope with new data requirements.

(b) Expand and improve analytical quality control program - This analytical quality control program is being developed because documentation of water quality standards violations must be of unquestioned validity. The specialized analytical support program recognizes that many complex analyses are required to enable States and FWPCA to detect and identify pollution situations or emerging problems. Regulatory agencies, either State or Federal, must be in a position to accurately and completely evaluate the effectiveness of industrial waste treatment and control facilities and also monitor the effects of waste discharges upon receiving waters. It is imperative that the program work closely with the States in working out plans for an effective analytical quality control program acceptable to both.

(c) Increase support of system quality monitoring systems - Additional support services are necessary to provide for monitoring water quality at selected locations to determine water quality trends and the status of compliance with water quality standards.

Staffing and funding for these purposes by location are as follows:

	<u>Positions</u>	<u>Amount</u>
Headquarters.....	6	\$115,000
Regional offices.....	14	172,000
Laboratories (including Cincinnati).	<u>15</u>	<u>173,000</u>
	35	460,000

Objective

The objective of water quality surveillance is to provide a system whereby technical pollution information and water quality data are collected, evaluated, and disseminated for use within FWPCA, particularly as these data relate to the enforcement and implementation of water quality standards, the effectiveness of waste treatment and control facilities, the establishment of water quality trends, and to the planning and management programs. Concurrently, full coordination with State regulatory bodies will assist all parties to fulfill the national goal for water pollution control.

The program provides systems to satisfy continuing technical data needs and to furnish information support to all programs in FWPCA. These support services include computerized storage, retrieval and evaluation of municipal and industrial waste facilities statistics, and water quality data.

Program of Work

To meet new circumstances and needs associated with water quality standards and specific problems at individual locations within a State, basin or on a national basis, the program will pursue the following work during FY 1969:

1. The establishment of a "benchmark" indicating the status of 15,000 municipal waste treatment and control facilities, including specific, scheduled construction needs as identified in (a) water quality standards for interstate waterways, (b) comprehensive immediate needs reports for intrastate streams, and (c) State program grant applications. This effort is being based on the updating of the 1962 inventory and was initiated during FY 1968 with processing and evaluation to be accomplished during FY 1969 and maintained on a current basis thereafter.

2. Based on procedures developed and initiated during FY 1968, the basic industrial waste water inventory will be gaining momentum during FY 1969. This first effort will seek to establish the status and effectiveness of waste handling facilities at about 6,000 manufacturing plants in the United States.

3. The operation of critical on-going monitoring stations in coordination with other Federal and State agencies will be expanded. Further, an assessment of ultimate water quality monitoring activities will be completed in coordination with other Federal and State agencies, so that orderly growth of necessary basin monitoring activities can be planned.

4. The analytical quality control program, including the selection, adoption, and use of certified agencies' methods and techniques will

be strengthened within FWPCA. Further, coordination with other agencies at the local, State and Federal level will be emphasized. Data from the laboratories of the States and other Federal agencies used in support of water quality standards must be comparable among themselves and with FWPCA information. The personnel at the Cincinnati laboratory will guide this program and operate the interlaboratory quality control program.

5. FWPCA regions will be equipped and staffed to assure responsiveness to changing conditions, including unanticipated waste loads, and to forge a coordinated program at the basin level. The Cincinnati activity will stress specialized analytical support capabilities, particularly with respect to industrial pollutants, including petroleum materials, and the many new synthetic organic compounds and radio-chemicals produced by the chemical industry and used widely throughout the United States.

6. The STORET System for the computerized storage, processing and evaluation of water pollution control information, water quality information and standards will be operated to provide responsive technical service within FWPCA and assistance to the States.

Accomplishments

Pollution Control information

The inventory of municipal waste treatment practices is in process to define facilities in-place and needed. The forms required to initiate the first national industrial waste water inventory await approval by the Bureau of the Budget. The annual publications "Fish Kills by Pollution," "Water and Sewer Bond Sales in the United States," and "Sewage and Waterworks Construction" were published for calendar year 1966. Also, "Municipal Water Facilities, Communities of 25,000 Population and Over" was updated to January 1966 and published. Various other pollution control information requirements are under active study.

Water quality information

Water data, available from the STORET System, was used in the review of quality goals in proposed State standards and were furnished to State and Federal agencies and to universities, other institutions, and industry in response to numerous specific requests.

Responsibility for the development and operation of basin water quality surveillance networks has been assigned to the regional level for coordination and implementation with the States. Water Pollution Surveillance System stations have been reviewed and a preliminary evaluation of the location of additional stations has been completed for each of the 20 major basins.

Analytical quality control

An interim selection of chemical and physical analytical methods, designed to ensure uniform procedures for collection and analysis of water quality data, was completed. These will be published initially in an informal listing titled, "Interim Selection of Analytical Quality Control Methods--Chemical and Physical." Selection of bacteriological and biological procedures was started. Identification of research needs in analytical methods is in progress. The interlaboratory quality control program was started on a modest scale and the intralaboratory program within regional laboratories will begin later this year.

STORET and related computer applications

Conversion of STORET water quality data capability from a DHEW computer in Cincinnati, Ohio, to the Department of the Interior IBM 360/65 computer has been accomplished. Computer programming has been initiated to store and retrieve water quality standards and implementation plans, including water uses, quality goals, waste treatment facilities data, and schedules. Hydrologic coding procedures are being automated to facilitate the storage and evaluation of these data. Consultation and guidance were provided to other Federal agencies, the States, and several Canadian provinces to assure effective interchange and use of data necessary to FWPCA and State pollution control efforts.

Construction grants administration

3. Construction grants administration: Fiscal year 1968, \$2,183,000; fiscal year 1969, \$2,667,000; increase, \$484,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$22,000	...	...	To meet increased pay costs.
(2)	+48,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	<u>+414,000</u>	<u>+62</u>	\$2,667,000	For support of administration of grants for waste treatment works construction.
	<u>+484,000</u>	<u>+62</u>		

Need for Increase

An increase of \$414,000 and 62 positions is requested to enable the program to more effectively administer the grants for waste treatment works construction. Authorized funds and staffing have not been adequate to carry out the expanding and increasing work load caused by the accelerated grant program resulting from recent Amendments to the Federal Water Pollution Control Act. Services are being provided within the confines of limited resources, but additional staff is needed to perform an adequate job of safeguarding the Federal interests.

The 1966 Amendments provide for reimbursement for the construction of any treatment works initiated after June 30, 1966. All communities undertaking construction of a waste treatment facility (whether initiated independently, under court order, enforcement proceeding or to comply with applicable water quality standards), are permitted to submit applications for Federal grants in anticipation of reimbursement of the applicable percentage from future appropriations. Each such reimbursement project must be approved by the Secretary and be administered in the same manner as projects for which Federal funds are available to make preconstruction grants. Thus, the number of projects to be administered is no longer directly related to the amount of the grant funds available in any given year.

Another of the provisions of the Clean Water Restoration Act of 1966 was the removal of grant dollar limitations for all projects on which construction is started after July 1, 1967. This is stimulating larger cities to begin construction of needed sewage treatment

facilities and is resulting in larger, more complex projects. These projects actually require more staff time for processing and administration because of their scope and complexity.

To enable this activity to fully meet all program requirements, additional staffing is essential.

Objective

The primary responsibilities of this activity are to administer and evaluate the effectiveness of the waste treatment works construction grants program under Section 8 of the Federal Water Pollution Control Act, as amended.

Program of Work and Accomplishment

Administration of the program includes reviewing and processing applications, making grant offers, reviewing plans and specifications, authorizing bid advertising, reviewing bids and approving award of contracts, periodically inspecting construction, processing and approving grant payments, conducting performance audits, and fulfilling collateral responsibilities relating to programs dealing with prevailing wage, anti-kickback, contract work hours standards and civil rights requirements. Effectiveness of the program is measured through the volume of contract awards, population served, water quality improvement, reduction in the backlog of unfilled needs for such facilities, and other factors.

In addition to the administration of grants under the Federal Water Pollution Control Act, as amended, this program has the added responsibility of reviewing and certifying all the sewer loans and grants awarded by the Economic Development Administration and the Department of Housing and Urban Development.

Work load statistics are as follows:

	<u>1967</u> <u>Actual</u>	<u>1968</u> <u>Estimate</u>	<u>1969</u> <u>Estimate</u>
Applications reviewed.....	830	1,270	1,850
Plans and specifications reviewed..	600	930	1,400
Construction starts.....	567	890	1,350
Projects under construction.....	984	1,080	1,270
Inspections.....	1,850	3,940	5,240
Plants completed.....	471	700	800
Performance audits.....	100	250	350
Sewer certifications.....	405	750	750

Training

(d) Training

	FY 1968 Amount <u>Available</u>	FY 1969 <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1968</u>
1. <u>Grants</u>			
(a) Training.....	\$3,367,000	\$3,535,000	+\$168,000
(b) Research fellowships..	633,000	600,000	-33,000
2. <u>Federal operations.</u>			
(a) Technical training....	518,000	911,000	+393,000
(b) Graduate and special training.....	251,000	254,000	+3,000
(c) Training grants administration.....	<u>119,000</u>	<u>119,000</u>	<u>...</u>
Total.....	4,888,000	5,419,000	+531,000

General

Over the long run the lack of adequately trained manpower could well prove to be the "Achilles heel" of the national water pollution control effort. Substantial expenditures for construction grants, research and development, river basin planning, technical assistance and similar endeavors are proposed. The effective utilization of these funds and the nature of the changes they create depend largely on adequate staffs of skilled people, from treatment plant operator to research scientist. The need to develop new treatment techniques and the accelerated water pollution control activity at Federal, State, and local levels, in industry and elsewhere, makes training a prime program requisite. Training at all levels must, therefore, become a major program thrust for FWPCA. A number of new approaches are being explored. Hopefully, the next five years will be a period of vastly accelerated effort and accomplishment.

If operator training needs are not met, the public may expect an unsatisfactory return on clean water investment because of inefficiently operated waste treatment plants. Present State training facilities and programs are generally inadequate in both quantity and quality to meet even the current needs. Thus, a major effort supporting States through grants under Section 7, experimenting with new training techniques, and exploring new channels for training will be fundamental in FWPCA's forthcoming program.

The report, "Manpower and Training Needs in Water Pollution Control" (Senate Document No. 49, 90th Congress, 1st Session), submitted to Congress by FWPCA in accordance with Section 16(b) of the Act, estimates the total manpower now involved in water pollution control (professionals, technicians and treatment plant operators for public and private agencies) at about 45,000 persons. The manpower needs in FY 1973 can be estimated at 135,000, an increase of 90,000 over FY 1967. The objectives of the FWPCA training programs are to encourage, cooperate with, and assist

appropriate agencies, institutions, and individuals in the conduct of specialized training relating to the cause, control, and prevention of water pollution. The programs are designed to provide adequately trained and motivated professional and subprofessional manpower for scientific, administrative, and technical positions in water pollution control. They must effect a threefold growth in personnel over the next five years.

FWPCA utilizes a wide variety of approaches to training, which are as follows: (1) a professional and technical training grant program, (2) a research fellowship grant program, (3) a technical and interagency training program, and (4) a graduate and specialized training program for FWPCA personnel.

1. Grants

(a) Training: Fiscal year 1968, \$3,367,000; fiscal year 1969, \$3,535,000; increase, \$168,000.

	FY 1968		FY 1969		Increase (+) Decrease (-) Over 1968	
	Amount Available		Estimate			
	No.	Amount	No.	Amount	No.	Amount
Continuations.....	60	\$2,478,000	72	\$2,610,000	+12	+\$132,000
New.....	19	889,000	25	925,000	+6	+36,000
Total.....	79	3,367,000	97	3,535,000	+18	+168,000

The increase consists of:

	Increase (+) or Decrease (-)	Total	Explanation
	Amount Positions	Program	
(1)	+\$132,000 ...	\$2,610,000	To fund continuation of training grants made in prior years.
(2)	<u>+36,000</u> ...	925,000	To help support the cost of 25 new training grants proposed for 1969 as compared with 19 in 1968.
	<u>+168,000</u>		

Need for Increase

An additional \$132,000 is required to support continuation of grants made in prior years. After the first year of an award, the institution training budget generally provides for additional student participation, curriculum expansion, and essential training aids. Therefore, in order to provide for the planned development of the 72 on-going training projects, the requested funds are necessary.

To meet the increasing demand for all the skills and specialties needed in the water pollution control field, it is necessary to continue stimulating training in the professional field and at the technical level through the development of new and improved institutional training programs. To assist in achieving some of these needs, the \$925,000 for new grants, including the \$36,000 increase, will be used to support the following:

(a) Nineteen new grants to academic institutions to establish or extend the scope of advanced training in water pollution control in their engineering, biological, physical and social science departments. This is expected to provide professional training to about 115 students. The recent report on Manpower Training Needs indicated that the water pollution control field will require about 36,000 professionals in FY 1973, or 24,000 more than now in this field. Therefore, these grants can only be considered as a catalyst in view of the overwhelming need.

(b) Six new grants to technical schools, junior colleges and similar institutions to expand the resources of subprofessional manpower such as engineering aides, scientific technicians and waste treatment operators required for water pollution control. Because of the magnitude of training needs in this area, in relation to the modest number proposed for this purpose, grants will be made in localities where both present and future training needs are most evident. These six grants are expected to support training of about 75 students.

Objective

Under Section 5(a)(2) of the Federal Water Pollution Control Act, as amended, authorization is given for the award of grants-in-aid to public and private agencies and institutions for training projects.

