

Buildings and Facilities, Water Administration

Federal Water Pollution Control Administration

Buildings and Facilities

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Appropriation Estimate
BUILDINGS AND FACILITIES

For construction, alteration, and equipment of facilities, including acquisition and development of sites, planning, architectural, and engineering services, and for measures to control acid mine drainage, \$4,624,000, to remain available until expended; Provided, That such unexpended balances as the Secretary of Health, Education, and Welfare may determine to be available as of June 30, 1966, in the appropriation for "Buildings and facilities," Public Health Service, for water pollution control activities shall be merged with this appropriation.

Note: Includes \$4,624 thousand of activities transferred in the estimates as follows (in thousands of dollars):

"Buildings and facilities," Public Health Service.....	3,350
"Water supply and water pollution control," Public Health Service.....	1,274

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Buildings and Facilities

Amounts Available for Obligation

	<u>1966</u>	<u>1967</u>
Appropriation.....	...	\$4,624,000
Comparative transfer from "Water Supply and Water Pollution Control, Public Health Service".....	\$1,870,000	...
Comparative transfer from "Buildings and Facilities, Public Health Service".....	8,971,368	...
Unobligated balance transferred from "Water Supply and Water Pollution Control, Public Health Service".....	...	1,426,000
Unobligated balance transferred from "Buildings and Facilities, Public Health Service".....	...	1,987,608
Deduct unobligated balance carried forward.....	...	<u>-424,000</u>
Total.....	10,841,368	7,613,608

Obligations by Activity

Page Ref.		<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
10	1. Water pollution control and water quality standards laboratories...	\$7,971,368	\$3,913,608	-\$4,057,760
15	2. Facilities for field evaluation of advanced waste treatment.....	1,000,000	1,000,000	...
17	3. Facilities for demonstrating control of acid mine drainage.....	<u>1,870,000</u>	<u>2,700,000</u>	<u>+830,000</u>
	Total obligations.....	<u>10,841,368</u>	<u>7,613,608</u>	<u>-3,227,760</u>

New Obligational Authority by Activity

Activity	1966 Estimate	1967 Estimate	Increase or Decrease
1. Water pollution control and water quality standards laboratories.	...	\$2,350,000	+\$2,350,000
2. Facilities for field evaluation of advanced waste treatment....	\$1,000,000 ^{a/}	1,000,000	...
3. Facilities for demonstrating control of acid mine drainage..	2,476,000 ^{b/}	1,274,000	-1,202,000
Total new obligatory authority.....	3,476,000	4,624,000	+1,148,000

a/ Appropriated in 1966 under appropriation heading
"Buildings and facilities, Public Health Service".

b/ Appropriated in 1966 under appropriation heading
"Water supply and water pollution control".

Obligations by Object

	1966 Estimate	1967 Estimate	Increase or Decrease
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION			
25 Other services.....	\$199,503	\$325,000	+\$125,497
31 Equipment.....	627,601	1,317,608	+690,007
32 Lands and structures.....	2,803,799	3,950,000	+1,146,201
Total, Federal Water Pollution Control Administration.....	3,630,903	5,592,608	+1,961,705
ALLOCATION TO GENERAL SERVICES ADMINISTRATION			
24 Printing and reproduction.....	15,500	5,000	-10,500
25 Other services.....	962,979	613,000	-349,979
26 Supplies and materials.....	3,059	3,000	-59
32 Lands and structures.....	6,228,927	1,400,000	-4,828,927
Total, General Services Administration.....	7,210,465	2,021,000	-5,189,465
Total obligations by object...	10,841,368	7,613,608	-3,227,760

Summary of Changes

1966 enacted appropriation.....	...
Available in 1966 in:	
"Buildings and facilities, Public Health Service".....	\$1,000,000
"Water supply and water pollution control".....	<u>2,476,000</u>
Total available in 1966.....	3,476,000
1967 estimate.....	<u>4,624,000</u>
Total change.....	<u>+1,148,000</u>

Increases

1. Water pollution control and water quality standards laboratories.....	2,350,000
2. Facilities for field evaluation of advanced waste treatment.....	1,000,000
3. Facilities for demonstrating control of acid mine drainage.....	<u>1,274,000</u>
Gross increases.....	4,624,000

Decreases

1. Facilities for field evaluation of advanced waste treatment.....	-1,000,000
2. Facilities for demonstrating control of acid mine drainage.....	<u>-2,476,000</u>
Gross decreases.....	-3,476,000
Total net change requested.....	<u>+1,148,000</u>

Explanation of Transfers

	<u>1966</u> <u>Estimate</u>	<u>1967</u> <u>Estimate</u>	<u>Purpose</u>
<u>Transfer from:</u>			
"Buildings and facilities, Public Health Service"	.....	\$1,988,000	To include in the appropriation in recognition of the establishment of a Federal Water Pollution Control Administration all unobligated balances of funds previously appropriated to Public Health Service for construction activities.
"Water supply and water pollution control"	.....	1,426,000	To include in this appropriation all funds budgeted for constructing acid mine drainage control measures. (Appropriation Act proposed)
<u>Comparative transfer from:</u>			
"Buildings and facilities, Public Health Service"	\$8,971,000	.....	To include in this appropriation all funds for construction activity previously budgeted in Public Health Service.
"Water supply and water pollution control"	1,870,000	.....	To include in this appropriation all funds appropriated for constructing acid mine drainage control measures.

Significant Items in House and Senate
Appropriations Committee Reports

<u>Item</u>	<u>Action Taken or to be Taken</u>
<u>1966 Senate Report</u>	
In reporting out on the "Buildings and Facilities, Public Health Service" appropriation under which account funds for water pollution control laboratories have been budgeted the Committee indicated that events have proven the need for additional laboratories, especially to serve the Great Plains region and the Lower Mississippi region, neither of which could be serviced adequately by the seven laboratories specifically authorized under the Federal Water Pollution Control Act. They directed the use of unobligated funds previously appropriated for planning and site acquisition purposes to plan facilities in the Columbia, Missouri area and Vicksburg-Jackson, Mississippi area to serve these regions.	Action has been taken to reserve \$320,000 of unobligated funds to finance cost of planning for these facilities. Site visitations have been made and discussions held with Congressional, State and local individuals concerned, in addition to institutions and Federal agencies. Progress is being made in isolating specific sites and developing program requirements for each.
<u>1966 Conference Report</u>	
Conferees in addition to agreeing on the Columbia, Missouri and Vicksburg-Jackson, Mississippi facilities also approved a facility at Wisconsin State University at Stevens Point, Wisconsin.	Similar action has been taken regarding this facility as stated above. In addition, \$160,000 has been reserved to plan this facility.

Buildings and Facilities

	<u>Budget Estimate to Congress</u>	<u>House Allowance</u>	<u>Senate Allowance</u>	<u>Appropriation</u>
1967	\$4,624,000			

Note: Prior to 1967 funds to finance activities now shown under this appropriation were requested and appropriated under the appropriation headings:

"Buildings and facilities, Public Health Service"

"Water supply and water pollution control"

Introduction:

This appropriation is established to include construction and related activities previously requested under the appropriation "Buildings and Facilities, Public Health Service" and "Water Supply and Water Pollution Control, Public Health Service" for water pollution control programs now included under the Federal Water Pollution Control Administration established by Congress in 1965.

1. Water pollution control and water quality standards laboratories

1967 appropriation estimate.....\$2,350,000

The Federal Water Pollution Control Act Amendments of 1961 (Public Law 87-88) provide for establishment of at least seven water pollution control laboratories in different regions of the Nation. In addition to the seven, in 1966 Congress authorized the planning of three more to be located at Columbia, Missouri; Vicksburg-Jackson, Mississippi area; and Stevens Point, Wisconsin. These new facilities will enable the program to provide technical support to the various elements of the Water Pollution Control Administration. Programs conducted in or out of these facilities include research, investigations, field demonstrations, technical assistance to State and local government and technical training for Federal, State, local, and other persons with suitable qualifications.

In 1966, four of these laboratories will be completed and operational. These include the facilities at Athens, Georgia; Ada, Oklahoma; Corvallis, Oregon; and College, Alaska. Planning or construction is proceeding on six additional laboratories including the three authorized by Congress in 1966. The construction contracts for the Boston, Massachusetts and Ann Arbor, Michigan laboratories will be awarded, with construction completed early in 1968. Planning for the Baltimore, Maryland; Columbia, Missouri; Vicksburg-Jackson, Mississippi; and Stevens Point, Wisconsin facilities has been initiated.

In addition to field water pollution control laboratories, in 1963 Congress authorized the construction of two national water quality standards laboratories to conduct necessary research for determining water quality standards for salt and fresh water. These facilities are being located in Narragansett, Rhode Island; and Duluth, Minnesota, respectively. The construction of the Duluth laboratory was started in early 1966 with completion estimated for March 1967. Construction of the laboratory at Narragansett is anticipated to start in 1967.

Current estimates of equipment needs were developed for each laboratory on the basis of the proposed research, technical assistance, and training programs to be carried out in each laboratory. The needs are compatible with operational requirements. The estimated cost of equipment needs for each facility is between \$517 to \$860 thousand, except Alaska. The following is a distribution of needs by laboratory:

	Equipment Requirements			
	Total Estimated Needs	Previously Appropriated	Additional Requirement 1967	Future Requirements
College, Alaska	\$253,000	\$95,000	\$60,000 ✓	\$98,000
Ada, Oklahoma	557,000	150,000	145,000 ✓	262,000
Corvallis, Oregon	517,000	150,000	135,000 ✓	232,000
Athens, Georgia	593,000	150,000	160,000 ✓	283,000
Ann Arbor, Michigan	525,000	150,000	...	375,000
Boston, Massachusetts	525,000	150,000	...	375,000
Narragansett, Rhode Island	650,000	150,000	100,000 ✓	400,000
Duluth, Minnesota	860,000	160,000	350,000 ✓	350,000
Total	4,480,000	1,155,000	950,000	2,375,000

(3) Repairs and improvements.....\$400,000

Installation of special laboratory facilities, additional storage facilities, and miscellaneous improvements including paving of parking areas and roads, landscaping, and installation of additional sidewalks at College, Alaska; Ada, Oklahoma and Corvallis, Oregon. Included in these funds is \$100,000 to complete the improvement of a climatic chamber at the Athens, Georgia laboratory. These chambers are an essential part of the Athens laboratory and are vital not only to the research program at Athens but also to the national research effort since this is the only laboratory now planned to have this capability. In 1966 funds were reprogrammed to complete the energetics model room. These funds will permit completing the ecological system room and thereby provide the total operational needs for controlled environmental chambers. Also included is \$165,000 for deficiencies at the Sanitary Engineering Center, Cincinnati, Ohio in the main laboratory building air conditioning system, replacement of basement corridor floor tile, installation of a flag pole, correction of site drainage problems, replacement and/or resurfacing of sidewalk and paved areas, and improvement of the video communication system used for training purposes.

Corvallis 2500
Ada 2500
Athens 153000

Sec 100
Athens 100
College 200
Boston 200
Duluth 350
Narragansett 100
Rhode Island 100

WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS LABORATORIES

Cost Estimates through 1967 ^{a/}

Location	Planned Personnel Strength	Sq. Feet	Planning Costs	Construction Cost	Portable Equipment Cost	Total Cost	Estimated Completion Date
<u>Water Pollution Control</u>							
College, Alaska	62	25,000	\$158,000	\$2,436,155	\$253,000	\$2,847,155	December 1965
Ada, Oklahoma	150	50,000	162,327	2,015,205	557,000	2,734,532	February 1966
Corvallis, Oregon	150	50,000	157,673	2,274,999	517,000	2,949,672	April 1966
Athens, Georgia	150	50,000	181,000	2,569,501	593,000	3,343,501	March 1966
Boston, Massachusetts	150	50,000	160,000	2,350,000	525,000	3,035,000	September 1967
Ann Arbor, Michigan	150	50,000	160,000	2,350,000	525,000	3,035,000	September 1967
Baltimore, Maryland	150	50,000	160,000	.....	.....	160,000	1969
Columbia, Missouri	...	.....	160,000	.....	.....	160,000	1969
Vicksburg-Jackson, Miss.	..	.....	160,000	.....	.....	160,000	1969
Stevens Point, Wisconsin	..	.....	160,000	.....	.....	160,000	1969
<u>Water Quality Standards</u>							
Narragansett, Rhode Island	102	35,000	.....	1,846,140	650,000	2,496,140	1968
Duluth, Minnesota	133	44,000	.....	2,284,000	860,000	3,144,000	March 1967
Total Estimate			1,619,000	18,126,000	4,480,000	24,225,000	
Available			1,619,000	17,126,000	1,155,000	19,900,000	
Balance			.....	1,000,000	3,325,000	4,325,000	
New obligational authority requested for 1967			.....	1,000,000	950,000	1,950,000	
Appropriation required future years			.....	.....	2,375,000	2,375,000	^{b/}

^{a/} Excludes repairs and improvements.

^{b/} Excludes construction and equipment requirements for the facilities being planned for at Baltimore, Maryland; Columbia, Missouri; Vicksburg-Jackson, Mississippi; and Stevens Point, Wisconsin.

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2. Facilities for field evaluation of advanced waste treatment

1967 appropriation estimate.....\$1,000,000

Rapid population and industrial growth, coupled with changing technologies and land practices, has resulted in a large increase in the amount, kinds, and complexity of pollutants requiring treatment before discharge to the Nation's watercourses.

Existing treatment technology is rapidly proving inadequate to deal with the mass and complexity of today's pollution. These processes, once inappropriately described as providing "complete" treatment, actually remove only 40-60 percent of all the pollutants present (principally those pollutants which can be separated physically by screening and settling, and by biological degradation). Many of the new organic chemical pollutants pass through the treatment process unchanged or relatively so. Biological processes oxidize nitrogen and phosphorous compounds into readily available plant nutrients which are causing major algal and associated pollution problems in down-stream waters.

The Nation has already entered the water reuse phase but increasing needs will require multiple reuse of the same waters, particularly in the water-short Southwest and Southwest-Pacific areas and in the highly populated and industrialized areas of the Midwest, Northeast, and Middle Atlantic.

Multiple reuse of water will not be possible unless much more effective and efficient waste treatment processes are developed than those available now. These will need to be basically new processes, probably utilizing chemical and physical techniques.

The objective of the Advanced Waste Treatment Program is to develop these new treatment processes. More broadly, the goal is to develop a new arsenal of treatment tools which will permit the reuse of water through a range of processes. These processes range from recharge of ground waters with treated waste effluents to the complete conversion of waste waters for deliberate recirculation in municipal or industrial water systems.

As new treatment processes are developed, they must, of necessity, be operated in the field through construction of field evaluation plants of a size sufficient to allow final development and assessment under full or nearly full-scale conditions. It is only after such field evaluation units are constructed and operated that the necessary costs, performance, and engineering design data become available for subsequent use by the general public.

In 1966, \$1,000,000 was appropriated under "Buildings and Facilities, Public Health Service" for the construction of a field evaluation plant for the granular carbon adsorption treatment system. In 1967, it is proposed that a second advanced waste treatment system be constructed for field evaluation purposes. The second system to be evaluated will be a demineralization process which will provide for the removal of dissolved inorganics. As in the case of our current field evaluation plant, a board of technical consultants will be established to make recommendations on site selection for the facility. The basis for this selection will include the cooperation that can be obtained from the community and the interest and need in the community for pollution control and for waste water purification and reuse. The field evaluation facility will be located adjacent to or may become part of an existing municipal waste treatment plant.

In 1967, \$1,000,000 is requested to finance the design and construction costs of this experimental field evaluation plant.

3. Facilities for demonstrating control of acid mine drainage

1967 appropriation estimate.....\$1,274,000

To carry out the demonstration program, Congress appropriated a total of \$5,049,000 in 1965 and 1966 under the appropriation "Water Supply and Water Pollution Control." \$3,296,000 of the amount appropriated was for the actual construction of the various control measures necessary. The \$5,049,000 provided for the planning and partial or complete construction of control measures at six sites, one in West Virginia, three in Pennsylvania, one in Maryland, and one in Kentucky. Contracts for all construction activity at the West Virginia site will have been negotiated by the end of 1966, and work at the other 5 sites will be in various stages of development. The 1967 funds requested will support the construction of partial or complete control measures at these remaining 5 sites.

In 1965, due to delays in getting landowners' permission to construct the control measures being proposed, it was necessary to get Congress to extend the availability of \$820,000, appropriated for 1965 to June 30, 1966. It has now become apparent that the funds for the actual construction of control measures cannot all be obligated in 1966. This is due primarily to:

- (a) time involved in getting permission from landowners where applicable,
- (b) planning and setting up specification for each site; and
- (c) negotiating contracts.

Therefore, it is proposed as follows:

(1) that the unobligated balance, as of June 30, 1966, of funds made available under "Water Supply and Water Pollution Control" appropriation for the actual construction continue to be made available in 1967 and be transferred and merged with this account. This is estimated to be \$1,426,000.

(2) all other needs for constructing control measures are requested under this appropriation. These actions will eliminate the need for requesting extensions and transfers. Funds for the direct operations activities (such as program planning, monitoring, evaluating effectiveness, etc.) by both the Departments of Health, Education, and Welfare, and of Interior will continue to be requested under the appropriation "Water Supply and Water Pollution Control."

The 1967 request of \$1,274,000 is to complete construction activity at one site, continue on three others, and initiate activity at another. \$1,676,000 is also being requested in 1967 under the appropriation "Water Supply and Water Pollution Control" for the cost of direct operation activity of the two Departments.

The construction activity planned for six sites is as follows:

<u>Sites</u>	<u>Total Estimate</u>	1966 ^{a/} <u>Available</u>	1966 ^{a/} <u>Obligation</u>	1966 ^{b/} <u>Unobligated Balance</u>	1967 <u>NOA</u>	1967 <u>Obligation</u>	<u>Required to Complete</u>
1. Elkins, W. Va.	\$1,470,000	\$1,470,000	\$1,470,000	\$.....	\$.....	\$.....	\$.....
2. Mocanaqua, Pa.	1,550,000	896,000	400,000	496,000	654,000	1,150,000	.....
3. Western Pennsylvania	1,100,000	300,000	.....	300,000	200,000	500,000	600,000
4. Central Pennsylvania	1,150,000	300,000	.....	300,000	200,000	500,000	650,000
5. Maryland	1,126,000	330,000	.....	330,000	50,000	380,000	746,000
6. Kentucky	<u>965,000</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>170,000</u>	<u>170,000</u>	<u>795,000</u>
Total	7,361,000	3,296,000	1,870,000	1,426,000	1,274,000	2,700,000	2,791,000

^{a/} Available and obligated under the appropriation "Water Supply and Water Pollution Control."

^{b/} Proposed to be transferred and merged with this account from the "Water Supply and Water Pollution Control" appropriation.

No estimates included for four new sites proposed to be selected in 1967--Tennessee, Indiana, Ohio and West Virginia.

In 1964, the Department of Health, Education, and Welfare and the Department of Interior started a joint program to demonstrate methods for abating and controlling acid drainage pollution from mines. This pollution is destroying fisheries and recreational values, creating unsightly esthetic conditions, making water treatment more costly and discouraging new industry in affected areas. Results from the demonstration program will provide the information needed to institute a general acid mine drainage control program.

The demonstration program includes 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; these being activities regularly done as part of reclamation of areas disturbed by mining. It further includes the collection of data on the amount of work and the costs involved in various phases of the work to aid in evaluation of the various measures tried.

Water Supply and Water Pollution Control

Federal Water Pollution Control Administration

Water Supply and Water Pollution Control

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Appropriation Estimate

WATER SUPPLY AND WATER POLLUTION CONTROL

[To carry out sections 301, 311, and 361 of the Act with respect to water supply and water pollution control, and to carry out the Federal Water Pollution Control Act, as amended (33 U.S.C. 466-466d, 466f-466k), \$44,514,000, including \$4,700,000 for grants to States and \$300,000 for grants to interstate agencies under section 5 of the Federal Water Pollution Control Act, as amended.]

[For an additional amount for "Water supply and water pollution control", \$628,000.]

For expenses necessary to carry out the Federal Water Pollution Control Act, as amended, and other related activities, including \$4,700,000 for grants to States and \$300,000 for grants to interstate agencies under section 7 of such Act, \$55,439,000: Provided, That the unobligated balance of funds appropriated under this head in the Department of Health, Education, and Welfare Appropriation Act, 1966, for constructing acid mine drainage control measures, shall remain available during the current fiscal year and shall be transferred to the appropriation for "Buildings and facilities." (Department of Health, Education, and Welfare Appropriation Act, 1966; Supplemental Appropriation Act, 1966.)

Note: Excludes \$1,282 thousand for activities transferred in the estimate as follows (in thousands of dollars):

"Buildings and facilities," Federal Water Pollution Control Administration.....	\$1,274
"Office of General Counsel, salaries and expenses".....	8
The amounts obligated in 1965 and 1966 are shown in the schedule as comparative transfers.	
Excludes \$58 thousand for activities transferred to:	
"Public Buildings Service, operating expenses," General Services Administration.....	48
"Office of Surgeon General, salaries and expenses," Public Health Service.....	10

Appropriation Language Change

The change provides language consistent with the establishment of a new Federal Water Pollution Control Administration as directed by Congress in passing the Water Quality Act of 1965. Additional language is provided for reappropriating the unobligated balance of funds appropriated in 1966 for constructing acid mine drainage control measures. This amount is estimated to be \$1,426,000. In 1966 \$3,296,000, including \$820,000 brought forward from 1965 by act of Congress, is available. It has now become apparent that all of these funds cannot be obligated in 1966. This is due primarily to 1) time involved in getting permission from landowners, 2) planning and setting up specifications for each site, and 3) negotiating contracts. Therefore, to enable these funds to be available as intended, it is proposed that they be reappropriated. Furthermore, to avoid this problem in the future, it also is proposed that they be permitted to be transferred to the "Buildings and facilities" appropriation which includes new proposals for obligational authority in 1967 for this purpose, and which provides that all funds appropriated under that heading for construction activity be available until expended.