Professional training

The professional training program is designed to increase the resource of professional manpower required for scientific, technical and economic management positions in water pollution control. There is a critical need for individuals having such training in government, industry, and educational institutions. Professional training grants are awarded to educational institutions to establish or expand advanced training in water pollution control. Under this program institutions are encouraged to develop specialized and multidisciplinary training of scientists, engineers, and administrators in water quality management. These grants provide funds to support expansion and improvement of faculties, equipment, and trainee stipends for students participating in the training program.

Technical training

The technical training grant program is to increase the resource of technical manpower required for water pollution control activities. These grants will develop the capabilities of appropriate institutions to

provide full-time specialized technical training. Awards normally will be made to schools in localities where there is the most evident present and future need for trained technicians and plant operators.

The Nation's resource of trained manpower must be increased to support rapidly expanding developments in waste water treatment and water quality. These manpower requirements cover a broad range of professional and subprofessional levels. In addition to highly trained engineers and scientists, there is an immediate need for supporting staffs of skilled engineering aides, scientific technicians, and treatment plant operators.

Technical training grants will complement professional training grants by extending training support to the level of subprofessional specialists. Technical training grants will be awarded to technical schools, junior colleges, and similar institutions to establish or expand full time training of new technical personnel in water pollution control. These grants will provide funds for teaching staff, equipment, and stipends to trainees.

Program of Work

Professional training

In 1969 emphasis will be placed on the establishment of new professional training projects at schools in geographical areas which currently do not have training grant support. The objective will be to strengthen the academic capabilities of educational institutions for specialized training in the field of water pollution control, and to increase the number of participating institutions.

Technical training grants

Also, in 1969 the program of technical training grants initiated in 1968 will be further developed. The program will support 6 new projects and 7 projects expected to be started in 1968. These projects are designed to increase the Nation's resources of trained manpower needed to support rapidly expanding developments in waste water treatment and water quality management.

Accomplishments

Professional training

In 1967, training grants were awarded to 71 institutions in 37 States. These professional training grants provided for the support of 415 graduate students.

During 1967 a total of 217 trainees received advanced degrees at the MS and Ph.D. levels. Of these, 57 were immediately employed in

government, 68 in industry, and 39 in educational institutions. The remaining 53 continued their education toward a higher degree.

Examples of new professional training grant awards in 1967 include:

<u>Institution</u>	<u>Project Title</u>
University of Florida Environmental Engineering Research Center	Graduate Training in Bioenviron- mental Science and Engineering
Harvard University Department of Engineering and Applied Physics	Graduate Training in Advanced Sanitary Chemistry
Marquette University Department of Civil Engineering	Water Pollution Control Engineering

(b) Research fellowships: Fiscal year 1968, \$633,000; fiscal year 1969, \$600,000; decrease, \$33,000.

	<u>FY 1968</u>		<u>FY 1969</u>		<u>Increase (+) Decrease (-) Over 1968</u>	
	<u>No.</u>	<u>Amount</u>	<u>No.</u>	<u>Amount</u>	<u>No.</u>	<u>Amount</u>
Continuations ..	25	\$155,000	65	\$403,000	+40	+\$248,000
New	77	478,000	31	197,000	-46	-281,000
Total	102	633,000	96	600,000	-6	-33,000

The decrease consists of:

	<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	<u>Explanation</u>
(1)	+\$248,000	...	\$403,000	To fund continuation of research fellows awarded in prior years.
(2)	-281,000	...	197,000	Due to a reduction in the number of new fellows proposed for 1969 compared with 1968.
	<u>-33,000</u>			

Objective

Under Section 5(a)(4) of the Federal Water Pollution Control Act, as amended, authorization is given to the Secretary to establish and maintain research fellowships in the Department with such stipends and allowances, including traveling and subsistence expenses, as he may deem necessary to procure the assistance of the most promising research fellowships: Provided, that the Secretary shall report annually to the appropriations committees of Congress on his operations under this paragraph.

The mission of this program is to increase the number of scientists and engineers qualified to conduct independent research in water pollution control problems.

Research fellowships are awarded to individuals for specialized graduate and postgraduate research training in water pollution control. Research fellowships support the intensive training of students in many physical and biological disciplines and in fields of engineering. These awards provide funds for institutional costs of education, stipends for fellows, and allowances for supplies.

Program of Work

During FY 1968, the research fellowship program will reflect a major change. Support will be limited to candidates for the doctoral degree and FWPCA service fellowships will be established for outstanding professionals whose talents can significantly contribute to FWPCA's mission, and who will carry out their research at FWPCA laboratories for a stated period.

In 1969, the research fellowship program will place emphasis on program development at institutions not now receiving research fellowship awards. These institutions will be visited to stimulate participation in this Administration's research fellowship program by attracting the efforts of faculties not previously engaged in water pollution control related activity.

Accomplishments

In 1967 fellowships were awarded to 102 individuals for research training at 47 institutions in 31 states and in 4 foreign countries.

During 1967, graduate degrees were received by 55 individuals supported by this program. Thirty-two were immediately employed in educational institutions, 13 in industry, and 10 in government agencies.

2. Federal operations

(a) Technical training: Fiscal year 1968, \$518,000; fiscal year 1969, \$911,000; increase, \$393,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>	<u>Total</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>
(1)	+\$8,000	...	...
(2)	+141,000	...	...
(3)	<u>+244,000</u>	<u>+17</u>	\$911,000
	<u>+393,000</u>	<u>+17</u>	

Explanation

To meet increased pay costs.

To support full year employment of new personnel authorized for FY 1968.

To support additional staffing in regional offices and laboratories.

Need for Increase

An additional \$244,000 and 17 positions are proposed for staffing the laboratories, regional offices and the National Training Center in Cincinnati, Ohio. Although specific, locally-oriented courses were needed in many areas, only a selected group of courses was scheduled and conducted during FY 1968 due to the limited training staff available in FY 1968. The size of the present staff is inadequate to conduct even this limited current schedule without external professional assistance from other operating programs at the regional laboratories and from the National Training Center in Cincinnati. The current level of this support from other programs at the regional facilities will not be available during FY 1969 and thereafter. Consequently, it will be necessary for the training program to become more nearly self-sufficient in personnel resources. Due to the key role of the National Training Center in Cincinnati, it is essential that this organization should continue to provide technical and administrative support in order to enable the training activities at laboratories to function at their planned capacity.

The proposed increase will provide three new positions in Cincinnati, Ohio; five in Metuchen, New Jersey; two each in Ada, Oklahoma; Athens, Georgia; and Corvallis, Oregon; and one each for Northeast, Great Lakes and Southwest regional offices. The last three positions, first in the regions outside the laboratories, will be primarily concerned with the assessment, coordination and development of Federal-State arrangements for operator training.

The report on "Manpower and Training Needs in Water Pollution Control," highlights a continuing need for technical training related to water pollution control at all professional and technical levels.

Specific attention has been drawn to the need for major increases in training of waste water plant operators. During FY 1969 and thereafter, the development and conduct of new and specialized courses are needed for training personnel who will conduct courses for waste water treatment plant operators and personnel on a nationwide basis. In addition to instruction of operator training personnel, increased consultation and assistance will need to be given to the States in their own programs of training waste treatment plant operators. Only by continual upgrading of the efficiency of treatment plant operators, technicians and technical personnel can the Government provide the full measure of pollution control promised by the millions of dollars invested in the physical construction of waste treatment plants.

Objective

Provide for training in technical matters relating to causes, prevention and control of water pollution to personnel of public agencies and other persons with suitable qualifications in accordance with Section 5 (a) of the Act.

In carrying out this objective, the program provides students and professionals across the Nation with the latest in scientific and technical information for the study and control of water pollution. It provides basic instruction and advanced professional training to Federal, State and local water pollution specialists; industrial representatives; waste water treatment plant operators; and university personnel. It not only raises the professional standards of water specialists but also puts the latest research knowledge into their hands almost as soon as it is available, thus reducing the customary time-lag between research and application.

Training is conducted in various locations to serve specific needs. The main training center is located in Cincinnati, Ohio. Here, training of a national scope is offered to both Federal and non-Federal agencies and students, including foreign students, concerned with the problem and treatment of water pollution. Advice and assistance are provided States, foreign representatives and others in developing their own training programs. The Center also provides continuing in-service training for Administration employees and develops new courses in response to changing technology and personnel needs.

To meet local requirements, training is conducted through regional laboratories. These facilities extend to the area of service training and are tailored to the special water problems in each area. In addition to in-service training and assistance to local, Federal and non-Federal specialists, the laboratory training staffs also provide consultation and assistance to the States in the training of waste treatment plant operators. This is a specialized and highly important function, since the optimum utilization of federally financed sewage treatment plants requires a specially trained crew.

Program of Work

In FY 1969, the training staff in all the laboratories currently in operation is proposed to be increased. As training needs become identified and properly assessed, a full array of scheduled courses will be developed and taught at each water pollution control laboratory. Additional technical and nonprofessional personnel will be needed. This will require an increase in the amount of technical and administrative backup and support services coming from the Cincinnati staff.

During FY 1969, an increased schedule of courses will be conducted at the Ada, Oklahoma; Athens, Georgia; Corvallis, Oregon; College, Alaska Laboratories, and our field facility at Metuchen, New Jersey. The special needs of the Alaska area should be known by this time and one or more prototype, highly specialized courses will be offered during the year.

Based on projections in "Manpower and Training Needs in Water Pollution Control," an estimated 24,000 new treatment plant operators and 32,000 new technicians will be needed by FY 1974.

At the same time, training programs for the 24,000 operators now on the job must also be expanded and improved. In response to this growing requirement, the FWPCA regional laboratory facilities are developing a stepped-up program to support State efforts.

Training of sewage treatment plant operators has traditionally been viewed as a State responsibility. Now, however, FWPCA is offering practical courses in waste water treatment plant operations, methods, and procedures both to operators and to State personnel engaged in operator training. This enables FWPCA to develop and test training techniques and materials which will ultimately be passed on to the States for large volume, local operator training.

The number and variety of all training courses offered will be substantially increased. Approaches to course content and to presentation will be varied experimentally. As new laboratory facilities are built, training will be made available to more people in new locations.

To maintain training programs proportionate to the personnel needs, FWPCA facilities should be training not less than 5,000 persons per year by FY 1973. Such a rate contemplates scheduling 250 to 300 technical short-course offerings per year for FWPCA and State agency professionals and subprofessionals and for trainers of waste treatment plant operators.

Capitalizing on the far-flung Federal activities already involved in State training programs, FWPCA is launching an interagency training scheme. In this direct outgrowth of the Manpower and Training study, FWPCA is enlisting the cooperation of the Office of Education in the U. S. Department of Health, Education, and Welfare, and the U. S. Department of Labor. The goal is a

national program for bulk training of new and incumbent personnel, particularly at the waste treatment plant level.

Some aspects of FWPCA's training activities are already providing inputs of new and tested course curricula, teaching techniques and illustrative materials. DHEW and Labor have on-going activities in their Vocational Education and Manpower and Development programs, institutional connections within the States, well established field organizations, and substantial funding for mass training to meet labor shortages. Little, if any, of their present effort is directed to water pollution control. The skilled manpower need is recognized. FWPCA's several catalytic efforts are designed to stimulate the States to emulate these activities.

FWPCA's joining with two Federal agencies, long experienced in manpower training, should give tremendous impetus to the training of skilled manpower, a critical element in the waste treatment effort.

This Federal interagency leadership will encourage the States and local entities to expedite both upgrading of present personnel and training of new recruits at the local level. Nationwide, this activity can direct attention and effort to a crucial aspect of successful waste treatment--the mandatory certification of sewage treatment plant operators. States requiring such certification have been most successful in improving employment conditions for sewage plant operators. Providing technician status and career opportunity is an effective method of moving out of the situation too often existing, where untrained, ill-paid personnel operate plants at low efficiency.

Accomplishments

In FY 1968, the training program continued its activities by providing new and more specialized training courses and services at Cincinnati and by developing a new training activity at Metuchen, New Jersey. The Cincinnati facility offered a curriculum of 19 courses comprising 29 weeks in all technical areas of water pollution control; namely, chemistry, biology, microbiology, and engineering. During the year, training courses with 31 weeks of training were offered in regional training facilities.

During FY 1968, persons receiving training will total 909 and enrollment in four seminars will increase this to 1,683. Approximately 40 persons, representing a number of foreign countries, were involved in the training effort. Specialized training is provided, as requested, to meet their requirements. Included in the number of persons to receive training are 256 members of our own professional staff in the Federal Water Pollution Control Administration.

In FY 1969, training will continue at the regional training facilities. New courses will continue to be developed in response to the changing and expanding knowledge provided through research. With the passage of the Water Quality Act of 1965 and the requirement

for establishment of stream standards, the training program also must provide specialized courses in the area of automatic field instrumentation for water quality monitoring.

An expanded program will provide training to approximately 700 persons at the National Training Center. Also, at our current rate, we expect to provide training to about 40 to 50 foreign personnel which may represent as many as ten foreign countries. At the field laboratory facilities, training will be provided to over 760 persons.

The following reflects the number of persons estimated to receive training by location:

	<u>1968</u>	<u>1969</u>
Cincinnati, Ohio	415	700
Ada, Oklahoma	178	220
Athens, Georgia	120	170
Metuchen, New Jersey	72	75
Corvallis, Oregon	100	200
College, Alaska	<u>24</u>	<u>100</u>
	909	1,465

In addition to the foregoing, two one-day seminars were conducted at both Ada and Metuchen, involving 290 and 484 participants, respectively.