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Water Supply and Water Pollution Control

Amounts Available for Obligation

	<u>1966</u>	<u>1967</u>
Appropriation.....	\$45,142,000	\$55,439,000
Comparative transfer to "Salaries and Expenses, Office of the General Counsel".	-8,000	...
Comparative transfer to "Buildings and Facilities, Federal Water Pollution Control Administration".....	-1,870,000 W	...
Transferred to "Operating Expenses, Public Buildings Service," General Services Administration (76 Stat. 728)(-).	-48,470 ✓	...
Transferred to "Salaries and Expenses, Office of Surgeon General".....	-10,000 ✓	...
Unobligated balance available start of year	820,000 W	1,426,000
Unobligated balance transferred to "Buildings and Facilities, Federal Water Pollution Control Administration".....	...	-1,426,000
Unobligated balance available end of year..	<u>-1,426,000</u>	<u>...</u>
Total.....	42,599,530	55,439,000

Obligations by Activity

Page Ref.		1966		1967		Increase or Decrease	
		Pos.	Amount	Pos.	Amount	Pos.	Amount
	Grants:		\$16,420,000		\$18,062,000		+\$1,642,000
35	Research.....		6,045,000		6,470,000		+425,000
36	Fellowship....		710,000		633,000		-77,000
37	Training.....		2,500,000		2,910,000		+410,000
38	Demonstration.		2,165,000		3,049,000		+884,000
39	Control program		5,000,000		5,000,000		...
	Direct						
	Operations:	2,187	26,179,530	2,834	37,377,000	+647	+11,197,470
43	Comprehensive.	544	7,049,760	801	10,911,000	+257	+3,861,240
59	Enforcement...	368	3,675,000	416	4,534,000	+48	+859,000
65	Research, training, and technical services.....	982	10,957,670	1,155	16,993,000	+173	+6,035,330
92	Construction grants and facilities demonstration services.....	189	1,723,000	210	2,236,000	+21	+513,000
95	Executive direction and management support.....	104	2,774,100	252	2,703,000	+148	-71,100
	Total obligations	2,187	42,599,530	2,834	55,439,000	+647	+12,839,470

Obligations by Object

	1966 Estimate	1967 Estimate	Increase or Decrease
Total number of permanent positions..	2,187	2,834	+647
Full-time equivalent of all other positions.....	93	118	+25
Average number of all employees.....	1,685	2,564	+879
<hr/>			
11 Personnel compensation:			
Permanent positions.....	\$13,356,365	\$21,187,000	+\$7,830,635
Positions other than permanent...	460,000	587,000	+127,000
Other personnel compensation.....	125,870	165,000	+39,130
Total personnel compensation....	13,942,235	21,939,000	+7,996,765
12 Personnel benefits.....	1,607,920	1,797,000	+189,080
21 Travel and transportation of persons.....	1,504,920	1,990,000	+485,080
22 Transportation of things.....	346,000	518,000	+172,000
23 Rent, communication, and utilities.....	1,021,790	1,863,000	+841,210
24 Printing and reproduction.....	305,000	361,000	+56,000
25 Other services.....	1,699,925	2,228,000	+528,075
Project contracts.....	1,000,000	2,100,000	+1,100,000
Services of other agencies.....	961,000	1,433,000	+472,000
Payment to:			
Bureau of State Services management fund.....	1,441,000	.....	-1,441,000
National Institutes of Health management fund.....	54,000	72,000	+18,000
26 Supplies and materials.....	1,130,440	1,514,000	+383,560
31 Equipment.....	1,064,300	1,461,000	+396,700
32 Lands and structures.....	100,000	100,000	.....
41 Grants, subsidies, and contributions.....	16,420,000	18,062,000	+1,642,000
42 Insurance claims and indemnities.....	1,000	1,000	.....
Total obligations.....	42,599,530	55,439,000	+12,839,470

Summary of Changes

1966 enacted appropriation.....	\$45,142,000
Comparative transfer to:	
"Salaries and expenses, Office of General Counsel", Office of the Secretary.....	-8,000
"Buildings and facilities", Federal Water Pollution Control Administration.....	-1,870,000
Transferred to:	
"Salaries and expenses, Office of Surgeon General", Public Health Service.....	-10,000
"Operating expenses, Public Buildings Service", General Services Administration (76 Stat. 728).....	-48,470
Unobligated balance, start of year.....	+820,000
Unobligated balance, end of year (proposed to be transferred to "Buildings and facilities", Federal Water Pollution Control Administration).....	-1,426,000
1966 total estimated obligations.....	42,599,530
1967 estimated obligations.....	55,439,000
Total change.....	+12,839,470

Increases

Mandatory:

1. Increased pay costs:	
Commissioned officers.....	\$201,000
Civil service.....	247,000
2. Annualization of 593 new positions authorized in 1966 for part of year.....	4,662,800
3. Annualization of 232 positions authorized in 1965 and left vacant in 1966 for 50% of the year.....	812,070
4. Full-year cost of rental space to be occupied in 1966.	96,000
Subtotal, mandatory increases.....	6,018,870

Program:

1. Research grants.....	425,000
2. Training grants.....	410,000
3. Demonstration grants.....	884,000
4. Comprehensive program (281 positions).....	3,465,000
5. Enforcement activities (105 positions).....	836,000
6. Water pollution control and water quality standards laboratory activities (123 positions).....	540,000
7. Research contracts--advanced waste treatment.....	1,000,000
8. Instrumentation, laboratory quality control and data operation control (14 positions).....	137,000

Summary of Changes--continued

9. Special technical assistance, studies and demonstration projects (45 positions).....	831,420
10. Demonstration of acid mine drainage control (9 positions).....	358,000
11. Federal installations activity (28 positions).....	230,000
12. Training (12 positions).....	126,000
13. Service research grants-NIH.....	18,000
14. Construction grants and facilities demonstration services (21 positions).....	<u>139,000</u>
Subtotal, program increases.....	9,399,420
Gross increases.....	15,418,290

Decreases

1. Fellowship grants.....	-77,000
2. Phase outs of comprehensive projects (-24 positions)..	-393,700
3. Phase outs of enforcement projects (-57 positions)....	-506,000
4. Phase outs of technical assistance projects (-58 positions).....	-568,920
5. Nonrecurring equipment, headquarters moving costs, etc.	<u>-1,033,200</u>
Subtotal, decreases.....	-2,578,820
Total net change requested.....	<u><u>12,839,470</u></u>

Explanation of ChangesResearch grants

\$425,000 is requested to provide for the cost of continuing 155 grants awarded in prior years. A total of \$6,470,000 will support 255 grants including 100 new projects.

Training grants

\$410,000 is to provide for the added cost of financing 64 continuation grants awarded in prior years. A total of \$2,910,000 will support 71 grants including 7 new projects the same number as 1966.

Demonstration grants

\$884,000 is required to finance the cost of 40 grants awarded in prior years. A total of \$3,049,000 will support 70 projects including 30 new ones which is the same number estimated for 1966.

Comprehensive program

The program increase of 281 positions and \$3,465,000 will provide for the initiation of comprehensive development phase in four new major river basins--New England, Lower Mississippi, Upper Mississippi, and Florida-Puerto Rico; planned expansion of projects initiated in prior years--Chesapeake Bay-Susquehanna, Ohio, Southeastern, Hudson-Champlain, Central Pacific and Missouri. Additional funds are requested to start implementing the management phase activities in areas where the development phase has been completed or about completed. The 1967 estimate for this activity is designed towards having the development phase of all major river basins of the country completed by 1972.

Enforcement

The increase of 105 positions and \$836,000 is to provide for expanding efforts to identify and evaluate interstate pollution areas, provide for implementing and carrying out the responsibilities of the "Water Quality Act of 1965" which provided that water quality standards will be established and also provides for initiation on a limited basis several major investigatory projects that are anticipated to arise from enforcement conferences or actions.

Water pollution control and water quality standards laboratory activities

The \$540,000 will finance 123 positions proposed for research, technical assistance and training activities in two water pollution control laboratories (Boston, Massachusetts and Ann Arbor, Michigan) and research activities in the two national water quality standards laboratories (Duluth, Minnesota and Narragansett, Rhode Island). The proposal includes 30 positions for Boston (15) and Ann Arbor (15) thereby providing a nucleus staff of 20 each by the end of 1967 to program activities in anticipation of these facilities being completed early in 1968. The additional 93 is for furthering the establishment and conduct of water quality standards research activities to be conducted at Duluth, Minnesota (72) for fresh water and Narragansett, Rhode Island (21) for salt water. This increase will provide for a total of 100 positions or 75% of the planned strength for Duluth and 71 positions or 70% for Narragansett's strength.

Research contracts-advanced waste treatment

A total of \$1,000,000 is requested for supporting research through contracts. In addition to the in-house research effort, research contracts are used to develop specific information, generally in conjunction with some in-house program. The principal use in this area has been in connection with advanced waste treatment research. Research in this area is considered to be of the highest priority in terms of total national needs for water

research. In 1967 contracts are proposed in such areas as nutrient removal, regeneration of powered carbon, reverse osmosis, and others. Major efforts will be directed towards projects relating to waste water purification and reuse. These funds are anticipated to support 20 such contracts.

Instrumentation, laboratory quality control and data operation control

\$137,000 and 14 positions is requested to accelerate equipment development; to meet post-enforcement and water quality management activities; establish a national laboratory quality control program to assure accuracy and comparability of analytical results coming out of all the Administration's laboratories and provide for expanding data storage and retrieval system which provides consultation regarding methodology and technical guidance to major field activities and the monitoring systems employed in water quality management.

Special technical assistance, studies and demonstration projects

A total of 45 positions and \$831,420 is requested to (1) further the objectives in recreation and water quality studies, particularly in the Pearl River (Mississippi) area and in several arid and semi-arid southwest areas to attain wider engineering, economic and social acceptance of water reclamation for recreational purposes; (2) provide expansion for the Klamath Basin study with special attention given to effects of pesticides and other contaminants from agricultural land drainage and study solutions to the algal nuisance problem; (3) initiate a study of Tampa Bay to determine the effect of water quality if hurricane barriers are erected; (4) initiate a project in the San Joaquin Valley to demonstrate techniques for the reclamation of irrigation waters.

Demonstration of acid mine drainage control

The proposed increase of 9 positions and \$358,000 will provide for planning four additional demonstration sites to be located in Ohio, Tennessee, West Virginia and Indiana, thus providing a total of 10 sites which will be in some stage of development for demonstrating acid mine drainage control measures. Also included in this request are funds to initiate a national inventory of acid pollution to identify all sources. Extent of problem must be fully known before any comprehensive national acid pollution control program can be instituted. The total program is a joint HEW-Interior effort.

Federal installation activity

An increase of 12 positions and \$230,000 is requested to meet the increased workload anticipated in carrying out the responsibility of

providing technical assistance and advice to all Federal agencies concerning prevention, control, and abatement of pollution from Federal installations as provided by an Executive Order. The Order is specifically directed toward cleaning up pollution from Federal installations.

Training

The increase of 12 positions and \$126 000 is proposed to add one person at headquarters for strengthening the national coordination activity in the technical training area and 11 positions to further provide advanced training at the graduate level with emphasis to be given on encouraging the development of skills in highly specialized areas of science and engineering in short supply.

Service research grants - NIH

An additional \$18,000 is requested to reimburse National Institutes of Health for servicing research grants in 1967.

Construction grants and facilities demonstration services

This additional \$139,000 and 21 positions is to meet the increased workload in 1967 generated by the additional \$30 million provided in 1966 for grants to construct waste treatment plants as provided by the Water Quality Act of 1965 and to service the increased workload anticipated from the additional grant funds for waste treatment works construction being requested in 1967.

Annualization of 232 positions authorized in 1965 left vacant in 1966 for 50% of the year

The "Water Quality Act of 1965" provided for the establishment of a Federal Water Pollution Control Administration and included provision for the conversion of Public Health Service Commissioned Officers to Civil Service. To obviate subsequent employment conversions, recruitment of Commissioned Officers was discontinued. Vacant Commissioned Officer billets were reprogrammed to equivalent general schedule (classified) positions. This change increased costs of personnel compensation and benefits by about \$147,000.

The establishment and staffing of seven regional field laboratories and two national water quality standards laboratories created a need for considerable number of upper level grade scientific and engineering skills essential to the conduct of our accelerated research effort. Fifty percent of the total staff of the water pollution laboratories and all of the water quality standards laboratories are directly related to the research effort. In other areas such as enforcement, technical

assistance and comprehensive programs which were also expanding, particularly in terms of the number of field projects, the requirements for top level competencies became apparent. The 1966 estimate generally recognizes these needs at an increased cost of about \$637,000.

The total cost of these proposals was \$784,000. Since the program entered the fiscal year with 232 vacancies and recruitment was lagging, savings from these positions are being used to meet this need. However, in 1967 it is proposed that these funds be made available to permit fuller employment. The 1967 estimate provides for a 7.2% lapse on all positions authorized in 1966 and prior years. Provision of the \$812,070 will prevent an excessively high rate of 11.3% lapse which would certainly have an impact on the program.

Explanation of Transfers

	<u>1966</u> <u>Estimate</u>	<u>1967</u> <u>Estimate</u>	<u>Purpose</u>
<u>Transfers to:</u>			
"Operating expenses, Public Buildings Services," General Services Administration	\$48,470	...	Transfer funds for leased space.
"Salaries and expenses, Office of Surgeon General," Public Health Service	10,000	...	Transfer to provide for consolidation of activities under Office of Surgeon General previously financed by other parts of Service. Activities include: internal audit, civil rights investigations, and publication of PHS World.
"Buildings and facilities," Federal Water Pollution Control Administration	... \$1,426,000		To transfer unobligated balance to "Buildings and facilities," Federal Water Pollution Control Administration, construction costs for acid mine drainage activities. (Appropriation act proposed.)
<u>Comparative transfers to:</u>			
"Salaries and expenses, Office of General Counsel"	8,000	...	To transfer to Office of General Counsel, Office of the Secretary, one position and funds included in 1966 supplemental for legal services.
"Buildings and facilities," Federal Water Pollution Control Administration	1,870,000	...	Transfer to "Buildings and facilities," Federal Water Pollution Control Administration construction costs for acid mine drainage activities.

Significant items in House and Senate
Appropriations Committee Reports

<u>Item</u>	<u>Action taken or to be taken</u>
<u>966 House Report</u>	
<p>1. The Committee added \$1,000,000 for demonstration grants. It emphasized its concern regarding the funding level of this activity since the 1966 budget proposal did not provide any funds for new grants. The Committee stated it has had called to its attention many projects which appeared worth while, particularly those aimed at making waste water safe for reuse and projects aimed at overcoming the serious problem existing in many larger cities whose single systems serves both as a sanitary sewer and storm sewer. Therefore, it added these funds so that projects such as these could be funded.</p> <p>2. An additional \$300,000 was authorized for staffing Ada, Corvallis and Athens, Georgia laboratories at about 75% of the proposed strength of these facilities. The Committee felt that there would be an undesirable delay in getting these laboratories into full operation.</p>	<p>1. Action has been taken to give priority to demonstration grant projects being proposed to those which primarily fall in the area mentioned by the Committee. In the first half of 1966 demonstration grants awards included 18 grants for waste water reuse projects and 5 grants for control of pollution from combined sewer systems. Eight of these are new and financed by the additional \$1,000,000 provided by Congress.</p> <p>2. Appropriate action was taken to carry out Congressional intent. However, recently due to the need for reprogramming resources to carry out an accelerated Federal Pollution control program for all installations as provided for by a Presidential Executive Order, it has been necessary to reduce 1966 staffing plans of these facilities to about 66-2/3% of the proposed staffing strength. This action still provides 12% more staff than had been requested in the Presidents budget for 1966.</p>

Water Supply and Water Pollution Control

	<u>Budget Estimate to Congress</u>	<u>House Allowance</u>	<u>Senate Allowance</u>	<u>Appropriation</u>
1962	\$20,628,000✓	\$20,028,000	\$20,628,000	\$20,328,000✓
1963	23,607,000✓	24,607,000	25,407,000	24,707,000✓
1964	30,110,000✓	28,010,000	30,069,000	29,069,000✓
1965	37,027,000✓	34,356,000	35,471,000	35,126,000✓
1966	41,229,000✓	44,514,000	45,142,000	45,142,000✓
1967	55,439,000			

Water Supply and Water Pollution Control

	<u>Estimate to Bureau of Budget</u>	<u>Budget Estimate to Congress</u>	<u>House Allowance</u>	<u>Senate Allowance</u>	<u>Appropriation</u>
1962	\$25,422,000	\$20,628,000	\$20,028,000	\$20,628,000	\$20,328,000
1963	30,776,000	23,607,000	24,607,000	25,407,000	24,707,000
1964	32,870,000	30,110,000	28,010,000	30,069,000	29,069,000
1965	40,677,000	37,027,000	34,356,000	35,471,000	35,126,000
1966	46,466,000	41,229,000	44,514,000	45,142,000	45,142,000
1967	60,720,000	55,439,000			

GrantsA. Research

	1966 Estimate		1967 Estimate		Increase or Decrease	
	No.	Amount	No.	Amount	No.	Amount
Noncompeting continuations	157	\$3,416,000	155	\$3,841,000	-2	+\$425,000
New grants	112	2,529,000	100	2,529,000	-12	.....
Supplementals	(13)	100,000	(13)	100,000	..	.....
Total research grants	269	6,045,000	255	6,470,000	-14	+\$425,000

The research grant program is an effective mechanism for stimulating needed research to help solve diversified and complex water pollution control problems. It is an extramural program involving investigations primarily in colleges and universities since these institutions are the principal source of research manpower and possess the facilities requisite for research. Recipients can also be from any public or nonprofit agency or institution. A basic objective of this program is to develop a nationwide competence in research relating to pollution among the many scientific fields involved, and to support scientists conducting research on neglected aspects of the problem.

In 1965, grants were awarded to 100 institutions and agencies in 42 States, the District of Columbia, and 4 foreign countries. A total of 876 professional staff and graduate students were engaged in the 242 research projects supported by these grants. The wide variety of personnel involved includes 7 fields in engineering, 19 disciplines in physical sciences, 24 in biological sciences, and 4 in social sciences.

Examples of new investigations include: Stanford University--pesticide distribution and degradation in waterways; University of Rhode Island--the effects of pollution on benthic marine plant communities; University of Texas--effect of toxic organics on waste stabilization; University of Washington--estuarine ecology as related to water pollution.

The budget for 1966 and 1967 reflects the application of the newly authorized cost sharing arrangements to competing research grant projects (new and renewal). This cost sharing plan considers the full indirect cost of the research project in arriving at the Federal and non-Federal share. For continuation of previously approved projects the earlier limitation of 20 percent or less for indirect cost is applied with an assurance of some sponsor cost participation.

In 1967, \$6,470,00 is requested to support continuation costs of 155 active grants and 100 new water pollution control research projects.

B. Fellowships

	1966 Estimate		1967 Estimate		Increase or Decrease	
	No.	Amount	No.	Amount	No.	Amount
Continuations	75	\$466,000	63	\$389,000	-12	-\$77,000
New awards	39	244,000	39	244,000	..	....
Total	114	710,000	102	633,000	-12	-77,000

The purpose of the research fellowship program is to assist in meeting the need for highly trained scientists and engineers qualified to conduct independent research in the broad field of water pollution control. Research fellowship awards support the specialized training of a professional manpower resource to complement the research grant and training grant programs in this field. Research fellowships are awarded to individual scientists and engineers for graduate and postgraduate research training at educational institutions of their choice.

In 1965 research fellowships were awarded to 101 individuals at 51 institutions in 28 states and 4 foreign countries. The need for specialized training is demonstrated by the growing number of applications for fellowship awards. The quality of applications has been high, with 78 percent of all applications being recommended for support.

During 1965, graduate degrees were received by 29 individuals supported by this program. These individuals were immediately employed in the following areas: sixteen in research and teaching positions, six in government agencies, five in industry and consulting, and two in continuing education.

Examples of new research fellowship studies are: Colorado State University--water resources management; State University of Iowa--virus movement through porous media; Ohio State University--law in the field of water quality and water resources; Oklahoma State University--primary productivity of a stream receiving oil refinery effluents; and Virginia Polytechnic Institute--coagulation of waste streams with solvents.

The request of \$633,000 for 1967 will support 102 fellowship awards, of which 39 will be new and 63 continuations.

C. Training grants

	1966 Estimate		1967 Estimate		Increase or Decrease	
	No.	Amount	No.	Amount	No.	Amount
Continuations	57	\$2,129,000	64	\$2,539,000	+7	+\$410,000
New grants	7	271,000	7	271,000	...	...
Supplementals	(6)	100,000	(6)	100,000	...	...
Total training grants	64	2,500,000	71	2,910,000	+7	+\$410,000

The purpose of the training grant program is to develop the potential of educational institutions for specialized training of engineers and scientists in areas of water pollution control. Training grants are awarded to colleges and universities for establishing or expanding graduate level training programs. These grants normally provide for development of a five-year program including support of faculties and stipends for students.

In 1965, training grants were awarded to 42 educational institutions in 32 states. Examples of new training programs supported in 1965 are: water pollution control specialist training at the University of Arkansas; water quality and quantity engineering at the University of Massachusetts; research training in the aquatic environment at the University of Cincinnati; water resources and sanitary engineering at South Dakota State University.

During 1965, students receiving graduate degrees under this program were employed in the following important areas: seven in research and teaching positions, twenty-four in government agencies, eleven in industry and consulting, and eight in continuing education.

Training grants were also awarded to support a program of summer institutes for graduate level training. This program has been an effective means of communicating new research information, techniques, methodology, design parameters etc. to the many levels of professionals engaged in the water pollution control activity. In 1965, two summer institute grants were awarded - one at Manhattan College, New York and the other at Clemson University, South Carolina.