(b) Graduate and special training: Fiscal year 1968, \$251,000; fiscal year 1969, \$254,000; increase, \$3,000. The increase consists of:

<u>Increase (+) or Decrease (-)</u>	<u>Total</u>	
<u>Amount</u>	<u>Positions</u>	<u>Program</u>
+\$3,000
		To meet pay increased costs.

Objective

To provide developmental opportunity in highly specialized areas for selected technical and scientific personnel with high potential to assist in meeting critical program staffing requirements that cannot be met through normal recruitment resources.

Selected employees are assigned to universities each year for specialized resident study at the graduate level. These assignments extend the professional competence of key personnel into other critical requirement categories. Prior to completion of the graduate training, these employees are considered for duty assignments wherein the training they have received may be fully utilized. Through this effort we will begin to develop our own competencies in the critical manpower shortage categories.

Program of Work

Graduate level training in 1969 will be considered and approved on the basis of meeting critical manpower needs of the Administration. Nominations for the long-term graduate training program will be solicited for employees ready for substantial career development and advancement whose planned graduate program is related to the needs of the Administration in staffing to meet the changes in program concept or emphasis, organization or functions. It will be designed to provide employees with demonstrated potential, an opportunity to extend their professional background as engineers and scientists into other areas of critical need such as operations research and systems analysis, urban, regional, resources planning, public administration, economics, and political science.

It is evident that there will be a continuing need to provide such training opportunities for carefully selected personnel to continue to develop and upgrade the competence of FWPCA's staff. The Administration is, therefore, faced with the necessity to develop its own competence in these areas by providing maximum training opportunities for selected staff.

Accomplishments

In 1966, a total of 24 candidates submitted requests for long-term graduate training to be conducted in 1967 and 15 applied in 1968. A training committee, composed of key program officials of the Administration, reviewed these requests against selected categories of training needs and recommended approval of 17 candidates for 1967 and 12 in 1968.

Immediately prior to completion of their training, the training committee reviewed the graduate programs undertaken by each employee and recommended placements based on their extended academic experience. Each employee was personally interviewed by key officials in whose program area the employee's training and background were most suitable. On the basis of this personal interview and review and evaluation of background and completed training, the employees were selected for assignments in the appropriate program area.

Some examples of the program of study which were approved in 1967 and 1968 that will greatly assist the Administration in meeting critical needs are as follows:

(a) Study of the application of mathematical techniques to water quality models, hydrology, mathematical analysis of data, and advanced waste treatment methods.

(b) Advanced sanitary engineering program which includes water resources engineering, applied chemistry of water and waste water, water purification and treatment, industrial waste treatment, industrial bacteriology and microbiology.

(c) Studies in systems analysis, statistics, water resource economics and regional science combined with seminars and opportunities for independent research. This study will greatly assist in the design and analysis of complex, large-scale environmental systems.

(d) Studies in advanced chemistry, with emphasis on organic chemistry, will aid in the study of organic contaminants which is becoming an increasingly important area in water pollution study.

(e) Advanced training in computer technology and systems analysis for engineering and other professional or scientific personnel. Recruitment efforts have failed to produce qualified candidates to fill positions in the field of systems design, development and analysis. There is no indication that the condition of the labor market will improve during the next several years. In view of the Administration's responsibility for the far reaching program of designing, developing, improving, testing and installing systems and techniques for the storage, retrieval, and processing of water quality, inventory, and other related data collected on streams, open bodies of water, etc., it is essential that steps be taken to produce the skills and knowledge needed.

(f) Advanced training in economics for sanitary engineers. The combination of economic and engineering skills is difficult to obtain. In spite of extensive efforts to recruit candidates with these skills in the current labor market, applicants have not been available to meet the critical needs of the organization.

(g) Advanced training of scientific or professional personnel in planning, economics, and public administration.

To effectively carry out the many complex and changing programs of the Administration, it is essential that skilled personnel who are capable of developing institutional arrangements for implementing pollution control programs be available. This requires a sufficiently broad background in planning, economics and public administration. By providing scientific or professional personnel with advance training in the management field, the combination will contribute significantly to accomplishment of future program objectives.

(c) Training grants administration: Fiscal year 1968, \$119,000; fiscal year 1969, \$119,000; no change.

Objective and Program of Work

Generally, the objective is to effectively and efficiently administer the training grant programs, i.e., fellowships and training grants. In this connection it performs the following:

- (a) Assists applicants in the development of grant proposals;
- (b) Receives and reviews completed grant applications;
- (c) Recommends approved applications for award;
- (d) Authorizes payment of funds;
- (e) Develops and applies policies and regulations;
- (f) Evaluates progress and terminal reports;
- (g) Provides statistical and scientific reports on grant programs;
- (h) Develops information on the status of training for program planning; and
- (i) Maintains liaison with the scientific community to coordinate training grant programs.

In addition, program administration will continue to expand in the following areas: stimulate project development in the areas of primary importance to the Administration and accelerate visiting of active projects to develop information on training accomplishments not available through progress or terminal reports.

Accomplishments

In FY 1968 the program will have provided grants administration services for 181 grants involving \$4 million as compared to 173 grants and \$3.5 million in FY 1967.

In FY 1969 a total of 193 training and research fellowship grants involving \$4.1 million will be serviced.

Enforcement

Enforcement

	FY 1967 Amount <u>Available</u>	FY 1968 Amount <u>Available</u>	FY 1969 <u>Estimate</u>	Increase (+) or Decrease (-) 1969 compared with 1968		
				<u>Total</u>	<u>Pay Cost^{a/}</u>	<u>Program</u>
Enforcement.....	\$2,999,575	\$3,393,000	\$3,498,000	+\$105,000	+\$23,000	+\$82,000
Unobligated balance lapsing.....	688,425	...	...	...	...	...
Total.....	<u>3,688,000</u>	<u>3,393,000</u>	<u>3,498,000</u>	<u>+105,000</u>	<u>+23,000</u>	<u>+82,000</u>

a/ To provide for increased pay cost for fiscal year 1968 positions.

Enforcement: Fiscal year 1968, \$3,393,000; fiscal year 1969, \$3,498,000; increase, \$105,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>	<u>Total</u>	<u>Explanation</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	
(1)	+\$23,000	...	...	To meet increased pay costs.
(2)	<u>+82,000</u>	...	...	To support full year employment of new personnel authorized in FY 1968.
	<u><u>+105,000</u></u>			

Objective

The Federal enforcement authority, in accordance with Section 10 of the Federal Water Pollution Control Act (33 U.S.C. 466 et seq.), as amended, provides that measures be taken to restore the maximum number of water uses through the abatement and control of pollution of interstate or navigable waters which endangers the health or welfare of any persons; to support and cooperate with State and interstate agencies in the exercise of their enforcement authority to abate and control water pollution; to prevent and control pollution from Federal installations; to enforce the abatement of violations of water quality standards established for interstate waters; and encourage cooperative activities by the States relating to prevention and control of water pollution, including enactment of improved State laws and compacts between States.

The Water Quality Act of 1965 extended enforcement jurisdiction to the abatement of discharges of wastes in violation of established water quality standards for interstate waters. Enforcement authority and procedures to abate pollution of interstate or navigable waters which endangers the health or welfare of any persons are invoked at State request and, under certain circumstances, on Federal responsibility and initiative without State request. Enforcement authority is accomplished in a three-stage procedure: conference, public hearing, and court action. Each successive stage is resorted to only if the previous one has not been effective. Encouragement is provided the States for obtaining compliance under their own authorities during the interim periods between successive stages.

The initial enforcement procedure--the informal conference between State and Federal authorities to explore the nature of the pollution situation, the delays encountered, and to agree, if possible, on required remedial measures and the schedule for their installation--has been notably

satisfactory. It should be noted that, out of a total of 43 initiated actions held to date (see pages and), it has been necessary to advance to the public hearing stage in only four instances, and to only a single ultimate court action involving the City of St. Joseph, Missouri. The 43 actions to date have been taken in many separate geographic areas. Forty-one States and the District of Columbia are parties to these actions. The actions involve approximately 1,274 municipalities, 1,297 industries, and will affect some 10,942 miles of rivers, as well as large areas of lakes and bays. Remedial facilities built, under construction, or scheduled, as a result of agreements reached to date (Lake Michigan not included) under these actions, will total about \$10.5 billion.

The Water Quality Act of 1965 provided that the States establish water quality standards for their interstate waters or they would be otherwise federally promulgated. Violations are abatable through direct court action, except that a stipulated 180 days are afforded for obtaining voluntary compliance before actual initiation of the court action. Again, every encouragement to the State authorities to obtain compliance under their own measures is provided.

In addition to the enforcement authority under the Federal Water Pollution Control Act, as amended, Section 211 of the Clean Water Restoration Act of 1966 transferred the administration of the Oil Pollution Control Act, 1924, from the Secretary of the Army to the Secretary of the Interior. This extended jurisdiction to include not only portions of the sea within the territorial jurisdiction of the United States and all inland waters navigable in fact in which the tide ebbs and flows, but to encompass all inland navigable waters. An additional requirement provides that persons discharging or permitting discharge of oil must remove it or pay costs for its removal. Violators are subject to fine or imprisonment or both.

In administering this Act, the Secretary may, with the consent of the Commandant of the Coast Guard and the Secretary of the Army, make use of their personnel, equipment, organization, and agencies and of Army Corps of Engineers, Customs, and Coast Guard personnel in its enforcement, as well as persons under his jurisdiction.

Program of Work

The national commitment to abate, prevent, and control water pollution and restore the cleanliness of our waters is expressed in its final sense through the enforcement activity. In line with administration and Congressional mandates, the enforcement authorities provided in the Federal Water Pollution Control Act, as amended, and the Oil Pollution Control Act, 1924, will be applied, when applicable, to:

- (1) abate long-standing pollution situations of a serious nature which endangers the health or welfare of any persons;

- (2) ensure compliance with established water quality standards for interstate waters; and
- (3) control and prevent the dumping or spillage of oil from boats or vessels.

It is anticipated that enforcement action will be initiated to abate pollution of interstate or navigable waters invoked at State requests or on the basis of reports, studies, or surveys indicating the need for Federal action. Voluntary compliance to institute remedial measures will be sought, where possible, where violations of water quality standards and the Oil Pollution Control Act, 1924, occur--and through court action wherever required. This will be initial experience in these areas of enforcement.

Accomplishments

In FY 1967, four new enforcement actions were instituted to abate pollution of interstate or navigable waters and additional conference sessions and meetings of conferees were conducted in continuance of previously initiated enforcement actions.

Initial Conferences

Chattahoochee River (Alabama-Georgia)

The conference was held on July 14-15, 1966, in Atlanta, Georgia, involving 23 municipalities, nine industries and two Federal installations. The conferees agreed on a schedule of remedial action which calls for necessary remedial facilities to be in operation by July, 1971.

Lake Tahoe (California-Nevada)

The conference was held on July 18-20, 1966, at Stateline, Nevada. The conferees agreed that at the present time Lake Tahoe is not polluted or contaminated, but there are recognizable long and short-term threats of pollution to both Lake Tahoe and the lands and waters of the entire Lake Tahoe Basin. The conferees agreed on a program to preserve and protect the Lake Tahoe Basin.

Moriches Bay and Eastern Section of Great South Bay (Long Island, New York)

The conference was held September 20-21, 1966, at Patchogue, New York. It was called under the shellfish provisions of the Federal Water Pollution Control Act, as amended. A coordinating committee was established at the recommendation of the conferees to develop a program of remedial action.

In addition, the conferees endorsed the New York State orders to abate pollution in the conference area, and these orders have been made Federal as well as State requirements. The conference was reconvened on June 21, 1967, to evaluate the committee's recommendation. Time schedules for pollution abatement were established.

Penobscot River and Upper Penobscot Bay (Maine)

The conference was held on April 20, 1967, at Belfast, Maine. This conference was called under the shellfish provisions of the Federal Water Pollution Control Act, as amended. The conferees agreed on water quality requirements for the conference area.

Additional Sessions on Actions Taken Prior to FY 1967

South Platte River (Colorado)

The first session of the conference was held October 29, 1963, at Denver, Colorado. A study project was established to investigate sources of pollution. A second session of the conference was held April 27-28, 1966, where the report of the South Platte River Enforcement Project was presented to the conferees. To allow the newly established Colorado Water Pollution Control Commission sufficient time to evaluate the Federal report and develop a program for implementation of remedial measures and a time schedule, the conferees agreed that the conference would be reconvened at a later date. The second session was reconvened on November 10, 1966. The conferees agreed to a remedial program and recommended a time schedule which calls for adequate remedial waste control facilities to be in operation by June 30, 1971.

Upper Mississippi River (Minnesota-Wisconsin)

The first session of the conference was held February 7-8, 1964, at St. Paul, Minnesota. More than 30 municipalities, 36 industries and seven Federal installations are involved. Subsequent to the conference, an intensive survey of the Upper Mississippi River was conducted. The conference was reconvened on February 28, 1967, to consider the report of the study findings. The conferees met again on March 20, 1967, to establish recommendations and a time schedule for remedial action.

Lake Erie (Michigan-Indiana-Ohio-Pennsylvania-New York)

The conference was held August 3-5, 1965, at Cleveland, Ohio, and August 10-11, 1965, at Buffalo, New York. Recommendations for remedial action were unanimously adopted by the conferees. A technical committee was established to evaluate water quality problems in Lake Erie relating to nutrients. A third meeting of the conferees was held June 22, 1966. At this time, the State of Michigan presented a detailed remedial schedule,

and this schedule was approved as satisfactory. The third conference session was held on March 22, 1967, at Buffalo, New York, to consider time schedules for completion of municipal and industrial waste treatment facilities. All States submitted detailed time schedules and they were unanimously adopted by the conferees.

Raritan Bay (New Jersey-New York)

The first session of the conference was held on August 22, 1961, at New York City and the second session was held May 9, 1963, at New York City. Fifty-eight communities, 46 industries, six institutions, and three military installations are involved. A study of pollution sources and their effects was initiated after the first session at the recommendation of the conferees. At the second session, the conferees reviewed preliminary study findings and recommended that the study be continued and completed. Upon completion of this study, the third conference session was held on June 14-15, 1967, and a program of remedial action and time schedules were adopted.

In addition, the conferees to the conferences on the Missouri River, Omaha area, and the Calumet Rivers-Lake Michigan, held meetings in FY 1967. The meeting of the conferees for the Missouri River, Omaha area, was held March 8, 1967, and the progress evaluation meeting for the Calumet Rivers-Lake Michigan was held March 15, 1967.

New FY 1968 Conferences

Eastern New Jersey Shore--from Shark River to Cape May (New Jersey)

The conference was held November 1, 1967. The conferees agreed that the estuaries and tributaries of eastern New Jersey, from Shark River on the north to Cape May on the south, receive the discharge of wastes from municipal waste treatment plants, individual septic tanks and cesspools, boats and land drainage. As a result, these waters are polluted by bacteria, suspended solids and nutrients. Because of the existing or potential pollution of these waters, the State of New Jersey, under the cooperative arrangements governing the National Shellfish Sanitation Program, has closed more than 36,000 acres of water to the direct harvesting of shellfish, leaving 127,000 acres available for shellfish harvesting. These closures have caused substantial economic injury resulting from the inability to market shellfish or shellfish products in interstate commerce. The estimated economic loss to the region is at least \$1.5 million annually. The conferees agreed upon a program of remedial action.

Lake Michigan and its Tributary Basin (Wisconsin-Illinois-Indiana-Michigan)

The conference was called by the Secretary of the Interior at the request of the Honorable Otto Kerner, Governor of Illinois, and on the

basis of reports, surveys, or studies. The conference was opened on January 31, 1968. The problems affecting Lake Michigan include eutrophication, bacterial pollution, chemical pollution, oxygen depletion, electric power plants, wastes from watercraft, oil pollution, disposal of dredged material, alewives, and pesticides.

Since June 30, 1967, four previously initiated conferences were reconvened. These conferences concerned (1) the Colorado River (sixth session held July 26, 1967); (2) Puget Sound (second session held September 6-7, 1967); (3) the Hudson River (second session held September 20-21, 1967); and (4) the Connecticut River (second session held September 27, 1967). Progress evaluation meetings were held concerning (1) the Calumet Rivers-Lake Michigan (September 11, 1967); and (2) the Red River of the North (December 6, 1967).

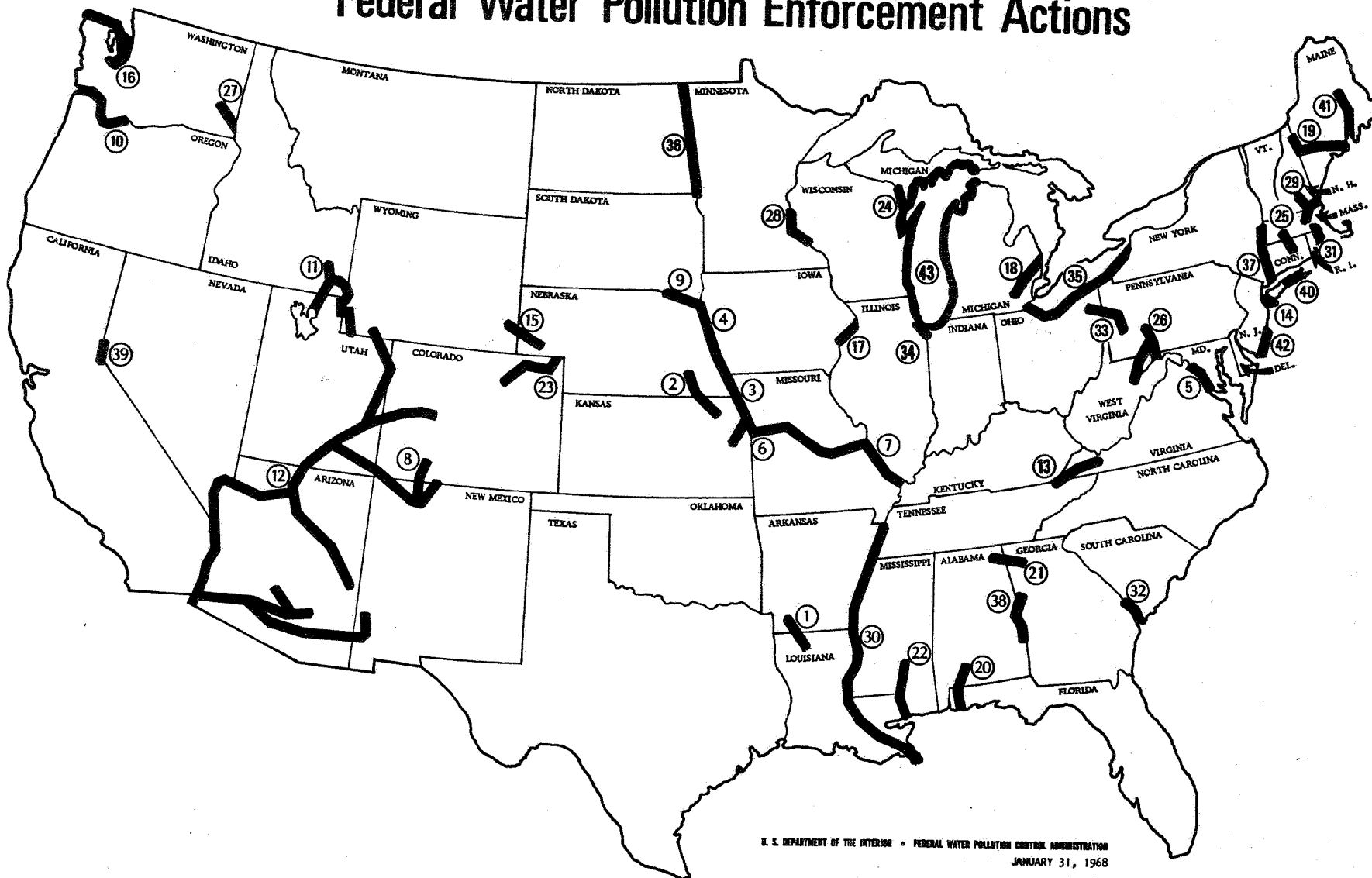
In some of the areas where enforcement actions are instituted, a wide range of complex technical issues must be resolved before a schedule of abatement and control measures can be developed. Extensive on-site studies are conducted to develop the information necessary to establish a sound basis for water quality control programs in such cases, or an active post surveillance activity to assure that the measures for abating pollution are installed and are eliminating the pollution problem. The number of these situations cannot be predicted.

Through 1967, major on-site investigations or surveillance activities, as a result of enforcement actions, are under way in 11 areas. (See table on page 131.)

Enforcement
(dollars in thousands)
Investigatory Projects Resulting from Enforcement Actions

	<u>1968</u> <u>Estimate</u>	<u>1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u>
Colorado River.....	\$536	\$542	+\$6
Washington State.....	10	...	-10
South Platte.....	128	...	-128
Twin Cities/Upper Mississippi.	9	...	-9
Merrimack-Nashua.....	203	208	+5
Monongahela.....	143	148	+5
Lake Erie.....	121	126	+5
Raritan Bay.....	108	113	+5
Detroit River.....	88	93	+5
Mahoning River.....	32	...	-32
Calumet.....	111	116	+5
New Studies.....	253	440	+187
Total.....	1,742	1,786	+44

Federal Water Pollution Enforcement Actions



FEDERAL WATER POLLUTION ENFORCEMENT ACTIONS

1. Corney Creek Drainage System
(Arkansas-Louisiana)
2. Big Blue River
(Nebraska-Kansas)
3. Missouri River-St. Joseph, Missouri Area
(Missouri-Kansas)
4. Missouri River-Omaha, Nebraska Area
(Nebraska-Kansas-Missouri-Iowa)
5. Potomac River-Washington Metropolitan Area
(District of Columbia-Maryland-Virginia)
6. Missouri River-Kansas City Metropolitan Area
(Kansas-Missouri)
7. Mississippi River-St. Louis Metropolitan Area
(Missouri-Illinois)
8. Animas River
(Colorado-New Mexico)
9. Missouri River-Sioux City Area
(South Dakota-Iowa-Nebraska)
10. Lower Columbia River
(Washington-Oregon)
11. Bear River
(Idaho-Wyoming-Utah)
12. Colorado River and all tributaries
(Colorado-Utah-Arizona-Nevada-California-
New Mexico-Wyoming)
13. North Fork of the Holston River
(Tennessee-Virginia)
14. Raritan Bay
(New Jersey-New York)
15. North Platte River
(Nebraska-Wyoming)
16. Puget Sound
(Washington)
17. Mississippi River-Clinton, Iowa Area
(Illinois-Iowa)
18. Detroit River
(Michigan)

Federal Water Pollution Enforcement Actions (continued)

19. Androscoggin River
(New Hampshire-Maine)
20. Escambia River
(Alabama-Florida)
21. Coosa River
(Georgia-Alabama)
22. Pearl River
(Mississippi-Louisiana)
23. South Platte River
(Colorado)
24. Menominee River
(Michigan-Wisconsin)
25. Lower Connecticut River
(Massachusetts-Connecticut)
26. Monongahela River
(West Virginia-Pennsylvania-Maryland)
27. Snake River-Lewiston, Idaho-Clarkston,
Washington Area
(Idaho-Washington)
28. Upper Mississippi River
(Minnesota-Wisconsin)
29. Merrimack and Nashua Rivers
(New Hampshire-Massachusetts)
30. Lower Mississippi River
(Arkansas-Tennessee-Mississippi-Louisiana)
31. Blackstone and Ten Mile Rivers
(Massachusetts-Rhode Island)
32. Lower Savannah River
(South Carolina-Georgia)
33. Mahoning River
(Ohio-Pennsylvania)
34. Grand Calumet River, Little Calumet River, Calumet River,
Wolf Lake, Lake Michigan, and their tributaries
(Illinois-Indiana)
35. Lake Erie
(Michigan-Indiana-Ohio-Pennsylvania-New York)

Federal Water Pollution Enforcement Actions (continued)

36. Red River of the North
(Minnesota-North Dakota)
37. Hudson River
(New York-New Jersey)
38. Chattahoochee River
(Georgia-Alabama)
39. Lake Tahoe
(California-Nevada)
40. Moriches Bay and Eastern Section of Great South Bay
and their tributaries
(Long Island, New York)
41. Penobscot River and Upper Penobscot Bay
and their tributaries
(Maine)
42. Eastern New Jersey Shore--from Shark River to
Cape May
(New Jersey)
43. Lake Michigan and its tributary basin
(Wisconsin-Illinois-Indiana-Michigan)

Administration

Administration

	FY 1967 Amount <u>Available</u>	FY 1968 Amount <u>Available</u>	FY 1969 <u>Estimate</u>	Increase (+) or Decrease (-) 1969 compared with 1968		
				<u>Total</u>	<u>Pay Cost^{a/}</u>	<u>Program</u>
a. Executive direction and management support.....	\$3,022,564	\$3,930,000	\$4,425,000	+\$495,000	+\$41,000	+\$454,000
b. Public information.....	378,786	417,000	521,000	+104,000	+4,000	+100,000
c. Commissioned officer retirement fund.....	...	350,000	300,000	-50,000	...	-50,000
Unobligated balance lapsing.....	29,650	...	...	...	...	...
Total.....	3,431,000	4,697,000	5,246,000	+549,000	+45,000	+504,000

a/ To provide for increased pay cost for fiscal year 1968 positions.

Executive direction & Management support

Administration

a. Executive direction and management support

	<u>FY 1968</u> <u>Amount</u> <u>Available</u>	<u>FY 1969</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1968</u>
1. Headquarters.....	\$2,660,000	\$2,837,000	+\$177,000
2. Regional offices...	<u>1,270,000</u>	<u>1,588,000</u>	<u>+318,000</u>
Total.....	3,930,000	4,425,000	+495,000

General

Overall leadership, direction and administrative management support activities are essential and necessary functions of any organization. These kinds of activities become doubly important for an organization such as FWPCA which has not only been expanding or increasing its financial, manpower and facility resources but has also been upgraded to an Administration and transferred to the Department of the Interior. In order to facilitate and achieve program objectives and plans in its 20 months in the Department, it has established or is in the process of establishing or strengthening its managerial and support activities. A strong basic cadre came from FWPCA's predecessor agency in Public Health Service. Many of the experienced personnel were members of the PHS Commissioned Officers Corps and understandably chose to retain this status. Administrative capabilities had been augmented to the extent that program responsibilities and work load factors were determinable. As of January 1, 1968, all managerial and administrative support activities are now handled by FWPCA or other agencies of the Department of the Interior. Organization structure has been defined, with regions established (see map on page 142) and headquarters-field relationship delineated adequately for the present. Procedures for program planning, direction and control have been formulated.

This is not to suggest that the FWPCA transition is complete and that the new organization is in perfect working order. Some problems remain but the difficult initial adjustment period is now past. The need for new arrangements and procedures to fill gaps and promote efficiency and economy will receive constant attention.