The table below indicates the number of professionals receiving full or part-time support and total number of graduate students supported or anticipated to be supported in training grant programs for 1965, 1966, and 1967.

	1965 Actual	1966 Estimate	1967 Estimate
Professional Staff (full or part-time support)	84	108	119
Graduate Students	291	335	375

In 1967, \$2,910,000 is requested to support 64 continuations, 7 new training grant projects, and provide for 6 supplemental awards.

D. Demonstration grants

	1966 Estimate		1967 Estimate		Increase or Decrease	
	No.	Amount	No.	Amount	No.	Amount
Continuations	21	\$751,000	40	\$1,635,000	+19	+\$884,000
New grants	30	1,350,000	30	1,350,000	...	...
Supplementals	(8)	64,000	(5)	64,000	(-3)	...
Total demonstration grants	51	2,165,000	70	3,049,000	+19	+884,000

Demonstration grants are awarded to support projects of an applied nature. These grants are designed to demonstrate the feasibility of new methods and to expedite incorporation of new knowledge into routine water supply and pollution control practice. Demonstration projects support a wide variety of studies, ranging from new methods to enable the reuse of waste water to methods of developing more effective participation in pollution control by local governmental officials.

Demonstration grants are available to eligible recipients from public and private nonprofit institutions and agencies. Because this program involves pilot scale or field trial investigations, many of these grants are awarded to State and local official agencies. Thus, these grants make it possible to utilize manpower, skills, and facilities not ordinarily available to demonstrate and evaluate the effectiveness of new technology. Grantees under the program normally provide matching funds.

In 1965, demonstration grants were awarded to 28 institutions and agencies in 20 states. Examples of new demonstration projects supported include: Tucson, Arizona - A waste water reclamation project; South Tahoe, California - Plant scale treatment for renovation of sewage effluent; Tulane University, Louisiana - Pilot scale project to improve sanitary sewer construction; Nassau County, New York - Waste water reclamation by underground recharge; and Oregon State University - Evaluation of new treatment methods to renovate waste water.

The requested \$3,049,000 for 1967 will support a total of 40 continuing grants projects and 30 new demonstration studies.

E. Grants for state and interstate water pollution control programs

	<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
State	\$4,700,000	\$4,700,000	....
Interstate agencies	<u>300,000</u>	<u>300,000</u>	<u>....</u>
Total	5,000,000	5,000,000	....

The Federal Water Pollution Control Act provides for active participation by state and interstate agencies in water pollution control programs. These grants to state and interstate agencies enable them to initiate or expand their activities in conducting field studies of actual and potential water pollution problems; 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.

Continued financial assistance is important to states and interstate agencies in maintaining and improving their expanded programs. The state and interstate agencies are expected to spend over \$20 million of their own funds in 1967 as compared to about \$12 million in 1962.

This request is for \$5,000,000, the full amount authorized by the Federal Water Pollution Control Act, as amended. It includes \$4,700,000 for states and \$300,000 for interstate agencies. The tables showing allocations by states and interstate agencies follow:

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

State or Territory	1965 Allocations	1966 Allocations	1967 Allocations
Alabama	\$96,200	\$96,100	95,900
Alaska	15,400	15,500	15,400
Arizona	39,700	39,800	39,900
Arkansas	60,900	61,000	61,400
California	285,600	289,900	294,200
Colorado	45,700	45,300	45,100
Connecticut	81,400	82,200✓	83,000
Delaware	45,000	45,300	45,400
District of Columbia	47,200	47,400	47,200
Florida	125,900	125,900	125,300
Georgia	108,900	109,700	109,500
Hawaii	38,300	38,100	38,100
Idaho	26,800	26,400	26,100
Illinois	200,000	201,500	203,700
Indiana	111,700	112,000	112,500
Iowa	69,300	67,900	67,000
Kansas	54,200	53,600	53,600
Kentucky	87,100	86,500	86,600
Louisiana	93,300	93,700	93,800
Maine	36,500	36,400✓	36,200
Maryland	86,100	87,000	87,900
Massachusetts	130,300	130,700	130,800
Michigan	178,400	177,100	174,000
Minnesota	81,000	80,400	80,800
Mississippi	79,900	78,300	77,400
Missouri	94,200	93,600	94,400
Montana	24,900	24,700	24,400
Nebraska	39,600	39,400	39,500
Nevada	16,700	17,000	17,400
New Hampshire	34,300	34,600	35,000
New Jersey	145,300	147,700	149,100
New Mexico	31,900	31,400	31,300
New York	310,100	311,300	311,300
North Carolina	129,200	128,300	127,700
North Dakota	24,800	24,800	24,300

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

State or Territory	1965 Allocations	1966 Allocations	1967 Allocations
Ohio	214,900	213,700	212,700
Oklahoma	64,300	63,700	63,400
Oregon	45,900	45,600	45,800
Pennsylvania	238,300	237,700	236,200
Rhode Island	58,000	58,300	58,400
South Carolina	81,300	81,700	80,500
South Dakota	26,500	26,300	26,100
Tennessee	103,600	103,900	104,100
Texas	204,200	204,200	205,200
Utah	31,500	31,400	31,200
Vermont	25,800	26,000	25,700
Virginia	104,100	104,200	103,000
Washington	66,300	65,100	64,200
West Virginia	57,200	57,000	57,100
Wisconsin	101,900	101,300	101,300
Wyoming	17,900	17,700	17,600
Guam	40,700	40,800	40,900
Puerto Rico	101,900	100,900	101,200
Virgin Islands	<u>39,900</u>	<u>40,000</u>	<u>40,200</u>
Total	\$4,700,000	\$4,700,000	\$4,700,000

Basis for allocation:

1. \$12,000 basic grant
2. Remainder: $\left\{ \begin{array}{l} 2/3 \text{ population weighted by per capita income} \\ 1/6 \text{ population density} \\ 1/6 \text{ no. of "wet" industries} \end{array} \right.$

Made every 1

Estimated Allocations to Interstate Agencies

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Interstate Agency	1965 Allocations	1966 Allocations	1967 Allocations
New England Interstate Water Pollution Control Commission.....	\$40,500	\$40,600	\$40,600
Ohio River Valley Water Sanitation Commission.....	92,100	92,000	92,100
Delaware River Basin Commission.....	40,000	40,000	40,000
Interstate Sanitation Commission.....	65,100	65,200	65,200
Klamath River Compact Commission.....	7,500	7,500	7,500
Interstate Commission on the Potomac River Basin.....	22,300	22,300	22,200
Bi-State Development Agency.....	16,900	17,000	17,100
Tennessee River Basin Water Pollution Control.....	<u>15,600</u>	<u>15,400</u>	<u>15,300</u>
Total	300,000	300,000	300,000

Comprehensive Program

	1966 Estimate		1967 Estimate		Increase or Decrease	
	Pos.	Amount	Pos.	Amount	Pos.	Amount
Personnel compensation and benefits.....	544	\$4,165,000	801	\$6,503,000	+257	+\$2,338,000
Other expenses.....	...	2,884,760	...	4,408,000	...	+1,523,240
Total.....	544	7,049,760	801	10,911,000	+257	+3,861,240

Summary by Program

1. Basic program.....	74	850,100	75	873,000	+1	+22,900
2. Development phase:						
Chesapeake Bay-						
Susquehanna.....	51	790,600	72	1,026,000	+21	+235,400
Columbia.....	39	442,800	37	435,000	-2	-7,800
Great Lakes-						
Illinois.....	124	1,666,200	105	1,320,000	-19	-346,200
Delaware Estuary...	14	180,700	11	141,000	-3	-39,700
Ohio.....	89	1,049,660	110	1,324,000	+21	+274,340
Southeastern.....	50	675,900	57	931,000	+7	+255,100
Hudson-Champlain...	67	812,300	120	1,446,000	+53	+633,700
Central Pacific....	14	235,100	36	491,000	+22	+255,900
Missouri.....	14	237,500	35	741,000	+21	+503,500
Lower Mississippi..	...	.....	56	540,000	+56	+540,000
Upper Mississippi..	...	.....	14	270,000	+14	+270,000
New England.....	...	.....	14	270,000	+14	+270,000
Florida-Puerto Rico	...	.....	19	356,000	+19	+356,000
Subtotal, development.	462	6,090,760	686	9,291,000	+224	+3,200,240
3. Management phase:						
Arkansas-Red.....	8	108,900	9	137,000	+1	+28,100
Delaware Estuary...	...	.....	2	45,000	+2	+45,000
Columbia.....	...	.....	2	90,000	+2	+90,000
Great Lakes-						
Illinois.....	...	.....	25	385,000	+25	+385,000
Southeastern.....	...	.....	2	90,000	+2	+90,000
Subtotal, management..	8	108,900	40	747,000	+32	+638,100
Total, comprehensive program.....	544	7,049,760	801	10,911,000	+257	+3,861,240

Comprehensive program

The comprehensive water pollution control program is directed toward the development of long-range regional pollution control programs designed to provide a regulated supply of clean water, available for all legitimate uses, to the present and future population of a given geographic area. For the purpose of comprehensive program development, the Nation has been divided into 20 river basins (see map on page 46). The long-range objective is to develop a comprehensive program for each of these basins by the end of 1972, in accordance with the schedule shown on page 47. Through 1966, comprehensive program development will have been underway in 10 of the 20 river basins.

The schedule for initiating comprehensive programs in the various basins is based upon the following criteria: (1) the need to resolve critical water problems in areas where pollution has curtailed water uses; (2) the need to time the comprehensive water pollution control program with water resources planning and construction by other Federal agencies; and (3) the degree of readiness by State, interstate, and local entities to cooperate in comprehensive program development.

Comprehensive pollution control programs have been coordinated with the water resource planning of the three other major executive departments involved--Army, Agriculture, and Interior--through the mechanism of the ad hoc Water Resources Council. The 1967 request reflects the coordinated budget schedules developed by the Council. Recent establishment of a permanent Water Resources Council under the Water Resources Planning Act will assure that such coordinated scheduling is continued and strengthened.

The schedule for each comprehensive program provides for two phases of operation--the development or intensive investigation phase and the management or program implementation phase. Of the ten programs underway through 1966, the intensive phase has been completed for one--the Arkansas-Red--which is now in the management phase.

In addition to the overall scheduling for initiation of comprehensive programs in various basins, each individual program is developed, to the extent possible, in accordance with a schedule of operation developed at the initiation of the project and revised annually as necessary to reflect unforeseen changes. This schedule is based upon "critical path" analysis, and is designed to balance optimum efficiency in utilization of staff and facilities with the need to carry out various components of the overall study in a given time sequence.

The budget request for 1967 reflects two major considerations: (1) the need to continue ongoing projects in accordance with individual study schedules; (2) the need to initiate new projects in accordance with the overall long-range objective, and in accordance with the priorities described above.

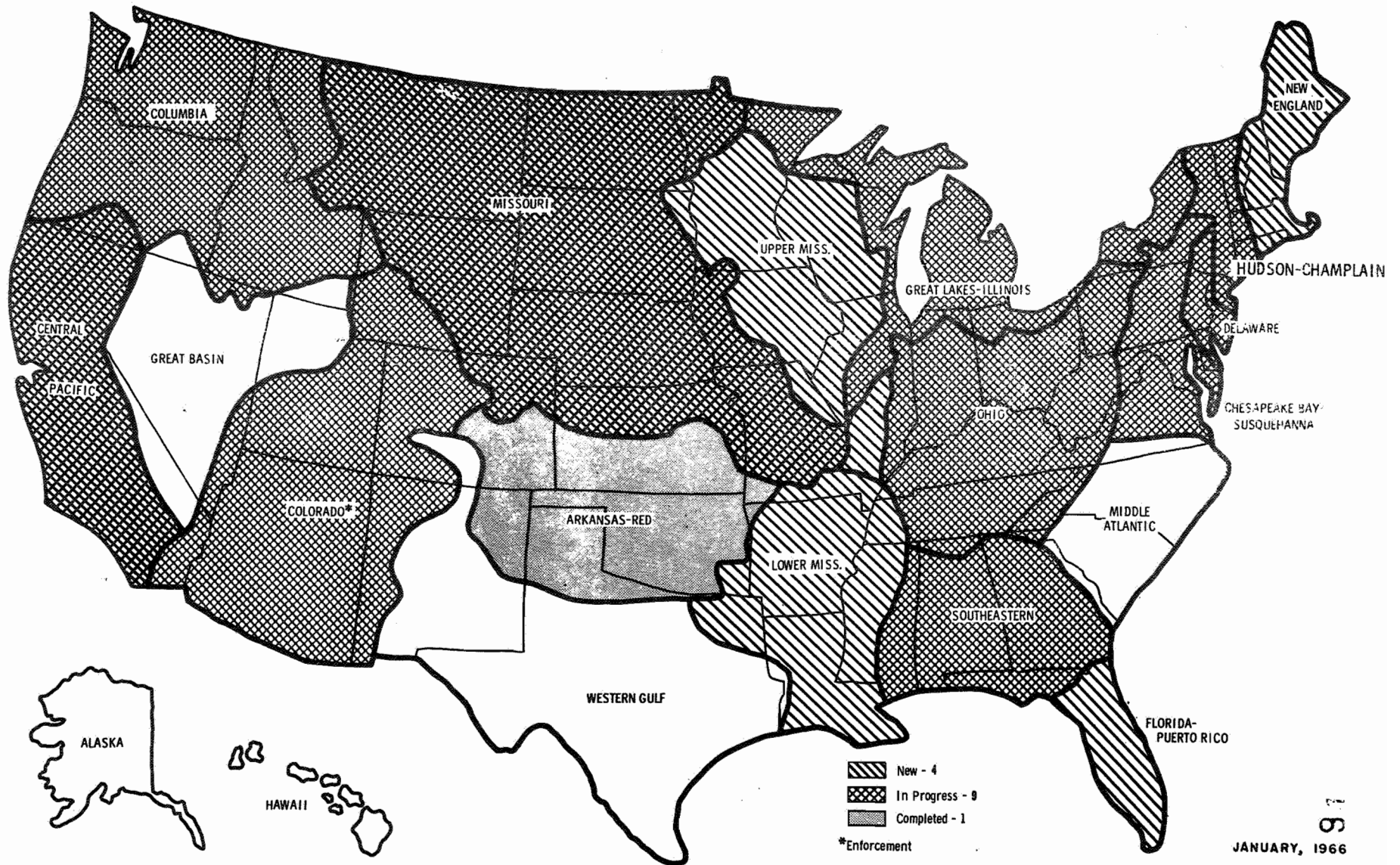
The program estimate for 1967 reflects the following: (1) modest expansion of basic program activities, (2) major development phase expansion of three existing projects--Hudson-Champlain, Central Pacific and Missouri, (3) modest development phase expansion of three projects--Chesapeake-Susquehanna, Ohio and Southeastern, (4) tapering-off of the development phase for three projects--Columbia, Great Lakes-Illinois and Delaware, (5) initiation of management phase activities of four projects--Delaware, Columbia, Great Lakes-Illinois and Southeastern, and (6) initiation of four new projects--Lower Mississippi, Upper Mississippi, New England and Florida-Puerto Rico.

The proposed program increase of 281 positions and \$3,465,000 is distributed as follows:

	<u>Pos.</u>	<u>Amount</u>
1. <u>Basic program</u>		
Program direction	1	\$8,000
2. <u>Development phase</u>		
Chesapeake Bay-Susquehanna River	21	174,000
Ohio	21	190,000
Southeastern	7	116,000
Hudson-Champlain	53	290,000
Central Pacific	22	220,000
Missouri	21	400,000
Lower Mississippi	56	540,000
Upper Mississippi	14	270,000
New England	14	270,000
Florida-Puerto Rico	<u>19</u>	<u>356,000</u>
Subtotal	248	2,826,000
3. <u>Management phase</u>		
Arkansas-Red	1	21,000
Delaware Estuary	2	45,000
Columbia River	2	90,000
Great Lakes-Illinois	25	385,000
Southeastern	<u>2</u>	<u>90,000</u>
Subtotal	<u>32</u>	<u>631,000</u>
TOTAL	281	3,465,000

COMPREHENSIVE PROGRAM DEVELOPMENT PHASE

FISCAL YEAR 1967



*Enforcement

JANUARY, 1966

COMPREHENSIVE PROGRAM

CURRENT STUDY SCHEDULE (DEVELOPMENT PHASE)

JANUARY, 1966

PROJECT AREA	FISCAL YEAR												
	60	61	62	63	64	65	66	67	68	69	70	71	72
ARKANSAS - RED													
CHESAPEAKE BAY - SUSQUEHANNA													
COLUMBIA													
GREAT LAKES - ILLINOIS													
DELAWARE													
OHIO													
SOUTHEASTERN													
HUDSON - CHAMPLAIN													
CENTRAL PACIFIC													
MISSOURI													
LOWER MISSISSIPPI													
UPPER MISSISSIPPI													
NEW ENGLAND													
FLORIDA & PUERTO RICO													
WESTERN GULF													
MIDDLE ATLANTIC													
ALASKA													
GREAT BASIN													
HAWAII													

NOTE: COLORADO RIVER BASIN STUDIED UNDER AN ENFORCEMENT ACTION

1. Basic program

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Basic program includes: (1) general direction, technical support and guidance to comprehensive projects; (2) conduct of preliminary planning in basins where comprehensive projects are not yet underway; and (3) execution of responsibilities under the Federal Water Pollution Control Act in basins where comprehensive projects are not yet underway. The Act provides for studies on streamflow regulation requirements for water quality control in connection with Federal reservoir projects.

Included in the basic program work load anticipated for 1967 is the continuation of services initiated in 1966 for the U. S. Army Corps of Engineers in connection with their responsibility for developing a water resources report under the Appalachian Regional Development Act of 1965. These services are being provided in part through the basic program and in part through those comprehensive projects having part of the Appalachian region in their area of study.

2. Development phase

A. Existing projects

(1) Chesapeake Bay-Susquehanna River Basins

In 1965, this project continued water pollution investigations within the several subbasins in its area of coverage, in accordance with the overall project schedule. In addition, it participated heavily in the work of the Interdepartmental Task Force established to develop a plan to make the Potomac basin a conservation model in accordance with the President's Message on Natural Beauty. This included completion of a working model of the Potomac estuary for prediction of pollutant and dissolved oxygen distributions, completion of a waste inventory of the Potomac basin in Maryland, and development of background information on water quality in the estuary.

During 1966 the project will complete economic and demographic projections for the Chesapeake area; complete intensive field investigations in the Susquehanna River basin and in the Potomac River estuary; complete preliminary reports on major subbasins of the Susquehanna River basin; project present and short-term water supply and pollution control requirements in the major subbasins of the Chesapeake area; and continue the development of mathematical models for the Potomac, James, York and Rappahannock Rivers. Concurrently, there will be continued emphasis on working with the Interdepartmental Task Force on the Potomac to determine what corrective actions will be required to clean up the Potomac and keep it clean. In addition, coordinated water resources planning for the Appalachian Region will be rescheduled and accelerated to meet the requirements of the U. S. Army Corps of Engineers in carrying out its responsibility under the Appalachian Regional Development Act of 1965.

The 1967 program calls for preliminary reports on the Susquehanna River Basin; completion of intensive field investigations and preliminary reports for the major subbasins of the Chesapeake area; continued application of mathematical models to estuaries and upstream segments of tributary streams in the Chesapeake area; initial planning of the management phase in the Susquehanna Basin; and the continuation of accelerated efforts related to the Appalachian Regional Development Program. By the end of 1967, investigations required for the development phase of the Chesapeake Bay-Susquehanna River Basins Project will be 75 percent complete.

(2) Columbia River Basin

The study area of this project is divided into 14 major subbasins. In 1966 efforts are being directed toward the completion of reports on five of these major subbasins: Snake River, Oregon Coast, Upper Columbia, Lower Columbia and Western Washington. Most subbasin field work and economic studies for comprehensive programs, except for special studies, will be completed by the end of 1966. Special studies will be initiated on typical reservoirs to form the basis for predicting influences of proposed reservoirs on dissolved oxygen and temperature.

A recent occurrence in the study area of this project demonstrated what could be accomplished in pollution control within the concepts of comprehensive program development. The fall salmon run, very important to commercial and sports fishermen, was seriously threatened in August 1965 by low dissolved oxygen in the Willamette River as a result of abnormally low runoff conditions in the basin. By combining the few existing water quality monitors and a mathematical model of stream quality responses to flow and pollution loads, the Columbia River Basin Project foresaw the critical quality conditions. Interested agencies were informed of the situation and of the alternate courses of action. Consensus was reached on an optimum combination of actions and on each agency's participation. Monitoring equipment and a computer were put to work together with short-range forecasts of streamflow and quality to seek day-by-day reservoir releases actually needed to maintain minimum quality to protect the fisheries over this critical period. The tight control of releases from power storage accommodated the salmon run and at the same time minimized the reduction in power revenues that would have otherwise accrued.

The second session of the Conference on the Lower Columbia River, called in September under the enforcement provisions of the Water Pollution Control Act, accelerated implementation of pollution abatement measures in this area.

The 1967 program will require a shift in emphasis toward more HEW cooperation and participation in coordinated comprehensive river basin planning, as scheduled by the Water Resources Council. Included in this participation are studies to determine municipal and industrial water

supply needs and studies to determine the extent reservoir storage for flow regulation will be needed to supplement treatment to attain water quality objectives. The Columbia River Project is involved in three such studies; the Willamette River Basin, Puget Sound Basin, and the Columbia-North Pacific Region.

(3) Great Lakes-Illinois River Basin

By the end of 1965 the program had progressed through completion of the development phase for the Illinois River Basin and Lake Michigan, including an intensive effort that provided the Department of Justice with factual data for use in the Supreme Court litigation concerning the diversion of lake waters at Chicago. Moreover, the development of a comprehensive program for the Lake Erie Basin was well on the road and initiation of the development phase had begun in Lake Huron and Lake Ontario. Project headquarters at Chicago, Illinois and field stations at Cleveland, Ohio; Rochester, New York and Grosse Ile, Michigan were in full operation.