1. Headquarters: Fiscal year 1968, \$2,660,000; fiscal year 1969, \$2,837,000; increase, \$177,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u> <u>Amount</u>	<u>Positions</u>	<u>Total</u> <u>Program</u>	<u>Explanation</u>
(1)	+\$29,000	...	...	To meet increased pay costs.
(2)	+102,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	<u>+46,000</u>	<u>+8</u>	\$2,126,000	Strengthen procurement and fiscal services to meet increased work load in the administrative management area.
	<u><u>+177,000</u></u>	<u><u>+8</u></u>		

Need for Increase

Procurement

The procurement work load has been steadily increasing each year. Program expansion proposed for FY 1969 will continue to increase the work load not only involving regular purchases but, most significantly, contract procurement. Again, as in other management support areas, it is becoming increasingly obvious that staffing for FY 1968 is not adequate to meet the increased work load now emerging. To illustrate the magnitude of some of the problems, in FY 1967 175 contracts were awarded either through negotiation or advertising. With increased contract funding in FY 1968 and FY 1969, the number will be greater in each succeeding year. In research and development contracts alone, it is estimated that there will be in excess of 250 contracts during these years. Contracts involving the research and development program require time consuming negotiation. Other contracts are awarded through advertising. In addition to the work involved in processing and making the contract awards, the procurement staff must be involved in the day-to-day work in contract administration. This involves change orders, supplements, review and approval of payment requests and review of the contractor's performance in accordance with the terms of the contract. Since many of these contracts run for more than one year, this work load continues, notwithstanding the work involved in letting new contracts each year. It should be noted that the procurement activity at headquarters is concerned with all FWPCA contracts on a national basis, either negotiated or advertised, that are in excess of \$2,500, as well as all other purchases.

In order that this activity can effectively meet this increased work load, four additional positions are necessary.

Fiscal Management

The proposed funding and employment for FWPCA will obviously have an impact on the fiscal management activities. On July 1, 1967, the responsibility for fiscal services was taken over by FWPCA. Heretofore, DHEW provided these services on a decentralized basis through their regional offices and select PHS installations; FWPCA has now centralized these functions in Washington. Therefore, every financial transaction occurring nationally in FWPCA is processed and recorded at the Washington level. It is obvious that any increase in funding and employment will increase the work load of fiscal management. These program increases will not only increase the number of documents to be processed and recorded for accounting purposes but, more significantly, will increase the number of payment vouchers processed, examined and certified for payment by Treasury. Because this function is new to FWPCA, data is not available at this time to make an intelligent projection of the work load, not only for FY 1969 but also for FY 1968. However, because of the minimal staffing available at the present time, to enable this activity to meet the obvious increase in work load in FY 1969, four additional voucher examiners must be provided to process payment vouchers, particularly for contractors and other vendors on a systematic and timely basis.

Objective

Provide overall leadership and direction and administrative management support to facilitate attainment of Federal Water Pollution Control Administration program missions. The functions supported at headquarters under this activity include the following:

- Office of the Commissioner
- Office of Program Plans and Development
- Office of Legislative Liaison
- Water Pollution Control Advisory Board
- Office of Administration
 - (a) Personnel Management
 - (b) Financial Management
 - (c) General Services
 - (d) Facilities Management
 - (e) Management Systems

Program of Work

Continue providing overall leadership and direction, establish policies plans, regulations and directives as needed. Continue expanding and strengthening the quantification of agency output objectives to make possible more incisive and far-reaching program analysis and reviews. Provide guidance, coordination and direction, and, where applicable, services to headquarters and field program activities. Although fiscal operations are being carried out by FWPCA, an effective integrated accounting and information system is not yet provided for--this is an objective of FWPCA for FY 1969.

Accomplishments

In fiscal years 1967 and 1968 a considerable amount of effort was devoted by top level management to the development and review of water quality standards. Increased emphasis will continue to be placed on the establishment and development of a program review and reporting system. In administrative management support, emphasis was given to the establishment and maintenance of regional administrative support operations. Major effort was devoted to the goal of becoming self-reliant in the administrative support area. As of January 5, 1967, the fiscal management operations which had been provided by DHEW were transferred and became the full responsibility of FWPCA. Other activities such as general services and facilities management are coming into their own and, therefore, becoming more effective and efficient in providing support to programs. Policies and procedures in many of these areas have been developed or revised to conform with those of the Department of the Interior.

2. Regional offices: Fiscal year 1968, \$1,270,000; fiscal year 1969, \$1,588,000; increase, \$318,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	<u>Explanation</u>
(1)	+\$12,000	...	...	To meet increased pay costs.
(2)	+127,000	...	...	To support full year employment of new personnel authorized for FY 1968
(3)	+145,000	+18	\$145,000	To meet contract compliance and equal opportunity responsibilities.
(4)	<u>+34,000</u>	<u>+6</u>	<u>1,443,000</u>	To provide additional clerical support.
	<u>+318,000</u>	<u>+24</u>		
		<u>Need for Increase</u>		

Equal employment opportunity and contract compliance

The increase is necessary in order to carry out the responsibilities delegated by the Department for meeting the requirements of Title VI of the Civil Rights Act of 1964 (non-discrimination in the provision of services or benefits) and Executive Order 11246 (equal employment opportunity in Federal employment; in employment by Federal contractors; and in employment on construction projects receiving Federal financial assistance).

The most significant work involved in carrying out the delegation will be with respect to Part III of the Executive Order (equal employment on construction projects receiving Federal financial assistance). In this connection, the Department of Labor and Department of the Interior both require specific site and project reviews: (1) construction contracts of \$1 million or more are subject to preaward conferences with the applicants and the prospective contractors; and (2) all construction contracts of \$100,000 or more are subject to postaward reviews.

Further, the Department of Labor, in an effort to provide for appropriate minority employment in the higher paying construction jobs, has designated particular cities for unified and intensive preaward Federal surveillance even where the construction contract is less than \$1 million. Examples are: St. Louis, Cleveland, San Francisco, and Philadelphia.

The number of projects affected by the construction contract review could reach 1,460 in fiscal year 1969. These preaward conferences and reviews could not be held without additional resources. Since most of the work will be performed in the field, an increase of 18 positions and \$145,000 is proposed for the location of one professional with a secretary in each of the nine regional offices. These regional assistants will be required to make the necessary preaward and postaward reviews in addition to carrying out other duties required by the statute and Executive Order.

Clerical support

The work load of the administrative support activities in the regional offices continues to expand. In establishing the management support activities in 1967 and 1968 which include personnel management, financial management (excluding fiscal) and general services, staffing was constrained to meet minimal requirements. The extent of services to support the field programs under their jurisdiction was underestimated for FY 1968. It should be noted that, by the end of FY 1968, the regional offices will be servicing, in varying degrees, personnel in 59 different locations. This dispersal of personnel and activities creates servicing problems. Every effort will be made to meet program support requirements with existing resources.

With proposed program expansion in FY 1969 and current deficiencies, the additional six positions and \$34,000 are necessary if the programs are to be effectively served.

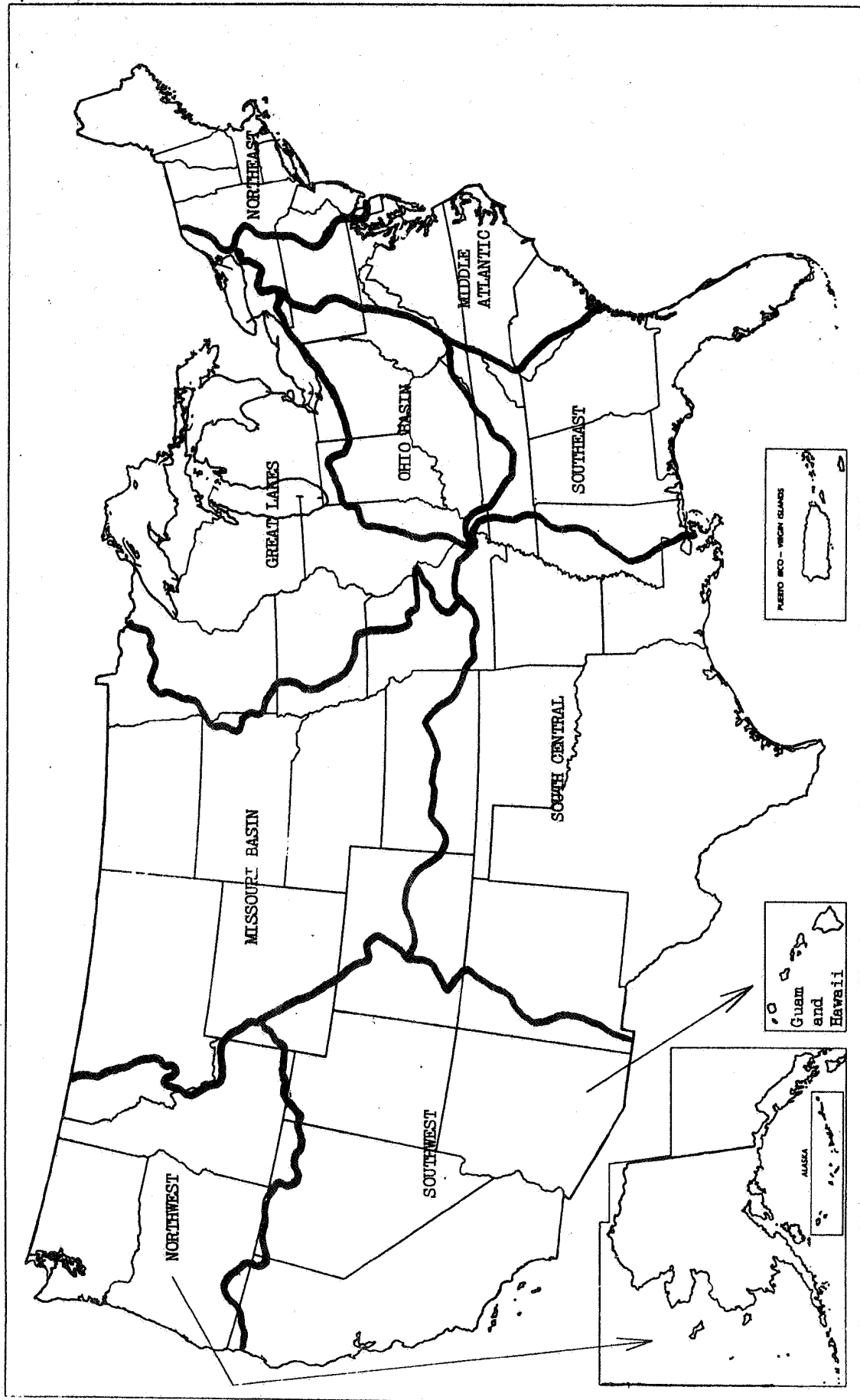
Objective

Regional directors represent the Commissioner and their objective, therefore, is to provide leadership, supervision, coordination and administrative management support for all program activities under their jurisdiction.

Program of Work and Accomplishment

Carry out and, when necessary, interpret policies of the Administration. Supervise, conduct and coordinate assigned programs, activities and projects. The expanded program activities resulting from the Clean Water Restoration Act of 1966 placed a tremendous demand on the regional organization. The State proposals for establishing water quality standards and the related implementation plans, the new basin planning grants, along with the expanded construction grants program and the new change in Federal participation have had a major impact in the relationship between the regional office and the States and local communities. This increased activity placed additional demands on the regional director and required increased coordination. In addition to program activity, considerable effort was and still is being devoted to establishing and maintaining an effective administrative support activity heretofore provided by DHEW.

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION REGIONS



Public information

b. Public information: Fiscal year 1968, \$417,000; fiscal year 1969, \$521,000; increase \$104,000. The increase consists of:

	<u>Increase (+) or Decrease (-)</u>	<u>Total</u>	<u>Explanation</u>	
	<u>Amount</u>	<u>Positions</u>	<u>Program</u>	
(1)	+\$4,000	...	...	To meet increased pay costs.
(2)	+15,000	...	...	To support full year employment of new personnel authorized for FY 1968.
(3)	+85,000	+5	\$521,000	For publications, exhibits, radio and TV series and secretarial assistance for regional offices.
	<u>+104,000</u>	<u>+5</u>		

Need for Increase

The \$85,000 increase is related to the Federal Water Pollution Control Administration's expanding activities, and to respond to the public's growing interest in pollution as a national problem.

Included in the increase is \$61,000 which is needed for publications, exhibits, and a new radio and TV series.

Primer on waste treatment. The need for such a primer as a means of informing the public on the fundamentals of water pollution control--from primary to advanced waste treatment--has been called to our attention by one of the major conservation groups. Text has been prepared, and the primer will be ready for the printer early in 1969. Estimated cost is \$15,000.

Boat shows. Several new exhibits, with accompanying literature, will be needed to meet urgent requests for FWPCA participation in 1969 boat shows. These shows represent an efficient means of reaching people in all walks of life with educational messages and materials on water pollution control built around a paramount interest in water for recreational purposes. Existing exhibits and literature suitable for boat shows will not begin to meet 1969 needs. The estimate is \$5,000 for exhibits and a new leaflet.

By the end of the fiscal year, the current radio and TV spots will have run their course and served their purpose. Therefore, a new series will be needed during FY 1969. This has proven to be a successful and economical medium for placing the facts about water pollution before the American people. The cost for this purpose is estimated at \$38,000.

In addition to the above funds, approximately \$3,000 will be needed to maintain a supply of existing publications that will still be useful during 1969 in responding to requests for information on water pollution and its prevention and control.

The remaining \$24,000 of the requested increase is for regional secretarial positions to meet the increased work load related to the Federal Water Pollution Control Administration's expanding activities, to respond to the public's growing interest in pollution as a national problem and to handle the still greater work load growing out of new legislation.

Requests by all information media for facts about water pollution and what the Federal Water Pollution Control Administration is doing and planning to do are running at an all time high and increasing. Many of these requests require extensive and time-consuming investigation and discussion by Office of Public Information personnel with program officials at all levels, particularly when long-range policy is involved.

The increase will provide for urgently needed secretarial staff in the regional offices. The Regional Information Officer is responsible for organizing, planning, and directing FWPCA's public information program within his region. He prepares speeches, special statements, press releases, and related material on a continuing basis. These offices are the source of information concerning missions and programs of FWPCA for the general public, special interest groups, and the information media--press, radio, television, and magazines.

Objective

The basic objective of the Office of Public Information, both at headquarters and in the field, is to (1) put the facts about water pollution and water pollution prevention and control on the public record, and (2) provide information in such forms as to be most useful to groups, organizations, and individuals whose cooperation is essential to the success of the entire program. The first part of this objective serves the public's right to know what FWPCA is doing and trying to do about water pollution. The second part serves the public's need to know how the water pollution control program works in order to participate effectively in the program at State and local levels.

Program of Work

In November 1966, the Harris Survey reported: "A majority of Americans report that most of the rivers and lakes where they live are polluted, and they are boiling mad about it." A poll published in the Congressional Record of November 29 showed that 83 percent of the people interviewed thought more should be done about water pollution control. Percentages on other leading issues covered by the poll were 82 for air pollution, 68 for job training for unskilled, 51 for beautification, 45 for antipoverty, and 26 for space exploration. A poll of AFL-CIO members across the country, published in August 1967, showed 94 percent in favor of Federal efforts toward water pollution control. This led all other issues, including repeal of Section 14(b) of the Taft-Hartley Act. These indications of national interest in water pollution

control are reinforced by both the volume and content of mail received by FWPCA from all parts of the country.

The program of work of the Office of Public Information for 1969 will place increased emphasis on how water pollution can be controlled. This will serve the dual purpose of (1) maintaining public awareness of the fact that water pollution can be controlled, the dominant initial theme of the FWPCA information program, and (2) helping to channel widespread public interest into effective action against all forms of water pollution.

Accomplishments

Six TV spots and seven radio spots were produced during FY 1967 and distributed to stations throughout the country. All have been widely acclaimed by stations and broadcasting publications. Variety complimented FWPCA for having produced the TV spots "on a shoestring." The radio spots were produced for virtually nothing except the cost of the tapes.

Prior to the use of the spots, mail addressed to "CLEAN WATER, Washington, D.C." was averaging less than 500 a month. After the spots started coming on the air, mail rose to an average of over 2,100 a month, and in one recent month reached 2,700. A special pamphlet, "What YOU Can Do About Water Pollution," is used as the principal response to these inquiries, with other materials as appropriate.

Phone inquiries to OPI from the press have risen to about 200 a week and personal visits by correspondents to about 25 a week. OPI has cooperated extensively in the Chicago Tribune campaign to save Lake Michigan, and in other special, if less spectacular, water pollution control campaigns around the country. During the last 12 months, OPI issued 61 press releases on various developments, 52 weekly round-up releases on construction grants, 52 issues of Water Pollution NEWS, and 52 weekly reports on newsworthy developments to the Assistant Secretary for Water Pollution Control.

OPI produced a variety of speeches and special articles for the Secretary, the Assistant Secretary, and the Commissioner. (As a result of a major policy speech, written in OPI, the Water Pollution Control Federation made fundamental changes in its basic policy statement, in line with the recommendations set forth in the speech, described by Gladwin Hill in the New York Times as a polite riot act.) In the graphics area, OPI designed 16 publications, planned and arranged for the production of 17 visual presentations and 16 exhibits, and handled 19 design and layout projects.

In addition to letters addressed to "CLEAN WATER," OPI receives a large volume of mail requiring individual responses, many of which involve considerable research for proper handling. The number of such letters reached nearly 300 in January 1968, and is expected to continue at the same rate.

OPI provided extensive editorial and writing assistance in the preparation of 230 scientific and technical papers and a number of special reports.

Pending the publication of an overall brochure on the FWPCA program, to be issued in 1968, OPI produced a set of attractive and informative fact sheets on each of the separate FWPCA activities. Most of the operating components of FWPCA had been requesting printed leaflets on their activities. The fact sheets were produced as an economical alternative and have proved highly effective.

Both from the standpoint of performance and potential, the quality of OPI staff work was steadily improved during the year.

Commissioned officer retirement fund

c. Commissioned officer retirement fund: Fiscal year 1968, \$350,000; fiscal year 1969, \$300,000; decrease \$50,000. The decrease consists of:

<u>Increase (+) or Decrease (-)</u>		<u>Total</u>	<u>Explanation</u>
<u>Amount</u>	<u>Positions</u>	<u>Program</u>	
-\$50,000	...	\$300,000	Due to nonrecurring payment to the civil service retirement fund for each Public Health Service commissioned officer converting to civil service status.

Purpose

The Water Quality Act of 1965, which established the Federal Water Pollution Control Administration, had a special provision with respect to Public Health Service commissioned officers then employed with the program who decided to resign their commission and transfer to civil service status.

In addition to other inducements for retaining these professionals, the Act provided that funds would be deposited to the credit of the civil service retirement fund on behalf of and to the credit of each transferring officer in an amount equal to that which the individual would be required to deposit in this fund to cover the years of service credited to him. The Act also provided that these funds would be deposited within two years after the date of an officer's transfer.

In the final analysis a total of 168 officers converted. In FY 1968, \$350,000 was requested and appropriated to meet this obligation for 93 commissioned officers who converted before July 1, 1967. To meet this obligation for the remaining 75 officers converting after June 30, 1967, a total of \$300,000 is required. This will complete the funding responsibility for this purpose.

Laboratory direction and management--Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

In FY 1969 FWPCA has transferred \$480,000 in the estimate--the costs for laboratory direction, maintenance and support of the Cincinnati laboratory--to the programs being supported at that facility. These costs heretofore were included as part of the "Administrative Management Support" under the Administration activity. This action is being taken to provide for consistency to the manner in which similar costs are programmed for other laboratories such as those located at Athens, Georgia; Ada, Oklahoma; Corvallis, Oregon; College, Alaska; Duluth, Minnesota; and Narragansett, Rhode Island. Costs for these purposes are included as part of the program costs for activities involved and are budgeted accordingly. The comparable amounts for fiscal years 1967 and 1968 are \$470,000 and \$478,000, respectively.

ITEMIZATION OF ESTIMATE

Department of the Interior

Appropriation Title: Water Supply and Water Pollution Control

Federal Water Pollution Control Administration

	Actual 1967	Estimate 1968	Estimate 1969	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total obligations.....	\$73,173,368	\$108,791,907	\$101,435,000	-\$7,356,907
Comparative transfer from other accounts.....	-22,888,233	-16,210,212	...	+16,210,212
Transfer to:				
"Operating expenses, Public Buildings Service,"				
General Service Administration.....	295,303	218,305	...	-218,305
"Salaries and expenses, Office of the				
Solicitor".....	116,000	...	...	...
Transferred from "Salaries and Expenses, Office				
of Field Administration," Department of				
Health, Education, and Welfare.....	-55,000	...	...	...
Unobligated balance lapsing.....	4,797,562	...	...	...
Appropriation.....	55,439,000	92,800,000	101,435,000	+8,635,000
<u>Obligations by objects:</u>				
11 Personnel compensation.....	18,429,915	22,535,000	26,079,000	+3,544,000
12 Personnel benefits.....	1,587,421	2,022,000	2,220,000	+198,000
21 Travel and transportation of persons.....	1,490,801	1,738,000	1,997,000	+259,000
22 Transportation of things.....	358,344	435,000	512,000	+77,000
23 Rent, communications, and utilities.....	1,304,298	1,716,695	1,961,000	+244,305
24 Printing and reproduction.....	384,113	421,000	512,000	+91,000
25.1 Other services.....	2,214,374	3,245,000	3,768,000	+523,000
Research contracts.....	4,452,166	15,065,000	11,900,000	-3,165,000
25.2 Services of other agencies.....	1,129,000	1,159,000	859,000	-300,000

Itemization of Estimate--continued

	Actual 1967	Estimate 1968	Estimate 1969	Increase (+) Decrease (-)
Obligations by objects: continued				
26 Supplies and materials.....	1,427,797	1,601,000	1,690,000	+89,000
31 Equipment.....	2,455,887	1,544,000	2,202,000	+658,000
32 Lands and structures.....	14,103	...	...	...
41 Grants, subsidies, and contributions.....	37,920,896	57,310,212	47,735,000	-9,575,212
42 Insurance claims and indemnities.....	4,253	...	...	...
Total obligations.....	73,173,368	108,791,907	101,435,000	-7,356,907

DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Buildings and Facilities

Appropriation 1968.....	...
Unobligated balance from prior years.....	<u>\$12,891,072</u>
Total available for obligation.....	12,891,072
<u>Decreases (1968)</u>	
Water pollution control and water quality standards laboratories.....	<u>-4,598,001</u>
Subtotal and total available for obligation, FY 1969.....	8,293,071
Less: Unobligated balance from 1968.....	<u>-8,293,071</u>
Budget estimate 1969.....	...

Buildings and Facilities

Analysis by Activities

	Fiscal Year 1969					Page Ref.
	Amount Available 1968	Estimated Total Available	Unobligated Balance from 1968	Budget Estimate	Total Available 1969 Compared to Total Available 1968	
1. Water pollution control and water quality standards laboratories.....	\$11,617,072	\$7,019,071	\$7,019,071	...	-\$4,598,001	152
2. Field evaluations.....	1,274,000	1,274,000	1,274,000	...	...	155
Total.....	<u>12,891,072</u>	<u>8,293,071</u>	<u>8,293,071</u>	...	<u>-4,598,001</u>	

Laboratories

1. Water pollution control and water quality standards laboratories:
FY 1968, -0-; fiscal year 1969, -0-; no change.

No additional funds are requested for FY 1969.

Although no new funds were appropriated in FY 1968 for this activity, in accordance with House action, \$2,000,000 was transferred from the field evaluation activity shown under this appropriation to fund the equipment and repairs and improvements requirements requested in the 1968 estimate.

Basis for Laboratory Construction Program

Section 5(e) of the Federal Water Pollution Control Act, as amended, provides:

"The Secretary shall establish, equip, and maintain field laboratory and research facilities, including, but not limited to, one to be located in the northeastern area of the United States, one in the Middle Atlantic area, one in the southeastern area, one in the midwestern area, one in the southwestern area, one in the Pacific Northwest, and one in the State of Alaska, for the conduct of research, investigations, experiments, field demonstrations and studies, and training relating to the prevention and control of water pollution. Insofar as practicable, each such facility shall be located near institutions of higher learning in which graduate training in such research might be carried out."

In addition to the seven initially authorized, in 1966 Congress authorized three more to be located at Columbia, Missouri; Vicksburg-Jackson, Mississippi area; and Stevens Point, Wisconsin.

Water pollution control regional facilities are necessary because:

(1) Water pollution control field activities require readily accessible, substantial, and highly technical laboratory support for activities involving development of a comprehensive program for water pollution control, enforcement of pollution abatement, collection of basic data, and technical assistance to State and local agencies. Technical training for Federal, State, and local water pollution control personnel is also provided at these facilities.

(2) Each region has its own unique water uses and related pollution problems which require intensive research. However, in some cases the findings developed in one region can also be applied to those other regions where similar uses of water exist or are developing.

At the present time four laboratories authorized under this section are completed and generally operational. These include facilities at Athens, Georgia; Ada, Oklahoma; Corvallis, Oregon; and College, Alaska.

WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS LABORATORIES

Cost Estimates Through 1969^{a/}

<u>Location</u>	<u>Planned Personnel Strength</u>	<u>Sq. Ft.</u>	<u>Estimated Planning and Construction Costs</u>
<u>Water Pollution Control</u>			
College, Alaska	62	25,000	\$2,594,155
Ada, Oklahoma	135	50,000	2,177,532
Corvallis, Oregon	135	50,000	2,432,672
Athens, Georgia	135	50,000	2,500,501
Boston, Massachusetts	135	50,000	2,510,000
Ann Arbor, Michigan	135	50,000	2,510,000
Middle Atlantic	...	...	160,000
Columbia, Missouri	...	...	160,000
Vicksburg-Jackson, Mississippi	...	...	160,000
Stevens Point, Wisconsin	...	...	160,000
<u>Water Quality Standards</u>			
Narragansett, Rhode Island	102	35,000	1,714,970
Duluth, Minnesota	133	44,000	<u>2,284,000</u>
Total estimate.....			19,363,830 ^{b/}
Available.....			<u>19,363,830</u>
New obligational authority requested.....			...

a/ Excludes repairs and improvements.

b/ Excludes construction costs for four new laboratories previously authorized by Congress.

Field evaluation

2. Field evaluations: FY 1968, -0-; FY 1969, -0-; no change.

(a) Acid mine drainage demonstration program

This program was jointly carried out with other agencies of the Department. The purpose was to determine the most effective and reasonably priced methods for control of acid mine drainage pollution and to evaluate those methods. This pollution is destroying fisheries and recreational values, creating unsightly esthetic conditions, making water treatment more costly and discouraging new industry in affected areas. The ultimate objective was to obtain information that will permit making adequate and valid legislative recommendations of control measures applicable within entire drainage basins affected by acid mine drainage.

At the present time the program is actively involved in evaluating measures installed at a site near Elkins, West Virginia.