The 1966 program provides for completion of the development phase in the Lake Erie Basin and continuation of this phase in the Lake Ontario and Lake Huron basins. The 1967 program provides for initiation of work in the Lake Superior basin and completion of the development phase for the basins of Lake Ontario and Lake Huron. Effective in 1967 the management phase will begin in basins where the development phase has been completed.

In certain enforcement conference areas, the project will be required in 1966 and 1967, as in the past, to review abatement schedules, propose municipal and industrial waste treatment, and to furnish assistance in support of enforcement undertakings. The project also has been directed to assist the Corps of Engineers in the problems of disposal of dredgings and other waste materials from navigation projects in the Great Lakes.

Enforcement actions such as those in the Calumet area (March 1965), Lake Erie (August 1965), and the Detroit River and Michigan waters of Lake Erie (June 1965) support comprehensive programs by focusing the attention of the public as well as responsible state and local water pollution control administrators on the major problems. The agreements and scheduled actions resulting from such conferences become important mile posts in the development of the program. Water quality deterioration caused by eutrophication, combined sewer discharges, channel dredging for navigational purposes, land run-off, diversion of water from the lakes and wastes and flood waters away from the lakes (all highlighted by recent enforcement conferences) are some of the difficult problems that the GLIRB Project must deal with in a timely manner.

(4) Delaware Estuary

This project has been outstanding in its application of systems analysis techniques to water quality management in a complex river basin. Major emphasis has been shifted from field investigations to computer analysis and cost of various water pollution control programs. The project has used its high speed mathematical model to provide accurate forecast information on the salt front moving toward Philadelphia and Camden as a result of the drought induced low flow conditions of the Delaware River.

During 1966, all field work will be completed and activities will begin on the formal compilation of the project's comprehensive program for water pollution control. The project will continue to provide forecast information required to combat the problems created by the drought in the northeastern states.

In 1967, the project will complete its report on a comprehensive program for the estuary, and terminate its development phase activities.

(5) Ohio River Basin

During 1965, the project's Wheeling Field Station concentrated on sampling activities in two major subareas of the Upper Ohio Basin--the Kanawha River Basin and the waters of the Allegheny, Monongahela and Upper Ohio Rivers in the industrial complex surrounding Pittsburgh. Concurrently, reports were prepared outlining the acid mine drainage conditions of the Ohio River Basin. The Evansville Field Station, headquarters for the lower portion of the Ohio Basin, completed a number of studies for the U. S. Army Corps of Engineers in 1965 and completed preliminary field activities in the oil fields of Indiana and Illinois to determine the extent of brine water pollution.

The program for 1966 reflects an expansion for the Ohio Project. By the end of the year comprehensive planning activities will be well under way for most subbasins, and interim reports will be completed for several subbasins. Concurrently, the project's activities in Appalachia will be reoriented and accelerated to meet the requirements of the U.S. Army Corps of Engineers for water resource studies under the Appalachian Regional Development Act of 1965.

A portion of the requested increase in operating funds in 1967 will be utilized for the continuation of the project's efforts in Appalachia. The Ohio Project will be responsible for most of the pollution control studies in Appalachia, since 66 percent of the counties in that region are in the Ohio River Basin. Aside from the requested increase to support the project's rescheduling of its Appalachia activities, the 1967 program expansion is based on meeting the schedule for completion of the project's development phase in 1970.

During 1965 the project completed field investigations for the Big Black River Basin and initiated surveys in the Appalachicola-Chattahoochee and Ochlochnee Basin. In 1966 the surveys on the Appalachicola-Chattahoochee and Ochlochnee Basin will be finished. Studies will be initiated for the Nassau, Saint Marys, and the Upper Coosa Basins. Economic base and agricultural studies will be conducted on the Mobile-Alabama-Coosa Basin and agricultural studies on the Mobile-Tombigbee Warrior Basin. In addition, project activities in the Appalachian region will be accelerated as part of the effort to assist the U.S. Army Corps of Engineers in carrying out its responsibility under the Appalachian Regional Development Act of 1965.

The program of 1967 calls for completion of the studies on the Upper Coosa Basin and the initiation of field surveys for the Mobile-Alabama, Warrior-Tombigbee, Upper Flint, Oconee and Ocmulgee Basins. Special studies will also be initiated for the Yellow and Blackwater River Basins. The economic base and agricultural studies on the Mobile-Alabama-Coosa and the Mobile-Tombigbee and Warrior Basins will be completed. The accelerated Appalachian regional activities will be maintained.

(7) Hudson-Champlain and Metropolitan Coastal

This project was initiated in 1965. Initial project activities were aimed at recruitment to fill key positions, obtaining and occupying suitable quarters, establishing contact with State, interstate and local agencies that will cooperate in the study, collection and evaluation of existing data, and contractual arrangements for the development of an information retrieval and management control system.

In addition, special attention was given to combating specific water pollution problems that have been aggravated by the severe drought in the northeastern states. Plans were developed for assistance to the State of New York for a cross-sectional analysis of the Hudson River in the vicinity of Chelsea in connection with the proposed use of the Hudson River as a supplemental water supply by New York City. Data were provided to the U.S. Army Corps of Engineers on the use and placement of low water sills in the Raritan River to prevent salt water intrusion from the bay and estuary.

In 1966, the project is being expanded. Evaluation of existing data will be completed; selective field study programs will be initiated throughout the area with particular emphasis on metropolitan waters; laboratory facilities will be developed to support the new field activities; map coding for the river mile indexing system will be completed; economic studies will be initiated; and investigation of the ground water problem on Long Island will be started. In addition, continued special attention to combating northeast drought problems will be maintained.

The requested increase for 1967 will provide for full scale subbasin field and laboratory studies. Water use studies, industrial waste surveys and upland freshwater area studies will be initiated. Work will continue in the tidal portions of the basin and ground water investigations on Long Island. Economic and demographic studies will be expanded.

(8) Central Pacific

This project was initiated in 1966. Among the unusual problems confronting the Central Pacific River Basins is that of having the major water use in California occurring in the southern part of the State and the San Joaquin Valley, while the northern third of the State receives two thirds of the total runoff. As a result, the U. S. Bureau of Reclamation, the U. S. Army Corps of Engineers, and the State of California are engaged in planning and constructing extensive water conservation projects involving numerous upstream storage reservoirs and elaborate interbasin transfer facilities. The major purpose of these projects is to intercept and transfer surplus water from rivers in northern California to water-short areas in the south. This massive north to south transfer of water will result in almost complete control of all major rivers and streams in California, considerably change the regimen of these waters, and affect most of California's population. Consequently, a significant part of the Central Pacific Project's efforts will be directed toward an evaluation of the effects that the various water resources development schemes will have on water quality and pollution control problems.

Initially, the project is directing its attention to the pressing problem related to the disposal of agricultural waste water from California's Great Central Valley. The 1966 "Construction and Rehabilitation" appropriation of the U. S. Bureau of Reclamation provides that the final point of discharge for the San Luis interceptor drain shall not be determined until completion of a pollution study by the Department of Health, Education, and Welfare. In view of the urgent need for information on which to base the decision on disposal of agricultural drainage from San Joaquin Valley, the central Pacific Project will devote all of its resources to this problem during its first year of operation.

In 1967, the project is scheduled for major expansion as it concludes the special agricultural waste drainage investigation and launches selective inventory and hydraulic study programs in the San Joaquin Valley, Sacramento Valley, and Southern California. A field station will be established in Southern California to carry out the work in that region.

(9) Missouri River

This project was initiated in 1966. A major activity during 1966 is providing water supply and water quality data to other Federal agencies cooperating in a comprehensive framework study of water and related land resource development in the Missouri Basin. In addition, other water pollution studies will be initiated.

The Missouri Project is scheduled for major expansion in 1967. Emphasis will be given to: (1) continuation of coordinated river basin planning with other Federal agencies; (2) establishment of laboratory facilities; (3) collection and analyses of hydrologic and water quality data; (4) river mile coding for the project area; (5) initiation of

waste inventories in the Lower Missouri and Red River of the North Basins, and (6) establishment of a field station in Bismarck, North Dakota.

B. New projects

(1) Lower Mississippi

The main streams of the Lower Mississippi River Drainage Basin are at the heart of one of the world's most important water navigation systems. The Basin is noted for its commercial production of shellfish and other seafoods, and is highly valued as a general recreation and sport fishing area. While agriculture is the principal activity in the region, in recent years there has been considerable growth of water using industries, particularly oil, metals, and organic chemicals. The industrial growth rate of this area is one of the highest in the Nation. Moreover, there has been an increasing use of the waters for municipal water supply purposes. Although the majority of municipal water supplies are from ground water, nearly half of the people within the area are served by municipal water systems dependent upon the Basin's surface water sources.

The increasing municipal and industrial water use demand, coupled with a reliance upon the assimilative capacity of the streams in this water-rich area, rather than waste treatment, have created a trend of general water quality deterioration in the Lower Mississippi River drainage area. Symptomatic of the developing problems are offensive tastes and odors that have occurred in municipal water supplies and massive fish kills from pesticides that have occurred periodically in this region since 1960.

As a result of the findings that the massive fish kills were resulting from pesticide pollution, a major Technical Assistance Project was initiated on a crash basis late in 1964 to develop control measures for this category of pollution. The technical assistance project is scheduled to be phased into the development of a comprehensive water pollution control program for the Lower Mississippi River Basin at the end of 1966. The staff, equipment and facilities, as well as much of the information developed in connection with the technical assistance studies of pesticide pollution, will provide a ready-made nucleus for the comprehensive project.

(2) Upper Mississippi

The Upper Mississippi River Basin includes all the area draining into the Mississippi River (exclusive of the Missouri River drainage) from Cairo, Illinois, to its headwaters in Minnesota. The scheduled initiation of this project in 1967 is based upon two major considerations:

(a) As a result of an enforcement conference, a study was initiated to develop an abatement program in the Minneapolis-St. Paul area. This study will be phased out at the end of 1966. The staff, facilities, and findings of the enforcement study will provide an effective base from which to expand the work done in the Twin Cities area to provide the entire Upper Mississippi Basin with a comprehensive water pollution control program.

(b) The development phase of the comprehensive water pollution control study of the Upper Mississippi Basin must be initiated in 1967, in order to be consonant with the scheduling of the U. S. Army Corps of Engineers, which is actively planning reservoir development in the basin.

Much of the project's activity in 1967 will be directed toward specifically providing data to the U. S. Army Corps of Engineers on storage of water for flow regulation and water quality control in connection with the comprehensive framework study of water and related land resource development in the basin. In addition, other studies necessary to the initial phases of comprehensive program development will be undertaken.

(3) New England

The President has requested that all Federal agencies involved in comprehensive water resource planning accelerate their efforts in the northeastern States in order to combat the problems resulting from the continuing severe drought conditions in that area. In order to be responsive to this request, and to be in step with the scheduling of other Federal agencies with active programs underway in the New England Basin, the New England Comprehensive Program has been rescheduled to start in 1967. Initiation of this project, together with the other projects already underway, will then provide for coverage of all river basins in the drought area.

During the first year of operation, efforts will be directed towards those initial activities necessary to get the project underway; towards high priority studies associated with drought related problems; and towards studies necessary to support the water resource planning activities of the Federal agencies.

(4) Florida-Puerto Rico

The Florida-Puerto Rico study will cover two major areas. One includes the State of Florida south of the northern boundary of Duval County; the other includes the Commonwealth of Puerto Rico and the Virgin Islands of St. Thomas, St. Croix and St. John. This project has been scheduled for initiation in 1967, in response to urgent needs to provide comprehensive solution to accelerating pollution problems in these two areas.

As an area with population and industrial growth rates among the most rapid in the Nation, Florida is facing a growing number of water pollution problems. As in many areas of the country, the quality and usefulness of both surface and ground waters are being jeopardized by an increased discharge of pollutants, while the municipal, industrial, agricultural and recreational demands for clean water are increasing. Illustrative of the urgent problems to be faced in Florida are high concentrations of nutrients in water which cause massive aquatic growths that result in obnoxious odors and serious damage to beaches; diversion of water from Everglades National Park causing a drastic change in the park's flora and fauna; salt water encroachment into ground water aquifers; land drainage and surface run-offs of agricultural chemicals; and the repeated appearance of the microscopic organisms referred to as "Red Tide", which results in the decimation of the fish population of the Gulf of Mexico adjacent to the Florida coast.

Three factors have made it urgent to initiate pollution control planning in Puerto Rico. First, Puerto Rico has one of the world's highest population densities. It is estimated that growth in the next 15 years will be equivalent to a 64 percent increase over today's figure. Because of the pollution increase related to population growth the Commonwealth may soon reach a time when its streams can no longer assimilate its municipal wastes with present treatment practices. Second the rapid industrial growth in the last two decades, and its accelerated tempo expected in the future, will require a more orderly development of water resources, as well as a higher degree of treatment for industrial wastes. Finally, there is the problem of the heavy and increasing use of nondegradable synthetic contaminants such as insecticides and herbicides.

During the initial year of operation, it is planned to staff and equip headquarters facilities in Florida and a field station in Puerto Rico, and to initiate studies in both areas.

3. Management phase

Following the completion of the intensive comprehensive program development phase, management phase activities are initiated to work towards implementation of the findings and recommendations of the comprehensive program. Management phase activities should begin when water uses of a stretch of stream have been identified, water quality goals have been agreed on, a plan for construction of water pollution control facilities has been adopted, and a water quality intelligence system has been perfected.

Included in the activities undertaken during the management phase are: (1) continuous measurements of water quality at key locations; (2) incorporation of water use and waste discharge locations into a developed information retrieval system; (3) reporting on the status of waste treatment facilities; (4) prediction of streamflow to be anticipated at critical points based on forecasts of uncontrolled runoff and schedules

of reservoir releases, and (5) reporting on the status of reservoirs containing storage earmarked for streamflow regulation for quality control.

A. Existing management phase activities--Arkansas Red

The development phase was completed in 1963. Since that time, the project has been working with the U.S. Army Corps of Engineers and various State agencies on implementing the proposed measures for reducing salt pollution, which is by far the major cause of poor water quality in these basins.

1965 was the first full year of surveillance of the experimental impoundment at Estelline Springs, Texas, for removal of brine from the Red River. This is the first experimental impoundment designed for this purpose and has proved wholly successful. Also, during 1965, the project continued its cooperative effort with the U. S. Army Corps of Engineers to determine the feasibility of controls of salt sources in the Wichita Basins and in other portions of the Red River and Arkansas River Basins. In addition, statistical studies were conducted to design monitoring programs and to determine the most acceptable methods of data treatment to confirm results of pollution abatement.

The program for 1966 calls for: (1) continuing cooperative effort with the U. S. Army Corps of Engineers for construction of salinity abatement facilities; (2) initiation of a pilot study in cooperation with the Oklahoma Corporation Commission and the Fish and Game Department on the leaching characteristics of brine pits, mode of entry of brine into receiving streams and the time required for brine pollution to stop after the pits are leveled, and (3) a study to identify additional sources for municipal and industrial water supplies on the North Fork of the Red River and evaluate various water quantity and quality management procedures.

The 1967 request for this project will provide for a continuation of the collection and evaluation of data to determine the effectiveness of chloride control measures, the development and use of statistical analysis in design of measurement systems, and the evaluation of the contributions of man-made pollution and the reductions brought about by the States' pollution control programs. In addition, the study of the leaching of brine pits will be completed, and the search for more economical methods of collection, analyses and storage of data will continue.

B. New management phase activities

The 1967 estimate provides for initiation of management phase activities in four comprehensive water pollution control projects.

In each case, development phase activities will still be underway in some portions of the overall project area, but will have been completed for other subbasins. For example, in the Columbia Basin Project, management of comprehensive programs for the Willamette and Yakima subbasins can begin in 1967, even though development phase activities will still be underway in other subbasins. In this way, implementation of project findings can be undertaken without delay.

The Delaware Project is scheduled to begin the implementation of its comprehensive plan for the Delaware River Basin as development phase activities are concluded in 1967. The Columbia Project will also initiate implementation of its program in the Willamette and Yakima subbasins, the Great Lakes-Illinois Project will begin its first management phase activity in the Illinois River Basins, Lake Michigan and Lake Erie. The Southeastern Project will initiate management of the Appalachian-Chattahoochee-Flint and Pearl-Pascagoula-Big Black Basins.

Enforcement

	1966 Estimate		1967 Estimate		Increase or Decrease	
	Pos.	Amount	Pos.	Amount	Pos.	Amount
Personnel compensation and benefits.....	368	\$2,583,355	416	\$3,476,000	+48	+\$892,645
Other expenses.....	...	1,091,645	...	1,058,000	...	-33,645
Total.....	368	3,675,000	416	4,534,000	+48	+859,000

Summary by Program

1. Reconnaissance surveys, investigations, proceedings, surveillance, standards and basic program.....	143	1,580,000	199	2,392,000	+56	+812,000
2. Enforcement projects:						
Colorado River.....	49	678,000	47	493,000	-2	-185,000
Washington State.....	25	205,000	9	102,000	-16	-103,000
South Platte.....	23	250,000	23	252,000	...	+2,000
Twin Cities-						
Upper Mississippi....	34	173,000	...	...	-34	-173,000
Merrimack-Nashua.....	12	115,000	11	92,000	-1	-23,000
Monongahela.....	11	141,000	7	119,000	-4	-22,000
New studies.....	47	290,000	92	805,000	+45	+515,000
Subtotal, enforcement.	201	1,852,000	189	1,863,000	-12	+11,000
3. Post-action surveillance:						
Raritan Bay.....	15	161,000	15	163,000	...	+2,000
Detroit River.....	9	82,000	9	83,000	...	+1,000
Twin Cities-						
Upper Mississippi....	...	...	4	33,000	+4	+33,000
Subtotal, post-action surveillance.....	24	243,000	28	279,000	+4	+36,000
Total, all.....	368	3,675,000	416	4,534,000	+48	+859,000

Enforcement

Enforcement lies at the very heart of any effective program for the prevention and control of pollution. The enforcement authority and enforcement measures will be applied as indicated to be necessary in achieving the national goal of prevention, control, and abatement of water pollution. In achieving this goal the activity will support and cooperate with State and interstate agencies in the exercise of their enforcement authority to abate and control pollution; prevent and control pollution from Federal installations; and encourage cooperative activities by the States relating to the prevention and control of water pollution, including enactment of improved State laws and compacts between States.

The 1965 Amendments to the Water Pollution Control Act expand and strengthen the enforcement authority. They provide for State and/or Federal action to establish water quality standards, and authorize the Secretary to call an enforcement conference whenever he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution and action of Federal, State, or local authorities.

The magnitude of the enforcement program, its requirements for continuous surveillance and evaluation of all interstate areas, and the time required to develop and enforce remedial schedules for construction of required facilities to abate pollution, will not admit of short-term completion of the program. Illustrative of the magnitude of the program is the fact that, of the some 26,000 waterbodies in the continental United States, approximately 4,000 are interstate waters within the meaning of the Act.

1. Reconnaissance surveys, investigations, proceedings, Federal installations, and water quality standards.

A program increase of 56 positions and \$503,000 is proposed for this category of enforcement activities. Strengthening of Federal enforcement activities is necessary to accelerate progress in abating pollution. The need for such strengthening is emphasized in Presidential directives, in the legislative history leading to passage of the 1965 Amendments to the Federal Water Pollution Control Act, and in the Amendments themselves. The proposed program increase will provide for acceleration of activity in identification and evaluation of pollution areas and increased level of enforcement proceedings. It will also provide for meeting the workload anticipated from the 1965 Amendments related to water quality standards and to abatement of pollution in shellfish growing areas.

(a) Reconnaissance surveys and investigations

This involves the identification and evaluation of interstate or navigable waters pollution problems to provide an overall basis for scheduling future Federal enforcement actions. The extent of field surveys and investigations necessary depends on whether or not adequate data are available to support a firm determination of the existence or nonexistence of pollution abatable under the enforcement procedures of the Federal Water Pollution Control Act. In many cases, this requires some type of field investigation.

In 1967 it is planned to up-date and reevaluate, in enforcement responsibility terms, the data on 400 already investigated areas, and investigate and evaluate 200 new interstate areas; this will require securing additional technical and scientific data on approximately 125 new areas; of which 30 are estimated to require short duration field studies and some type of field investigation for the remainder. It is estimated that 30 new areas will involve enforcement responsibilities under the new shellfish provisions. Comparable estimates for 1966 include 300 already investigated areas, 160 new interstate areas, and 26 short duration field studies.

(b) Proceedings

From 1956 to December 31, 1965, 37 actions were instituted. More than half of these (22) were initiated on the Secretary's own responsibility, and four actions have been called at the request of State Governors and as a result of reports made by the Federal Agency. Eleven actions have been initiated on State request alone.

As a result of these actions, remedial collection and waste treatment facilities at an estimated cost of \$1.7 billion are in various stages of planning, construction, and operation. This cost figure is expected to rise substantially when schedules of remedial action are established for several large areas on which major studies and investigations are being conducted.

Continued vigorous emphasis on abatement of pollution situations is anticipated to result in many new actions during 1967. Some 20 interim sessions of pending conference actions will be held to evaluate progress being made toward completion of remedial action schedules; to review progress of ongoing investigations; to lay plans to further investigative programs; or to adjust remedial action schedules.

From July 1, 1964 through December 1965 the following seven actions were instituted:

<u>Action Area</u>	<u>Date of Initiation</u>	<u>Disposition</u>
1. Blackstone and Ten Mile Rivers (Massachusetts-Rhode Island)	January 26, 1965	Remedial schedules established.
2. Lower Savannah River (South Carolina-Georgia)	February 2, 1965	Remedial schedules to be established.
3. Mahoning River (Ohio-Pennsylvania)	February 16, 1965	Remedial program established.
4. Lake Michigan, Wolf Lake Calumet Rivers (Illinois-Indiana)	March 2, 1965	Remedial schedules being established.
5. Lake Erie (Michigan-Indiana-Ohio- Pennsylvania-New York)	August 3, 1965	Remedial program established.
6. Red River of the North (North Dakota-Minnesota)	September 14, 1965	Remedial program to be established.
7. Hudson River	September 28, 1965	Remedial program established.