The program included such things as the installation of masonry seals and lined channels, drilling and grouting of rock strata with various substances, forcing collapse of abandoned mine galleries, application of gaseous and liquid chemicals to immobilize exposed sulfides, reshaping the land surface, compacting soil over subsidence areas and along spoilbanks, building and sealing ponds, applying various mulches and other amendments to the soil, seeding in cover crops for soil stabilization, and planting shrubs and trees.

Installation of control measures at other sites is deferred in light of the fiscal situation.

(b) Evaluation of advanced waste treatment processes

Through fiscal 1967, \$2,000,000 had been appropriated for major Federal demonstration projects for this purpose. Since none of these funds had been used and future requirements for this purpose would be met under the research and development grant and contract program authorized by the Clean Water Restoration Act of 1966, the House authorized the use of these funds for the equipment and repairs and improvement program requested for laboratories in FY 1968. No further activity for this purpose will be proposed under this appropriation in the future.

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Buildings and Facilities

	Actual 1967	Estimate 1968	Estimate 1969	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total obligations.....	\$636,096	\$4,598,001	\$160,000	-\$4,438,001
Unobligated balance transferred from "Buildings and facilities," Public Health Service.....	-8,668,168	...	...	...
Unobligated balance lapsing.....	1,420,618	...	...	...
Unobligated balance brought forward.....	...	-12,891,072	-8,293,071	+4,598,001
Unobligated balance carried forward.....	12,891,072	8,293,071	8,133,071	-160,000
Appropriation.....	4,624,000	...	...	...
Reappropriation.....	1,655,618	...	...	...

Obligations by objects:

21 Travel and transportation of persons.....	939	9,000	4,000	-5,000
22 Transportation of things.....	93	...	...	...
23 Rent, communications, and utilities.....	5,000	...	...	...
24 Printing and reproduction.....	2,030	12,000	4,000	-8,000
25 Other services.....	296,122	1,691,001	151,000	-1,540,001
26 Supplies and materials.....	16,076	2,000	1,000	-1,000
31 Equipment.....	240,565	1,712,000	...	-1,712,000
32 Lands and structures.....	75,271	1,172,000	...	-1,172,000
Total obligations.....	636,096	4,598,001	160,000	-4,438,001

Constr. Grants for Waste Treatment Works

DEPARTMENT OF THE INTERIOR

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Construction Grants for Waste Treatment Works

Appropriation.....	\$203,000,000
Unobligated balance from prior years.....	+64,144,245
Comparative transfer to "Water supply and water pollution control".....	-16,210,212
Revert to Treasury from prior year appropriations.....	-542,484
Transfer to Appalachian regional development.....	<u>-3,054,998</u>

Total available for obligation.....	247,336,551
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Increases

Waste treatment works construction.....	<u>+50,557,908</u>
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Total available for obligation.....	297,894,459
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Less: Unobligated balance from 1968.....	<u>-72,894,459</u>
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Budget estimate 1969.....	225,000,000
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Construction Grants for Waste Treatment Works

Analysis by Activities

Activity	Amount Available 1968	Fiscal Year 1969			Total Available 1969 Compared to Total Available 1968	Page Reference
		Estimated Total Available	Unobligated Balance from 1968	Budget Estimate		
1. Waste treatment works construction.....	\$247,336,551	\$297,894,459	\$72,894,459	\$225,000,000	+\$50,557,908	160

Construction Grants for Waste Treatment Works

New Obligational Authority by Activity

Activity	FY 1967	FY 1968	FY 1969 Estimate	Increase (+) over 1968
1. Waste treatment works construction.....	\$150,000,000	\$203,000,000	\$225,000,000	+\$22,000,000
2. Appalachian regional development.....	3,000,000	...	...	...
Total new obligational authority.....	153,000,000	203,000,000	225,000,000	+22,000,000

Waste treatment works construction: Fiscal year 1968, \$203,000,000; fiscal year 1969, \$225,000,000; increase \$22,000,000.

The total estimate is necessary to continue stimulating needed construction or upgrading of waste treatment works for eliminating the discharge of untreated or inadequately treated municipal sewage into the Nation's waterways. The FY 1969 authorization for this purpose is \$700 million; however, because of the national fiscal situation, the amount requested is \$225 million.

Objective

The program is designed to help bring water pollution from municipalities under control by achieving a rate of construction which will overcome the unmet backlog of needed facilities; keep pace with needs for new facilities resulting from population growth; and keep pace with needs to replace facilities which become obsolescent because of age, technical advancement, or population relocation.

As directed by Congress, FWPCA conducted the first comprehensive in-depth analysis of the need for and costs of treating municipal, industrial and other effluents for the next five years. This report, "Cost of Clean Water" was transmitted to Congress in January. The need and cost of treatment, particularly municipal wastes, has been a subject of considerable discussion and controversy. It is not expected that this report will settle conclusively this complex and difficult question; however, it is a start and we expect to continually refine and improve on these findings. Some of the significant findings follow.

Problem

The urban population of the United States is estimated at about 146 million persons in FY 1968. Of this total, about 82 million people presently have adequate treatment facilities, almost 32 million have less than adequate facilities, and slightly more than 32 million have no treatment facilities. In the next five years the cost of constructing needed municipal waste treatment facilities, using 1968 dollar value, is estimated to be \$8.0 billion, exclusive of land and associated costs. Of this amount, the elimination of the current unmet need will cost \$4.6 billion. This includes \$1.9 billion to upgrade service to secondary treatment for the urban population whose wastes now receive primary treatment (excluding areas where primary treatment is likely to be adequate to meet water quality standards); and \$2.7 billion to provide secondary treatment to the urban population whose wastes do not receive any treatment at present. Another \$2.2 billion will be required for urban population growth and \$1.2 billion for replacement of obsolete facilities. See chart on page 167.

If we are to bring municipal pollution under control by 1974--through providing for population growth, upgrading primary treatment works, constructing works for urban population presently unserved, and replacement of obsolete facilities--an average national expenditure of approximately \$1.6 billion annually is necessary.

Program and Appropriation Authorization

Section 8 of the Federal Water Pollution Control Act was amended by the Clean Water Restoration Act of 1966 to authorize appropriations of \$150 million for fiscal year 1967, \$450 million for fiscal year 1968 (appropriation authorized \$203 million), \$700 million for fiscal year 1969 (appropriation requested \$225 million), \$1 billion for fiscal year 1970, and \$1.2 billion for fiscal year 1971, for grants to aid in the construction of municipal waste treatment facilities in order to prevent the discharge of untreated or inadequately treated sewage or other waste into any waters. Funds appropriated are to be apportioned to the States and other jurisdictions according to a formula prescribed in the statute. See page 164 for distribution of funds for fiscal years 1968 and 1969.

The Amendments to the Act further authorized grants of 30% of the estimated reasonable cost of construction of necessary waste treatment works without dollar limitations. The 30% grant limitation may be increased to 40% if the State agrees to pay 30% of the estimated reasonable cost of all projects receiving Federal funds from the same allocation. The 30% limitation may also be increased to 50% if enforceable water quality standards have been established for the waters into which the project discharges and the State agrees to pay not less than 25% of the estimated reasonable cost of all projects receiving Federal funds from the particular allocation. The amount of a grant may be increased 10% if a project is certified as being in conformity with a comprehensive plan developed by an official State, metropolitan or interstate planning agency. Thus, if all conditions are met, the total grant award can be as high as 55% of the total cost of construction.

The 1966 Amendments also provide that in the case of any project on which construction was initiated after June 30, 1966, which was approved by the appropriate State agency and which the Secretary finds meets the requirements of Section 8 but which is constructed without Federal assistance, the allotments for construction grants for any fiscal year ending before July 1, 1971, shall also be available to make payments for reimbursement of State or local funds to the extent that financial assistance could have been provided if the project had been approved pursuant to Section 8 and adequate funds had been available to make a grant. In the case of a project on which construction was initiated after June 30, 1966, and which was constructed with Federal assistance

Based on past and anticipated activity, new construction starts and completions are estimated as follows:

	<u>Starts</u>	<u>Completions</u>
1968	890	700
1969	1350	800

Appalachian Regional Development FY 1968, -0-; FY 1969, -0-;
no change.

For fiscal years 1968 and 1969 funds for grants to construct sewage treatment works in the Appalachian region to carry out Section 212 of the Appalachian Regional Development Act are now being financed under Appalachia Regional Commission program account ("Funds Appropriated to President").

but the amount of assistance was a lesser percent of the cost of construction than was allowable pursuant to Section 8, payment and reimbursement of State or local funds is permitted to the extent that assistance could have been provided if adequate funds had been available. The same provisions apply for such retroactive grants as apply if the grant is being made for future construction.

In authorizing these Amendments, Congress clearly recognized the problems of the larger cities in obtaining significant financial assistance in the construction of needed sewage treatment facilities. The removal of dollar limitations of \$1.2 million, or \$4.8 million in the case of multimunicipal projects, together with the added incentive of higher grant percentages with certain specified State participation, is stimulating many of these larger cities and metropolitan areas to move ahead at an accelerated pace with construction. Greater activity in major cities will result in a greater number of larger projects and, therefore, a greater contribution toward pollution control.

Accomplishments

As of January 31, 1968, including supplemental aid under the Public Works Acceleration Program, the Appalachian Regional Development and the Public Works and Economic Development Acts of 1965, a total of 8,158 projects have been approved for grants totalling \$1.0 billion. Local communities have contributed an additional \$3.5 billion to meet the total project cost of \$4.5 billion.

Approved projects will serve a population of nearly 66 million, and will improve the quality of water in approximately 66,000 miles of streams. As of January 31, 1968, there were 2,602 applications for grants for projects costing \$2.7 billion being processed or reported to be in preparation.

Anticipated Activity

The FY 1968 program provides for Federal grants amounting to over \$174.4 million requiring State and local community participation in the amount of \$399 million for a total construction program of \$573.4 million. This is based on the assumption that the average grant will be 30.4 percent of the total cost. It should be noted that, because of restrictive spending required by Congress for FY 1968, about \$23 million of Federal support is being deferred until FY 1969. The effect of this action on any specific State and/or project will not be known until later in the fiscal year when, and if necessary, grant awards will have to be deferred until July 1, 1968.

In FY 1969 it is anticipated that \$242 million of Federal grants will be awarded requiring \$451 million in State and local community participation resulting in a total construction program of \$693 million. The average grant is estimated to be 34.9 percent of the cost. See chart on page 168.

Based on past and anticipated activity, new construction starts and completions are estimated as follows:

	<u>Starts</u>	<u>Completions</u>
1968	890	700
1969	1350	800

Appalachian Regional Development FY 1968, -0-; FY 1969, -0-;
no change.

For fiscal years 1968 and 1969 funds for grants to construct sewage treatment works in the Appalachian region to carry out Section 212 of the Appalachian Regional Development Act are now being financed under Appalachia Regional Commission program account ("Funds Appropriated to President").

Allocations of Grant-in-Aid Funds for Waste Treatment Works Construction

State or Territory	1967 Allocations	1968 Estimate	1969 Estimate	Increase over 1968
Alabama	3,012,350	3,933,700	4,329,100	395,400
Alaska	811,300	867,300	894,700	27,400
Arizona	1,624,000	2,030,100	2,187,700	157,600
Arkansas	2,259,300	2,743,500	2,959,700	216,200
California	9,314,300	13,912,000	15,814,200	1,902,200
Colorado	1,756,200	2,293,300	2,505,600	212,300
Connecticut	2,028,750	2,786,400	3,093,200	306,800
Delaware	853,250	1,050,600	1,104,600	54,000
District of Columbia	1,016,100	1,248,600	1,341,000	92,400
Florida	3,642,200	5,093,900	5,693,200	599,300
Georgia	3,256,600	4,370,500	4,847,800	477,300
Hawaii	1,145,750	1,294,100	1,370,700	76,600
Idaho	1,373,600	1,539,000	1,619,800	80,800
Illinois	6,233,000	9,175,500	10,395,700	1,220,200
Indiana	3,384,250	4,728,500	5,292,800	564,300
Iowa	2,384,700	3,196,000	3,529,800	333,800
Kansas	2,078,900	2,667,200	2,930,900	263,700
Kentucky	2,802,450	3,654,200	4,022,000	367,800
Louisiana	2,913,900	3,827,500	4,221,600	394,100
Maine	1,519,350	1,825,300	1,942,600	117,300
Maryland	2,430,150	3,354,900	3,730,100	375,200
Massachusetts	3,539,550	5,068,600	5,691,700	623,100
Michigan	5,077,750	7,344,500	8,291,300	946,800
Minnesota	2,743,250	3,728,000	4,141,200	413,200
Mississippi	2,653,850	3,246,900	3,510,500	263,600

Allocations of Grant-in-Aid Funds for Waste Treatment Works Construction--continued

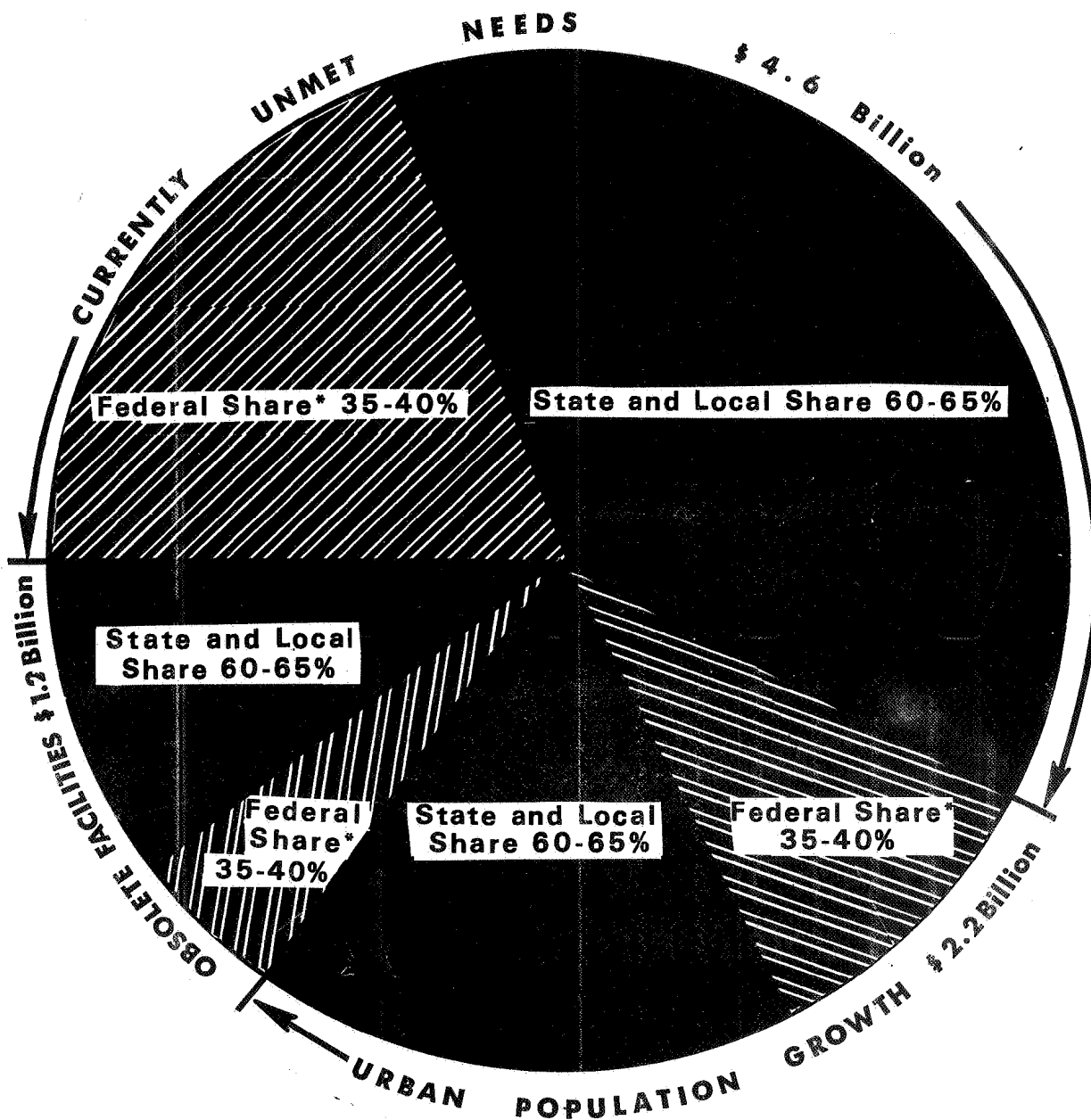
State or Territory	1967 Allocations	1968 Estimate	1969 Estimate	Increase over 1968
Missouri	3,177,950	4,490,500	5,013,400	522,900
Montana	1,272,700	1,478,900	1,560,600	81,700
Nebraska	1,646,400	2,067,900	2,238,700	170,800
Nevada	777,950	888,000	922,600	34,600
New Hampshire	1,212,750	1,371,900	1,445,300	73,400
New Jersey	4,027,600	5,790,000	6,524,300	734,300
New Mexico	1,533,900	1,797,000	1,912,100	115,100
New York	9,890,950	14,807,900	16,839,000	2,031,100
North Carolina	3,610,000	4,937,900	5,489,400	551,500
North Dakota	1,308,450	1,518,300	1,625,400 1,594,800	76,500
Ohio	6,129,950	8,966,500	10,141,300	1,174,800
Oklahoma	2,277,450	2,959,300	3,241,100	281,800
Oregon	1,776,050	2,294,200	2,508,200	214,000
Pennsylvania	7,035,150	10,348,600	11,718,600	1,370,000
Rhode Island	1,297,800	1,521,400	1,625,400	104,000
South Carolina	2,569,700	3,248,000	3,536,400	288,400
South Dakota	1,393,350	1,658,800	1,741,200	82,400
Tennessee	3,094,100	4,127,500	4,559,200	431,700
Texas	6,222,500	9,013,900	10,173,300	1,159,400
Utah	1,424,000	1,680,700	1,788,500	107,800

Allocations of Grant-in-Aid Funds for Waste Treatment Works Construction--continued

State or Territory	1967 Allocations	1968 Estimate	1969 Estimate	Increase over 1968
Vermont	1,178,700	1,301,700	1,348,900	47,200
Virginia	3,130,600	4,278,100	4,758,200	480,100
Washington	2,345,300	3,176,600	3,522,000	345,400
West Virginia	2,096,150	2,684,500	2,909,600	225,100
Wisconsin	3,009,050	4,166,700	4,645,000	478,300
Wyoming	992,850	1,143,300	1,183,300	40,000
Guam	1,492,450	1,470,000	1,478,100	8,100
Puerto Rico	2,748,150	3,391,200	3,675,500	284,300
Virgin Islands	1,473,250	1,440,600	1,444,500	3,900
Total	150,000,000	203,000,000	225,000,000	22,000,000

ESTIMATED COST OF MUNICIPAL SEWAGE TREATMENT WORKS CONSTRUCTION REQUIRED FOR PERIOD 1969-1973

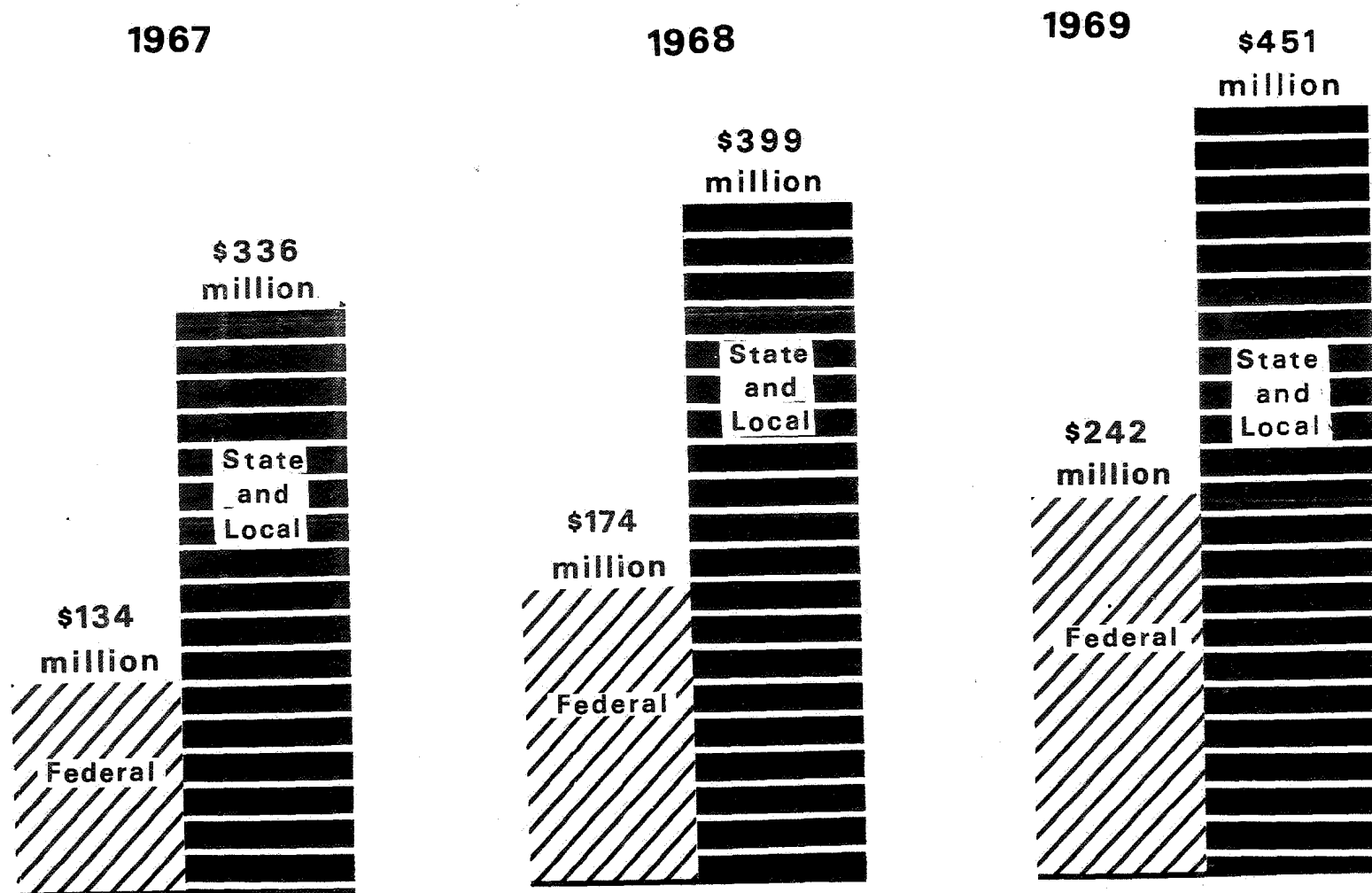
Total Cost — \$8.0 Billion



Federal Share Estimated at \$2.8 to \$3.2 Billion
State and Local Share Estimated at \$4.8 to \$5.2 Billion

OBLIGATIONS FOR SEWAGE TREATMENT WORKS

Fiscal Years 1967, 1968, and 1969



TOTALS:

\$470 Million

\$573 Million

\$693 Million

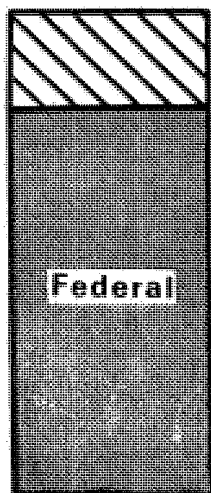
TOTAL OBLIGATIONS FOR SEWAGE TREATMENT WORKS SUPPORTED BY OR THROUGH THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

July 1, 1956 To December 31, 1967

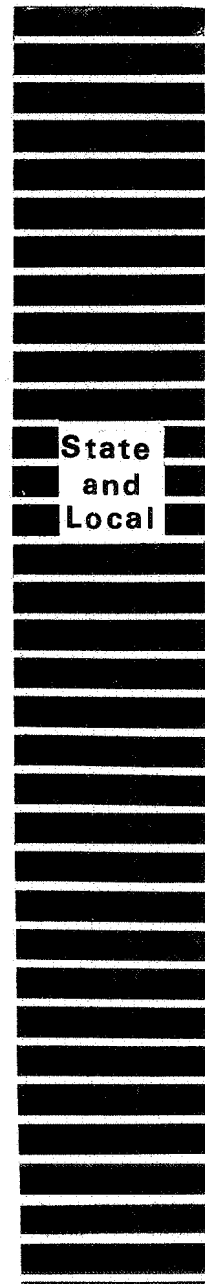
***APW—ACCELERATED PUBLIC WORKS PROGRAMS
EDA—ECONOMIC DEVELOPMENT ACT
ARC—APPALACHIAN REGIONAL
DEVELOPMENT ACT**

***APW, EDA, ARC
\$134 million**

**FWPCA
\$853 million**



**Total
\$987
million**



**Total
\$3,397
million**

TOTAL OBLIGATIONS—\$4,384 Million

STATUS OF STATE ACTIONS FOR INCREASED CONSTRUCTION GRANTS

STATE				STATE			
Matching Grants Authorized				Matching Grants Authorized			
Matching Grants Funded				Matching Grants Funded			
Metropolitan Areas Established				Metropolitan Areas Established			
Alabama				Nebraska			
Alaska				Nevada			
Arizona				New Hampshire			
Arkansas				New Jersey			
California				New Mexico			
Colorado				New York			
Connecticut				North Carolina			
Delaware				North Dakota			
District of Columbia				Ohio			
Florida				Oklahoma			
Georgia				Oregon			
Hawaii				Pennsylvania			
Idaho				Rhode Island			
Illinois				South Carolina			
Indiana				South Dakota			
Iowa				Tennessee			
Kansas				Texas			
Kentucky				Utah			
Louisiana				Vermont			
Maine				Virginia			
Maryland				Washington			
Massachusetts				West Virginia			
Michigan				Wisconsin			
Minnesota				Wyoming			
Mississippi				Guam			
Missouri				Puerto Rico			
Montana				Virgin Islands			

LEGEND:



No Action Taken



Action Completed



Partially Authorized
or Established



Action Pending

(As of January, 1968)

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Construction Grants for Waste Treatment Works

	Actual 1967	Estimate 1968	Estimate 1969	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total obligations.....	\$133,921,950	\$174,442,092	\$242,000,000	+\$67,557,908
Comparative transfer to "Water supply and water pollution control".....	+22,888,233	+16,210,212	...	-16,210,212
Comparative transfer to Appalachian regional development.....	+1,388,877	+3,054,998	...	-3,054,998
Unobligated balance lapsing.....	+84,432	+542,484	...	-542,484
Unobligated balance brought forward.....	-49,427,737	-64,144,245	-72,894,459	-8,750,214
Unobligated balance carried forward.....	+64,144,245	+72,894,459	+55,894,459	-17,000,000
Appropriation.....	173,000,000	203,000,000	225,000,000	+22,000,000

Obligations by objects:

41 Grants, subsidies, and contributions.....	133,921,950	174,442,092	242,000,000	+67,557,908
Total obligations.....	133,921,950	174,442,092	242,000,000	+67,557,908