(c) Water Quality Standards

The 1965 Amendments contain provisions for the establishment of water quality standards either by State or Federal action. This provision is to be used as a mechanism for upgrading the water quality and preventing pollution before it starts. These standards are not to be designed for use primarily as an enforcement device, but as an additional tool for the Secretary and State and local agencies to guide their overall abatement programs, and encourage preventative control.

Generally, the water quality standards provisions call for the following:

(1) Within one year from date of enactment, each State must file with the Secretary a letter indicating its intent of establishing standards by June 30, 1967.

(2) Standards established by the State must be approved by the Secretary.

(3) If a State does not act either by filing a letter of intent or subsequently establishing approved standards, the Secretary could, after a conference with all interested parties, publish Federal water standards for a particular interstate stream or portion of it. The State would still have 6 months to establish its own standards subject to the approval of the Secretary before promulgation by the Secretary. After promulgation, a Governor may request a hearing within 30 days by a board dominated neither by the State nor Federal governments.

(4) Once standards are established either by State or Federal action, any violator of a standard has six months to conform. If they do not conform, court action can be instituted to force compliance.

(5) The Secretary may on his own initiative or at the request of a Governor, institute enforcement proceedings against any polluter violating established standards.

(6) Provisions are also included for revising standards consistent with the need either on the Secretary's initiative or at the request of a Governor.

To implement and carry out these provisions, it will be necessary to perform the following functions:

- (1) develop standards.
- (2) prepare regulations setting forth standards.
- (3) develop arrangements for consultation with other Federal agencies concerned.
- (4) review proposed State standards for consistency.
- (5) provide consultation and guidelines to State and interstate agencies.
- (6) when necessary, collect water quality data to evaluate or develop standards.
- (7) establish standards if such standards are not established by the appropriate State or interstate agency.
- (8) provide for revisions of standards.
- (9) institute enforcement proceedings where established standards are being violated.

In the initial stages of the program heavy emphasis will be placed, where applicable, on reviewing proposed standards, developing standards, preparing regulations, developing guidelines, collecting water quality data to evaluate standards, and developing arrangements for consultation with other Federal agencies concerned.

2. Enforcement projects

In some of the areas where enforcement actions have been 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.

In 1965 six such on-site projects were being conducted in connection with prior actions. These include the Colorado River, Washington State, South Platte, Twin Cities-Upper Mississippi, Merrimack-Nashua, and Monongahela. In 1966 it is anticipated that the Twin Cities-Upper Mississippi

project will also be completed. In 1967 the remaining projects will be phasing out at various levels with completion shortly thereafter. Funds are available in 1966 to initiate new activities that may be required as a result of enforcement actions. There is included in 1967 45 positions and \$300,000 for new studies that will be required as a result of new enforcement actions anticipated. This will permit the start of several projects depending on the extent of the problems involved. These funds are necessary if the Secretary is to carry out his responsibilities under the enforcement provision of the Federal Water Pollution Control Act.

3. Post-action surveillance

The purpose of each enforcement action is the restoration and conservation of water quality to serve all legitimate uses. When a major on-site project has been completed and a schedule of remedial action developed, the surveillance job begins. The Department must see to it that the work required of each polluter, generally construction, is undertaken to completion and that the resulting facilities are properly operated. Such construction includes building sewer lines and interceptors and the construction, enlargement or improvement of treatment plants and the like. In some cases, where industries are involved, remedial action may require in-plant or process changes or installation of recovery processes.

Post-action surveillance activity is conducted for all enforcement action. Where there has been no major on-site investigation the activity is carried out by the reconnaissance, survey and investigation staff as part of their overall responsibilities. Where there has been a major on-site investigation, this surveillance is maintained by a small component of the original project staff.

For the two large enforcement projects which were completed in 1965, Detroit River and Raritan Bay, activity has been shifted to post-action surveillance in 1966. In 1967 it is proposed to shift the Twin Cities-Upper Mississippi to post-surveillance requiring 4 positions and \$33,000.

Research, training, and technical services

	1966 Estimate		1967 Estimate		Increase or Decrease	
	Pos.	Amount	Pos.	Amount	Pos.	Amount
Personnel compensation and benefits.....	982	\$6,615,900	1,155	\$9,857,000	+173	+\$3,241,000
Other expenses.....	...	4,341,770	...	7,136,000	...	+2,794,230
Total.....	982	10,957,670	1,155	16,993,000	+173	+6,035,330

Summary by Program

Research.....	427 ✓	4,656,766	537	7,690,750 ✓	+110	+3,033,984
Collection, analysis, and dissemination of basic data.....	✓122	✓1,277,634	136	1,510,000 ✓	+14	+232,366
Technical assistance..	✓339	✓3,863,020	374	6,301,300 ✓	+35	+2,438,280
Training.....	✓40	✓477,250	54	707,550 ✓	+14	+230,300
Research, training, and demonstration grant services.....	✓31	✓366,300	31	422,000 ✓	...	+55,700
Public information and technical reports.....	✓23	✓316,700	23	361,400	...	+44,700
Total.....	982	10,957,670	1,155	16,993,000	+173	+6,035,330

2/7/69
Research
 537
 15
 33
 11
 30
 San Joaquin
 PMD
 Gto. Services
 Pac Dem Services

1. Research

1966 Estimate		1967 Estimate		Increase or Decrease	
<u>Pos.</u>	<u>Amount</u>	<u>Pos.</u>	<u>Amount</u>	<u>Pos.</u>	<u>Amount</u>
427	\$4,656,766	537	\$7,690,750	+110	+\$3,033,984

The basic purpose of the research program is to develop new or improved technology for solving water pollution problems. Research has been a lagging aspect of the national water pollution control effort because of limited funds and resources. The priority need to accelerate efforts in water pollution control research has been pointed to in all recent assessments of national research needs in the water resources field.

In recent years, unprecedented population and industrial growth and concentration, revolutionary new technologies, and changing land uses and practices have thrust enormous pollution problems on a relatively unprepared science. Research must now deal with new problems caused by the sheer mass of pollutants and by a whole host of new pollutants that are highly complex in composition and which may persist for extremely long periods, even indefinitely, in water.

The analytical tools, scientific knowledge, and engineering controls which served well for the problems of the past are proving increasingly inadequate in dealing with present pollution problems and will become even more inadequate to cope with foreseeable future problems. Thus, water pollution research must develop an effective new technology while program administrators attempt to hold the pollution line with available knowledge.

The overall research effort is planned and programmed to deal with both existing and emerging problems of pollution control. Emphasis is placed on research which leads directly to the solution of pollution problems, with high priority given those needs defined by the other program elements of the Federal Water Pollution Control Administration (comprehensive programs, enforcement, technical assistance).

A wide range of scientific and engineering research problems are involved. Basically, these problems can be categorized as (1) determining the causes and effects of pollution of the Nation's water resources, and (2) developing pollution prevention and control measures necessary to maintain the national water resources at a quality continuously suitable for domestic and municipal water supply, industrial and agricultural purposes, recreation, propagation of fish and aquatic life and wildlife, and other beneficial uses.

For the most part, in-house research activities are conducted at the Sanitary Engineering Center, at the national water quality laboratories, and at the regional water pollution control laboratories of the Administration. Some in-house effort is also expended at various field sites and pilot plant

facilities outside the laboratories. Research programs at each of the Administration's laboratories are being developed as centers of excellence in one or more specific research areas. In this way, staffing and facilities can be tailored to specific needs, the most effective use of research supervisors and scarce scientific and engineering personnel can be achieved, and a higher overall degree of competence and productivity can be obtained. Where feasible, areas of research involving similar skills and equipment are grouped in the same laboratory.

In addition to this in-house research effort, research contracts are used to develop specific research information, generally in conjunction with some aspect of the in-house program. The principal use of research contracts has been in connection with advanced waste treatment research.

In carrying out the Federal responsibility for water pollution research, eight broad areas of needed research have been defined. Essentially all research, either through direct effort or through outside contract, can be classified under one of these areas. These categories are similar to those proposed by the Committee on Water Resources Research, Federal Council for Science and Technology. They are as follows:

1. Identification of wastes

Present methodology for detecting and measuring the presence and amounts of significant pollutants is inadequate. A program to develop and apply analytical methods is necessary if we are to adequately assess water pollution problems, determine origins of pollutants, predetermine chronic toxic effects of pollutants, and devise and operate effective, efficient programs and treatment methods for preventing and controlling pollution. This requires that chemicals be measured in concentrations of parts per billion and less. Research will enable improved quantitative measurement of viral and bacterial organisms which will permit more effective surveillance in the battle against infectious diseases spread through water contact. One objective of this research is to develop and improve procedures for the recovery, identification, measurement, monitoring and evaluation of specific contaminants affecting water quality. For example, efforts will continue on the application and development of such techniques as the extremely sensitive gas chromatographic method. This and similar new techniques are also extremely valuable in the detection and measurement of pesticides and other new synthetic chemicals entering the environment and in the differentiation of man-made wastes from natural contaminants that occur in streams. A second objective is the definition of measures of the character, strength, and properties of wastes to predict their effects, persistence, and removability and development of methodology for their measurement.

2. Sources and fate of pollution

Our lakes, streams, and rivers are systems which are fundamentally biological in nature, and which can not retain indefinitely the capacity to assimilate wastes at the rate they are presently being discharged and will be discharged in the future. New knowledge and methodology are required to

determine where pollutants originate, to define the paths of pollutants through and the fate of pollutants in the environment, to distinguish between natural and man-made pollution, and to quantify the waste load being imposed on the Nation's waters.

Inherently, some pollutants are physically, chemically, or biologically changed after they enter receiving waters. Research in this area will be concerned primarily with the origin, dispersal, movement, persistence, degradation, and ultimate fate of contaminants disposed to surface waters, ground waters, coastal waters, or soil. This includes contaminants from both point sources and nonpoint sources such as from irrigation return flows and urban and rural runoff.

Dispersal of waste effluents in large volumes of water is of increasing concern for the 23 States located on coastal waters, the eight States located along the Great Lakes, and for the larger cities on the Nation's streams. The oceanographic aspects of waste disposal are growing in importance with continuing development of coastal areas as urban, industrial and recreational centers. There are also several million persons dependent on septic tanks for waste disposal and even fundamental principles of soil adsorption systems are not well known. A growing interest is apparent also in the disposal of industrial wastes into deep underground formations. The basic principles of effluent disposal into waters and soils must be defined and applied. A research need of increasing significance lies in the recharge of underground water-bearing formations with renovated waste waters.

3. Effects of pollution

Many new wastes, particularly in the synthetic chemical field, are being discharged into waters where they appear as discrete pollutants. Many are extremely persistent and stable in water and resist removal by conventional water and waste treatment methods. Some cause obnoxious tastes and odors in drinking waters, others are toxic to fish and aquatic life or taint fish flesh, and almost nothing is known of their toxic effect on humans. Inorganic chemical contaminants such as nitrogen and phosphorus compounds present in many waste discharges, have been previously ignored but are now felt to be prime contributors to the occurrence of major pollution episodes including extensive algal blooms. Techniques are needed to assess the pollutional characteristics of wastes especially where traditional parameters no longer apply, to understand and predict the effects of pollution, and to relate pollutional effects to levels of pollution. These methods are needed not only for new types of pollution but also for some of the older wastes and for natural pollutants.

Typical of the studies to be carried out are those designed to a) determine the effects of impurities on water for municipal supplies, propagation of fish, aquatic life and wildlife, recreation, agriculture and industry; b) determine the relationships between concentrations of impurities and pollutional effects (water quality requirements); c) elucidate the causes of, mechanisms of, and relationships between pollution and accelerating eutrophication; d) define the role of water in the transmission of bacterial and viral diseases; e) assess the epidemiological and toxicological significance of water pollution.

The water quality standards provision of the 1965 Amendments to the Federal Water Pollution Control Act adds particular importance to this category of research. Research findings of the National Water Quality Laboratories at Duluth and Narragansett will provide much of the scientific information necessary to the establishment, review, and improvement of water quality criteria and standards. For this reason, advanced staffing provided for the National Water Quality Laboratories in 1966, and additional staffing is requested in 1967.

4. Waste treatment

Existing waste treatment technology is rapidly proving inadequate to deal with the mass and complexity of today's pollution loads. New and improved treatment techniques are essential if the Nation is to protect its water resources and provide for the multiple reuse necessary to meet water demands. Further, the operations and processes of conventional treatment technology must be better understood to insure economical design and operation of pollution control facilities.

Research on advanced waste treatment is a special aspect of this overall problem. A major goal of our research effort is waste water renovation and reuse which involves the development and demonstration of practical means for treating waste waters to remove the maximum possible amounts of pollutants to permit repeated reuse of the Nation's waters.

Research on development of advanced waste treatment technology represents the major part of the research program and it is considered to be of the highest priority in terms of total national needs for water research. The Office of Science and Technology-Committee on Water Resources Research lists this area of research at the top of its priority list.

The nature of advanced waste treatment research requires that it be supported by a combination of in-house and contract research projects. The major contributions that contract research brings to this area are: 1) the feasibility testing of many new ideas and approaches is possible without requiring government investment in specialized facilities and competencies; 2) a variety of approaches can be explored simultaneously to accomplish screening of potentially feasible techniques in the shortest possible time; 3) the country's most highly qualified and experienced scientific and engineering capabilities, wherever they exist, can be brought to bear on these problems. Contract research represents, in many cases, a key step in the development of new waste treatment technology and the current rate of progress is being inhibited by lack of contract research funds.

In previous years, contracts have been awarded to industries, universities, and research institutes. Through this mechanism, for example, the granular activated carbon adsorption process has been developed, largely as the result of contracts with the Pittsburgh Chemical Company, Dow Industrial Service, and Harvard University. Another promising advanced waste treatment process, electrodialysis,

has been brought to pilot scale by a combination of in-house effort and research contracts with Ionics, Incorporated. In 1967 it is planned that a number of contracts for research in such areas as nutrient removal, regeneration of powdered carbon, reverse osmosis, and others will be let. Major efforts will be directed toward research and development projects relating to waste water purification and reuse. It is anticipated that the additional \$1 million requested in 1967 for research contracts will support an estimated 20 essential research contracts in this area.

Pilot plant studies are carried out on those techniques (developed by contract research, in-house or extramural research) which show further promise for practical application. The techniques which show promise include adsorption, bio-denitrification, coagulation-precipitation, electrodialysis, and reverse osmosis. Several pilot plant studies in cooperation with local authorities are now underway to develop these advanced processes for both pollution control and for waste water purification and reuse. More answers to the solution of difficult pollution problems can be achieved through successful advanced waste treatment research than through any other research activity.

Some of these processes are now at or approaching the stage at which they must be subjected to field evaluation. They must be tested at full-scale in actual practice, in order that municipalities, industries, and consultants may use these methods with assurance. In 1966 funds were provided for field evaluation of one process. The 1967 budget for "Buildings and Facilities" proposes funds to construct an additional experimental field facility to evaluate a second process on a full-scale basis. In addition to research on advanced treatment methods, other studies in this category include (a) improved operational control of biological treatment processes; (b) adaptation of micro-organisms to degrade wastes; and (c) improvement of effectiveness of waste disinfection.

5. Ultimate Disposal of Wastes

The contaminants removed from waste waters cannot normally be disposed of by discharging them into surface streams or underground aquifers since this approach would yield no alleviation of water pollution and would, in fact, make the original separation of the impurities from the water completely pointless. Means for the permanent (nonpollutional) disposal of separated waste concentrates must be developed simultaneously and in conjunction with new and improved waste treatment processes. Four general categories of disposal methods appear to exist: 1) conversion to innocuous form as by incineration, wet oxidation (destruction of organic compounds by exposure to high temperature and pressure), or biological degradation (consumption of concentrated waste materials by bacteria, algae, etc.); 2) "dumping" the concentrates into designated waste reservoirs (e.g., specially constructed and sealed basins, natural waste sinks such as certain desert areas, or even remote areas of the oceans); 3) injection into very deep underground formations or either natural or artificial cavities in the earth; and 4) recovery of usable materials for sale (e.g., fertilizer, soil conditioners, chemical or pharmaceutical raw materials, etc.).

Included in this category is the development of the most effective and economical disposal process or combination of processes to meet a whole range

of disposal requirements. The development and improvement of sludge handling, conditioning, and preconcentration techniques is also covered.

6. Water Treatment

Much of the research and development effort devoted to treatment for municipal and industrial wastes is applicable and translatable to the treatment of water supplies, even though the concentrations of impurities are likely to differ. There are, however, a number of problems which are unique to the area of water treatment, including those associated with the distribution systems, such as corrosion, iron and manganese control and the development of biological slimes. Water treatment research will include development of methodology for recovery of chemicals used in treatment, treatment of Alaskan tundra waters, development of small treatment systems and systems engineering technology for the optimal incorporation of water treatment plants into basin-wide quality management programs.

7. Water Quality Control

Wastes can be broadly categorized as those which can be collected and conveyed to a central place (municipal sewage, urban storm drainage, and most industrial wastes), and those which cannot be collected and conveyed to a central place and, therefore, must be controlled by techniques other than waste treatment. Methods, including elimination of wastes at the source, must be developed for control of acid mine drainage, natural and oil field brines and pollution from land drainage. Other pollution which must be controlled at its source or place of occurrence is exemplified by that which results in algal blooms and other nuisance vegetative growth in lakes, streams, and impoundments. This latter problem, in particular, is assuming major proportions, and in an attempt to apply new technology to the solution of this problem, two eutrophication pilot projects have been established. These research and development programs must be continued and expanded in order to determine practical solutions and engineering feasibility data for application throughout the nation.

During rainstorms and immediately thereafter, large quantities of impurities are discharged to receiving waters through runoff from street washings, flushing of creek beds, etc. Many cities have combined sewer systems which simultaneously carry storm runoff, domestic sewage, and industrial wastes. Methods must be developed to prevent pollution from storm and combined sewer discharges including research in hydraulics and feasibility investigations of a variety of proposed engineering solutions.

The control of pollution contributions from industrial wastes must be investigated in terms of process and plant operation modifications.

The development of methods for the control of land drainage is another example of the studies in this category. The Federal Council for Science and Technology, Committee on Water Resources Research, has identified "Causes and Effects of Water Pollution from Rural Lands" as a priority research item. It is planned to expand research in this area in cooperation with the Department of Agriculture.

Where pollution control by treatment or elimination at the source is not practicable and in the case of drainage from urban and agricultural land surfaces for which control may not be feasible because of the impracticability of collecting the waste, protection of the water resource may be accomplished by providing additional dilution water; that is, control is achieved by regulating stream flow with previously impounded water to reduce the concentration of pollutants to tolerable levels. The influence of impoundments on water quality must be determined. Biological transformations of nitrogen, the effects of photosynthesis on the dissolved oxygen resources, the rate of iron and manganese, and thermal stratification are included in the factors which must be studied.

Conservation of water in domestic and industrial use can be an important means towards water pollution control and as such, research will begin on development of new techniques and devices for leakage control, recycling, and reducing volume requirements for industrial and domestic water uses.

8. Water Resources Planning and Resources Data

With the greatly increasing demand for water to be used by municipalities, industries, agriculture and in recreational pursuits, it has become mandatory to develop planning techniques and socio-economic evaluation methods to permit optimum use and reuse of our water resource. For a commodity which is absolutely necessary for the life processes and an essential raw material in almost every industrial manufacturing operation, the existing methods of cost allocation and pricing of water must be overhauled and new ones developed. Water laws and institutions for regulating the use of water have resulted in misuse. The techniques of systems analysis are applicable to the economics of water supply, river basin pollution control, and benefit evaluation, but these techniques must be extended and research performed to develop new methodology to incorporate the vast complexities of the Nation's water resources use characteristics.

In order to ensure the most effective and efficient conduct of our research and development program to achieve optimum water pollution control, and to permit optimum water resource management, improved methods must be developed for collecting, evaluating, and processing pertinent water data and information.

The program increase for 1967 for staffing the laboratories is 110 positions and \$503,400 and for research contracts, \$1,000,000.

2. Collection, analysis and dissemination of basic data

1966 Estimate		1967 Estimate		Increase or Decrease	
Pos.	Amount	Pos.	Amount	Pos.	Amount
122	\$1,277,634	136	\$1,510,000	+14	+\$232,366

Intelligence on the sources, kinds and amounts of pollutants and their effects on water quality and water uses is essential to an effective water pollution control program. Several activities are conducted to meet these needs:

1) Surveillance systems designed to determine levels and trends of pollution through analysis of water samples obtained at key points in the major river basins. One hundred and thirty-one river basin sampling points were maintained; a report of 1963-64 results of sampling analyses was published in volumes oriented to the major river basins. The program compiled and published: 1) A report of pollution-caused fish kills, 2) the 1964 water inventory of facilities serving populations of 25,000 and over, and 3) publication of municipal bond sales and construction awards data. Special reports such as an evaluation of radioactivity loadings on the Columbia River at Pasco, Washington were prepared for comprehensive river basin planning. Automatic monitoring equipment was installed at several surveillance points and plans were developed in connection with the Susquehanna and Chesapeake Bay comprehensive river basin program for expanding the Potomac River pollution surveillance system to include two additional automatic monitors with telemetering capability to support mathematical model work;

2) Maintenance of inventories of municipal water and sewage facilities which enable analysis for trends and needs of treatment facilities and related requirements in the water supply and waste disposal fields. Collection and dissemination of data on municipal bond sales for water and sewage works and contracts awarded for construction of water and sewage facilities;

3) Collection and dissemination of reports on pollution-caused fish kills as collected through a nationwide state and local agency reporting system;

4) Support of data gathering activities of the various agency programs through development of a Data Storage and Retrieval System (STORET), providing required consultation on data storage and retrieval methodology, technical guidance on automatic instrumentation for pollution intelligence systems, and a quality control program for laboratory methodology prescribed for chemical, physical and biological analysis of samples from the aquatic environment.

The field program of these activities in the past has been carried out through the regional offices and a laboratory in Cincinnati. It is now planned that as agency field laboratories are activated, river basin surveillance, inventory and special support portions of on-going field operational programs will be carried out through those facilities. The system is now used for data storage and retrieval by all on-going comprehensive projects. In this connection a series of standard statistical programs and development of a subsystem for coding of lakes and estuaries was completed.

Emphasis will be placed on transferring inventory and surveillance operational responsibilities from the regional offices and the Cincinnati laboratory to the pollution intelligence activities at the several operational field laboratories. This transfer will be effected in a manner to complement the objective of assuring maximum utility of the data collected for all agency activities. It will be necessary to continue substantial amounts of operational surveillance activity at the Cincinnati laboratory since certain highly specialized professional competence and equipment requirements can best be provided from a central laboratory, particularly while the various field laboratories are being constructed, staffed up and becoming operational. During this period, a reorientation of the Cincinnati laboratories will be directed toward developing and effecting a quality control program for the agency laboratories and expanding the existing instrumentation activity to satisfy needs for automatic monitoring as related to the management phase of the comprehensive river basin planning activity.

Proposed program increases for 1967 for instrumentation, laboratory quality control, and data operations.

1. Developmental work on monitoring instrumentation

Equipment development to meet post-enforcement and water quality management activities must be accelerated. Although major advances have been made in water quality instrumentation, much more effort in this area is required. In addition, instrumentation must now be applied to actual water management situations resulting from comprehensive program and enforcement projects, which will require further advances in instrumentation and telemetering of data. It is planned to increase the instrumentation program staff at Cincinnati with two positions, one electronics engineer, and an electronics technician, and provide additional monitoring equipment. Proposed program increase is 2 positions and \$34,000.

2. Laboratory quality control

It is planned to establish a national laboratory quality control program. The increasing number of laboratories in the agency makes it vital that a program of methods development and application include a sound quality control program to assure accuracy and comparability of analytical results. To meet this need five positions are proposed with four for Cincinnati and one for headquarters for coordinating the national program. Proposed program increase is 5 positions and \$41,000.

3. Data operations control

Expansion of data operations control (STORET) is necessary to meet the growing needs of the major field projects and the monitoring systems employed in water quality management. Seven positions are requested for headquarters. This will permit the addition of a sanitary engineer and increase the number of support personnel in cartography and programming. Proposed program increase is 7 positions and \$62,000.

3. Technical Assistance

1966 Estimate		1967 Estimate		Increase or Decrease	
Pos.	Amount	Pos.	Amount	Pos.	Amount
339	\$3,863,020	374	\$6,301,300	+35	+\$2,438,280

Technical assistance activities are the heart of the Federal-State-regional-local cooperative approach to water pollution problems. Expert scientific and engineering staff render technical services, maintain intelligence, and provide technical information on difficult water pollution control problems to other Federal, State, regional, and local authorities, to industry, to the public at large, and to other activities in the water supply and pollution program. Technical assistance activities range from letter responses to requests for information to major project investigations involving several years or more.

Summary by Activity

	1966 Estimate		1967 Estimate		Increase or Decrease	
	Pos.	Amount	Pos.	Amount	Pos.	Amount
a. Basic program.....	190	\$1,459,600	201	\$2,593,300	+11	+\$1,133,700
b. Recreation and water quality.....	9	121,900	14	253,000	+5	+131,100
c. Klamath River study..	8	128,000	20	261,000	+12	+133,000
d. Demonstration of acid mine drainage control and abatement.....	24	1,267,600	33	1,676,000	+9	+408,400
e. Charleston Harbor- Cooper River study..	13	139,000	..	90,000	-13	-49,000
f. Lower Mississippi....	45	519,920	..	.....	-45	-519,920
g. Tampa Bay.....	..	.....	13	103,000	+13	+103,000
h. San Joaquin.....	..	.....	15	473,000	+15	+473,000
i. Federal installations	50	227,000	78	852,000	+28	+625,000
Total	339	3,863,020	374	6,301,300	+35	+2,438,280

a. Basic Program

Under the basic program operations 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 headquarter staffs. Examples of consultative services rendered during 1965 are as follows:

(1) To the State of Maine: An evaluation of eutrophication and its causes in Lake Sebasticook, and measures to be taken to control the rate of eutrophication and improve the recreational usability of the lake.

(2) To New York State: In relation to the New York City water shortage, an evaluation of the economic alternatives for meeting the current water supply shortage and preventing future water shortages.

(3) To the Department of Agriculture and the Poultry Industry: An evaluation of Long Island duck slaughtering and duck processing waste so as to assist in a program of water conservation and in the development of economical waste treatment methods.

(4) To the foundry industry: An evaluation of waste from various types of foundry operations leading to water pollution control measures.

(5) To the State of South Carolina: An evaluation of a fish kill on the Ashley River, a tributary to Charleston Harbor.

The laboratories planned or under construction 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 area serviced by the laboratories. Many requests for technical assistance have already been received by the field laboratories.

In contrast to the research activities at these field 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 the problem, or if these are not available, recommending acceleration of efforts either through research or other means for developing appropriate methods for solving the specific problem. Through these investigations new understandings of the basic relationships involved may develop merely as a by-product not an objective.

In 1967 additional staffing of 11 positions and \$31,000 is proposed to establish a nucleus organization for conducting activities out of the Ann Arbor and Boston laboratories anticipated to be completed in early fiscal year 1968.

b. Recreation and Water Quality

The objectives of recreation and water quality studies are: (1) to evaluate the deterioration in water quality, if any, that results from the intensive use of a watershed and reservoir for recreational purposes, (2) to evaluate the feasibility of utilizing treated waste water for recreational purposes, and (3) to determine how best to eliminate poor water quality

conditions that interfere with recreational use of water. Three studies have been underway since 1962 in the following locations: Indianapolis, Indiana (Geist Reservoir), Jackson, Mississippi (Pearl River), and San Diego, California (Santee Water Reclamation Project). The Geist Reservoir and Pearl River studies have concentrated on objective one, while the Santee study has concentrated on objective two. A fourth study at Lake Shagawa, Ely, Minnesota, was begun in 1966 which will concentrate on objective three.

In 1966 the Geist Reservoir and Santee projects will be completed. Three intensive sampling seasons on Geist Reservoir have been completed, and a report on the findings of the project will be available before the close of the fiscal year.

The Santee project has undertaken monitoring the community's health following its first time use of reclaimed waste water for swimming this past summer. Virological and bacteriological examinations of the reclaimed waste water have been combined with a summary of recreational uses, including registration of swimmers and epidemiological surveillance of the community and registrants.

The Pearl River project completed the pre-impoundment phase of its study in 1964 and began the post-impoundment phase in 1965. In 1966 the post-impoundment study has been expanded. This past summer has been the first recreational season after full impoundment and offers the first opportunity to evaluate the effects of intensive recreational use on the entire reservoir. In 1967 the post-impoundment study of this reservoir will continue.

In 1966 a new joint technical assistance-research project was begun on Lake Shagawa, Ely, Minnesota, which lies at the geographical entrance to and near the headwaters of the Boundary Waters Canoe Area. This project will concentrate on how to best eliminate poor water quality conditions that interfere with its recreational uses, and on the problem of eutrophication. In recent years, objectionable conditions due to algal blooms have advanced to an alarming state. The recreation and water quality phase of the Lake Shagawa study is expected to continue in 1967, although the precise directions of the study will depend on the results of the 1966 evaluation of the lake's eutrophication problem.

In order to attain wider engineering, economic and social acceptance of water reclamation for recreation in the arid and semi-arid Southwest, it is proposed that in 1967 the information gained from the Santee project be used in cooperative water reclamation investigations and demonstrations at several other locations in the Southwest where there is a strong need for reuse of effluent.

Proposed program increase is five positions and \$133,000 and is for the Southwest area and the Pearl River project.

c. Klamath Basin Study

The Klamath Basin Study is designed to establish a basis for a water quality management program within the basin. Special attention is being given to the effects of pesticides and other contaminants from agricultural land drainage on the Tule Lake and Lower Klamath Lake National Wildlife Refuges. The project also is studying solutions to the algal nuisance problem in the Upper Klamath Lake and the Klamath River.

Data derived from the study will assist the Federal Water Pollution Control Administration, the Klamath Basin Compact Commission, and the States of California and Oregon in developing and implementing intra and interstate water pollution control policies. The long range result will be water quality improvement and the reduction or avoidance of pollution damage.

During 1965 and 1966 the study has been conducting chemical and biological investigations in the Lost River Subbasin in cooperation with the Oregon State Sanitary Authority. Other Federal agencies are being utilized to provide monitoring of flows, exploration of the effects of pesticides on selected wildlife and the effects of pesticides in plants and soils. By 1967 the program will develop a statistically reliable measurement of peak and mean concentrations of pesticides and a water-nutrient accounting system. By the end of 1967 sufficient information will be acquired to permit computer analyses of past, present, and proposed practices of water management by mathematical model in the Klamath River Basin. These analyses will reveal water quality trends and result in recommendations on agricultural land management and basin water management changes to improve water quality conditions and reduce or avoid pollution damages. In order to carry out the planned activities in 1967, additional staff is required. Program increase proposed is 12 positions and \$122,420.

d. Demonstration of control and abatement of water pollution from acid mine drainage

Reduction of acid pollution of the streams is a prime necessity to development of depressed areas in Appalachia, and is a serious problem in other areas as well. Acid pollution necessitates expensive treatment procedures to produce water fit for municipal and industrial use, corrodes boats and barges and bridges and other installations, destroys fish and fish food organisms, prevents use of streams for recreational purposes, and creates unsightly conditions because of deposits of red iron oxides in the channels.

Current Program

While various measures for control or prevention of acid mine drainage are known, their relative efficiency, absolute effectiveness and relative costs of different measures under differing conditions have not been determined. The purpose of the acid mine drainage pollution control demonstration program is to determine these three things about the known useful control measures, as well as to test and similarly evaluate other potential new control

measures. The demonstration program is aimed at providing a guide to general control programs to make them more effective and less costly for the results obtained. In view of the large amount of money involved in a complete control program, amounting to an estimated \$400,000 per square mile of area (surface and underground) directly disturbed by coal mining, guidance from the demonstration program to increase broad control program effectiveness is imperative.

A broad control program for acid pollution could be started immediately, with certain known and tested methods such as backfill and burial of the acid producing materials. However, for the most efficient attack on the problem, an attack that will necessarily involve a variety of control methods to meet a variety of situations, the program should include from the start establishment of demonstration projects.

As any demonstration project site is given complete treatment to prevent or control acid formation, it represents a finished step in any general acid control program which may subsequently be undertaken in addition to its principal use for evaluation purposes. The work done to control or prevent acid at the same time reduces the amounts of iron compounds getting into streams, and cuts down the contributions of silt from lands disturbed by surface mining. Work on a demonstration site, which might comprise ten to fifty square miles, would result in completion of treatment on perhaps as much as two percent of the total area needing treatment in a major drainage basin.

In 1964 a joint HEW-Interior program was initiated with plans for three demonstration projects to test and evaluate measures that could be used to combat acid mine drainage pollution. Subsequently in 1966, three additional projects were authorized for accelerating demonstration activities in the Appalachian Region. These six projects are or will be located as follows:

1. Elkins, West Virginia
2. Mocanaqua, Pennsylvania
3. Western Pennsylvania
4. Central Pennsylvania
5. Western Maryland
6. Western Kentucky

Elkins, West Virginia

It has been initially anticipated that construction of control measures at the Elkins, West Virginia site could be initiated in 1965. However, due to legal problems in getting permission from the landowners, \$820 000 appropriated for this purpose was extended by Congressional action for obligational purposes to June 30, 1966. It is now anticipated that with these funds plus the funds authorized for 1966, the contracts for constructing all the planned control measures will be negotiated by the end of 1966. Intensive ground surveys now about completed show an extraordinarily large number (well over 1,500) of subsidence areas needing sealing treatment to prevent air and water from moving into the underground mine galleries. Many of them present problems of difficult access as well as expensive treatment.

Mocanaqua, Pennsylvania

Planning and intensive ground surveys are proceeding. Initial construction activity is proposed for 1966 with contracts to be awarded in 1967 for the construction of final measures proposed at this site. Water quality monitoring and sampling is and will continue to be carried out. The ground survey indicates that a much greater amount of backfill will be needed than originally estimated and, therefore, the project is expected to cost more than originally anticipated.

Other approved projects

Activities in 1966 and 1967 will include site selection, monitoring streamflow and water quality, making stream biology studies, mapping topography and geology and mining activity, making a survey to locate holes where air or water have access to acid producing materials, core drilling for subsurface geologic exploration and underground studies, and designing and planning works for control and prevention of acid production. It is not anticipated that any construction of control measures will be initiated until 1967.

Transferring unobligated balances of construction funds

It has now become quite apparent from experience with the Elkins, West Virginia and Mocanaqua projects, that the construction activity associated with these projects cannot be initiated in the schedule as planned. Since funds were appropriated in 1966 to carry out more construction than is now feasible and since these funds will be needed in 1967, it is proposed that an estimated unobligated balance of \$1,426,000 representing part of \$2,476,000 appropriated in 1966 be made available in 1967 and transferred to "Buildings and Facilities, Water Pollution Control Administration".

Since the funds in that account are for construction purposes and available until expended, it would permit having these funds available when needed. At present, all funds in this appropriation not obligated by the end of each fiscal year lapse.

The following indicates the available construction funds, estimated obligations, and balance estimated to be available for transfer:

<u>Site</u>	<u>Total Estimate</u>	<u>1966^{a/} Available</u>	<u>1966^{b/} Obligation</u>	<u>1966^{c/} Unobligated Balance</u>
1. Elkins, W. Va.	\$1,470,000	\$1,470,000 ^{c/}	\$1,470,000	\$
2. Mocanaqua, Pa.	1,550,000	896,000	400,000	450,000
3. Western Pennsylvania	1,100,000	300,000	.....	300,000
4. Central Pennsylvania	1,150,000	300,000	.....	350,000
5. Maryland	1,126,000	330,000	326,000
6. Kentucky	<u>965,000</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>
Total	7,361,000	3,296,000	1,870,000	1,426,000

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- ^{a/} Includes \$820,000 from 1965 authorized to be carried forward through 1966.
^{b/} Comparative transfer to Buildings and Facilities, FWPCA
^{c/} Proposed to be transferred and merged with the appropriation, Buildings and Facilities, Federal Water Pollution Control Administration.

New Projects for 1967

Four additional projects are proposed to be initiated in 1967. Experience gained in the initial phases of this project has indicated that to provide an adequate sampling of the wide variety of physical factors affecting both the production of mine acid and the kind and cost of measures necessary for its control, it will be necessary to extend this program to other areas. These additional sites may be in Ohio, Tennessee, West Virginia, and Indiana. Distribution of the projects is guided by the types of mining operations, past and present. The first year for these additional sites will include site selection, water sampling, monitoring, and other previously mentioned planning activities. No construction funds are requested in 1967 for these projects.

Inventory

All acid pollution sources are not completely known. Therefore, it is proposed to initiate a national inventory to identify all sources. This will include collecting and organizing data available from existing studies and carrying out field investigations to cover areas not previously studied. Major stream systems suffering acid pollution are known, as is the general region within which such pollution is significant. There is as yet no coordinated, topographic, hydrologic, and geologic inventory of the acid pollution sources; detailed planning for control and restoration of source areas requires such a base. Meaningful recommendations for effective solutions to apply in a comprehensive national acid pollution control program cannot be made until the extent of the problem is fully known. Therefore, the initiation of this inventory is necessary.

The total funds in this appropriation for 1967 include \$825,000 for Department of Interior for participation by Bureau of Mines, Geological Survey, and Bureau of Sport Fisheries and 33 positions and \$851,000 for the Water Pollution Control program activities. Program increase is 9 positions and \$358,000. New construction funds for 1967 are included in the "Buildings and Facilities" appropriation.

e. Charleston Harbor-Cooper River Study

In response to a request by the United States Army Corps of Engineers a study was begun late in 1964 to determine what effect the diversion of the Cooper River from Charleston Harbor, South Carolina, would have on water quality in the harbor. Diversion of an estimated 27,000 cubic feet per second of fresh water could cause a major change in the waste assimilation capacity and hydraulic regimen of the estuary.

Laboratory and office facilities for the study were built into a large floating barge obtained from the Corps of Engineers. This barge is anchored in the harbor. In 1965 and 1966 the project has conducted standard routine monitoring of water pollution conditions in the harbor, a number of round-the-clock intensive surveys of these conditions, and dye studies whose results have been projected by reference to a hydraulic model of the harbor that the Corps of Engineers has constructed. The project has also been called on to investigate and report on a number of recent fish kills in the harbor and in the Cooper-Ashly River complex.

It is anticipated that all field work will be completed by the close of 1966 and that a report on the study will be completed for the Corps of Engineers on or before December 31, 1966. The work in 1967 will, therefore, consist entirely of engineering analysis and report preparation.

f. Lower Mississippi

Requests for technical assistance from the States of Louisiana and Tennessee and an enforcement conference between the Department of Health, Education, and Welfare and the States of Arkansas, Louisiana, Mississippi, and Tennessee regarding pollution of the Mississippi River and its tributaries resulted in establishment of this project.

The most significant problem being investigated by this project is organic pollution stemming from the manufacture and use of chlorinated hydrocarbon pesticides. A major source of pesticide compounds pollution has been located and appropriate action taken to significantly reduce the amount of such pollution. By the end of 1966 the project will have located the other sources of these pollutants and determined the extent and pattern of pesticide pollution of the Lower Mississippi River, the Atchafalaya River, and of the fish, shellfish, muds, groundwaters, and public water supplies. Through field investigations, information is being developed for a remedial and preventative program to control pesticide pollution. As the program is developed, the States are furnished with the information so that appropriate measures can be implemented to prevent this type of pollution.

This technical assistance project will be completed in 1966. In 1967, staff equipment, and facilities will form the nucleus for the start of the Lower Mississippi comprehensive project.

g. Tampa Bay Study

There is an immediate need to determine the cause of obnoxious odors along the western side of Hillsborough Bay, which is an arm of Tampa Bay, and to recommend measures for eliminating the causes of the odors. It is suspected that the odors are attributable to the various sources of wastes which are discharged into the Tampa Bay area, including the ships which used the Bay.

In addition, the Jacksonville District of the Corps of Engineers has been studying the feasibility of erecting hurricane protective measures for Hillsborough Bay. It is possible that the erection of hurricane barriers could have an adverse affect on water quality in the bay and further aggravate existing water pollution conditions.

A study to determine the cause of the bay's odor problems and to evaluate hurricane barrier proposals from the standpoint of water pollution control is proposed for 1967. Upon completion of field work in the Charleston Harbor area, it is planned that the laboratory facilities suitable for estuarine studies be moved into the Tampa Bay area. In addition, the experienced personnel of the Charleston Harbor Study will be available to assist in this study, which is of a similar nature.

This operation will be incorporated into the Florida-Puerto Rico comprehensive project in 1968. In 1967, 13 positions and \$103,000 are requested to initiate this project.

h. San Joaquin Project

The United States Bureau of Reclamation and the California Department of Water Resources propose to construct a drain to collect waste irrigation waters from the southern and western portions of the San Joaquin Valley. The initial plan was to discharge these wastes to the Sacramento-San Joaquin Delta, which drains directly into the San Francisco Bay. Significant water pollution problems in the bay area would probably result from the nutrients and pesticides which the waste water is expected to carry.

In 1966, the Central Pacific Comprehensive Project will direct its initial year of operations to this specific problem. It will conduct an investigation to determine feasible means of disposal of agricultural drainage without causing serious pollution problems. This study will prepare an economic and technical feasibility report on the reclamation of the waste irrigation waters. Salt concentration in these waters presently renders them unfit for reuse for irrigation. However, if the waters could be treated by utilizing electrodialysis or other processes so as to lower the salinity content, the waste water could be recirculated for irrigation purposes and pollution of the bay area could be averted.

While there are many economic and engineering problems requiring further investigation, the proposal to treat the San Luis drain waste has considerable merit:

1. In the event that the comprehensive studies confirm the preliminary studies and conclusions that disposal to San Francisco Bay should not be permitted, serious political problems would be raised concerning the right of one group of beneficiaries to proceed with a project which would result in substantial damage to another. Should treatment be found to be technically and economically feasible, irrigated agriculture could continue to expand.

2. Since electric energy, which can be easily distributed, is the only major input of energy to the processes, it is conceivable that the processes can be applied at multiple small locations such as individual irrigation districts or segments thereof.

3. The local nature of the installations will make possible the reduction of major drainage facilities and will make completely unnecessary the construction of the major interceptor drain.

4. This process, if successful, will reclaim water in a water-short area. The only new water that need be added will be that lost by evaporation in the process of irrigation and the small amount used to transport the waste slurry to the Pacific Ocean. The economic appraisal of the proposal will need to take into consideration the total cost of supplying the irrigation water including that subsidized by the Federal government and the savings which will accrue through the elimination of the need to construct the major drain and the reduction in size of the feeder canals.

In view of this, it is proposed that 15 positions and \$473,000 be provided in 1967 to plan and design an irrigation waste treatment plant utilizing electrodialysis and other processes.

This project is considered to have the highest priority because of the magnitude and cost of the drainage schemes proposed by the Bureau of Reclamation, the need to meet without further delay the potential conflict in terms of water pollution problems which would be caused by the agricultural waste discharges, and the importance of Central Valley agriculture to the economy of the State of California and to the nation.

i. Federal installations

On November 17, 1965 President Johnson signed Executive Order 11258 requiring all Federal agencies to step up their efforts in the nationwide battle against water pollution. The President emphatically expressed his objective that Federal agencies provide leadership in pollution control through exemplary prevention, control and abatement of pollution from Federal installations. This Order placed heavy responsibilities on the Department for providing consultation, review and technical assistance to all Federal agencies concerned. These responsibilities include the following:

(1) Review essential features of control and treatment measures proposed for all new Federal facilities and buildings and advise on their adequacy and effectiveness.

(2) Provide consultation services to agencies developing plans required to be submitted to the Director of the Bureau of the Budget by July 1, 1966 on a phased and orderly plan for installing such improvements as may be needed to prevent water pollution from existing facilities and buildings. All subsequent revisions must also be developed in consultation with the program.

(3) Review and report on the potential impact of any proposed Federal water resources development project on water quality including any changes considered necessary with respect to design, construction and operation of the project.

(4) Provide technical assistance to Federal agencies in their review of loan, grant, and contract practices to determine the extent to which water pollution control standards set forth in the Order should be adhered to by borrowers, grantees, or contractors. Report on results to be submitted to the Bureau of the Budget by July 1, 1966.

(5) Review the Department's own loan, grant, and contract practices to make the same determinations and meet the reporting requirements.

(6) Make a comprehensive study of the problem of water pollution within the United States caused by vessels operated by Federal agencies and develop such recommendation for corrective or preventive action as may be appropriate.

In order to meet the high level of workload anticipated, the established schedules and the fact that the objective of preventing, controlling and abating wastes from Federal installations becomes paramount, it is necessary to reprogram \$227,000 to immediately implement the program. The manpower and financial resources necessary to meet this need was provided by reprogramming the major part of this need from the resources authorized 1966 for laboratory staffing.

To meet the continued activity anticipated for 1967, an additional 28 positions and \$230,000 are proposed.

4. Training

1966 Estimate		1967 Estimate		Increase or Decrease	
Pos.	Amount	Pos.	Amount	Pos.	Amount
40	\$477,250	54	\$707,550	+14	+\$230,300

The growing shortage of skilled personnel in all fields of engineering and science, together with the increasing diversity and complexity of water supply and pollution control problems, makes advanced training a matter of high priority. There is also a need to improve and accelerate the flow of information resulting from research and technological improvements to the practicing engineers and scientists in the field. The training program provides for in-service technical training of qualified personnel from Federal, State and local agencies, universities and industry and for graduate training of agency personnel in specialized disciplines. Proposed program increase is 14 positions and \$131,600.

(a) Technical training

In addition to the primary objective of upgrading professional skills, the technical training program bridges the customary time-lag between research and application to place new knowledge at the immediate disposal of professional and technical personnel of State and local agencies and industries responsible for water pollution control activities.

Up to now the technical training program has been directed from the Sanitary Engineering Center in Cincinnati. However, with the establishment of water pollution control laboratories, routine training courses will be decentralized to the laboratories. Training at these facilities will be tailored to the specific situations encountered in the various areas involved.

In 1965 a total of 20 short-term courses were conducted for approximately 550 professional staff members of State, local and other organizations with water pollution control interests including 140 staff members of the agency. Two special in-service courses were conducted for agency staff in systems analysis and handling of data for a storage retrieval system.

In 1966 and 1967 the Cincinnati staff will place more emphasis on developing new courses and special in-service courses based on research results and technological improvements. Emphasis will also be placed on providing consultation and assistance as requested by State agencies and others relating to particular aspects of training and assist in developing training courses to be sponsored by each of the water pollution control laboratories. Some of

the existing courses may be scheduled at the laboratories with technical and administrative backings where necessary, provided by Cincinnati staff.

The proposed increase for 1967 is three positions and \$17,600 to strengthen the headquarters activity with an additional professional staff member and provide a professional staff member in the Ann Arbor and Boston laboratories.

The overall effect of this program will be to increase the opportunities for training, thereby accelerating the application of new technological knowledge in the field, and to make training courses more effective in terms of meeting needs of specific areas. Decentralization to the laboratories will provide for the training of larger numbers of people overall and for the attendance at training courses of State and local personnel unable to receive training at Cincinnati because of travel restrictions.

(b) Graduate training

Selected employees are assigned to universities each year for specialized resident study at the graduate level. These assignments have increased the number of key personnel with advanced training and have provided for the development of highly specialized skills, including those in shortage categories. Most of those who have completed such assignments have progressed to more advanced duty assignments than those held before their training. For 1967 an additional 11 positions and \$114,000 are requested to further provide advanced training with emphasis to be given on encouraging the development of skills in highly specialized areas of science and engineering in short supply.

5. Research, training, and demonstration grant services

1966		1967		Increase or	
Estimate		Estimate		Decrease	
Pos.	Amount	Pos.	Amount	Pos.	Amount
31	\$366,300	31	\$422,000	...	+\$55,700

This activity provides professional and administrative staff services for four extramural grant programs: research, demonstration, and training grants, and research fellowship awards. These services provided by this activity include technical assistance to scientific and engineering institutions in the development of significant research and training project applications, the professional staff management services for competent grant review and award operations, the clerical analysis and processing of grant awards; and evaluation of grant productivity. The activity also reimburses the National Institutes of Health, PHS, for payment and other administrative services on research grants.

During its five year history water pollution control research,

demonstration, and training grant appropriations have increased more than three-fold. This rapid growth in grant appropriations, combined with new responsibilities in grant management and committee management, is increasing the workload accordingly. By 1967 an estimated total of 432 grant projects will have been completed.

In 1966 a staff of three professionals were authorized for the laboratories, one each in Ada, Corvallis and Athens. This staff will be the prime informational resource on research and training grant programs in the geographical area served by a laboratory. They will be available to (1) provide consultation and advice to potential grantees and fellows; (2) explain and clarify terms and conditions of applicants' eligibility; (3) assist in the performance of headquarters grants management responsibilities by making site visits in connection with grant applications and awards; and (4) solve specific problems which may arise on the conduct of grants. It is ultimately planned to have similar competence in all water pollution control laboratories (except Alaska).

Program increase for this activity is \$18,000 for additional cost to reimburse NIH.

6. Public information and technical reports

1966 Estimate		1967 Estimate		Increase or Decrease	
Pos.	Amount	Pos.	Amount	Pos.	Amount
23	\$316,700	23	\$361,400	...	+\$44,700

The main objectives of this activity is to (1) increase the public's awareness of its need for water pollution control, and provide communication skills to other parts of the Administration; and (2) provide technical writing, editing, and publishing services for the use of scientific and technical personnel, and to effect better scientific communication within the field of water pollution control generally.

a. Public Information

This activity works to build public awareness of the water pollution problem. Working in cooperation with the Advertising Council, the radio and television industries, and twenty-five national civic organizations, it operates the "Clean Water" mass media campaign. It also works to encourage and supplement educational programs conducted by the State water pollution agencies and such organizations as League of Women Voters, the General Federation of Women's Clubs, and the Junior Chambers of Commerce. Support of this program maintains a high level of interest in water pollution control on the part of the public and helps build a reservoir of

understanding that will benefit the cause of clean water for years to come.

b. Technical Reports

This activity aims to place technical writing and editing skills throughout the research programs of the Administration conducted in the field. It also provides for technical reference services for these programs. Scientists and technicians, if they are to do their jobs, must have such a basic tool as reference services. If they are to successfully communicate the knowledge they develop, they must have the support of editorial and publication skills. In 1966 such competence is being provided specifically in the Ada, Corvallis and Athens laboratories.

Construction grants and facilities demonstration services

	1966		1967		Increase or	
	Pos.	Amount	Pos.	Amount	Pos.	Amount
Personnel compensation and benefits.....	189	\$1,284,000	210	\$1,791,000	+21	\$507,000
Other expenses.....	...	439,000	...	445,000	...	+6,000
Total	189	1,723,000	210	2,236,000	21	+513,000

Summary by Program

1. Construction grant services.....	159 ✓	✓1,529,000	180	1,877,000	+21	+348,000
2. Facilities demonstration services.....	30 ✓	✓194,000	30	359,000	..	+165,000
Total	189 ✓	✓1,723,000	210	2,236,000	+21	+513,000

The Federal Water Pollution Control Act Amendments of 1965 increased the authorization for waste treatment works construction program from \$100 million to \$150 million and authorized a new \$20 million annual program of grants and contracts to assist in the development of projects designed to control the discharge of untreated or inadequately treated wastes from sewers. In 1966, additional personnel and funds were provided to meet the additional workload created by this legislation. The increase proposed for 1967 is to annualize the cost of 62 new positions authorized in 1966 and a program increase of 21 positions and \$139,000 to meet increased workload related to \$29 million in additional grants and optimum workload from the 1966 grant increase.

1. Construction grants services

The responsibilities of this activity are to administer and evaluate the effectiveness of the waste treatment works construction grants program.

In 1967 the grant program budget includes \$150 million or \$29 million more than 1966 for grants to any State, municipality, intermunicipal or interstate agency to assist in the construction of sewage treatment works. The funds are allotted to the States according to a statutory formula based on population and per capita income.

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 contract, inspecting construction, processing 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 backlog and other factors. The work load of this activity can best be demonstrated by the following statistics:

	<u>Work load statistics</u>			
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>Optimum</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	
Appropriations (millions)	\$90	\$121	\$153	\$150
Obligations (millions)	85	121	140	150
Grant Offers	611	956	1,090	1,140
Plans & specifications	700	870	1,100	1,330
Construction starts	751	860	1,100	1,330
Payment inspection and audits	2,175	2,510	3,100	3,600
Plants completed	772	850	900	930

Note: Includes Appalachian program.

2. Facilities demonstration services

The amendments of 1965 authorized appropriations of \$20 million per year for four years beginning in 1966 for grants and contracts to assist in the development of projects which will demonstrate new or improved methods of controlling the discharge of untreated or inadequately treated waste from sewers which carry storm water or both storm water and sewage or other waste. The Act provides that 25 percent of the appropriated funds may be used for research or demonstration contracts.

The purpose of this activity is to administer the program of grants and contracts to stimulate the development of engineering and economic data and the demonstration of methods that can be utilized to control the pollution from storm water and combined sewers. Grant funds will be used to assist communities to devise and carry out projects which will demonstrate improved means of controlling the discharge of untreated or inadequately treated waste from sewers which carry storm water or both storm water and sewage, or other waste. The selection of grant projects will take into consideration the extent to which they will

demonstrate new or improved methods and the provisions made to develop sound engineering and economic data that will be useful in the evaluation of the method demonstrated.

Contracts will be awarded to universities, and other institutions and individuals to provide additional information on solutions to the problem. Contract provisions will be utilized to develop theoretical concepts, study feasibility, perform laboratory and pilot studies and evaluate existing facilities.

Administration of the program includes, development of scopes of work for contract studies and investigations, contract management, analysis of contract and grant proposals, review of construction plans and specifications, and performance of field inspections. Data will be analyzed to permit evaluation of the technical soundness and economic feasibility of the methods tested to enable recommendation of solutions to this water pollution problem.

In 1966 and 1967, it is anticipated that there will be 25 grants serviced and 50 to 100 contracts negotiated and serviced. In servicing these grants and contracts, it is estimated that each year 125 grant applications will be reviewed in addition to a number of unsolicited contract proposals which cannot be estimated at this time.

Executive direction and management support

	1966		1967		Increase or	
	Pos.	Amount	Pos.	Amount	Pos.	Decrease
						Amount
Personnel compensation and benefits.....	104	\$901,900	252	\$2,109,000	+148	+\$1,207,100
Other expenses.....	...	1,872,200 ^{a/}	...	594,000	...	-1,278,200
Total.....	104	2,774,100	252	2,703,000	+148	-71,100

a/ Includes \$1,441,000 for Public Health Service, Bureau of State Services "Management Fund."

The establishment of the Federal Water Pollution Control Administration results in a major revision of management responsibilities.

In 1965 and prior years executive direction and management support responsibilities for the water pollution control program was primarily vested in the Public Health Service. Major management and administrative support was provided by the Office of Surgeon General and the Bureau of State Services (Environmental Health) staffs. Environmental Health management and administrative support provided at headquarters and at the Sanitary Engineering Center in Cincinnati, Ohio were budgeted in the Bureau of State Services, Management Fund with funds for their support being provided by the "Water Supply and Water Pollution Control" appropriation. In 1966 \$1,441,000 has been earmarked for this purpose representing support of 148 positions. The establishment of the Federal Water Pollution Control Administration on December 31, 1965, outside of Public Health Service, inevitably creates a different situation and creates new problems. Its establishment requires a major revision of the existing organization to effectively and efficiently carry out program responsibilities. It will require providing its own executive and staff leadership and its own administrative management support, such as personnel management, financial management, general services and management analysis. This for the most part has been the responsibility of Public Health Service.

Initially the Administration is exercising its program responsibilities through existing headquarters and field organizational structure, procedures, staff and resources that were transferred to the Administration with the Division of Water Supply and Pollution Control. As soon as practicable, the Commissioner, with the approval of the Secretary, will organize the Administration, determine its method of operation, select and assign key officials and arrange for the assignment of all other personnel.

Initially and for such temporary periods as proves necessary all organizations concerned will provide the Administration the administrative support and services which have been provided for the Division of Water Supply and

Pollution Control. It is proposed that the Administration develop its own administrative support and services competences and arrangements, as rapidly as possible. In 1966 this will occur on a step-by-step basis, and incremental transfers made to the Administration of a proportional share of Bureau of State Services (Environmental Health) Management Fund positions, personnel, associated personal property, records, real property, equipment, and other resources will be both anticipated and accommodated. The target date for completion of transfers is July 1, 1966.

The extent to which these existing resources will meet the needs of the new Federal Water Pollution Control Administration has not as yet been definitely determined at this time.

This activity now includes support of the headquarters staff for executive direction and administrative support needs and for the water pollution control programs at Sanitary Engineering Center in Cincinnati, Ohio which has been provided through the Management Fund of the Bureau of State Services (Environmental Health).

This activity also includes the financing of the Water Pollution Control Advisory Board and its executive secretariat. This Board is established in accordance with provisions of the Federal Water Pollution Control Act to advise, consult with, and make recommendations to the Secretary on matters of pollution.

The 148 position increase represents positions to be transferred from the Public Health Service, Bureau of State Services (Environmental Health) Management Fund. Because of the many uncertainties still involved in the establishment of the Federal Water Pollution Control Administration, no fund increases are being proposed.

New Positions Requested
Fiscal Year 1967

<u>Comprehensive</u>	<u>Grade</u>	<u>Annual Salary</u>
(3) Engineer.....	GS-15	\$51,165
(2) Laboratory chief.....	GS-13	25,020
(17) Engineer.....	GS-13	212,670
(18) Scientist.....	GS-13	225,180
(8) Engineer.....	GS-12	84,952
(18) Scientist.....	GS-12	191,142
(2) Technical writer.....	GS-11	17,922
(25) Engineer.....	GS-11	224,025
(24) Scientist.....	GS-11	215,064
(14) Engineer.....	GS-9	104,706
(11) Scientist.....	GS-9	82,269
(17) Engineering assistant.....	GS-7	106,573
Electronic technician.....	GS-7	6,269
Administrative assistant.....	GS-7	6,269
(2) Secretary.....	GS-6	11,404
(10) Clerical assistant.....	GS-5	51,810
(5) Draftsman.....	GS-5	25,905
(9) Engineering aide.....	GS-5	46,629
Draftsman.....	GS-4	4,641
(54) Clerical assistant.....	GS-4	250,614
(7) Clerical assistant.....	GS-3	29,043
(6) Engineering aide.....	GS-3	24,894
(5) Laboratory technician.....	GS-3	20,745
Messenger.....	GS-3	4,149
(20) ungraded positions.....		<u>112,004</u>
	(281)	2,135,064
Net adjustment due to project phase out....	<u>-24</u>	<u>-124,825</u>
	257	2,010,239

Enforcement

	<u>Grade</u>	<u>Annual Salary</u>
Engineer.....	GS-14	\$14,680
(5) Engineer.....	GS-13	62,550
(5) Scientist.....	GS-13	62,550
(9) Engineer.....	GS-12	95,571
(8) Scientist.....	GS-12	84,952
(2) Engineer.....	GS-11	17,922
(14) Scientist.....	GS-9	104,706
(2) Administrative assistant.....	GS-9	14,958
(12) Laboratory assistant.....	GS-7	75,228
(5) Engineering aide.....	GS-5	25,905
(2) Laboratory assistant.....	GS-5	10,362
(18) Clerical assistant.....	GS-5	93,258
(12) Clerical assistant.....	GS-4	55,692
Clerk typist.....	GS-2	3,814
9 ungraded positions.....	_____	<u>44,550</u>
	105	766,698
Net adjustments due to project phase out.....	<u>-57</u>	<u>-393,035</u>
	48	373,663

<u>Research, Training, and Technical Services</u>	<u>Grade</u>	<u>Annual Salary</u>
Engineer.....	GS-15	\$17,055
(4) Engineer.....	GS-14	58,720
(10) Scientists.....	GS-14	146,800
(9) Engineers.....	GS-13	112,590
(6) Scientists.....	GS-13	75,060
(3) Economists.....	GS-13	37,530
Statistician.....	GS-13	12,510
(3) Grants management specialist.....	GS-13	37,530
(2) Executive secretary, D.G. scientific review...	GS-13	25,020
(2) Training officer.....	GS-13	25,020
(2) Administrative assistant.....	GS-12	21,238
(2) Facility manager.....	GS-12	21,238
Grants management officer.....	GS-12	10,619
(9) Engineer.....	GS-12	95,571
(13) Scientist.....	GS-12	138,047
(3) ADP specialist.....	GS-12	31,857
Administrative assistant.....	GS-11	8,961
(26) Scientist.....	GS-11	232,986
(22) Engineer.....	GS-11	197,142
(5) Engineer.....	GS-9	37,395
Librarian.....	GS-9	7,479
Personnel specialist.....	GS-9	7,479
Digital computer programmer.....	GS-9	7,479
Economist.....	GS-9	7,479
Data systems analyst.....	GS-9	7,479
Laboratory assistant	GS-7	6,269
Statistical clerk.....	GS-7	6,269
(9) Engineering aide.....	GS-7	56,421
(2) Administrative assistant.....	GS-7	12,538
(2) Grants assistant.....	GS-7	12,538
Librarian.....	GS-7	6,269
(4) Scientist	GS-7	25,076
(11) Clerical assistant.....	GS-6	62,722
(6) Laboratory assistant.....	GS-5	31,086
(2) Draftsman	GS-5	10,362
Engineering aide.....	GS-5	5,181
(14) Clerical assistant.....	GS-5	72,534
(5) Laboratory assistant.....	GS-4	23,205
Draftsman	GS-4	4,641
(31) Clerical assistant.....	GS-4	143,871
(8) Clerk-typist.....	GS-3	33,192
(2) Laboratory assistant.....	GS-3	8,298
	(231)	1,900,756
Net adjustment due to project phase out	-58	-369,092
	(173)	1,531,664

Construction Grants and Facilities
Demonstration Services

	<u>Grade</u>	<u>Annual Salary</u>
(5) Engineer.....	GS-12	\$53,095
(5) Engineer.....	GS-11	44,805
(6) Engineer.....	GS-9	44,874
(3) Clerical assistant.....	GS-4	13,923
(2) Clerk typist.....	GS-3	<u>8,298</u>
	(21)	164,995

<u>Executive Direction and Management Support</u>	<u>Grade</u>	<u>Annual Salary</u>
Administrative officer.....	GS-15	\$17,055
Special assistant for health affairs.....	GS-15	17,055
Special assistant for legislation.....	GS-15	17,055
Director, laboratory.....	GS-15	17,055
Chief, program planning and development.....	GS-14	14,680
General services officer.....	GS-14	14,680
Staff analyst.....	GS-13	12,510
(2) Analyst.....	GS-13	25,020
ADP specialist.....	GS-13	12,510
Budget analyst.....	GS-13	12,510
Supervisory accountant, chief.....	GS-13	12,510
Digital computer systems analyst.....	GS-13	12,510
Architectural engineer.....	GS-13	12,510
General services specialist.....	GS-13	12,510
Contract specialist.....	GS-13	12,510
Publications officer.....	GS-13	12,510
(2) Management analyst.....	GS-13	25,020
Digital computer systems administrator.....	GS-13	12,510
(2) Financial management specialist.....	GS-13	25,020
Chief fiscal operations.....	GS-13	12,510
Personnel specialist.....	GS-13	12,510
Facilities planning officer.....	GS-13	12,510
General supply officer.....	GS-13	12,510
(2) Program analyst.....	GS-13	25,020
Economist.....	GS-13	12,510
(2) Administrative officer.....	GS-13	25,020
(2) Administrative assistant.....	GS-12	21,238
Program analyst.....	GS-12	10,619
Patent specialist.....	GS-12	10,619
Budget analyst.....	GS-12	10,619
Supervisory operating accountant.....	GS-12	10,619
Accountant.....	GS-12	10,619
(2) Management analyst.....	GS-12	21,238
Digital computer systems analyst.....	GS-12	10,619
Employee development officer.....	GS-12	10,619
Procurement officer.....	GS-12	10,619
Facilities planning specialist.....	GS-11	8,961
Procurement specialist.....	GS-11	8,961
Property officer.....	GS-11	8,961
Employee relations specialist.....	GS-11	8,961
Employee development specialist.....	GS-11	8,961
Management analyst.....	GS-11	8,961
Management technician.....	GS-11	8,961
Grants fiscal administrative analyst.....	GS-11	8,961
Systems accountant.....	GS-11	8,961

Executive Direction and Management Support-cont.GradeAnnual ¹⁰²
Salary

Accountant.....	GS-11	\$ 8,961
Personnel specialist.....	GS-11	8,961
(2) Secretary.....	GS-7	12,538
Secretary-steno.....	GS-7	6,269
(2) Budget analyst (trainee).....	GS-7	12,538
Accountant technician.....	GS-7	6,269
Supervisory voucher examiner.....	GS-7	6,269
Contract assistant.....	GS-7	6,269
General supply assistant.....	GS-7	6,269
(2) Secretary-steno.....	GS-6	11,404
Supply clerk.....	GS-6	5,702
Secretary.....	GS-6	5,702
(2) Stock control clerk.....	GS-5	10,362
Printing clerk.....	GS-5	5,181
(6) Clerk.....	GS-5	31,086
(2) Voucher examiner.....	GS-5	10,362
Secretary-steno.....	GS-5	5,181
(3) Secretary.....	GS-5	15,543
(4) Clerk steno.....	GS-5	20,724
(3) Supply clerk.....	GS-4	13,923
Secretary typist.....	GS-4	4,641
(4) Clerk typist.....	GS-4	18,564
Mail and file clerk.....	GS-4	4,641
Stock control clerk.....	GS-4	4,641
Appointment clerk typist.....	GS-4	4,641
Voucher examiner.....	GS-4	4,641
(2) Accounts maintenance clerk.....	GS-4	9,282
(4) Clerk-steno.....	GS-4	18,564
Personnel file clerk.....	GS-3	4,149
(7) Clerk typist.....	GS-3	29,043
Telephone operator.....	GS-3	4,149
(3) Mail and files clerk.....	GS-3	12,447
(3) Mail clerk.....	GS-2	11,442
(2) Messenger.....	GS-2	7,628
27 ungraded positions.....		<u>166,408</u>
	(148)	1,132,801
Total, all activities.....	(647)	<u><u>5,213,362</u></u>

Grants for Water Treatment Works Construction

Federal Water Pollution Control AdministrationGrants for Waste Treatment Works Construction
and Sewer Overflow Control

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Appropriation Estimate

GRANTS FOR WASTE TREATMENT WORKS CONSTRUCTION
AND SEWER OVERFLOW CONTROL[Grants for Waste Treatment Works Construction]

[For payments under section 6 of the Water Pollution Control Act, as amended (33 U.S.C. 466e), \$91,000,000: PROVIDED, That allotments under such section 6 for the current fiscal year shall be made on the basis of \$100,000,000: PROVIDED FURTHER, That none of the sums allotted to a State shall remain available for obligation after December 31, 1966.]

[For an additional amount for "Grants for waste treatment works construction", \$50,000,000, to remain available until December 31, 1966, and of which \$30,000,000 shall be for grants for construction of sewage treatment works in accordance with the allotment formula set forth in the third sentence of section 8(c) of the Federal Water Pollution Control Act, as amended, and \$20,000,000 shall be for grants and contracts pursuant to section 6 of such Act to demonstrate new and improved methods of controlling the discharge into water of sewage or other wastes from sewers.]

For grants and contracts for waste treatment works construction, and for research and development under section 6 of the Water Pollution Control Act, as amended, to remain available until expended, \$173,000,000 of which, \$20,000,000 shall be for grants and contracts pursuant to section 6 of such Act, \$150,000,000 shall be for grants for construction of sewage treatment works pursuant to section 8 of such Act, and \$3,000,000 shall be for grants for construction of sewage treatment works pursuant to section 212 of the Appalachian Regional Development Act of 1965 (Public Law 89-4). (Department of Health, Education, and Welfare Appropriation Act, 1966; Supplemental Appropriation Act, 1966).

Appropriation Language Change

The 1966 appropriation acts provided appropriations of \$121 million for waste treatment grants in lieu of the \$150 million authorized by the Water Pollution Control Act, as amended. Prior to the passage of the 1965 amendments to the Water Pollution Control Act, Congress appropriated \$91 million for such grants and included language which permitted allotting funds on the basis of \$100 million and restricted the availability of these allotments to a State for obligation purposes through December 31, 1966. An additional \$30 million for waste treatment grants was appropriated as a result of the 1965 amendments and allocated on the basis of population only.

The proposed language for 1967 will provide for the conduct of the waste treatment grants program to fully implement the authorized level and provisions for funding under section 8 of the Federal Water Pollution Control Act, as amended. The provisions that will be applicable in 1967 which are not applicable in 1966 are as follows:

(a) Provide for the full authorized level of \$150 million of which \$100 million will be allocated on the basis of population and per capita income and \$50 million on the basis of population only.

(b) All funds to remain available until expended.

(c) Provide for reallocation of these funds within 6 months following the end of the fiscal year from each State not obligating the sums allotted because of the lack of projects which have been approved by the State water pollution control agency to States having approved projects for which grants have not been made because of the lack of funds.

(d) However, prior to reallocating any funds from any State, if the Secretary finds that the need for a project in a community in such State is due in part to any Federal institution or construction activity, he may make an additional grant to such project which will in his judgment reflect an equitable contribution for the need.

The additional appropriation of \$29 million and the application of the above provisions will finance 187 additional waste treatment facilities and make available an estimated \$1.5 million for Federal impact provisions.

The proposed language also provides for carrying out the full intent of section 212 of the Appalachian Regional Development Act of 1965 which states as follows:

"(a) In order to provide facilities to assist in the prevention of pollution of the region's streams and to protect the health

and welfare of its citizens, the Secretary of Health, Education, and Welfare is authorized to make grants for the construction of sewage treatment works in accordance with the provisions of the Federal Water Pollution Control Act (33 U.S.C. 466 et seq.), without regard to any provisions therein relating to appropriation authorization ceilings or to allotments among the States. Grants under this section shall be made solely out of funds specifically appropriated for the purpose of carrying out this Act, and shall not be taken into account in the computation of the allotments among the States pursuant to any other provision of law.

(b) Not to exceed \$6,000,000 of the funds authorized in section 401 of this Act shall be available to carry out this section."

The \$3 million is the balance of the authorization and will support the construction of 30 new waste treatment facilities. Initial \$3 million was appropriated in 1965.

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Grants for Waste Treatment Works Construction
and Sewer Overflow ControlAmounts Available for Obligation

	<u>1966</u>	<u>1967</u>
Appropriation.....	\$141,000,000	\$173,000,000
Unobligated balance brought forward.....	31,638,731	31,438,731
Unobligated balance carried forward.....	<u>-31,438,731</u>	<u>-44,438,731</u>
Total.....	141,200,000	160,000,000

Obligations by Activity

Page Ref.		<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
111	Waste treatment works construction..	\$118,200,000	\$137,000,000	+\$18,800,000
112	Sewer overflow and storm water control.....	20,000,000	20,000,000	.....
114	Appalachian regional development....	<u>3,000,000</u>	<u>3,000,000</u>	<u>.....</u>
	Total.....	<u>141,200,000</u>	<u>160,000,000</u>	<u>+18,800,000</u>

New Obligational Authority by Activity

Description	<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
Waste treatment works construction..	\$121,000,000	\$150,000,000	+\$29,000,000
Sewer overflow and storm water control.....	20,000,000	20,000,000	.....
Appalachian regional development....	<u>.....</u>	<u>3,000,000</u>	<u>+3,000,000</u>
Total new obligational authority...	141,000,000	173,000,000	+32,000,000

Obligations by Object

	1966 Estimate	1967 Estimate	Increase or Decrease
25 Research contracts.....	\$5,000,000	\$5,000,000	\$.....
41 Grants, subsidies, and contributions.....	136,200,000	155,000,000	+18,800,000
Total.....	141,200,000	160,000,000	+18,800,000

Summary of Changes

1966 enacted appropriation.....	\$141,000,000
Estimate for 1967.....	<u>173,000,000</u>
Total change.....	+32,000,000

Increases

A. Increase in amount funded for grants to States.....	+29,000,000
B. Appalachian regional development.....	<u>+3,000,000</u>
Net change requested.....	+32,000,000

Explanation of ChangeWaste treatment works construction

An increase of \$29,000,000 is requested for grants to States. This will permit funding construction of essential waste treatment facilities at the maximum level authorized by the Federal Water Pollution Control Act.

Appalachian regional development

An increase of \$3,000,000 is requested for grants to construct sewage treatment works as provided for under Section 212 of the Appalachian Regional Development Act of 1965. The \$3,000,000 will support 30 projects.

Grants for Waste Treatment Works Construction
and Sewer Overflow Control

	<u>Budget Estimate to Congress</u>	<u>House Allowance</u>	<u>Senate Allowance</u>	<u>Appropriation</u>
1957	\$50,000,000	N.C.	\$50,000,000	\$50,000,000
1958	50,657,000	\$50,657,000	45,647,000	45,657,000 ✓
1959	46,816,000	46,816,000	46,816,000	46,816,000 ✓
1960	21,101,000 ✓	46,101,000	46,101,000	46,101,000 ✓
1961	25,000,000	45,000,000	50,000,000	45,645,260 ✓
1962	80,000,000 ✓	80,000,000	80,000,000	80,000,000 ✓
1963	90,000,000 ✓	90,000,000	90,000,000	90,000,000 ✓
1964	100,000,000 ✓	90,000,000	90,000,000	90,000,000
1965	93,000,000 ✓	93,000,000	93,000,000	93,000,000 ✓
1966	100,000,000 ✓	100,000,000	91,000,000	91,000,000 ✓
Suppl.	50,000,000 ✓	N.C.	50,000,000	50,000,000 ✓
1967	173,000,000 ✓			

Grants for Waste Treatment Works Construction
and Sewer Overflow Control

	<u>Estimate to Bureau of Budget</u>	<u>Budget Estimate to Congress</u>	<u>House Allowance</u>	<u>Senate Allowance</u>	<u>Appropriation</u>
1957	\$50,000,000	\$50,000,000	N.C.	\$50,000,000	\$50,000,000
1958	50,657,000	50,657,000	\$50,657,000	45,657,000	45,657,000
1959	36,816,000	46,816,000	46,816,000	46,816,000	46,816,000
1960	46,101,000	21,101,000	46,101,000	46,101,000	46,101,000
1961	50,000,000	25,000,000	45,000,000	50,000,000	45,645,260
1962	77,500,000	80,000,000	80,000,000	80,000,000	80,000,000
1963	90,000,000	90,000,000	90,000,000	90,000,000	90,000,000
1964	100,000,000	100,000,000	90,000,000	90,000,000	90,000,000
1965	106,000,000	93,000,000	93,000,000	93,000,000	93,000,000
1966	100,000,000	100,000,000	100,000,000	91,000,000	91,000,000
Suppl.	70,000,000	50,000,000	N.C.	50,000,000	50,000,000
1967	173,000,000	173,000,000			

<u>Waste treatment works construction</u>	<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
	\$121,000,000	\$150,000,000	+\$29,000,000

The Federal Water Pollution Control Act Amendments of 1965 authorize annual appropriations for 1966 and 1967 of \$150 million for grants to aid in the construction of municipal waste treatment facilities to prevent the discharge of untreated or inadequately treated sewage or other waste into any waters. These funds are to be apportioned to the States and other jurisdictions according to a formula prescribed in the statute.

The Act authorizes grants of 30 percent of the cost of construction of necessary municipal waste treatment works or \$1,200,000, whichever is smaller, provided, however, that in the case of a project which will serve more than one municipality the maximum grant may be increased to \$4,800,000. The dollar limitations do not apply if the State agrees to match equally all Federal grants made from appropriations in excess of \$100 million. The amount of a grant may be increased 10 percent if a project is certified as being in conformity with a comprehensive plan developed by an official State, metropolitan or interstate planning agency.

As of December 31, 1965, supplemented in 1962 and 1963 by the Public Works Acceleration Program, a total of 6,582 projects have been approved for grants totalling \$728 million. Local communities have contributed an additional \$2.7 billion to meet the total project cost of \$3.4 billion. Approved projects will serve a population of 53 million, and will improve the quality of water in 55,000 miles of streams. Currently, there are 1,551 applications for grants being processed or reported to be in preparation. These applications would require \$196 million in grants in support of projects costing \$993 million.

The authorization of Federal aid in 1956 was accompanied by a 62 percent increase in waste treatment works construction, with construction rising from a previous 5-year annual average of \$266 million to \$432 million under Public Law 84-660. With the increased assistance under the 1961 amendments to the Federal Water Pollution Control Act (Public Law 87-88) construction expanded again reaching \$539 million in 1961, \$654 million in 1962, \$815 million in 1963, and \$600 million in 1964. The greatly increased stimulation in 1963 reflects the additional \$108 million grant funds under the Accelerated Public Works Program.

In spite of the marked increase, construction has still not reached the level necessary to bring the municipal waste pollution problem under control during the present decade. Prior to the grants program, construction failed to keep up with obsolescence of existing treatment facilities and population growth, to say nothing of the backlog of needs which developed during World War II. Initial Federal aid in 1956 of \$50 million per year increased construction sufficiently to take care of population growth and obsolescence,

but had little effect on the backlog. Since 1961 there has been a steady cutback in the backlog of treatment facilities needed for sewered communities, but this has been accompanied by an offsetting increase in needs for presently unsewered communities. The rate of decrease in the backlog is still inadequate to assure control of the problem in the near future.

Annual surveys of the municipal waste treatment needs are conducted by the Conference of State Sanitary Engineers in cooperation with the Public Health Service. The 1965 survey reports that 1,342 communities presently discharging raw sewage require new plants for the treatment of waste for a population of 11 million. An additional 1,337 cities and towns with existing treatment plants require new or enlarged facilities because of obsolescence, or because of insufficient treatment or capacity. These communities presently discharge inadequately treated waste for a population of 17 million.

While unsewered towns are not usually major sources of pollution, they frequently experience serious ground water pollution and other public health problems because of individual disposal of sewage. The Conference of State Sanitary Engineers reports 2,598 unsewered communities which require sewer systems and sewage treatment plants for a population of 5.1 million. The estimated cost of the present backlog of 5,277 needed projects is \$1.8 billion for treatment plants, interceptors, outfall sewers, and other ancillary works.

In addition to the \$1.8 billion backlog, each year there accrue additional construction requirements of \$502 million (through 1970) to replace facilities becoming obsolete and to meet the needs for the annual population increase in the United States. This includes \$246 million for replacing existing facilities due to their limited life span, technical advances, or population relocation; and \$256 million to provide adequate treatment facilities for the population increase estimated at 3 million annually.

The 1967 estimate of \$150 million, which is the full amount of the authorization, will ultimately help support approximately 1,140 projects and stimulate waste treatment works construction totalling about \$500 million, as compared to 953 projects and a construction level of approximately \$403 million in 1966. In 1967 there will be 1,060 grant offers as compared to 611 in 1965 and 926 in 1966.

	1966 Estimate	1967 Estimate	Increase or Decrease
<u>Sewer overflow and storm water control</u>	\$20,000,000	\$20,000,000	.....

The Federal Water Pollution Control Act Amendments of 1965 authorize annual appropriations of \$20 million each for fiscal years 1966 through 1969 for the conduct of research and demonstrations relating to new or improved methods of controlling the discharge into any waters of untreated or inadequately treated sewage or other waste from sewers which carry storm water or both storm water and sewage or other waste. The Act authorizes grants of up to 50 percent of the estimated reasonable cost of projects which demonstrate new or improved methods of controlling the discharge of combined

waste, or \$1 million, whichever is the smaller. The Act provides further that 25 percent of the total amount appropriated may be utilized for contracts with public or private agencies and institutions to achieve the purposes of the Act, and places upon such contracts the same dollar limit for any single project.

The discharge of mixed raw sewage and storm water into streams from combined system overflows is one of the most difficult water pollution problems confronting our urban areas today. Combined storm and sanitary sewers in many of the Nation's municipalities seriously aggravate the national pollution situation. During periods of storm water runoff, even in small amounts, the sewers of some municipalities discharge flows of storm water and sanitary sewage in excess of the capacity of intercepting sewers and/or treatment plants. Thus, much untreated waste is bypassed into receiving waters. This type of pollution has been found to be causing serious problems in urban areas. In addition, storm water itself can be a serious pollution problem if not properly controlled.

A recent Public Health Service inventory of municipal sewage facilities shows more than 1,300 U. S. communities with combined sewer systems serving 25.8 million people. Another 630 communities of 33.1 million population have both combined and separate systems. The 59 million people affected by the combined systems represent 50 percent of the total sewered population of the Nation.

The purpose of this provision is to stimulate the development of engineering and economic data and the demonstration of new or improved methods that can be utilized to control combined waste overflow. Grant funds will be used to assist projects which will demonstrate improved means of controlling the discharge of untreated or inadequately treated waste from sewers which carry storm water or both storm water and sewage. Contracts will be awarded to universities, and other institutions or individuals for studies to develop theoretical concepts, study feasibility, perform laboratory and pilot studies and evaluate the effectiveness of existing facilities constructed to control combined sewage overflows, and to provide additional information on the problem. Combined, the program of grants and contracts will be administered to develop, test, evaluate, and demonstrate the maximum possible range of solutions for controlling this source of pollution.

Of the \$20 million requested, \$15 million will be for grants and will result in about 25 grant-assisted projects. The \$5 million proposed for the contract aspects of this program, based on an estimated range of \$50,000 to \$100,000, will support 50 to 100 such projects. A similar amount was appropriated for 1966 with appropriate action being taken to implement this new program.

<u>Appalachian regional development</u>	<u>1966 Estimate</u>	<u>1967 Estimate</u>	<u>Increase or Decrease</u>
	\$3,000,000	+\$3,000,000

Section 212 of the Appalachian Regional Development Act of 1965 authorizes the Secretary of Health, Education, and Welfare to make grants for the construction of sewage treatment works in accordance with the provisions of the Federal Water Pollution Control Act without regard to the appropriation authorization ceilings or to allotments among the States as prescribed in the latter Act. A total of \$6 million was authorized for this purpose. Late in 1965, \$3 million was appropriated for this purpose to support 30 projects. In 1966, grants are anticipated to be offered to the full extent of this \$3 million.

Sewage problems are widely manifest in the Appalachia region, resulting in a high prevalence of infections and other conditions which may be attributed to the improper disposal of human wastes. Basic environmental conditions are considerably worse there than in the more developed communities of the Nation; pollution is particularly deleterious in Appalachia since clean water is so vital to economic growth. There is a great need for the construction of sewage treatment facilities to protect health, attract industry, and develop the recreational potential of the area.

The \$3 million requested, the balance of the \$6 million authorization under the Appalachian Regional Development Act of 1965, will support an additional 30 essential projects.

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

	1965	1966	1967
State or Territory	Total Allocations	Total Allocations	Total Allocations
Alabama	\$2,121,800	\$2,661,760	\$3,012,350
Alaska	745,500	797,320	811,300
Arizona	1,256,850	1,481,520	1,624,000
Arkansas	1,779,550	2,045,560	2,259,300
California	4,979,850	7,582,460	9,314,300
Colorado	1,272,400	1,563,970	1,756,200
Connecticut	1,318,000	1,739,710	2,028,750
Delaware	729,550	804,300	853,250
District of Columbia	808,450	938,640	1,016,100
Florida	2,286,350	3,115,180	3,642,200
Georgia	2,188,400	2,829,490	3,256,600
Hawaii	959,650	1,075,480	1,145,750
Idaho	1,185,200	1,310,500	1,373,600
Illinois	3,446,800	5,110,830	6,233,000
Indiana	2,099,100	2,864,550	3,384,250
Iowa	1,633,650	2,087,700	2,384,700
Kansas	1,466,200	1,828,500	2,078,900
Kentucky	1,967,200	2,456,120	2,802,450
Louisiana	2,011,050	2,562,340	2,913,900
Maine	1,244,400	1,412,060	1,519,350
Maryland	1,579,600	2,087,440	2,430,150
Massachusetts	2,113,200	2,962,920	3,539,550
Michigan	2,939,550	4,241,170	5,077,750
Minnesota	1,793,100	2,359,330	2,743,250
Mississippi	2,095,650	2,427,490	2,653,850
Missouri	1,993,800	2,699,900	3,177,950
Montana	1,086,850	1,201,560	1,272,700
Nebraska	1,237,850	1,470,770	1,646,400
Nevada	696,450	736,320	777,950
New Hampshire	1,030,600	1,123,570	1,212,750
New Jersey	2,333,100	3,345,980	4,027,600
New Mexico	1,280,500	1,439,760	1,533,900
New York	5,263,600	8,041,630	9,890,950
North Carolina	2,373,800	3,115,100	3,610,000
North Dakota	1,161,700	1,267,870	1,308,450

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

	1965	1966	1967
State or Territory	Total Allocations	Total Allocations	Total Allocations
Ohio	\$3,454,200	\$5,068,570	\$6,129,950
Oklahoma	1,625,600	2,025,620	2,277,450
Oregon	1,300,900	1,577,750	1,776,050
Pennsylvania	3,914,200	5,790,910	7,035,150
Rhode Island	1,046,150	1,192,190	1,297,800
South Carolina	1,922,400	2,310,540	2,569,700
South Dakota	1,150,650	1,302,070	1,393,350
Tennessee	2,117,650	2,698,070	3,094,100
Texas	3,572,550	5,165,060	6,222,500
Utah	1,173,000	1,325,250	1,424,000
Vermont	1,055,350	1,111,150	1,178,700
Virginia	2,050,150	2,717,470	3,130,600
Washington	1,558,500	2,042,910	2,345,300
West Virginia	1,571,050	1,882,500	2,096,150
Wisconsin	1,919,800	2,572,200	3,009,050
Wyoming	925,450	944,630	992,850
Guam	1,514,950	1,498,370	1,492,450
Puerto Rico	2,142,800	2,502,930	2,748,150
Virgin Islands	<u>1,505,350</u>	<u>1,483,010</u>	<u>1,473,250</u>
Total	100,000,000 ^{a/}	130,000,000 ^{b/}	150,000,000 ^{c/}

a/ \$90 million appropriation with authorization to allocate on basis of \$100 million.

b/ \$91 million appropriated with authorization to allocate \$100 million on basis of per capita income and population. Remaining \$30 million appropriated and allocated on basis of population only.

c/ \$100 million allocated on basis of per capita income and population. Additional \$50 million allocated on basis of population only.